Production Information and Credits

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Welcome!

You are about to start a Professional Development Course which will help you identify the gifted and talented students in your class or your school, and differentiate the curriculum to respond to their individual learning needs. You'll also be able to decide which of your students may benefit from various forms of ability or interest grouping and which may possibly be candidates for one or more of the many forms of academic acceleration.

About the Package

The course consists of six Modules

Each Module consists of three levels: Core, Extension and Specialisation. The Core levels of the six Modules are the heart of this course. The Core Modules contain essential information and practical advice and strategies to assist you to identify and respond to your gifted and talented students.

We strongly suggest that you complete the Core level of each Module.

Pre-tests

We are aware that teachers and school administrators will enter this course with a wide range of existing knowledge of gifted and talented education. To accommodate this range of knowledge and experience, we have started each Core Module, from Module 2 onwards, with a pre-test. We encourage you to take these pre-tests and, if you ‘test out’ on any Module at Core level, simply move on to the next Module. For example, if you ‘test out’ of Core Module 2 you will pass over that Module and move on to Core Module 3.

Extension and Specialisation Levels

Extension and Specialisation levels for each Module. Material covered in the Extension and Specialisation levels builds on the knowledge you will have gained from the Core level in each Module. Key issues are examined in greater depth and participants explore a wider range of issues in the cognitive and social-emotional development of gifted students. New identification, curriculum differentiation and program development techniques are introduced.

The Extension and Specialisation levels require teachers, counsellors and administrators to undertake further reading and practical activities to reflect on classroom practice, school practice and policy. They encourage participants to focus on their specific role in the school and prepare a brief action plan to demonstrate application or mastery of outcomes.

Schools may decide that completion of the course at Specialisation level would be a useful prerequisite for becoming the school's Gifted Education Coordinator.
What will you learn in this course?

The course consists of six Modules:

**Module One: Understanding Giftedness**
Understanding the nature of giftedness and talent; what the terms mean; levels and types of giftedness. Cognitive and affective characteristics of gifted and talented students; ways in which these students may differ from their classmates - even if at first we don’t observe this.

**Module Two: The Identification of Gifted Students**
A range of practical identification procedures, with particular attention to procedures which are effective in identifying gifted students from culturally diverse and disadvantaged groups. We’ll be emphasising the use of a combination of approaches rather than a single measure such as IQ testing or teacher nomination used in isolation.

**Module Three: Social and Emotional Development of Gifted Students**
Understanding the social and emotional characteristics and needs of gifted students. Ways in which gifted students may differ somewhat from their classmates in their social and emotional development. Supporting gifted students and their parents. Teaching strategies and class structures which foster the development of positive social attitudes and supportive peer relationships in gifted students.

**Module Four: Understanding Underachievement in Gifted Students**
Understanding the causes of underachievement in gifted students. Identifying gifted underachievers and planning interventions designed to prevent and reverse cycles of underachievement.

**Module Five: Curriculum Differentiation for Gifted Students**
Teaching strategies and methods of curriculum differentiation which enhance the learning of gifted students in the regular classroom. Appropriate use of different enrichment models that international research has found to be effective with gifted and talented students. Practical applications of pre-testing, curriculum compacting and individualised programming.

**Module Six: Developing Programs and Provisions for Gifted Students**
Practical strategies for the establishment and monitoring of ability, achievement or interest grouping, and the many forms of accelerated progression. Particular attention will be paid to the effects of various strategies on students’ academic and social development.
Using the package

Much of the material is suitable across teaching and learning contexts. This content is not specifically marked. However, content that may be applicable to your particular context is identified as follows:

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Follow these symbols through the content to customise your learning path.

Each Module comes in two parts, each concluding with a practical exercise. We suggest that you complete the first and second parts a few days apart - unless this is not workable in your particular learning context. This will give you a chance to digest the information in Part 1 and work through the Reflective/Practical component.
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Welcome to the fifth Module for this Professional Development Course.

Module 5 is divided into two main sections, Module 5A and Module 5B, which in combination examine the key core issues of curriculum differentiation. You will find a pre-test at the beginning of each section which you are invited to complete before deciding the pathway you will take through each section. You are also encouraged to modify a unit of work that you currently teach as you work through the activities within this Module.

When working through this Module it is strongly advised that the most appropriate mode for professional development in all activities within the Module, is that of individual or small group. The small groups may be organised as faculty or grade teams. This will ensure that appropriate opportunities are provided for professional dialogue and reflection on the content of this Module.
Pre-Test

What do the terms ‘differentiation’ and ‘curriculum compacting’ mean to you? Spend a few moments to write your definitions below:
Briefly look at the examples of unit planning appropriate to your stage of teaching. Choose which one you think best depicts differentiated curriculum. Where can you see evidence of curriculum compacting occurring in these examples?

**Example One**

Mr Symmons is a beginning teacher and has been teaching in a preschool in a coastal town about four hours from the nearest major city. Most children attend the preschool one or two days per week, and there is an even mix of boys and girls on any given day.

The teachers at the preschool plan their program on themes stemming from the children’s interests. The next theme they are going to cover is ‘Dinosaurs’. One morning a few weeks before they were to begin the new theme, one of the boys in Mr Symmons’s Tuesday group had delighted in telling him all about all the different dinosaurs he knew, as well as providing their correct scientific names.

Mr Symmons decided that at the beginning of the unit he would ask this boy to tell the other children about the dinosaurs he knew and then ask the children to draw, paint or make models of the dinosaurs the boy described.

**Example Two**

Located in a remote area of Australia, Mr Cheung is teaching the early childhood unit in a two-teacher school. He has 12 children, aged from 4 years 6 months to 7 years 6 months, who are primarily from remote properties and Indigenous communities. Some of the children have intermittent school attendance patterns and can be absent for weeks at a time, dependent on weather or farming activities.

Mr Cheung has designed an integrated program for each term which is based on a three-year cycle, so that all of the children are able to experience the key early childhood outcomes during that time, as well as develop their literacy and numeracy skills.

Next term, Mr Cheung wants to teach an integrated unit based on the theme of ‘Systems’ in which the children specifically learn about measurement, weather, and transport systems. He has individually pre-tested the children over a few days with a variety of different activities. He has planned whole class, small group and individual activities in response to these results.

He has decided to base these activities on Bloom’s Taxonomy and will encourage the more able students to work at the higher order levels of the taxonomy.

Two of the children demonstrated an excellent mastery of the measurement outcomes in the unit and so Mr Cheung has consulted with his colleague teaching the primary class and subsequently these children will work on measurement outcomes from the primary program to replace the early childhood outcomes already mastered.
Example Three

Mrs Miller is an experienced Year One teacher in a metropolitan primary school. The school population is multicultural and draws from low to middle socio-economic families.

Recently, the Year One and Year Two teams decided to program their literacy and numeracy programs vertically to cater for the wide variety of ability levels in both grades. The children have been placed in groups based on the results of individual running records and PAT Reading test results.

Mrs Miller has volunteered to take the top literacy group and has been planning a unit of work on ‘Fairytales’ using questions designed from each level of Bloom’s Taxonomy. During the unit the children in her group will work on six different activities, one from each thinking level of Bloom’s, and will be able to choose one of these activities to present to the group at the end of the unit.
Each of the examples described shows elements of differentiation and while more information would be needed on each example to make a definite judgement on the level of differentiation and curriculum compacting, the scenario in the box (below) is the most exemplary instance of best practice in differentiation and curriculum compacting.

The criteria for judging your understanding of differentiated curriculum and compacting are:

**Strong understanding:** Identified the example which has three or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from the other two examples, such as lack of theme, pre-testing, curriculum model or compacting.

**Some understanding:** Identified an example with at least two or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from one other example, such as lack of theme, pre-testing, curriculum model or compacting.

**Little or no understanding:** Identified an example with one element of differentiation, such as the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Unable to identify areas of omission from any examples.

The following points about each example can be highlighted:

In **Example One**, Mr Symmons and the other teachers at the preschool use **themes** to plan their teaching units and using themes or key concepts as a starting point for planning differentiated units of work provides teachers with a variety of options to meet individual student needs. The child’s conversation with Mr Symmons about his interest in dinosaurs is a classic example of **incidental or anecdotal pre-testing** and Mr Symmons might have discovered how much information about dinosaurs other children knew if he had designed a pre-test experience for them all. While the young boy may have enjoyed telling other children what he knew about dinosaurs, gifted children are not always good teachers for their peers and the other children may have resented his ‘lesson’. There is **no indication of curriculum compacting** in this unit.

In **Example Two**, Mr Cheung has created a good example of a differentiated unit which is based on a **theme, pre-testing, Bloom’s Taxonomy** and programming for student needs. He has **accelerated** two of the children in the measurement outcomes in consultation with the teachers from the primary unit. (Note, these children will complete the primary outcomes in this maths strand prior to completion of primary school and communication between primary and high school staff will be necessary to ensure a smooth and appropriate transition between both levels of schooling.) **Some curriculum compacting** is occurring in the activities involving Bloom’s Taxonomy, and in the programming for the children who have completed the early childhood measurement outcomes.
In Example Three, Mrs Miller has used Bloom’s Taxonomy to differentiate her teaching program, which is an excellent model to modify process skills in a unit of work. However, it is important that gifted students encounter the higher order thinking skills of this taxonomy with more frequency than the lower order skills. It would be more appropriate in the case of this literacy unit that the gifted children choose fewer tasks based on the lower order questions, more from the higher order questions and choose one of the higher order questions to present to the group. Presenting to their like-minded peers is appropriate as other gifted children will usually appreciate the depth and complexity of such presentations. Curriculum compacting is not evident in this unit from the information given.

Choosing a Pathway

Your responses to this pre-test task should have helped to:

- validate your current understandings of curriculum differentiation and compacting, if you identified the example of best practice.
- delineate the strengths or weaknesses of your understandings of curriculum differentiation and compacting, if you identified the majority of points.
- clarify the areas on which you need to focus while working through Module 5 Parts A and B, if you did not identify the features of differentiated curriculum such as pre-testing and curriculum compacting.

Content Areas of Core Module 5: Part A and Part B

Core Module 5A is divided into Parts 1 and 2 (NB If you feel you have a firm understanding of the basic tenets of differentiation following your responses to the pre-test, you may wish to omit Part 1 and move to Part 2 instead):

- Part 1 (page 8) examines definitions, issues and strategies of differentiation.
- Part 2 (page 15) examines compacting the curriculum through unit planning and pre-testing.

Core Module 5B is also divided into Parts 1 and 2 (NB Pre-tests at the beginning of this module will help you choose a pathway through both parts of the module):

- Part 1 continues the process of differentiation by examining two curriculum models - Bloom’s Taxonomy and the Williams Model.
- Part 2 examines additional strategies that can useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.
Outcomes

At the completion of this half of the Module you will be able to:

- explain the definition and purpose of differentiation, in relation to gifted students specifically.
- analyse the elements of differentiation present in a unit of work.
- describe the process of curriculum compacting.
- develop an outcomes-based pre-test for a unit of work you teach.
This Module introduces the concept of differentiation, and appropriate planning and teaching strategies to achieve differentiation in a classroom environment. Part 1 examines some definitions, and the purpose and need for planning a differentiated unit of work.

**What is curriculum differentiation?**

A ‘one size fits all’ syllabus rarely delivers what provisions it claims. Most state and territory syllabus documents are designed to meet the learning needs of the majority of students in any classroom. Some documents suggest that the ‘special learning needs’ students, as well as gifted students, may necessitate curriculum modification; however, the reality of initiating such modifications in classrooms of 30 or more students is often overwhelming to classroom teachers who may have no previous experience in planning a multi-layered program.

Curriculum differentiation can address this issue and help to cater for the different learning needs of students in any classroom structure. A number of definitions of curriculum differentiation exist, all of which highlight the same main issue:

**Differentiated curriculum addresses the different learning styles and rates of learning of students in both mixed ability and self contained gifted classrooms.**

Classroom structures at any level of schooling are rarely homogeneous and therefore a teacher-directed program set to only one style of learning or one pace of learning will generally fail to meet the needs of the majority of the students in the class.
“Essentially, the aim of differentiating instruction is to maximize each student’s growth by meeting each student where he or she is and helping the student to progress. In practice, it involves offering several different learning experiences in response to students’ varied needs.

Learning activities and materials may be varied by difficulty to challenge students at different readiness levels, by topic in response to students’ interests, and by students’ preferred ways of learning or expressing themselves.

This is not the individual education program (IEP) approach where there are different experiences for all 20-30 students in the class. Typically two to four different learning experience are offered by the teacher, or students are given opportunities to make their own choices.”


Who is curriculum differentiation for, and why use it?

Meeting the needs of all students in the variety of educational settings teachers may find themselves in, such as mixed ability and self-contained gifted classrooms, poses some interesting challenges for educators.

The often resorted to ‘teach to the middle’ approach may in many cases result in frustration for both students and teachers. Some students, often the gifted, experience the frustration of a curriculum that is lacking in challenge and moves too slowly, whilst other students, usually those with special learning needs, experience the frustration of a curriculum that moves too quickly and which lacks the scaffolding and structure on which they need to frame their learning. Such frustration sometimes leads to behaviours which are undesirable and non-productive. These behaviours are not always outwardly visible and disruptive. For some students their frustration is more evident in the level to which they become passive and withdrawn from the learning process.

Curriculum differentiation provides a framework that is better able to address the needs of all learners in the classroom and thus reduce some of the frustrations being experienced by both teacher and students. All students need to regularly experience that moment in their learning where they achieve a ‘personal best - a PB’. In the sporting arena, the achievement of a ‘PB’ is greeted with applause and accolade, and so should it be in the academic arena as well.

When specifically looking at the needs of gifted learners, three important issues of curriculum arise:

- Gifted students need a challenging curriculum that addresses their needs for pace and complexity.
- Gifted students require instruction and scaffolding for their learning but may not require the level of repetition and support needed by other less able students.
Gifted students who have not experienced a differentiated curriculum previously may challenge the process with the ‘it’s not fair that I have to do something that is different/harder/has higher expectations’.

It is very important to establish with all students in your classrooms the understanding that they each have different learning needs and that in a differentiated classroom it is common for students to be using different thinking processes and creating different levels of products. This is not a matter of ‘unfair’ distribution of tasks but rather a system which is fair to all learners in terms of their respective needs.

What are some of the strategies you can utilise to design differentiated curriculum?

So, what are some of the strategies you can use to begin designing differentiated curriculum? Maker (1982) describes curriculum modifications for gifted students as encompassing four areas:

**Content modifications** for gifted students should:

- be abstract, complex, varied
- involve issues of organisation, study of people, methods of inquiry.

**Process modifications** for gifted students should:

- involve higher order thinking processes
- promote creative and critical thinking
- require problem solving
- involve group interaction
- have variable levels of pacing
• allow for debriefing of the process
• involve open-endedness
• allow for freedom of choice.

**Product modifications** for gifted students should:

• involve real world problems
• be for real world audiences
• require real deadlines
• require transformation of learning
• involve appropriate assessment and evaluation
• involve extended or accelerated outcomes.

**Learning environment modifications** for gifted students should:

• be flexible and open
• encourage independent and intrinsic learning
• be accepting and non judgemental
• encourage complex and abstract thought.

Commonsense dictates that the areas of content, process, product and learning environment are where curriculum may also need to be modified for students with special learning needs. However, it is important to note that **teachers new to differentiation may choose to begin by differentiating content or process or product, rather than all of them, until they are both familiar and comfortable with the strategies.**

Additionally, the following strategies will also assist the process of differentiation:

• Assessing students’ prior skills and understandings (see Part 2 of Module 5A).
• Using pre-assessment to compact the curriculum for students who have already mastered the core (see Part 2 of Module 5A).
• Using tiered assignments and/or assessment tasks (see Part 2 of Module 5B).
• Accelerating the pace for gifted students to allow for independent study on student interest (see the Extension level of this Module).
• Flexibly grouping to allow gifted students to work with like-minded peers (see Module 6).
• Designing independent research tasks (see Part 2 of Module 5B) where students learn how to develop and manage their independent learning skills. The degree of complexity of the project will depend on student readiness and independent research may begin as a paired project.
- Negotiating learning contracts where a written agreement between teacher and student results in students working independently. The contract helps students to set daily and weekly work goals and develop management skills. It also helps the teacher keep track of student progress (see Part 2 of Module 5B).

- Creating learning centres, particularly in early childhood and primary classrooms. It is important to note that a learning centre is not necessarily differentiated unless the activities are varied by complexity, taking into account different student ability and readiness. It is also important that students understand what is expected of them in any task they choose from the learning centre and that they are encouraged to develop time management skills to complete these tasks.

- Becoming a teacher as a facilitator rather than a director of learning.
Reflective/Practical Component

Having worked through Part 1 of this Module, how would you now define the terms compacting and differentiation? Do you need to modify your original definition? If so, re-work your definition in the space below.

Which aspects of differentiated curriculum would you find most difficult to implement?

Compare your responses.
Now evaluate the level of differentiation in a unit of work you have taught previously, or alternatively, a unit of work you want to teach. Use the questions below to guide you and note down some of your thoughts in the spaces provided.

Was/Is the content appropriate for the class?

- Was/Is the level of content offered suitable for each of the abilities within the range in your class?
- Did/Will you pre-test the outcomes for the content of this unit?
- Did /Will you make any changes to the content from your original program? Why?
- Might you change any of the content in any future teaching of the unit? Why or why not?

Were/Are the processes in the teaching toward the outcomes in this unit appropriate for the class?

- Was/Is the pace of instruction offered suitable for each of the ability groups in your class?
- Did/Will you pre-test the skills-based outcomes of the unit?
- Did/Will you make any changes to the higher order thinking skills from your original program? Why?
- Might you change any of the process strategies in any future teaching of the unit? Why or why not?

Were/Are the products required appropriate for the unit outcomes?

- Were/Are the types of products offered suitable for each of the ability groups in your class?
- Did/Will you make any changes to the products required from your original program? Why?
- Might you change any of the products in any future teaching of the unit? Why or why not?

Was/Is the learning environment appropriate for the class?

- Did/Will any of the ability groups in your class require modifications to the learning environment?
- Did/Will you make any changes to the learning environment from your original program? Why?
- Might you change any aspects of the learning environments in any future teaching of the unit? Why or why not?
What does the term ‘compacting the curriculum’ mean?

There are six key steps to curriculum compacting:

- identifying the outcomes
- pre-testing the outcomes
- eliminating the areas of repetition
- streamlining the learning experiences
- offering enrichment, extension and/or acceleration - matching student need to intervention
- documenting the process.

How do you incorporate curriculum compacting into unit planning?

In this section, you are encouraged to begin the process of curriculum differentiation and curriculum compacting by mapping a unit of work that you will teach in the near future.

Examples of unit planning for different levels of schooling can be found in the resource section of this Module and it is suggested that these may be useful as a model when mapping a differentiated unit for the first time.

Resource section:
Example of Early Childhood unit planning (page 50)

Two alternative methods might be used in this process, dependent on preference of planning as shown in the following flowcharts. NB: The examples show five contributing questions but this may vary from three to five depending on the time frame of the unit:
Method One

- Pre-testing core outcomes to establish prior understandings and skills of students
- Core contributing question + core assessable outcomes
  - Core contributing question + core assessable outcomes
  - Core contributing question + core assessable outcomes
  - Core contributing question + core assessable outcomes
  - Core contributing question + core assessable outcomes

Extended question + extended outcomes
Method Two

These methods differ only in the point at which the outcomes are involved in the planning process. Curriculum compacting occurs in the planning that follows the pre-testing and may involve extended outcomes, independent research projects and/or acceleration of outcomes. In Module 6, acceleration and grouping will be addressed in detail.

**Method One** is useful for units where the theme, or the ‘big idea’, is the first point in the planning process. In states where mandatory content outcomes must be addressed in the teaching and learning process, it may be more appropriate to use **Method Two**.
The following pages step out the two different methods of unit planning:

**Method One**

Using a concept map (page 51), flowchart (page 51) or a list (page 52) from the resource section, work through the following steps (NB the given example is a generic unit of work for teachers which is based on the topic of curriculum differentiation):

**Step One:** Choose a theme which incorporates the basis of the unit. For example abstract nouns often serve as useful themes:

- Change
- Systems
- Growth
- Power
- Freedom
- Democracy
- Tolerance
- Persecution
- Traditions
- Survival
- Communication
- Justice
- Time
- Truth, and so on.

NB: Be careful not to mistake a topic for a theme; eg, ‘Electricity’ is a topic, ‘Systems’ is a theme.
**Step Two:** Construct a focus question which links to the theme. This question should set the focus for all students working on this unit, regardless of their ability level, and should require substantial thinking or study to answer it.

For example, on the theme of ‘Systems’, the focus question might be: ‘Does curriculum differentiation ensure learning for all?’ or ‘How and why is curriculum differentiation important?’

**Step Three:** The core contributing questions for the unit are constructed next. The number of questions needed depends on the length of the unit and the age group being taught.

For example, in an early childhood unit of work, teachers may decide that three questions are enough to address in a term’s unit of work, whereas teachers in primary classrooms may extend that to four or five questions throughout a term. One contributing question may take two to three weeks to address in early childhood or primary classrooms.

In secondary classrooms, where units may only be taught for half a term or less, contributing questions may be addressed in shorter time periods.

The contributing questions should be designed to support the theme and the focus question. The key or assessable core outcomes are then matched to the core contributing questions. In some states, the core outcomes are also the assessable outcomes; however, in other cases there is a difference between assessable and indicative outcomes and teachers may choose to match only the assessable outcomes in the planning stage.
The following example illustrates the planning of the theme, focus question, contributing questions and outcomes for this Module of the Professional Development course on curriculum differentiation:

Step Four: Once the contributing questions have been established, a set of extended questions should be developed from the core contributing questions. These questions will be the framework for the extension activities designed for gifted students. NB: If differentiating for all levels in a mixed ability classroom, a set of support or structured questions may also be designed for students with special learning needs.

Theme: Systems

Focus Question: Does curriculum differentiation ensure learning for all?

Contributing Question One: Which students need a differentiated curriculum and why?

Extended Question: Is differentiation the only choice available to cater for student differences?

Extended Question: How do we measure the impact of curriculum differentiation on students?
Contributing Question Two: In what areas can we differentiate the curriculum?

Extended Question: Is differentiation only effective if used in all areas of the curriculum?

Extended Question: Are process modifications the most important part of curriculum differentiation?

Contributing Question Three: In what ways can pre-testing help differentiate the curriculum?

Extended Question: Is pre-testing only effective when there are objective criteria to judge performance?

Extended Question: Should pre-testing be matched with post-testing to judge learning gain?

Contributing Question Four: What models can we use to modify the curriculum for all levels of ability?

Extended Question: Is any one curriculum model better than the others for differentiation and why?

Extended Question: Are some models more appropriate for different levels of schooling and different subjects?

Contributing Question Five: What strategies can we use to differentiate the curriculum?

Extended Question: Can freedom of choice be the best option for curriculum differentiation?

Extended Question: Do students always choose appropriately difficult tasks?
What content outcomes do your students already know before beginning the unit of work?

What skills outcomes have your students already achieved prior to this unit of work?

Once the unit has been mapped out, the next step is to design ways to assess prior learning. In this design, it is important to:

- take into account the variety of student learning styles, so that all students have the opportunity to demonstrate what they understand and what skills they already possess.
- pre-test the key or assessable outcomes.
- pre-test students individually and not as a group or a class, to allow all students a chance to respond.
- make sure that students have encountered the style of pre-test previously, eg, if students have not used a Venn diagram before, teach them the skill first then use the strategy as a pre-test.

The following list of ideas may be helpful in the construction of pre-tests for your unit of work:

- Concept maps - Resource section page 53
- Venn diagrams - Resource section page 53
- Flow charts - Resource section page 54
- Draw a diagram, picture
- Written response
- Picture matching - Resource section page 54
Experimental design
Label a diagram - Resource section page 55
Multiple choice
Short answers
Essay response
Problem solving
Hypothesis-based responses
Cloze passage
Make a model
Hands-on activities
Bloom’s Taxonomy questions (one from each level)

**Important points to remember**

- Pre-tests can, and should, be administered well in advance of the start of the unit of work to allow time to differentiate the unit activities appropriately.
- Some students suffer from test anxiety and may not be able to respond to the pre-test activity to the best of their ability if they perceive that the pre-test will be reportable. It is often better to explain to your students that you are planning the next unit you will be teaching them and would like to find out if they know any of the content or if they can do any of the skills prior to beginning the unit. This way you can reassure the students that the purpose of the activity is to help with planning rather than to assess and report on them.
- Pre-tests should not be displayed in the classroom nor added to portfolios, as their purpose is for diagnosis of content and skills needs only.
- Students do not need to achieve 100% accuracy on a pre-test activity to demonstrate mastery of an outcome. **Accuracy or competency equating to 85% or greater demonstrates a mastery level for which extension is essential.**
- To evaluate student mastery of an outcome, objective criteria for each outcome being pre-tested should be developed. For example, what does a student need to include in a pre-test to be evaluated as ‘working at grade level’ and therefore a candidate for extension?

Pre-testing should not be a lengthy process:

For example, pre-tests can be administered as one activity in a set of rotational activities. It is often quite difficult to pre-test younger children as a whole class, particularly if you want to take anecdotal notes while the children are working on the task. At this age, children often ‘norm reference’ their ideas or work with other children and it is important to observe their behaviours during the pre-test activity.
Self Assessment

Choose at least two different styles from the suggested list (or any which are not mentioned) and design two outcomes-based pre-tests for the unit of work you have been mapping.

Trial your pre-tests with your class and collect work samples representing each level of the reporting descriptors, or grades, you use in your school.

For example:

- working towards grade, working at grade, working beyond grade
- experiencing difficulty, developing, competent, highly developed
- band one, band two, band three.

Module 5B Parts 1 and 2 will discuss ways of differentiating the curriculum for those students who have demonstrated some or all mastery of the outcomes you have pre-tested and who should subsequently work on the extended questions from the unit concept map.

Why use a curriculum model when differentiating the curriculum?

It is important that curriculum differentiation is based on the application of one or more models to carry out the instructional outcomes of the proposed program or unit of work. The model or models chosen should have research to support that they produce ‘substantial’ gains in the areas of academic, social, or emotional development. The models explained in Module 5B have been chosen because they meet these parameters.

References


Websites

Inspiration Software, Inc - Visual learning tools: www.inspiration.com

Houghton Mifflin: Education Place - graphic organisers in .pdf format to download: http://www.eduplace.com/graphicorganizer/
Core Module 5B

Pre-Test

How familiar are you with the strategies of Bloom’s Taxonomy and the Williams Model? By completing the following pre-tests you will have the opportunity to decide which pathway you need to take through this part of Module 5:

**Bloom’s Taxonomy**

Read through the activities [for your level of teaching] and identify which of Bloom’s strategies is represented by each.

1. Write or draw what living things need to grow.
2. Do you think living things should be kept in zoos? Why or why not? Give a talk to the class explaining your ideas.
3. Draw or paint 3 living things and 3 non-living things.
4. Choose a living thing you are interested in and design a poster which tells people how to care for it.
5. Choose two different living things. Draw a picture sequence for each, showing how it grows and changes.
6. Make a model of the habitat of one living thing.
The Williams Model

Read through the activities for your level of teaching and identify which Williams Model strategies are represented by each.

(Note that while the model offers 18 different teaching strategies, the pre-test targets a selection of 6 of these strategies.)

1. How is a living thing like a house?
2. What if you could save one of the endangered animals of the world? Which one would you choose?
3. What would the world be like if there were no birds?
4. Should we have zoos or should all animals be free?
5. Design a habitat for your imaginary creature.
6. Which living thing are you most like and why?
Bloom’s Taxonomy

Please note that the first answer for each question is from the original version of Bloom’s Taxonomy and the second from the revised version of the model.

The criteria for judging your understanding of Bloom’s Taxonomy are:

**Strong understanding:** Accurately identified five or six examples of Bloom’s strategies.

**Some understanding:** Accurately identified three or four examples of Bloom’s strategies.

**Little or no understanding:** Accurately identified two or fewer examples of Bloom’s strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of Bloom’s Taxonomy, you may choose to omit the section on Bloom’s Taxonomy and attempt the Williams Model pretest (page 26).

1. Write or draw what livings things need to grow.
   KNOWLEDGE / REMEMBER

2. Do you think living things should be kept in zoos? Why or why not? Give a talk to the class explaining your ideas.
   EVALUATION / EVALUATE

3. Draw or paint 3 living things and 3 non-living things.
   COMPREHENSION / UNDERSTAND

4. Choose a living thing you are interested in and design a poster, which tells people how to care for it.
   SYNTHESIS / CREATE

5. Choose two different living things. Draw a picture sequence for each showing how it grows and changes.
   ANALYSIS / ANALYSE

6. Make a model of the habitat of one living thing.
   APPLICATION / APPLY
Williams Model

The criteria for judging your understanding of the Williams Model are:

**Strong understanding:** Accurately identified five or six examples of the Williams strategies.

**Some understanding:** Accurately identified three or four examples of the Williams strategies.

**Little or no understanding:** Accurately identified two or fewer examples of the Williams strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of the Williams Model, you may choose to omit the section on the Williams Model and attempt Module 5B Part 2 (page 40).

1. How is a living thing like a house?
   ANALOGY

2. What if you could save one of the endangered animals of the world? Which one would you choose?
   TOLERANCE FOR AMBIGUITY

3. What would the world be like if there were no birds?
   DISCREPANCY

4. Should we have zoos or should all animals be free?
   PROVOCATIVE QUESTION

5. Design a habitat for your imaginary creature.
   VISUALISATION

6. Which living thing are you most like and why?
   INTUITIVE EXPRESSION
Choosing a Pathway

Your responses to this pre-test task should have helped to:

- validate your current understandings of Bloom’s Taxonomy and the Williams Model if you correctly identified all of the activities.
- delineate the strengths or weaknesses of your understandings of Bloom’s Taxonomy and the Williams Model, if you correctly identified the majority of the activities.
- clarify the areas on which you need to focus whilst working through Module 5 Part B.

Content Areas of Core Module 5: Part B

Core Module 5B is divided into Parts 1 and 2:

- Part 1 continues the process of differentiation by examining the curriculum models of Bloom’s Taxonomy and the Williams Model.
- Part 2 examines strategies that can be useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.

Outcomes

At the completion of this half of the Module you will be able to:

- develop differentiated activities for gifted students using Bloom’s Taxonomy or the Williams Model.
- develop an independent study project using the Kaplan Model.
- select and apply appropriate strategies for implementing differentiation in your specific area of teaching.
This Module continues the process of differentiation by developing appropriate planning and teaching strategies using the curriculum models of Bloom’s Taxonomy, the Williams Model and the Kaplan Model.

**How do you extend students who have demonstrated competency in the outcomes based pre-tests?**

Passow (1988) proposed the following criteria to gauge whether the curriculum presented to gifted students is appropriate:

- **Would** all students **want to be involved** in such learning experiences?
- **Could** all students **be involved** in such learning experiences?
- **Should** all students **be expected to succeed** in such learning experiences?

The answer to these three questions should be ‘no’ if the curriculum is to be appropriate only for the gifted students in your class. If the answer is ‘yes’ then the curriculum is suitable for all students.

It is important to understand that all students benefit from enrichment opportunities and they should not be denied these opportunities. However, gifted students need to experience curriculum that is beyond this level of enrichment and extends their understandings and skills in complex and challenging ways.

**How do you extend students’ critical thinking skills?**

*Judge a man by his questions rather than his answers. Voltaire*

Bloom’s Taxonomy (1956) was constructed as a means to develop the higher order thinking skills of students by taking them through a sequential hierarchical progression. Bloom intended the taxonomy to be applicable to all age groups, subject areas and ability levels, so you will also find the strategies he developed used in adult training.

However, it is also important to note that the amount of time that should be spent on the strategies at each level of the hierarchy differs in relation to the ability level and prior knowledge of students.
For example, the following diagrams, developed by Davis and Rimm (2004), illustrate the difference between the way Bloom’s Taxonomy should be used for core students and for gifted students.

This first version of the model is suitable for students working at the core level of the curriculum. Students working at the core level of the curriculum should have access to all levels of the taxonomy but should spend more learning time using the lower order strategies of knowledge, comprehension and application, as they work towards the higher order thinking skills.
While gifted students need to acquire, comprehend and apply the knowledge relating to any discipline, they may come with, or rapidly acquire, the knowledge base and it is more important for them to spend a greater proportion of their time analysing, synthesising and evaluating this knowledge.

**How do the six different levels of Bloom’s Taxonomy develop thinking skills?**

As Bloom’s Taxonomy is hierarchical, each level builds on the skills of the level before it. For example, in order for a student to apply the knowledge they have acquired, they must first be able to comprehend it. The following table provides a definition and examples of each level.

Note that the revised version of Bloom’s Taxonomy, by Anderson and Krathwohl (2001), is included in the brackets.
<table>
<thead>
<tr>
<th>Bloom's strategy and definition</th>
<th>Examples of question stems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge (Remember): Mastery of facts, terminologies, conventions, trends, classifications,</td>
<td>What did the ________ say about______?</td>
</tr>
<tr>
<td>categories, methodologies, principles, generalisations, theories and structures. Retrieval of knowledge from long-term memory.</td>
<td>Who invented ________?</td>
</tr>
<tr>
<td></td>
<td>When did _______ discover _____?</td>
</tr>
<tr>
<td></td>
<td>Which _________ decided _____?</td>
</tr>
<tr>
<td>Comprehension (Understand): Translation, interpretation and extrapolation of knowledge.</td>
<td>Who do you think _________?</td>
</tr>
<tr>
<td>Construction of meaning from oral, written and graphical communication.</td>
<td>What was the main idea _____?</td>
</tr>
<tr>
<td></td>
<td>Can you briefly outline ________?</td>
</tr>
<tr>
<td></td>
<td>What does ________ show us?</td>
</tr>
<tr>
<td>Application (Apply): Application of previously encountered rules or concepts to new situations</td>
<td>How could you illustrate _____?</td>
</tr>
<tr>
<td>and the transfer of understanding to other concrete, real-life and hypothetical situations.</td>
<td>What questions would you ask_?</td>
</tr>
<tr>
<td></td>
<td>How could you model ________?</td>
</tr>
<tr>
<td></td>
<td>Which factors would you change?</td>
</tr>
<tr>
<td>Analysis (Analyse): Deconstruction of knowledge to be able to infer assumptions and points of</td>
<td>How is _____ similar to _____?</td>
</tr>
<tr>
<td>view; distinguish fact from opinion and relative importance of details; identify underlying</td>
<td>What must you know for _____ to be true?</td>
</tr>
<tr>
<td>motives, frameworks of ideas, problems, tone and mood; recognise fallacies, bias and purpose;</td>
<td>What was the underlying theme of ______?</td>
</tr>
<tr>
<td>relate cause and effect.</td>
<td>How did _____ compare with _____?</td>
</tr>
<tr>
<td>Synthesis (Create): Creation of new and unique products by combining elements of understanding;</td>
<td>What would happen if _______?</td>
</tr>
<tr>
<td>recognition of elements in new patterns or structures. Product may result from hypothesising,</td>
<td>Can you design a ____ to ______?</td>
</tr>
<tr>
<td>designing and constructing unique communications, plans, abstract relationships.</td>
<td>How many ways can you ______?</td>
</tr>
<tr>
<td></td>
<td>Can you see a possible solution to ________?</td>
</tr>
<tr>
<td>Evaluation (Evaluate): Ability to make judgements, choices or decisions based on predetermined</td>
<td>How effective is ___________?</td>
</tr>
<tr>
<td>standards or criteria from internal and/or external evidence.</td>
<td>Do you believe ________? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>What do you think about ________? Justify your position.</td>
</tr>
<tr>
<td></td>
<td>What changes to ______ would you recommend?</td>
</tr>
</tbody>
</table>

Adapted from Gross, MacLeod, Drummond & Merrick (2001); Anderson & Krathwohl (2001).
How does this apply to classroom practice?

The important thing is to not stop questioning. Albert Einstein

Bloom’s Taxonomy strategies can be used in a variety of ways in the classroom and do not always need to lead to a physical product. For example, questions framed from the taxonomy might be used as discussion starters and the taxonomy itself may be taught to the students to provide them with a greater understanding of the requirements of each level within it.

The following strategies are suggested as some possible ways of implementing Bloom’s Taxonomy in the classroom:

- Discussion starters
- Small group activities
- Independent research tasks
- Contract sheets which allocate a different proportion of questions at different levels
- Pre-tests
- Post-tests
- Assessments
- Learning centres

Examples of Bloom’s Taxonomy activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations.

Resource section: Early Childhood selected examples of Bloom’s Taxonomy activities.

Literacy: - Resource section page 56
Numeracy: - Resource section page 57
What are some of the strategies you can use to develop students’ creative and divergent thinking skills?

An excellent model to develop creative and divergent thinking skills with students is the Williams Model (1993). This three-dimensional model focuses on:

**Dimension One:** the subject matter of the curriculum;

**Dimension Two:** the teaching strategies that stimulate positive learning behaviours;

**Dimension Three:** the development of cognitive-intellective and affective-temperament behaviours of students, using the following strategies:

- Fluency - measured by number of responses to a theme
- Flexibility - measured by the variety of changes or categories
- Originality - measured by degree of unusual or uncommon responses
- Elaboration - embellishment or expansion of the idea
- Risk-taking - willingness to try different or difficult things
- Curiosity - ability to seek many alternatives, depth of study
- Complexity - capacity to explore or discover
- Imagination - power to visualise, dream or conceive forms of action symbolically

The following table lists the 18 teaching strategies from Dimension Two of the model:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: ‘Necessity is the mother of invention’.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories.</td>
</tr>
<tr>
<td>Listing</td>
<td></td>
<td>Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the 'Brotherhood' use the five-pointed star as their symbol of recognition? If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Provocative Question</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it? What does a ‘Renaissance man' have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women'?</td>
</tr>
<tr>
<td>Examples of Change</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives? Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Examples of Habit</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used? Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Organised Random Search</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood'? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>Skills of Search</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Tolerance for Ambiguity</td>
<td>Open-ended questions – 'what if…?'</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
<tr>
<td>Intuitive Expression</td>
<td>Expressing emotion through the senses; guided imagery; role-playing</td>
<td>Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather. You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police?</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Adjustment to Development</td>
<td>Examine or playback mistakes or failures</td>
<td>As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched? Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success.</td>
</tr>
<tr>
<td>Study Creative Process</td>
<td>Analyse the traits of creative people, creative processes or creative products</td>
<td>Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions? Learn about the work of one of the female artists attached to the ‘Heidelberg School’.</td>
</tr>
<tr>
<td>Evaluate Situations</td>
<td>Analyse implications or consequences, extrapolate from ideas or actions</td>
<td>A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why? The spice trade, coffee trade and now the drug trade – how have plants altered the course of history?</td>
</tr>
<tr>
<td>Creative Reading Skill</td>
<td>Generate novel ideas by reading</td>
<td>Read Journey to Antarctica by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent? Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition?</td>
</tr>
<tr>
<td>Creative Listening Skill</td>
<td>Generate novel ideas by listening</td>
<td>Interview an inventor to discover when he or she became interested in inventing new things or ideas. Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time?</td>
</tr>
</tbody>
</table>
Creative Writing Skill
Generate novel ideas in writing
Rewrite a fairytale so there is no reference to numbers.
Write a short story for Louisa Lawson's magazine, The Dawn.

Visualisation
Express ideas in three-dimensional or non-traditional formats
Help to plan and create a mural for your class based on the book.
Construct a scale model of the Roman Forum or the Athenian Acropolis.

Adapted from: Gross, MacLeod, Drummond & Merrick (2001) and Gross, MacLeod & Pretorius (1999).

Examples of Williams Model activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations:

Resource section: Early Childhood selected examples of Williams Model activities.

Literacy: - Resource section page 58
Numeracy: - Resource section page 58
Reflective/Practical Component

Using as models examples of either Bloom’s Taxonomy or the Williams Model from the support materials, develop differentiated activities for gifted students in your classroom. These activities should relate to the extension questions you developed for the concept mapping of your unit.

Use the Bloom’s Taxonomy (page 59) or Williams Model blank matrix (page 60) found in the Resource section as a scaffold to construct these activities. **It is not necessary to write all strategies for each unit of work but it is important to ensure that your students access a variety of strategies throughout the unit.**
Part 2 examines some of the ways of implementing differentiation in the classroom and introduces the Kaplan Model as a scaffold for developing independent research projects for gifted students.

What are some ways that curriculum differentiation can be implemented in the classroom?

A variety of strategies may be used to implement curriculum differentiation in the classrooms:

- **Pre-testing** (see Module 5A).
- **Compacting** (see Module 5A).
- **Developing tiered instruction** - the teacher develops a series of activities based on the same area of study but hierarchical in nature and complexity. Students begin activities at a level appropriate to their ability.
- **Negotiating contracts** - an agreement between the student, teacher and sometimes parent that results in the student working independently with varying levels of guidance.
- **Designing independent study or research projects** - a research project where students learn how to develop the skills for independent learning. The degree of help and structure will vary between students and depend on their ability to manage ideas, time and productivity.
- **Utilising paired and small group work** - expectations that the students work together in the collection, analysis and organisation of information but that each student prepares an individual product to demonstrate that learning has taken place.
• **Introducing future studies** - predicting, hypothesising, problem solving, finding possible solutions and hindsight.

• **Initiating negotiated curriculum** - students set their own topic, time span, and ways of presenting work.

**How do you develop Independent Study or Research Projects for gifted students?**

Kaplan (1979) listed the following principles as a guide in making curriculum decisions for gifted students:

1. Focus on major issues and concepts.
2. Emphasis on a large knowledge base.
3. Use of activities that show how subjects relate.
4. Emphasis on in-depth research.
5. Teaching of thinking skills.
6. Higher order thinking incorporated into all instruction.
7. Increased complexity and pace.
8. Focus on student self-direction.

The Kaplan Model (1986) examines curriculum differentiation in the areas of content, process, product and learning environment and the model provides an excellent scaffold for developing theme-based independent research or study projects.
In an independent investigation:
1. Students are attempting to answer a question through research.
2. Students need to use a variety of resources.
3. Students need to communicate their findings in an effective manner.

To do so, students must:

• review the literature to find out what is already known about the topic.
• generate questions about a self-selected or teacher-selected topic.
• select one question.
• formulate one or more hypotheses about the question.
• design a way to answer the question or assess whether or not the hypothesis is true.
• collect and analyse information.
• form conclusions about the question or hypothesis.
• present conclusions to an appropriate audience.
• present questions for further research.

The following are the steps of development of such projects. (NB the given example is a generic independent research task for teachers which is based on the topic of curriculum differentiation, introduced in Module 5A). You may like to use the blank Kaplan Grid (pg __) from the Resource Section to develop an independent research project for your unit of work as you work through this section.

**Step One:** Choose a key word, theme and discipline/s on which to base the project. Note that it is often appropriate to use the theme of the core unit of work being implemented. It may be necessary to choose two key words to create more complex projects.

**Key Words**

<table>
<thead>
<tr>
<th>Kinds</th>
<th>Relationship</th>
<th>Types</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Purpose</td>
<td>Style</td>
<td>Conditions</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>Importance</td>
<td>Characteristics</td>
</tr>
</tbody>
</table>
**Themes**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Power</th>
<th>Change</th>
<th>Leisure</th>
<th>Freedom</th>
<th>Commitment</th>
<th>Life</th>
<th>Unity</th>
<th>Freedom</th>
<th>Peace</th>
<th>Courage</th>
<th>Ownership</th>
<th>Work</th>
<th>Work</th>
</tr>
</thead>
</table>

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step Two:** Choose the core or extended outcomes to be addressed by the project from the appropriate syllabus documents.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1 Module 5B Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step Three: Determine the research skills to be developed by this project.

Research Skills

- Taking notes
- Using a classification key
- Interviewing
- Using reference resources
- Computerised bibliographic research
- Reporting research
- Designing a research method
- Establishing criteria to judge
- Using a retrieval system
- Using a card catalogue
- Taking a survey
- Observing detail through verbal/visual description
- Using journals, magazines, newspapers
- Writing abstracts
- Analysing, interpreting data
- Outlining
- Substantiating with evidence
- Using fiction and non-fiction

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1</td>
<td>Designing a research method;</td>
<td>Establishing criteria to judge</td>
<td>Product</td>
</tr>
<tr>
<td></td>
<td>Module 5B Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Step Four:** Choose a critical and creative thinking skill to be developed through the project. These skills may be selected from Bloom’s Taxonomy and the Williams Model (see Module 5B Part 1):

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of</td>
<td>Module 5A</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td>Evaluate situations</td>
</tr>
<tr>
<td>Systems</td>
<td>Outcome 1</td>
<td>Establishing criteria to judge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step Five:** Choose a product or choice of products, which will reflect the outcomes and skills of the project. The following list may be useful but is by no means exhaustive:

- Self-evaluation
- Editorial
- Opinion
- Debate
- Story
- Written report
- Diagram
- News article
- Chart
- Advertisement
- Cartoon
- Model
- Recipe
- Illustration
- Invention
- Mobile
- Television show
- Map
- Structure
- Diorama
- Puppet show
- Sculpture
- Pantomime
- Puzzle
- Set of photographs
- Magazine
- Simulation
- Newspaper
- Play
- Book
- Demonstration
- Tape
- Teaching lesson
- Filmstrip
- Computer program
- Recommendation
- Scrapbook
- Letter
- Research report
- Journal
- Bulletin board
- Panel discussion
- Exhibit
- Poem
- Oral presentation
- Value statement
- Graphic representation
- Survey questionnaire
- New game
**Step Six:** Develop an implementation sequence for the project in consultation with the student or students involved.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td>Research report - multimedia format</td>
</tr>
<tr>
<td></td>
<td>Outcome 1</td>
<td>Establishing criteria to judge</td>
<td>Evaluate situations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Implementation Sequence:

1. Students will develop a differentiated unit of work to implement with their class in order to answer the question: How do we measure the impact of curriculum differentiation on students?
2. Students will design a research method.
3. Students will develop criteria for measuring curriculum differentiation's impact on students.
4. Students will collect data to analyse.
5. Students will analyse data and draw conclusions.
6. Students will create a multimedia presentation as a synthesis of their findings.

Resource section: Early Childhood example of Kaplan Model independent research projects.
Resource section page 63
If you have not yet done so, continue the modification of your unit of work by adding an independent research task for gifted students, using the blank Kaplan Model Grid (page 62) in the Resource section.

Alternatively, develop an implementation plan which maps out the timeline of the unit (as shown in the Kaplan grid example (page 63).

For further reading – An interesting article on differentiation by Sandra Berger may be found after the Resource Section should you like to further explore the elements of differentiating the curriculum.
Further References


Websites

Professional Support and Curriculum. NSW Department of Education and Training:

The Learning Place: EQ Gifted and Talented Education:
Method One

Concept Map

Flow chart

Simple Flow Chart

Complex Flow Chart
List

Theme:
Focus Question:

Contributing Question One:
Extended Question:
Extended Question:

Contributing Question Two:
Extended Question:
Extended Question:

Contributing Question Three:
Extended Question:
Extended Question:

Contributing Question Four:
Extended Question:
Extended Question:

Contributing Question Five:
Extended Question:
Extended Question:
Construction of pre-tests for your unit of work

Concept Map

Venn diagram
Flow chart

Simple Flow Chart

Complex Flow Chart

Picture matching

Books

Sheet Music

Lion
Label a diagram

Trunk

Leaves / Canopy

Branch

Grass
Early Childhood selected examples of Bloom’s Taxonomy activities.

**Literacy**

Responding to *I Spy: An Alphabet in Art* by Lucy Micklethwait

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Make an A – Z picture list of the images hidden in each artwork.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Can you write the words for these images?</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Make models of the letters of the alphabet.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Compare two different artworks from the book. Give a talk to explain how they are alike and unlike.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Choose three letters of the alphabet and paint or draw your own ‘I Spy’ pictures for them.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Which was your favourite picture in the book ‘I Spy’. Why?</td>
</tr>
</tbody>
</table>


**Bronwyn MacLeod, 2004.**
**Numeracy**

Responding to *I Spy: Shapes in Art* by Lucy Micklethwait

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Draw pictures of the different shapes hidden in each artwork.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Explain to a friend what at least three of the shapes in the book look like.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Use craft materials to make each of the shapes you found in the book. Or make a collage of all of the shapes in the book.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>What makes the shapes similar or different? Identify and explain the differences between flat and solid shapes.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Create a chart which could be used to teach younger children all of the shapes from the book and their important features.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Which picture in the book helped you to learn the most about a shape? Why?</td>
</tr>
</tbody>
</table>


**Bronwyn MacLeod, 2004.**
Early Childhood selected examples of Williams Model activities.

Early Childhood:
Williams – Literacy & HSIE/SOSE
Theme: Systems
Focus Question: What systems help us live in our community?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogy</td>
<td>How is our community like an airport?</td>
</tr>
<tr>
<td>Creative listening skills</td>
<td>What sounds can you hear in your community? Find a way to make some of those sounds with recycled materials.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Help to plan and create a class mural of your community.</td>
</tr>
<tr>
<td>Intuitive expression</td>
<td>Imagine a new child has come to your school from another area. Role play with a partner how you would make this child feel welcome.</td>
</tr>
<tr>
<td>Attribute listing</td>
<td>List the most important services that help to make our community work.</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if you were a ____________ for the day? What would you do? What would you change? How would you feel?</td>
</tr>
</tbody>
</table>

Early Childhood:
Williams – Numeracy
Theme: Patterns
Focus Question: Are patterns in nature important, and why?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>Patterns are everywhere but do we really notice them?</td>
</tr>
<tr>
<td>Skills of search</td>
<td>Research and find how many different patterns there are in the playground. Which ones are from nature and which ones are man-made? Devise a way to present your findings.</td>
</tr>
<tr>
<td>Evaluation of situations</td>
<td>Triangles can make almost any pattern. Find a way to prove this by drawing as many patterns as you can using triangles.</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if patterns could only have straight sides? What patterns wouldn’t we have any more? Choose two patterns from nature and draw what they would look like with only straight sides.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Create a class exhibition of all the patterns that can be found in your school.</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is a sunflower like an orange?</td>
</tr>
</tbody>
</table>
### Bloom's Taxonomy Blank Matrix

<table>
<thead>
<tr>
<th>Bloom Strategy</th>
<th>Activity or activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/Remembering</td>
<td></td>
</tr>
<tr>
<td>Comprehension/Understanding</td>
<td></td>
</tr>
<tr>
<td>Application/Applying</td>
<td></td>
</tr>
<tr>
<td>Analysis/Analysing</td>
<td></td>
</tr>
<tr>
<td>Synthesis/Creating</td>
<td></td>
</tr>
<tr>
<td>Evaluation/Evaluating</td>
<td></td>
</tr>
</tbody>
</table>
## William’s Model Blank Matrix

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: ‘Necessity is the mother of invention’. When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories. Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Listing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend? How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the ‘Brotherhood’ use the five-pointed star as their symbol of recognition? If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>Provocative</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it? What does a ‘Renaissance man’ have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women’?</td>
</tr>
<tr>
<td>Question</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples of</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives? Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples of</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used? Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Habit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organised</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood’? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>Random</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Skills of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerance for</td>
<td>Open-ended questions – ‘what if…?’</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
<tr>
<td>Ambiguity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intuitive Expression</td>
<td>Expressing emotion through the senses; guided imagery; role-playing</td>
<td>Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather. You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police?</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Adjustment to Development</td>
<td>Examine or playback mistakes or failures</td>
<td>As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched? Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success.</td>
</tr>
<tr>
<td>Study Creative Process</td>
<td>Analyse the traits of creative people, creative processes or creative products</td>
<td>Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions? Learn about the work of one of the female artists attached to the ‘Heidelberg School’.</td>
</tr>
<tr>
<td>Evaluate Situations</td>
<td>Analyse implications or consequences, extrapolate from ideas or actions</td>
<td>A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why? The spice trade, coffee trade and now the drug trade – how have plants altered the course of history?</td>
</tr>
<tr>
<td>Creative Reading Skill</td>
<td>Generate novels ideas by reading</td>
<td>Read Journey to Antarctica by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent? Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition?</td>
</tr>
<tr>
<td>Creative Listening Skill</td>
<td>Generate novel ideas by listening</td>
<td>Interview an inventor to discover when he or she became interested in inventing new things or ideas. Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time?</td>
</tr>
<tr>
<td>Creative Writing Skill</td>
<td>Generate novel ideas in writing</td>
<td>Rewrite a fairytale so there is no reference to numbers. Write a short story for Louisa Lawson’s magazine, The Dawn.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Express ideas in three-dimensional or non-traditional formats</td>
<td>Help to plan and create a mural for your class based on the book. Construct a scale model of the Roman Forum or the Athenian Acropolis.</td>
</tr>
</tbody>
</table>
Kaplan Grid

**KAPLAN MODEL Planning Grid**

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
</table>

Implementation Sequence
Early Childhood example of Kaplan Model independent research projects.

KAPLAN MODEL Planning Grid – Early Childhood Example

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td>Appropriate state or territory outcome</td>
<td>Observing detail through verbal/visual description</td>
<td>Analysis Evaluate situations</td>
<td>Labelled flowchart or concept map</td>
</tr>
</tbody>
</table>

Implementation Sequence

Implementation plan: One afternoon per week for 4-5 weeks, identified gifted children will work individually or in small ‘like-minded’ groups on their research project while the rest of the class work on in-class rotational activity centres.

Activity One: whole class discussion on what is living and what is non-living; children observe photographs and drawings of a variety of living and non-living things. In small ability groups organise a provided set of images into these categories (NB: the images should be more complex for the gifted group/s).

Activities for gifted individual/small groups:

Children choose one of the following questions and develop an hypothesis as to what they think will be the answer to the question.

- Do all living things need the same things to grow? Choose two different types of living things to observe.
- Do living things all change at the same rate? Choose two different types of living things to observe.
- Are some places too extreme for living things to be found? Choose one living things to observe in a variety of extreme places.

Children propose ways that they might test out their hypothesis, eg an experiment they might design and observe the results. (NB: to teacher - children will need an explanation of experimental design, to discuss the concepts of control groups and fair tests.)

Children set up their experiment, drawing or writing descriptions of their procedure and initial observations.

Children make weekly observations through drawings or writing, or both. NB: Children will need to be taught how to use a flowchart and/or a concept map during these sessions. Children should also be encouraged to investigate their questions through textual and multimedia sources of information.

Children draw conclusions as to the accuracy of their hypothesis and what further questions may arise from their experiments, and present their findings using a flowchart or concept map.
Students who are gifted and talented are found in full-time self-contained classrooms, magnet schools, pull-out programs, resource rooms, regular classrooms, and every combination of these settings. No matter where they obtain their education, they need an appropriately differentiated curriculum designed to address their individual characteristics, needs, abilities, and interests.

Developing an Effective Curriculum

An effective curriculum for students who are gifted is essentially a basic curriculum that has been modified to meet their needs. The unique characteristics of the students must serve as the basis for decisions on how the curriculum should be modified (Feldhusen, Hansen, & Kennedy, 1989; Maker 1982; TAG, 1989; VanTassel-Baska et al., 1988).

It is difficult to generalize about students who are gifted because their characteristics and needs are so personal and unique. However, as a group they comprehend complex ideas quickly, learn more rapidly and in greater depth than their age peers, and may exhibit interests that differ from those of their peers. They need time for in-depth exploration, they manipulate ideas and draw generalizations about seemingly unconnected concepts, and they ask provocative questions.

A program that builds on these characteristics may be viewed as qualitatively (rather than quantitatively) different from the basic curriculum; it results from appropriate modification of content, process, environment, and product (Maker, 1982).

Modifying Content

Content consists of ideas, concepts, descriptive information, and facts. Content, as well as learning experiences, can be modified through acceleration, compacting, variety, reorganization, flexible pacing, and the use of more advanced or complex concepts, abstractions, and materials. When possible, students should be encouraged to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity. Their learning characteristics are best served by thematic, broad-based, and integrative content, rather than just single-subject areas. An entire content area arranged and structured around a conceptual framework can be mastered in much less time than is traditionally allotted (VanTassel-Baska, 1989). In addition, such concept-based instruction expands opportunities to generalize and to integrate and apply ideas. (See Bruner, 1966, Man: a Course of Study Macros for an example of a thematic, integrated curriculum.)

Middle and secondary schools are generally organized to meet student needs within content areas. Providing an interdisciplinary approach is another way of modifying curriculum. Jacobs and Borland (1986) found that gifted students benefit greatly from curriculum experiences that cross or go beyond traditional content areas, particularly when they are encouraged to acquire an integrated understanding of knowledge and the structure of the disciplines.

Modifying Process

To modify process, activities must be restructured to be more intellectually demanding. For example, students need to be challenged by questions that require a higher level of response or by open-ended
questions that stimulate inquiry, active exploration, and discovery. Although instructional strategies
depend on the age of the students and the nature of the disciplines involved, the goal is always to
encourage students to think about subjects in more abstract and complex ways. Activity selection
should be based on student interests, and activities should be used in ways that encourage self-directed
learning. Bloom's Taxonomy of Educational Objectives (1956) offers the most common approach to
process modification. His classification system moves from more basic levels of thought, such as
memory or recall, to more complex levels of analysis, synthesis, and evaluation. Parnes (1966), Taba
(1962), and others have provided additional models for structuring thinking skills. Every teacher
should know a variety of ways to stimulate and encourage higher level thinking skills. Group
interaction and simulations, flexible pacing, and guided self-management are a few of the methods for
managing class activities that support process modification.

Modifying Environment

Gifted students learn best in a receptive, nonjudgmental, student-centered environment that encourages
inquiry and independence, includes a wide variety of materials, provides some physical movement, is
generally complex, and connects the school experience with the greater world. Although all students
might appreciate such an environment, for students who are gifted it is essential that the teacher
establish a climate that encourages them to question, exercise independence, and use their creativity in
order to be all that they can be.

Modifying Product Expectation and Student Response

Teachers can encourage students to demonstrate what they have learned in a wide variety of forms that
reflect both knowledge and the ability to manipulate ideas. For example, instead of giving a written or
oral book report, students might prefer to design a game around the theme and characters of a book.
Products can be consistent with each student's preferred learning style. They should address real
problems, concerns, and audiences; synthesize rather than summarize information; and include a self-
evaluation process.

Assessing Curriculum Effectiveness

In their synthesis of curriculum effectiveness studies and effective practice, VanTassel-Baska et al.
(1988) suggested that differentiated curriculum would respond to diverse characteristics of gifted
learners in the following three ways:

1. By accelerating the mastery of basic skills through testing-out procedures and reorganization
   of the curriculum according to higher level skills and concepts.
2. By engaging students in active problem-finding and problem-solving activities and research.
3. By providing students opportunities for making connections within and across systems of
   knowledge by focusing on issues, themes, and ideas.

Curriculum development is a dynamic, ongoing process. Special attention needs to be paid to
articulation, scope, and sequence to avoid gaps and repetition through grade levels; ensure that the
understandings and skills we expect children to develop fit together; and assure that children are
provided with the knowledge and skills that will prepare them for the future. Periodic evaluations of
curriculum effectiveness allow corrections to be made when needed, and they are essential if
curriculum is to meet the long-term needs of gifted students for increasingly complex and challenging
opportunities.

Conclusion

The curriculum committee of the Leadership Training Institute (Passow, 1982) developed seven
guiding principles for curriculum differentiation that reflect the considerations described in this Digest.

1. The content of curricula for gifted students should focus on and be organized to include more
   elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate
   knowledge within and across systems of thought.
2. Curricula for gifted students should allow for the development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.

3. Curricula for gifted students should enable them to explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.

4. Curricula for gifted students should encourage exposure to, selection, and use of appropriate and specialized resources.

5. Curricula for gifted students should promote self-initiated and self-directed learning and growth.

6. Curricula for gifted students should provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.

7. Evaluations of curricula for gifted students should be conducted in accordance with the previously stated principles, stressing higher level thinking skills, creativity, and excellence in performance and products.

Developing curriculum that is sufficiently rigorous, challenging, and coherent for students who are gifted is a challenging task. The result, however, is well worth the effort. Appropriately differentiated curriculum produces well-educated, knowledgeable students who have had to work very hard, have mastered a substantial body of knowledge, and can think clearly and critically about that knowledge. Achieving such results for one or for a classroom full of students who are gifted will produce high levels of satisfaction, not only for the students who are beneficiaries, but also for every teacher who is willing to undertake the task.

**References**


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Welcome!

You are about to start a Professional Development Course which will help you identify the gifted and talented students in your class or your school, and differentiate the curriculum to respond to their individual learning needs. You'll also be able to decide which of your students may benefit from various forms of ability or interest grouping and which may possibly be candidates for one or more of the many forms of academic acceleration.

About the Package

The course consists of six Modules

Each Module consists of three levels: Core, Extension and Specialisation. The Core levels of the six Modules are the heart of this course. The Core Modules contain essential information and practical advice and strategies to assist you to identify and respond to your gifted and talented students.

We strongly suggest that you complete the Core level of each Module.

Pre-tests

We are aware that teachers and school administrators will enter this course with a wide range of existing knowledge of gifted and talented education. To accommodate this range of knowledge and experience, we have started each Core Module, from Module 2 onwards, with a pre-test. We encourage you to take these pre-tests and, if you ‘test out’ on any Module at Core level, simply move on to the next Module. For example, if you ‘test out’ of Core Module 2 you will pass over that Module and move on to Core Module 3.

Extension and Specialisation Levels

Extension and Specialisation levels for each Module. Material covered in the Extension and Specialisation levels builds on the knowledge you will have gained from the Core level in each Module. Key issues are examined in greater depth and participants explore a wider range of issues in the cognitive and social-emotional development of gifted students. New identification, curriculum differentiation and program development techniques are introduced.

The Extension and Specialisation levels require teachers, counsellors and administrators to undertake further reading and practical activities to reflect on classroom practice, school practice and policy. They encourage participants to focus on their specific role in the school and prepare a brief action plan to demonstrate application or mastery of outcomes.

Schools may decide that completion of the course at Specialisation level would be a useful prerequisite for becoming the school's Gifted Education Coordinator.
What will you learn in this course?

The course consists of six Modules:

**Module One: Understanding Giftedness**
Understanding the nature of giftedness and talent; what the terms mean; levels and types of giftedness. Cognitive and affective characteristics of gifted and talented students; ways in which these students may differ from their classmates - even if at first we don’t observe this.

**Module Two: The Identification of Gifted Students**
A range of practical identification procedures, with particular attention to procedures which are effective in identifying gifted students from culturally diverse and disadvantaged groups. We’ll be emphasising the use of a combination of approaches rather than a single measure such as IQ testing or teacher nomination used in isolation.

**Module Three: Social and Emotional Development of Gifted Students**
Understanding the social and emotional characteristics and needs of gifted students. Ways in which gifted students may differ somewhat from their classmates in their social and emotional development. Supporting gifted students and their parents. Teaching strategies and class structures which foster the development of positive social attitudes and supportive peer relationships in gifted students.

**Module Four: Understanding Underachievement in Gifted Students**
Understanding the causes of underachievement in gifted students. Identifying gifted underachievers and planning interventions designed to prevent and reverse cycles of underachievement.

**Module Five: Curriculum Differentiation for Gifted Students**
Teaching strategies and methods of curriculum differentiation which enhance the learning of gifted students in the regular classroom. Appropriate use of different enrichment models that international research has found to be effective with gifted and talented students. Practical applications of pre-testing, curriculum compacting and individualised programming.

**Module Six: Developing Programs and Provisions for Gifted Students**
Practical strategies for the establishment and monitoring of ability, achievement or interest grouping, and the many forms of accelerated progression. Particular attention will be paid to the effects of various strategies on students’ academic and social development.
Using the package

Much of the material is suitable across teaching and learning contexts. This content is not specifically marked. However, content that may be applicable to your particular context is identified as follows:

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Follow these symbols through the content to customise your learning path.

Each Module comes in two parts, each concluding with a practical exercise. We suggest that you complete the first and second parts a few days apart - unless this is not workable in your particular learning context. This will give you a chance to digest the information in Part 1 and work through the Reflective/Practical component.
## Core Module 5A

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Welcome to the fifth Module for this Professional Development Course.

Module 5 is divided into two main sections, Module 5A and Module 5B, which in combination examine the key core issues of curriculum differentiation. You will find a pre-test at the beginning of each section which you are invited to complete before deciding the pathway you will take through each section. You are also encouraged to modify a unit of work that you currently teach as you work through the activities within this Module.

When working through this Module it is strongly advised that the most appropriate mode for professional development in all activities within the Module, is that of individual or small group. The small groups may be organised as faculty or grade teams. This will ensure that appropriate opportunities are provided for professional dialogue and reflection on the content of this Module.
Core Module 5A

Pre-Test

What do the terms ‘differentiation’ and ‘curriculum compacting’ mean to you? Spend a few moments to write your definitions below:
Briefly look at the examples of unit planning appropriate to your stage of teaching. Choose which one you think best depicts differentiated curriculum. Where can you see evidence of curriculum compacting occurring in these examples?

Example One

Ms Casewell teaches Year 3 at an inner city school and has planned a Term 3 unit of work for her co-educational mixed ability class entitled ‘Our local area’.

She has decided to pre-test the children on their knowledge of the local area by asking them to identify well-known local landmarks and structures from a set of pictures she shows the whole class. The children put their hands up if they recognise the picture and she asks a few to explain what they think they are.

At the end of the lesson, Ms Casewell decides that although a few children did put their hands up and accurately explain the landmark or structure most of the children did not know very much and so she planned the unit with all children working at a core level, completing the same tasks in the same amount of time allocation.

Example Two

Mr McDonnell’s Year 5 class consists of more boys than girls this year and so Mark plans a lot of visual and hands-on activities in his units of work. Being located in a rural town, the children in his class come from a wide variety of backgrounds, including farming and Indigenous families.

For the last term of the year, the scope and sequence in HSIE/SOSE indicates that he should be teaching about ‘Gold’ and in Science, the topic is ‘Simple Machines’. To assess whether his class has any prior understanding or skills of the syllabus outcomes, Mr McDonnell asks the children to complete individually the first two columns of a KWL (What do I Know? What do I Want to know? What have I Learnt?) on the topic of ‘Gold’ and another on the topic of ‘Simple Machines’.

Most of the boys wanted to know lots of things about ‘Simple Machines’, so Mr McDonnell thought he would use this information and planned a unit based on the children’s interests which would be very hands-on.

The work on ‘Gold’ was achieved by all children in the class completing a set number of activities from a Bloom’s Taxonomy and MI (Gardner’s Multiple Intelligences) grid.

Example Three

Mrs Ibrahim teaches a mixed ability Year 6 class of girls in an independent school in a fairly new outer suburb of a metropolitan area. A majority of the girls in her class are from migrant families, many of whom have recently arrived in Australia. Although it is only early in the year, she is aware that a number of the girls are quite bright and may need some enrichment or extension.
In planning for Term 2, she has already pre-tested the girls for their understanding of the mathematics outcomes and has found that she needs to use Bloom’s Taxonomy to plan for at least three different levels of support, core and extension, especially in the Number strand for the class.

Additionally, two of the girls demonstrated complete mastery of all of the Term 2 outcomes and so Mrs Ibrahim has organised for those girls to work on a maths program based on extended outcomes and a problem solving scenario.
Each of the examples described show elements of differentiation and while more information would be needed on each example to make a definite judgement on the level of differentiation and curriculum compacting, the scenario in the box (below) is the most exemplary instance of best practice in differentiation and curriculum compacting.

The criteria for judging your understanding of differentiated curriculum and compacting are:

**Strong understanding:** Identified the example which has three or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from the other two examples, such as lack of theme, pre-testing, curriculum model or compacting;

**Some understanding:** Identified an example with at least two or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from one other example, such as lack of theme, pre-testing, curriculum model or compacting;

**Little or no understanding:** Identified an example with one element of differentiation, such as the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Unable to identify any areas of omission from any of the examples.

The following points about each example can be highlighted:

In **Example One**, Ms Casewell is on the right track with the idea of using a pre-test to discover what her class understands about the local area. Pre-tests should be linked to the outcomes of the teaching unit and allow individual students to demonstrate their understandings and skills prior to the start of the unit. Pre-testing the whole class in an open forum such as in Ms Casewell’s example will only provide a small number of students a chance to participate, and less verbal or introverted children may choose not to share what they know. Additionally, a pre-test in which a student demonstrates 85% accuracy or more on the outcomes being pre-assessed indicates the need for differentiated activities which replace, rather than add to, the core activities. There is no evidence of curriculum compacting in this example.

In **Example Two**, there are a some elements of differentiation indicated. Mr McDonnell planned individual pre-tests and responded to his students’ interests in the planning of activities to suit their learning styles and preferences, by including the learning strategies of Bloom’s Taxonomy and Multiple Intelligences. While it is clear that the boys in the class wanted to know ‘lots of things’ about ‘Simple Machines’, it is not clear what they, or the girls in the class, already knew about the outcomes associated with the topics of ‘Simple Machines’ or ‘Gold’. When responding to pre-tests it is important that the planning is based on the students’ prior knowledge and skills of the core outcomes, along with student interest. Aside from the activities for the ‘Simple Machine’ unit being ‘hands-on’,...
little information is given as to what level of differentiation occurred to match the ability levels of the students. In the case of the ‘Gold’ unit it is unclear how the children chose the activities they completed from the Bloom’s/MI grid. There is no curriculum compacting evident from the information given on this example.

In Example Three, Mrs Ibrahim has compacted the curriculum for those girls in her class who have demonstrated mastery of the core maths outcomes through the pre-test activity by developing extended outcomes and associated problem solving activities for them to complete. Additionally, she has differentiated the curriculum for her class, based on their pre-test results, by planning tiered activities with Bloom’s Taxonomy, for students demonstrating different levels of proficiency on each of the maths outcomes she intends to present to her class.

Choosing a Pathway

Your responses to this pre-test task should have helped to:

- validate your current understandings of curriculum differentiation and compacting, if you identified the example of best practice.
- delineate the strengths or weaknesses of your understandings of curriculum differentiation and compacting, if you identified the majority of points.
- clarify the areas on which you need to focus while working through Module 5 Parts A and B, if you did not identify the features of differentiated curriculum such as pre-testing and curriculum compacting.

Content Areas of Core Module 5: Part A and Part B

Core Module 5A is divided into Parts 1 and 2 (NB If you feel you have a firm understanding of the basic tenets of differentiation following your responses to the pretest, you may wish to omit Part 1 and move to Part 2 instead):

- Part 1 (page 8) examines definitions, issues and strategies of differentiation.
- Part 2 (page 15) examines compacting the curriculum through unit planning and pre-testing.

Core Module 5B is also divided into Parts 1 and 2 (NB Pre-tests at the beginning of this module will help you choose a pathway through both parts of the module):

- Part 1 continues the process of differentiation by examining two curriculum models - Bloom’s Taxonomy and the Williams Model.
- Part 2 examines additional strategies that can useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.
Outcomes

At the completion of this half of the Module you will be able to:

- explain the definition and purpose of differentiation, in relation to gifted students specifically.
- analyse the elements of differentiation present in a unit of work.
- describe the process of curriculum compacting.
- develop an outcomes-based pre-test for a unit of work you teach.
This Module introduces the concept of differentiation, and appropriate planning and teaching strategies to achieve differentiation in a classroom environment. Part 1 examines some definitions, and the purpose and need for planning a differentiated unit of work.

What is curriculum differentiation?

A ‘one size fits all’ syllabus rarely delivers what provisions it claims. Most state and territory syllabus documents are designed to meet the learning needs of the majority of students in any classroom. Some documents suggest that the ‘special learning needs’ students, as well as gifted students, may necessitate curriculum modification; however, the reality of initiating such modifications in classrooms of 30 or more students is often overwhelming to classroom teachers who may have no previous experience in planning a multi-layered program.

Curriculum differentiation can address this issue and help to cater for the different learning needs of students in any classroom structure. A number of definitions of curriculum differentiation exist, all of which highlight the same main issue:

Differentiated curriculum addresses the different learning styles and rates of learning of students in both mixed ability and self contained gifted classrooms.

Classroom structures at any level of schooling are rarely homogeneous and therefore a teacher-directed program set to only one style of learning or one pace of learning will generally fail to meet the needs of the majority of the students in the class.
“Essentially, the aim of differentiating instruction is to maximize each student’s growth by meeting each student where he or she is and helping the student to progress. In practice, it involves offering several different learning experiences in response to students’ varied needs.

Learning activities and materials may be varied by difficulty to challenge students at different readiness levels, by topic in response to students’ interests, and by students’ preferred ways of learning or expressing themselves.

This is not the individual education program (IEP) approach where there are different experiences for all 20-30 students in the class. Typically two to four different learning experience are offered by the teacher, or students are given opportunities to make their own choices.”


Who is curriculum differentiation for, and why use it?

Meeting the needs of all students in the variety of educational settings teachers may find themselves in, such as mixed ability and self-contained gifted classrooms, poses some interesting challenges for educators.

The often resorted to ‘teach to the middle’ approach may in many cases result in frustration for both students and teachers. Some students, often the gifted, experience the frustration of a curriculum that is lacking in challenge and moves too slowly, whilst other students, usually those with special learning needs, experience the frustration of a curriculum that moves too quickly and which lacks the scaffolding and structure on which they need to frame their learning.

Such frustration sometimes leads to behaviours which are undesirable and non-productive. These behaviours are not always outwardly visible and disruptive. For some students their frustration is more evident in the level to which they become passive and withdrawn from the learning process.

Curriculum differentiation provides a framework that is better able to address the needs of all learners in the classroom and thus reduce some of the frustrations being experienced by both teacher and students. All students need to regularly experience that moment in their learning where they achieve a ‘personal best - a PB’. In the sporting arena, the achievement of a ‘PB’ is greeted with applause and accolade, and so should it be in the academic arena as well.

When specifically looking at the needs of gifted learners, three important issues of curriculum arise:

- Gifted students need a challenging curriculum that addresses their needs for pace and complexity.
- Gifted students require instruction and scaffolding for their learning but may not require the level of repetition and support needed by other less able students.
• Gifted students who have not experienced a differentiated curriculum previously may challenge the process with the ‘it’s not fair that I have to do something that is different/harder/has higher expectations’.

It is very important to establish with all students in your classrooms the understanding that they each have different learning needs and that in a differentiated classroom it is common for students to be using different thinking processes and creating different levels of products. This is not a matter of ‘unfair’ distribution of tasks but rather a system which is fair to all learners in terms of their respective needs.

What are some of the strategies you can utilise to design differentiated curriculum?

So, what are some of the strategies you can use to begin designing differentiated curriculum? Maker (1982) describes curriculum modifications for gifted students as encompassing four areas:

Content modifications for gifted students should:
• be abstract, complex, varied
• involve issues of organisation, study of people, methods of inquiry.

Process modifications for gifted students should:
• involve higher order thinking processes
• promote creative and critical thinking
• require problem solving
• involve group interaction
• have variable levels of pacing
• allow for debriefing of the process
• involve open-endedness
• allow for freedom of choice.

**Product modifications** for gifted students should:
• involve real world problems
• be for real world audiences
• require real deadlines
• require transformation of learning
• involve appropriate assessment and evaluation
• involve extended or accelerated outcomes.

**Learning environment modifications** for gifted students should:
• be flexible and open
• encourage independent and intrinsic learning
• be accepting and non judgemental
• encourage complex and abstract thought.

Commonsense dictates that the areas of content, process, product and learning environment are where curriculum may also need to be modified for students with special learning needs. However, it is important to note that teachers new to differentiation may choose to begin by differentiating content or process or product, rather than all of them, until they are both familiar and comfortable with the strategies.

Additionally, the following strategies will also assist the process of differentiation:
• Assessing students’ prior skills and understandings (see Part 2 of Module 5A).
• Using pre-assessment to compact the curriculum for students who have already mastered the core (see Part 2 of Module 5A).
• Using tiered assignments and/or assessment tasks (see Part 2 of Module 5B).
• Accelerating the pace for gifted students to allow for independent study on student interest (see the Extension level of this Module).
• Flexibly grouping to allow gifted students to work with like-minded peers (see Module 6).
• Designing independent research tasks (see Part 2 of Module 5B) where students learn how to develop and manage their independent learning skills. The degree of complexity of the project will depend on student readiness and independent research may begin as a paired project.
• Negotiating learning contracts where a written agreement between teacher and student results in students working independently. The contract helps students to set daily and weekly work goals and develop management skills. It also helps the teacher keep track of student progress (see Part 2 of Module 5B).

• Creating learning centres, particularly in early childhood and primary classrooms. It is important to note that a learning centre is not necessarily differentiated unless the activities are varied by complexity, taking into account different student ability and readiness. It is also important that students understand what is expected of them in any task they choose from the learning centre and that they are encouraged to develop time management skills to complete these tasks.

• Becoming a teacher as a facilitator rather than a director of learning.
Reflective/Practical Component

Having worked through Part 1 of this Module, how would you now define the terms compacting and differentiation? Do you need to modify your original definition? If so, re-work your definition in the space below.

Which aspects of differentiated curriculum would you find most difficult to implement?

Compare your responses.
Now evaluate the level of differentiation in a unit of work you have taught previously, or alternatively, a unit of work you want to teach. Use the questions below to guide you and note down some of your thoughts in the spaces provided.

Was/Is the content appropriate for the class?
- Was/Is the level of content offered suitable for each of the abilities within the range in your class?
- Did/Will you pre-test the outcomes for the content of this unit?
- Did/Will you make any changes to the content from your original program? Why?
- Might you change any of the content in any future teaching of the unit? Why or why not?

Were/Are the processes in the teaching toward the outcomes in this unit appropriate for the class?
- Was/Is the pace of instruction offered suitable for each of the ability groups in your class?
- Did/Will you pre-test the skills-based outcomes of the unit?
- Did/Will you make any changes to the higher order thinking skills from your original program? Why?
- Might you change any of the process strategies in any future teaching of the unit? Why or why not?

Were/Are the products required appropriate for the unit outcomes?
- Were/Are the types of products offered suitable for each of the ability groups in your class?
- Did/Will you make any changes to the products required from your original program? Why?
- Might you change any of the products in any future teaching of the unit? Why or why not?

Was/Is the learning environment appropriate for the class?
- Did/Will any of the ability groups in your class require modifications to the learning environment?
- Did/Will you make any changes to the learning environment from your original program? Why?
- Might you change any aspects of the learning environments in any future teaching of the unit? Why or why not?
What does the term ‘compacting the curriculum’ mean?

There are six key steps to curriculum compacting:

- identifying the outcomes
- pre-testing the outcomes
- eliminating the areas of repetition
- streamlining the learning experiences
- offering enrichment, extension and/or acceleration - matching student need to intervention
- documenting the process.

How do you incorporate curriculum compacting into unit planning?

In this section, you are encouraged to begin the process of curriculum differentiation and curriculum compacting by mapping a unit of work that you will teach in the near future.

Examples of unit planning for different levels of schooling can be found in the resource section of this Module and it is suggested that these may be useful as a model when mapping a differentiated unit for the first time.

Resource section:
Example of Primary unit planning (page 52)

Two alternative methods might be used in this process, dependent on preference of planning as shown in the following flowcharts. NB: The examples show five contributing questions but this may vary from three to five depending on the time frame of the unit:
Method One

Core contributing question + core assessable outcomes

Core contributing question + core assessable outcomes

Core contributing question + core assessable outcomes

Core contributing question + core assessable outcomes

Core contributing question + core assessable outcomes

Pre-testing core outcomes to establish prior understandings and skills of students

Extended question + extended outcomes
Method Two

These methods differ only in the point at which the outcomes are involved in the planning process. Curriculum compacting occurs in the planning that follows the pre-testing and may involve extended outcomes, independent research projects and/or acceleration of outcomes. In **Module 6**, acceleration and grouping will be addressed in detail.

**Method One** is useful for units where the theme, or the ‘big idea’, is the first point in the planning process. In states where mandatory content outcomes must be addressed in the teaching and learning process, it may be more appropriate to use **Method Two**.
The following pages step out the two different methods of unit planning:

**Method One**

Using a concept map (page 53), flowchart (page 53) or a list (page 54) from the resource section, work through the following steps (NB the given example is a generic unit of work for teachers which is based on the topic of curriculum differentiation):

**Step One:** Choose a theme which incorporates the basis of the unit. For example abstract nouns often serve as useful themes:

- Change
- Systems
- Growth
- Power
- Freedom
- Democracy
- Tolerance
- Persecution
- Traditions
- Survival
- Communication
- Justice
- Time
- Truth, and so on.

NB: Be careful not to mistake a topic for a theme; eg, ‘Electricity’ is a topic, ‘Systems’ is a theme.
Step Two: Construct a focus question which links to the theme. This question should set the focus for all students working on this unit, regardless of their ability level, and should require substantial thinking or study to answer it.

For example, on the theme of ‘Systems’, the focus question might be: ‘Does curriculum differentiation ensure learning for all?’ or ‘How and why is curriculum differentiation important?’

Step Three: The core contributing questions for the unit are constructed next. The number of questions needed depends on the length of the unit and the age group being taught.

For example, in an early childhood unit of work, teachers may decide that three questions are enough to address in a term’s unit of work, whereas teachers in primary classrooms may extend that to four or five questions throughout a term. One contributing question may take two to three weeks to address in early childhood or primary classrooms.

In secondary classrooms, where units may only be taught for half a term or less, contributing questions may be addressed in shorter time periods.

The contributing questions should be designed to support the theme and the focus question.

The key or assessable core outcomes are then matched to the core contributing questions. In some states, the core outcomes are also the assessable outcomes; however, in other cases there is a difference between assessable and indicative outcomes and teachers may choose to match only the assessable outcomes in the planning stage.

The following example illustrates the planning of the theme, focus question, contributing questions and outcomes for this Module of the Professional Development course on curriculum differentiation:
Step Four: Once the contributing questions have been established, a set of extended questions should be developed from the core contributing questions. These questions will be the framework for the extension activities designed for gifted students. NB: If differentiating for all levels in a mixed ability classroom, a set of support or structured questions may also be designed for students with special learning needs.

Theme: Systems

Focus Question: Does curriculum differentiation ensure learning for all?

Contributing Question One: Which students need a differentiated curriculum and why?

   Extended Question: Is differentiation the only choice available to cater for student differences?

   Extended Question: How do we measure the impact of curriculum differentiation on students?
Contributing Question Two: In what areas can we differentiate the curriculum?

Extended Question: Is differentiation only effective if used in all areas of the curriculum?

Extended Question: Are process modifications the most important part of curriculum differentiation?

Contributing Question Three: In what ways can pre-testing help differentiate the curriculum?

Extended Question: Is pre-testing only effective when there are objective criteria to judge performance?

Extended Question: Should pre-testing be matched with post-testing to judge learning gain?

Contributing Question Four: What models can we use to modify the curriculum for all levels of ability?

Extended Question: Is any one curriculum model better than the others for differentiation and why?

Extended Question: Are some models more appropriate for different levels of schooling and different subjects?

Contributing Question Five: What strategies can we use to differentiate the curriculum?

Extended Question: Can freedom of choice be the best option for curriculum differentiation?

Extended Question: Do students always choose appropriately difficult tasks?
What content outcomes do your students already know before beginning the unit of work?

What skills outcomes have your students already achieved prior to this unit of work?

Once the unit has been mapped out, the next step is to design ways to assess prior learning. In this design, it is important to:

- take into account the variety of student learning styles, so that all students have the opportunity to demonstrate what they understand and what skills they already possess.
- pre-test the key or assessable outcomes.
- pre-test students individually and not as a group or a class, to allow all students a chance to respond.
- make sure that students have encountered the style of pre-test previously, eg, if students have not used a Venn diagram before, teach them the skill first then use the strategy as a pre-test.

The following list of ideas may be helpful in the construction of pre-tests for your unit of work:

- Concept maps - Resource section page 55
- Venn diagrams - Resource section page 55
- Flow charts - Resource section page 56
- Draw a diagram, picture
- Written response
- Picture matching - Resource section page 56
- Experimental design
- Label a diagram - Resource section page 57
- Multiple choice
- Short answers
- Essay response
- Problem solving
- Hypothesis-based responses
- Cloze passage
- Make a model
- Hands-on activities
- Bloom’s Taxonomy questions (one from each level)

Important points to remember

- Pre-tests can, and should, be administered well in advance of the start of the unit of work to allow time to differentiate the unit activities appropriately.

- Some students suffer from test anxiety and may not be able to respond to the pre-test activity to the best of their ability if they perceive that the pre-test will be reportable. It is often better to explain to your students that you are planning the next unit you will be teaching them and would like to find out if they know any of the content or if they can do any of the skills prior to beginning the unit. This way you can reassure the students that the purpose of the activity is to help with planning rather than to assess and report on them.

- Pre-tests should not be displayed in the classroom nor added to portfolios, as their purpose is for diagnosis of content and skills needs only.

- Students do not need to achieve 100% accuracy on a pre-test activity to demonstrate mastery of an outcome. **Accuracy or competency equating to 85% or greater demonstrates a mastery level for which extension is essential.**

- To evaluate student mastery of an outcome, objective criteria for each outcome being pre-tested should be developed. For example, what does a student need to include in a pre-test to be evaluated as ‘working at grade level’ and therefore a candidate for extension?

Pre-testing should not be a lengthy process:

For example, in primary school classrooms, pre-test activities might be presented as a short activity during the term prior to the unit of work. All KLA outcomes may be pre-tested, but the first time you try this planning strategy it is advisable to begin with one or two outcomes in one KLA, such as HSIE/SOSE or Science/Science and Technology.
Self Assessment

Choose at least two different styles from the suggested list (or any which are not mentioned) and design two outcomes-based pre-tests for the unit of work you have been mapping.

Trial your pre-tests with your class and collect work samples representing each level of the reporting descriptors, or grades, you use in your school.

For example:

- working towards grade, working at grade, working beyond grade
- experiencing difficulty, developing, competent, highly developed
- band one, band two, band three.

Module 5B Parts 1 and 2 will discuss ways of differentiating the curriculum for those students who have demonstrated some or all mastery of the outcomes you have pre-tested and who should subsequently work on the extended questions from the unit concept map.

Why use a curriculum model when differentiating the curriculum?

It is important that curriculum differentiation is based on the application of one or more models to carry out the instructional outcomes of the proposed program or unit of work. The model or models chosen should have research to support that they produce 'substantial' gains in the areas of academic, social, or emotional development. The models explained in Module 5B have been chosen because they meet these parameters.

References


Websites

Inspiration Software, Inc - Visual learning tools:
www.inspiration.com

Houghton Mifflin: Education Place - graphic organisers in .pdf format to download:
http://www.eduplace.com/graphicorganizer/
How familiar are you with the strategies of Bloom’s Taxonomy and the Williams Model? By completing the following pre-tests you will have the opportunity to decide which pathway you need to take through this part of Module 5:

**Bloom’s Taxonomy**

Read through the activities for your level of teaching and identify which of Bloom’s strategies is represented by each.

1. Imagine that you have been elected as the Prime Minister of Australia. Write a poem or a song describing how you will be a positive influence for Australia.

2. List the major facts you know about the following:
   - democracy
   - anarchy
   - monarchy
   - dictatorship
   - government
   - elections
   - freedom
   - Ancient Greece

3. How are democracy and monarchy similar? How are they different?

4. Imagine you travelled through time from Ancient Greece to Australia. What differences would you see between life in democratic Australia from that of Ancient Greece?

5. Many people immigrate to Australia because they believe that its democracy will bring them freedom in their lives. Does democracy ensure freedom? Explain why or why not?

6. Make a flowchart of the important steps you know of in a Federal Government election in Australia.
**The Williams Model**

Read through the activities for your level of teaching and identify which Williams Model strategies are represented by each.

(Note that while the model offers 18 different teaching strategies, the pre-test targets a selection of 6 of these strategies.)

1. How is the system of democracy like a monarchy?
2. Is democracy a choice only available to wealthy nations?
3. Research the origins of the system of democracy.
4. What if all countries of the world were democracies?
5. Freedom is often hard fought for by individuals for the sake of many. Investigate the life of one such ‘freedom fighter’. What changes did this person bring because of her/his work?
6. If Peter Lalor had not been transported to Australia, how might the development of democracy in Australia have been different?
**Bloom’s Taxonomy**

Please note that the first answer for each question is from the original version of Bloom’s Taxonomy and the second from the revised version of the model.

The criteria for judging your understanding of Bloom’s Taxonomy are:

- **Strong understanding:** Accurately identified five or six examples of Bloom’s strategies.
- **Some understanding:** Accurately identified three or four examples of Bloom’s strategies.
- **Little or no understanding:** Accurately identified two or fewer examples of Bloom’s strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of Bloom’s Taxonomy, you may choose to omit the section on Bloom’s Taxonomy and attempt the Williams Model pretest (page 26).

1. Imagine that you have been elected as the Prime Minister of Australia. Write a poem or a song describing how you will be a positive influence for Australia.
   
   SYNTHESIS / CREATE

2. List the major facts you know about the following:
   
   democracy  anarchy  monarchy  dictatorship
government  elections  freedom  Ancient Greece

   KNOWLEDGE / REMEMBER

3. How are democracy and monarchy similar? How are they different?
   
   ANALYSIS / ANALYSE

4. Imagine you travelled through time from Ancient Greece to Australia. What differences would you see between life in democratic Australia from that of Ancient Greece?
   
   APPLICATION / APPLY

5. Many people immigrate to Australia because they believe that its democracy will bring them freedom in their lives. Does democracy ensure freedom? Explain why or why not?
   
   EVALUATION / EVALUATE

6. Make a flowchart of the important steps you know of in a Federal Government election in Australia.
   
   COMPREHENSION / UNDERSTAND
**Williams Model**

The criteria for judging your understanding of the Williams Model are:

- **Strong understanding:** Accurately identified five or six examples of the Williams strategies.
- **Some understanding:** Accurately identified three or four examples of the Williams strategies.
- **Little or no understanding:** Accurately identified two or fewer examples of the Williams strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of the Williams Model, you may choose to omit the section on the Williams Model and attempt Module 5B Part 2 (page 41).

1. How is the system of democracy like a monarchy?
   **ANALOGY**

2. Is democracy a choice only available to wealthy nations?
   **PROVOCATIVE QUESTION**

3. Research the origins of the system of democracy.
   **SKILLS OF SEARCH**

4. What if all countries of the world were democracies?
   **TOLERANCE FOR AMBIGUITY**

5. Freedom is often hard fought for by individuals for the sake of many. Investigate the life of one such ‘freedom fighter’. What changes did this person bring because of his/her work?
   **EXAMPLES OF CHANGE**

6. If Peter Lalor had not been transported to Australia, how might the development of democracy in Australia have been different?
   **DISCREPANCY**
Choosing a Pathway

Your responses to this pre-test task should have helped to:

- validate your current understandings of Bloom’s Taxonomy and the Williams Model if you correctly identified all of the activities.
- delineate the strengths or weaknesses of your understandings of Bloom’s Taxonomy and the Williams Model, if you correctly identified the majority of the activities.
- clarify the areas on which you need to focus whilst working through Module 5 Part B.

Content Areas of Core Module 5: Part B

Core Module 5B is divided into Parts 1 and 2:

- Part 1 continues the process of differentiation by examining the curriculum models of Bloom’s Taxonomy and the Williams Model.
- Part 2 examines strategies that can be useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.

Outcomes

At the completion of this half of the Module you will be able to:

- develop differentiated activities for gifted students using Bloom’s Taxonomy or the Williams Model.
- develop an independent study project using the Kaplan Model.
- select and apply appropriate strategies for implementing differentiation in your specific area of teaching.
This Module continues the process of differentiation by developing appropriate planning and teaching strategies using the curriculum models of Bloom’s Taxonomy, the Williams Model and the Kaplan Model.

**How do you extend students who have demonstrated competency in the outcomes based pre-tests?**

Passow (1988) proposed the following criteria to gauge whether the curriculum presented to gifted students is appropriate:

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would all students want to be involved in such learning experiences?</td>
<td></td>
</tr>
<tr>
<td>Could all students be involved in such learning experiences?</td>
<td></td>
</tr>
<tr>
<td>Should all students be expected to succeed in such learning experiences?</td>
<td></td>
</tr>
</tbody>
</table>

The answer to these three questions should be ‘no’ if the curriculum is to be appropriate only for the gifted students in your class. If the answer is ‘yes’ then the curriculum is suitable for all students.

It is important to understand that all students benefit from enrichment opportunities and they should not be denied these opportunities. However, gifted students need to experience curriculum that is beyond this level of enrichment and extends their understandings and skills in complex and challenging ways.

**How do you extend students’ critical thinking skills?**

*Judge a man by his questions rather than his answers. Voltaire*

Bloom’s Taxonomy (1956) was constructed as a means to develop the higher order thinking skills of students by taking them through a sequential hierarchical progression. Bloom intended the taxonomy to be applicable to all age groups, subject areas and ability levels, so you will also find the strategies he developed used in adult training.

However, it is also important to note that the amount of time that should be spent on the strategies at each level of the hierarchy differs in relation to the ability level and prior knowledge of students.

For example, the following diagrams, developed by Davis and Rimm (2004), illustrate the difference between the way Bloom’s Taxonomy should be used for core students and for gifted students.
This first version of the model is suitable for students working at the core level of the curriculum. Students working at the core level of the curriculum should have access to all levels of the taxonomy but should spend more learning time using the lower order strategies of knowledge, comprehension and application, as they work towards the higher order thinking skills.
While gifted students need to acquire, comprehend and apply the knowledge relating to any discipline, they may come with, or rapidly acquire, the knowledge base and it is more important for them to spend a greater proportion of their time analysing, synthesising and evaluating this knowledge.

**How do the six different levels of Bloom’s Taxonomy develop thinking skills?**

As Bloom’s Taxonomy is hierarchical, each level builds on the skills of the level before it. For example, in order for a student to apply the knowledge they have acquired, they must first be able to comprehend it. The following table provides a definition and examples of each level.

Note that the revised version of Bloom’s Taxonomy, by Anderson and Krathwohl (2001), is included in the brackets.
<table>
<thead>
<tr>
<th>Bloom's strategy and definition</th>
<th>Examples of question stems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge (Remember): Mastery of facts, terminologies, conventions, trends, classifications, categories, methodologies, principles, generalisations, theories and structures. Retrieval of knowledge from long-term memory.</td>
<td>What did the ________ say about______?</td>
</tr>
<tr>
<td></td>
<td>Who invented ________?</td>
</tr>
<tr>
<td></td>
<td>When did ________ discover _____?</td>
</tr>
<tr>
<td></td>
<td>Which _________ decided _____?</td>
</tr>
<tr>
<td>Comprehension (Understand): Translation, interpretation and extrapolation of knowledge. Construction of meaning from oral, written and graphical communication.</td>
<td>Who do you think _________?</td>
</tr>
<tr>
<td></td>
<td>What was the main idea _____?</td>
</tr>
<tr>
<td></td>
<td>Can you briefly outline ________?</td>
</tr>
<tr>
<td></td>
<td>What does ________ show us?</td>
</tr>
<tr>
<td>Application (Apply): Application of previously encountered rules or concepts to new situations and the transfer of understanding to other concrete, real-life and hypothetical situations.</td>
<td>How could you illustrate _____?</td>
</tr>
<tr>
<td></td>
<td>What questions would you ask__?</td>
</tr>
<tr>
<td></td>
<td>How could you model ________?</td>
</tr>
<tr>
<td></td>
<td>Which factors would you change?</td>
</tr>
<tr>
<td>Analysis (Analyse): Deconstruction of knowledge to be able to infer assumptions and points of view; distinguish fact from opinion and relative importance of details; identify underlying motives, frameworks of ideas, problems, tone and mood; recognise fallacies, bias and purpose; relate cause and effect.</td>
<td>How is _____ similar to _____?</td>
</tr>
<tr>
<td></td>
<td>What must you know for _____ to be true?</td>
</tr>
<tr>
<td></td>
<td>What was the underlying theme of _____?</td>
</tr>
<tr>
<td></td>
<td>How did _____ compare with _____?</td>
</tr>
<tr>
<td>Synthesis (Create): Creation of new and unique products by combining elements of understanding; recognition of elements in new patterns or structures. Product may result from hypothesising, designing and constructing unique communications, plans, abstract relationships.</td>
<td>What would happen if ________?</td>
</tr>
<tr>
<td></td>
<td>Can you design a ____ to ______?</td>
</tr>
<tr>
<td></td>
<td>How many ways can you ______?</td>
</tr>
<tr>
<td></td>
<td>Can you see a possible solution to ________?</td>
</tr>
<tr>
<td>Evaluation (Evaluate): Ability to make judgements, choices or decisions based on predetermined standards or criteria from internal and/or external evidence.</td>
<td>How effective is ___________?</td>
</tr>
<tr>
<td></td>
<td>Do you believe ________? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>What do you think about ________?</td>
</tr>
<tr>
<td></td>
<td>Justify your position.</td>
</tr>
<tr>
<td></td>
<td>What changes to ______ would you recommend?</td>
</tr>
</tbody>
</table>

Adapted from Gross, MacLeod, Drummond & Merrick (2001); Anderson & Krathwohl (2001).
How does this apply to classroom practice?

The important thing is to not stop questioning. Albert Einstein

Bloom’s Taxonomy strategies can be used in a variety of ways in the classroom and do not always need to lead to a physical product. For example, questions framed from the taxonomy might be used as discussion starters and the taxonomy itself may be taught to the students to provide them with a greater understanding of the requirements of each level within it.

The following strategies are suggested as some possible ways of implementing Bloom’s Taxonomy in the classroom:

- Discussion starters
- Small group activities
- Independent research tasks
- Contract sheets which allocate a different proportion of questions at different levels
- Pre-tests
- Post-tests
- Assessments
- Learning centres

Examples of Bloom’s Taxonomy activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations.
What are some of the strategies you can use to develop students’ creative and divergent thinking skills?

An excellent model to develop creative and divergent thinking skills with students is the Williams Model (1993). This three-dimensional model focuses on:

**Dimension One:** the subject matter of the curriculum;

**Dimension Two:** the teaching strategies that stimulate positive learning behaviours;

**Dimension Three:** the development of cognitive-intellective and affective-temperament behaviours of students, using the following strategies:

- Fluency - measured by number of responses to a theme
- Flexibility - measured by the variety of changes or categories
- Originality - measured by degree of unusual or uncommon responses
- Elaboration - embellishment or expansion of the idea
- Risk-taking - willingness to try different or difficult things
- Curiosity - ability to seek many alternatives, depth of study
- Complexity - capacity to explore or discover
- Imagination - power to visualise, dream or conceive forms of action symbolically
The following table lists the 18 teaching strategies from Dimension Two of the model:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: 'Necessity is the mother of invention'. When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute Listing</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the 'Brotherhood' use the five-pointed star as their symbol of recognition?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>Provocative Question</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What does a ‘Renaissance man' have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women’?</td>
</tr>
<tr>
<td>Examples of Change</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Examples of Habit</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Organised Search</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood’? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Random Search</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Skills of Search</td>
<td>Open-ended questions – ‘what if…?’</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
<tr>
<td>Tolerance for Ambiguity</td>
<td>Expressing emotion through the senses; guided imagery; role-playing</td>
<td>Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather. You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police?</td>
</tr>
<tr>
<td>Intuitive Expression</td>
<td>Examine or playback mistakes or failures</td>
<td>As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched? Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success.</td>
</tr>
<tr>
<td>Adjustment to Development</td>
<td>Analyse the traits of creative people, creative processes or creative products</td>
<td>Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions? Learn about the work of one of the female artists attached to the ‘Heidelberg School’.</td>
</tr>
<tr>
<td>Activity</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Evaluate Situations</strong></td>
<td>Analyse implications or consequences, extrapolate from ideas or actions</td>
<td>A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why? The spice trade, coffee trade and now the drug trade – how have plants altered the course of history?</td>
</tr>
<tr>
<td><strong>Creative Reading Skill</strong></td>
<td>Generate novel ideas by reading</td>
<td>Read Journey to Antarctica by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent? Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition?</td>
</tr>
<tr>
<td><strong>Creative Listening Skill</strong></td>
<td>Generate novel ideas by listening</td>
<td>Interview an inventor to discover when he or she became interested in inventing new things or ideas. Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time?</td>
</tr>
<tr>
<td><strong>Creative Writing Skill</strong></td>
<td>Generate novel ideas in writing</td>
<td>Rewrite a fairytale so there is no reference to numbers. Write a short story for Louisa Lawson’s magazine, The Dawn.</td>
</tr>
<tr>
<td><strong>Visualisation</strong></td>
<td>Express ideas in three-dimensional or non-traditional formats</td>
<td>Help to plan and create a mural for your class based on the book. Construct a scale model of the Roman Forum or the Athenian Acropolis.</td>
</tr>
</tbody>
</table>

Adapted from: Gross, MacLeod, Drummond & Merrick (2001) and Gross, MacLeod & Pretorius (1999).
Examples of Williams Model activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations:

Resource section: Primary selected examples of Williams Model activities.

English: - Resource section page 62
HSIE-SOSE: - Resource section page 62
Mathematics: - Resource section page 63
Science/Science and Technology: - Resource section page 63
Visual Arts: - Resource section page 64
PD and Health: - Resource section page 64
Reflective/Practical Component

Using as models examples of either Bloom’s Taxonomy or the Williams Model from the support materials, develop differentiated activities for gifted students in your classroom. These activities should relate to the extension questions you developed for the concept mapping of your unit.

Use the Bloom’s Taxonomy (page 65) or Williams Model blank matrix (page 66) found in the Resource section as a scaffold to construct these activities. It is not necessary to write all strategies for each unit of work but it is important to ensure that your students access a variety of strategies throughout the unit.
Part 2 examines some of the ways of implementing differentiation in the classroom and introduces the Kaplan Model as a scaffold for developing independent research projects for gifted students.

**What are some ways that curriculum differentiation can be implemented in the classroom?**

A variety of strategies may be used to implement curriculum differentiation in the classrooms:

- **Pre-testing** (see Module 5A).
- **Compacting** (see Module 5A).
- **Developing tiered instruction** - the teacher develops a series of activities based on the same area of study but hierarchical in nature and complexity. Students begin activities at a level appropriate to their ability.
- **Negotiating contracts** - an agreement between the student, teacher and sometimes parent that results in the student working independently with varying levels of guidance.
- **Designing independent study or research projects** - a research project where students learn how to develop the skills for independent learning. The degree of help and structure will vary between students and depend on their ability to manage ideas, time and productivity.
- **Utilising paired and small group work** - expectations that the students work together in the collection, analysis and organisation of information but that each student prepares an individual product to demonstrate that learning has taken place.
• **Introducing future studies** - predicting, hypothesising, problem solving, finding possible solutions and hindsight.

• **Initiating negotiated curriculum** - students set their own topic, time span, and ways of presenting work.

**How do you develop Independent Study or Research Projects for gifted students?**

Kaplan (1979) listed the following principles as a guide in making curriculum decisions for gifted students:

1. Focus on major issues and concepts.
2. Emphasis on a large knowledge base.
3. Use of activities that show how subjects relate.
4. Emphasis on in-depth research.
5. Teaching of thinking skills.
6. Higher order thinking incorporated into all instruction.
7. Increased complexity and pace.
8. Focus on student self-direction.
The Kaplan Model (1986) examines curriculum differentiation in the areas of content, process, product and learning environment and the model provides an excellent scaffold for developing theme-based independent research or study projects.

**In an independent investigation:**
1. Students are attempting to answer a question through research.
2. Students need to use a variety of resources.
3. Students need to communicate their findings in an effective manner.

**To do so, students must:**
- review the literature to find out what is already known about the topic.
- generate questions about a self-selected or teacher-selected topic.
- select one question.
- formulate one or more hypotheses about the question.
- design a way to answer the question or assess whether or not the hypothesis is true.
- collect and analyse information.
- form conclusions about the question or hypothesis.
- present conclusions to an appropriate audience.
- present questions for further research.

The following are the steps of development of such projects. (NB the given example is a generic independent research task for teachers which is based on the topic of curriculum differentiation, introduced in Module 5A). You may like to use the blank Kaplan Grid (pg __) from the Resource Section to develop an independent research project for your unit of work as you work through this section.

**Step One:** Choose a key word, theme and discipline/s on which to base the project. Note that it is often appropriate to use the theme of the core unit of work being implemented. It may be necessary to choose two key words to create more complex projects.

**Key Words**

<table>
<thead>
<tr>
<th>Kinds</th>
<th>Relationship</th>
<th>Types</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Purpose</td>
<td>Style</td>
<td>Conditions</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>Importance</td>
<td>Characteristics</td>
</tr>
</tbody>
</table>
**Themes**

<table>
<thead>
<tr>
<th>Power</th>
<th>Death</th>
<th>Leisure</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Work</td>
<td>Courage</td>
<td>Life</td>
</tr>
<tr>
<td>Freedom</td>
<td>Peace</td>
<td>Commitment</td>
<td>Conflict</td>
</tr>
<tr>
<td>Family</td>
<td>Responsibility</td>
<td>Violence</td>
<td>Love</td>
</tr>
<tr>
<td>Invincibility</td>
<td>Sound</td>
<td>System</td>
<td>Religion</td>
</tr>
<tr>
<td>Hate</td>
<td>Creation</td>
<td>Silence</td>
<td>Invention</td>
</tr>
<tr>
<td>Wisdom</td>
<td>Morality</td>
<td>Evaluation</td>
<td>Energy</td>
</tr>
<tr>
<td>Friendship</td>
<td>Fairness</td>
<td>Infinity</td>
<td>Emotion</td>
</tr>
<tr>
<td>Conservation</td>
<td>Pollution</td>
<td>Tradition</td>
<td>Happiness</td>
</tr>
<tr>
<td>Destruction</td>
<td>Law&amp;Order</td>
<td>Happiness</td>
<td>Suffering</td>
</tr>
<tr>
<td>Truth</td>
<td>Knowledge</td>
<td>Beauty</td>
<td>Ignorance</td>
</tr>
<tr>
<td>Spirituality</td>
<td>Justice</td>
<td>Survival</td>
<td>Equality</td>
</tr>
<tr>
<td>Loyalty</td>
<td>Healing</td>
<td>Tolerance</td>
<td>Growth</td>
</tr>
<tr>
<td>Values</td>
<td>Education</td>
<td>Time</td>
<td></td>
</tr>
</tbody>
</table>

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step Two:** Choose the core or extended outcomes to be addressed by the project from the appropriate syllabus documents.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1 Module 5B Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step Three: Determine the research skills to be developed by this project.

Research Skills

- Taking notes
- Using a classification key
- Interviewing
- Using reference resources
- Computerised bibliographic research
- Reporting research
- Designing a research method
- Establishing criteria to judge
- Using a retrieval system
- Using a card catalogue
- Taking a survey
- Observing detail through verbal/visual description
- Using journals, magazines, newspapers
- Writing abstracts
- Analysing, interpreting data
- Outlining
- Substantiating with evidence
- Using fiction and non-fiction

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1</td>
<td>Designing a research method;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B Outcome 2</td>
<td>Establishing criteria to judge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Step Four:** Choose a critical and creative thinking skill to be developed through the project. These skills may be selected from Bloom’s Taxonomy and the Williams Model (see Module 5B Part 1):

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A 1</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B 2</td>
<td>Establishing criteria to judge</td>
<td>Evaluate situations</td>
<td></td>
</tr>
</tbody>
</table>

**Step Five:** Choose a product or choice of products, which will reflect the outcomes and skills of the project. The following list may be useful but is by no means exhaustive:

- Self-evaluation
- Editorial
- Opinion
- Debate
- Story
- Written report
- Diagram
- News article
- Chart
- Advertisement
- Cartoon
- Model
- Recipe
- Illustration
- Invention
- Mobile
- Television show
- Map
- Structure
- Diorama
- Puppet show
- Sculpture
- Pantomime
- Puzzle
- Set of photographs
- Magazine
- Simulation
- Newspaper
- Play
- Book
- Demonstration
- Tape
- Teaching lesson
- Filmstrip
- Computer program
- Recommendation
- Scrapbook
- Letter
- Research report
- Journal
- Bulletin board
- Panel discussion
- Exhibit
- Poem
- Oral presentation
- Value statement
- Graphic representation
- Survey questionnaire
- New game
**Step Six:** Develop an implementation sequence for the project in consultation with the student or students involved.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td>Research report - multimedia format</td>
</tr>
<tr>
<td></td>
<td>Module 5B Outcome 2</td>
<td>Establishing criteria to judge</td>
<td>Evaluate situations</td>
<td></td>
</tr>
</tbody>
</table>

**Implementation Sequence:**

1. Students will develop a differentiated unit of work to implement with their class in order to answer the question: How do we measure the impact of curriculum differentiation on students?
2. Students will design a research method.
3. Students will develop criteria for measuring curriculum differentiation’s impact on students.
4. Students will collect data to analyse.
5. Students will analyse data and draw conclusions.
6. Students will create a multimedia presentation as a synthesis of their findings.

Resource section: Primary example of Kaplan Model independent research projects.

Resource section page 69
If you have not yet done so, continue the modification of your unit of work by adding an independent research task for gifted students, using the blank Kaplan Model Grid (page 68) in the Resource section.

Alternatively, develop an implementation plan which maps out the timeline of the unit (as shown in the Kaplan grid example (page 69).

For further reading – An interesting article on differentiation by Sandra Berger may be found after the Resource Section should you like to further explore the elements of differentiating the curriculum.
Further References


Websites

Professional Support and Curriculum. NSW Department of Education and Training:

The Learning Place: EQ Gifted and Talented Education:
Resources
Theme: Democracy
Focus Question:
Does democracy ensure freedom?

Is freedom merely a state of mind?

What does it mean to be free?

Can freedom be measured?

What impact did democracy have on ancient civilizations and why?

How does democracy link us to the past?

What remains of the democracy of Ancient Greece?

Is democracy the best form of government?

Is democracy a choice only available to wealthy nations?

What are the rights and responsibilities of living in a democracy?

Are the rights and responsibilities the same in all democracies?

Is democracy a political, economic or social way of life?

Does democracy mean the equal treatment of all?

Can democracy exist without a political framework?

Who establishes and upholds the rights and responsibilities of democracy?

Are the rights and responsibilities the same in all democracies?

Is democracy a political, economic or social way of life?

Does democracy mean the equal treatment of all?

Can democracy exist without a political framework?

Is democracy a choice only available to wealthy nations?

How does democracy compare to other political systems?

Example Primary Concept Map
MacLeod, 2004.
Method One

Concept Map

Flow chart

Simple Flow Chart

Complex Flow Chart
List

Theme:
Focus Question:

Contributing Question One:
Extended Question:
Extended Question:

Contributing Question Two:
Extended Question:
Extended Question:

Contributing Question Three:
Extended Question:
Extended Question:

Contributing Question Four:
Extended Question:
Extended Question:

Contributing Question Five:
Extended Question:
Extended Question:
Construction of pre-tests for your unit of work

Concept Map

Venn diagram
Flow chart

Simple Flow Chart

Complex Flow Chart

Picture matching

Books

Sheet Music

Lion
Label a diagram

- Trunk
- Grass
- Leaves / Canopy
- Branch
Primary selected examples of Bloom’s Taxonomy activities

**English**
Responding to Jeannie Baker’s *Window* and *Belonging*.

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Make a list of the main events of each story.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Who was the key character in each story?</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Write an interview with the main character in each book which explores his/her feelings throughout the story.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>What are the similarities and differences between the two books? Use a Venn diagram to organise your thoughts.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Create an advertising poster for these books which reflects the theme and the main issues of both stories.</td>
</tr>
</tbody>
</table>


*Bronwyn MacLeod, 2004.*
**Mathematics**  
**Graphs**  
**Theme: Systems**  
**Focus Question: How and why do we use graphs in our everyday lives?**

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>List all of the different types of graphs you can discover.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Create a chart of each type of graph with a visual representation of each.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Conduct a survey of the class to discover what graphs they know and use. Present your results in graphical form.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Compare the different graphs that can be used to display data. Present your information using appropriate examples of each.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Create a multimedia presentation to teach younger students about the types of graphs used in everyday life and how they are used.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Which graphs are the most effective in providing a visual understanding of data? Why?</td>
</tr>
</tbody>
</table>

*Bronwyn MacLeod, 2004.*
HSIE/SOSE  
Antarctica  
Theme: Systems  
Focus Question: Why is it important to protect Antarctica?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Make a facts chart about Antarctica.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Develop a timeline to illustrate the important events in the history of Antarctica.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Construct a topographic map of Antarctica and include all the main natural and man-made features.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Compare Antarctica to the Arctic. What are the important similarities and differences between them?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Construct a three-dimensional model of a research station to be established on Antarctica. Label each section and include explanations of its proposed use(s).</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>The Antarctic Treaty was established in 1961 to protect the continent and its environment. Has the treaty been successful? Why or why not?</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
Science/Science and Technology
Simple Machines
Theme: Systems
Focus Question: What’s so simple about simple machines?

Bronwyn MacLeod, 2004.

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>What are simple machines? Make a facts chart about each simple machine.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Where are simple machines found and used?</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Construct a model to show how one simple machine works.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>What makes simple machines so effective? Compare and contrast at least 3 different simple machines.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Design a way to survey the households represented by your class, in order to discover which simple machine is the most indispensable in these homes and why.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Could we live without simple machines? Why or why not? Create a multimedia presentation to explain your ideas.</td>
</tr>
</tbody>
</table>
Primary selected examples of Williams Model activities.

### Primary

**Williams - English**

Theme: Change
Focus Question: How can the fantasy genre change the way we think?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogy</td>
<td>How is a fantasy story like a finding your way through a maze?</td>
</tr>
<tr>
<td>Provocative question</td>
<td>Is fantasy a means of escape or a lesson in reality? Discuss, referring to two of the fantasy novels you have read.</td>
</tr>
<tr>
<td>Evaluation of situations</td>
<td>In the battle between ‘good’ and ‘evil’ in the novel, what event do you believe was the ‘turning point’ of the battle? Why?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if you found yourself in the land of the novel? How would you cope? Who would you ask for help, and why?</td>
</tr>
<tr>
<td>Examples of change</td>
<td>If you were asked to be the director of the film version of the novel you have been reading, what parts/characters in the story would you change to suit the film medium?</td>
</tr>
<tr>
<td>Creative reading skills</td>
<td>Compare two versions of a fantasy story - eg two different text versions, or a text and a film version, or a text and an audio version.</td>
</tr>
</tbody>
</table>

### Primary

**Williams - HSIE / SOSE**

Theme: Change
Focus Question: How have Australian explorers helped us to understand this continent?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>List the main areas of exploration in Australia under appropriate headings.</td>
</tr>
<tr>
<td>Provocative question</td>
<td>‘There isn’t anywhere left which hasn’t been explored already.’ How true is this statement in terms of the Australian continent?</td>
</tr>
<tr>
<td>Examples of change</td>
<td>Investigate the changes brought about by one Australian explorer’s discoveries.</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>What might have happened if Cook had not explored the Southern Ocean?</td>
</tr>
<tr>
<td>Study creative process</td>
<td>Who are the explorers of modern times? Choose one Australian modern-day explorer and investigate her/his life.</td>
</tr>
<tr>
<td>Evaluate situations</td>
<td>Which journey of exploration had the greatest impact on our understanding of the Australian continent?</td>
</tr>
</tbody>
</table>
### Primary
#### Williams - Mathematics
**Theme:** Patterns  
**Focus Question:** Are tessellations a mathematical or an artistic way of creating patterns?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>List the most important features of a tessellation, giving examples of each.</td>
</tr>
</tbody>
</table>
| Examples of habit | ‘M.C. Escher was a man studied and greatly appreciated by respected mathematicians, scientists and crystallographers yet he had no formal training in math or science. He was a humble man who considered himself neither an artist nor mathematician.’  
[www.worldofescher.com](http://www.worldofescher.com)  
How did Escher change the way people thought about tessellations? |
| Evaluation of situations | How are tessellations created? Compare two different cultural ways of creating and representing tessellations. Which is more effective and why? |
| Adjustment to development | Using a 2D or 3D format, create a timeline of the development of tessellations. |
| Visualisation     | Create a 2D or 3D tessellation in the style of Escher.                     |
| Analogy           | How is a tessellation like a jigsaw puzzle? An ‘impossible puzzle’?       |

### Primary
#### Williams - Science
**Theme:** Systems  
**Focus Question:** How and why is energy important in our daily lives?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>List the different types of energy you use in your daily activities under headings that best describe each type.</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>If you had to live without one form of energy in your life, which one would you choose and how would this affect you?</td>
</tr>
<tr>
<td>Evaluation of situations</td>
<td>Choose the three most important forms of energy used by humans and develop a PMI (plus, minus, interesting) chart on each.</td>
</tr>
<tr>
<td>Adjustment to development</td>
<td>How strong is static electricity? Develop your hypothesis, then design a fair test to find out if your hypothesis is correct.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Design a working model of a toy or game that uses only one form of energy.</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is a fossil fuel like a river?</td>
</tr>
</tbody>
</table>
**Primary**  
**Williams - Visual Arts**  
Theme: Visualisation  
Focus Question: How do patterns and lines help us visualise real and imaginary worlds?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualisation</td>
<td>Look at Thomas Warrender’s <em>Still Life</em>. Create a three-dimensional, modern, real-life version of this work.</td>
</tr>
<tr>
<td>Adjustment to development</td>
<td>Choose a painting or drawing that you like and recreate it, using different patterns or lines. For example, use curved lines instead of straight lines. Does it have the same effect?</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is a pattern like a poem?</td>
</tr>
<tr>
<td>Evaluate situations</td>
<td>In Henri Rousseau’s painting, <em>Football Players</em>, what patterns and lines did he use to create this imaginary world?</td>
</tr>
<tr>
<td>Creative listening skills</td>
<td>While listening to the music, draw or paint the world you hear.</td>
</tr>
<tr>
<td>Attribute listing</td>
<td>In the artworks shown to you by your teacher, list the patterns you can see which help to create the imaginary or real world they depict.</td>
</tr>
</tbody>
</table>

---

**Primary**  
**Williams - PD/Health**  
Theme: Systems  
Focus Question: How do our body systems work together?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative writing skill</td>
<td>Write a story for a picture book that has been designed to explain one of the systems of the body to younger children.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Create a model to show how one of the body systems works.</td>
</tr>
<tr>
<td>Intuitive expression</td>
<td>Which system of the human body are you most like and why?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if you could interview one of the body systems? What questions would you ask and what answers would you expect?</td>
</tr>
<tr>
<td>Evaluate situations</td>
<td>Which has been the most significant discovery about the human body systems during the last 100 years?</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>Research what early scientists believed about the heart and the circulatory system. How did these beliefs change?</td>
</tr>
</tbody>
</table>
## Bloom's Taxonomy Blank Matrix

<table>
<thead>
<tr>
<th>Bloom Strategy</th>
<th>Activity or activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/Remembering</td>
<td></td>
</tr>
<tr>
<td>Comprehension/Understanding</td>
<td></td>
</tr>
<tr>
<td>Application/Applying</td>
<td></td>
</tr>
<tr>
<td>Analysis/Analysing</td>
<td></td>
</tr>
<tr>
<td>Synthesis/Creating</td>
<td></td>
</tr>
<tr>
<td>Evaluation/Evaluating</td>
<td></td>
</tr>
</tbody>
</table>
### William’s Model Blank Matrix

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: ‘Necessity is the mother of invention’. When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute Listing</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories. Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend? How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the ‘Brotherhood’ use the five-pointed star as their symbol of recognition? If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>Provocative Question</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it? What does a ‘Renaissance man’ have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women’?</td>
</tr>
<tr>
<td>Examples of Change</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives? Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Examples of Habit</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used? Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Organised Random Search</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood’? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>Skills of Search</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Tolerance for Ambiguity</td>
<td>Open-ended questions – ‘what if…?’</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
</tbody>
</table>
| **Intuitive Expression** | Expressing emotion through the senses; guided imagery; role-playing | Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather.  
You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police? |
| **Adjustment to Development** | Examine or playback mistakes or failures | As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched?  
Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success. |
| **Study Creative Process** | Analyse the traits of creative people, creative processes or creative products | Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions?  
Learn about the work of one of the female artists attached to the ‘Heidelberg School’. |
| **Evaluate Situations** | Analyse implications or consequences, extrapolate from ideas or actions | A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why?  
The spice trade, coffee trade and now the drug trade – how have plants altered the course of history? |
| **Creative Reading Skill** | Generate novels ideas by reading | Read *Journey to Antarctica* by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent?  
Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition? |
| **Creative Listening Skill** | Generate novel ideas by listening | Interview an inventor to discover when he or she became interested in inventing new things or ideas.  
Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time? |
| **Creative Writing Skill** | Generate novel ideas in writing | Rewrite a fairytale so there is no reference to numbers.  
Write a short story for Louisa Lawson’s magazine, *The Dawn*. |
| **Visualisation** | Express ideas in three-dimensional or non-traditional formats | Help to plan and create a mural for your class based on the book.  
Construct a scale model of the Roman Forum or the Athenian Acropolis. |
Kaplan Grid

KAPLAN MODEL Planning Grid

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
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**Implementation Sequence**
Primary example of Kaplan Model independent research projects.

KAPLAN MODEL Planning Grid – Primary Example

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy</td>
<td>Appropriate state or territory outcome</td>
<td>Interviewing Reporting research</td>
<td>Tolerance for ambiguity, Provocative question Analysis</td>
<td>Research paper: written or multimedia, oral presentation</td>
</tr>
</tbody>
</table>

Implementation Sequence

Organisation: Following the pre-test during the previous term, students are placed in ability groups to work on group tasks and, in some cases, individual tasks. Students are provided one period a week to work on group tasks. Gifted students are provided an additional period per week to work on independent research tasks, while the rest of the class work on in-class activities.

Independent research tasks for identified gifted students: Choose one of the following tasks to complete. You will present your findings to the class and invited ‘experts’, during the final week of this unit:

1. What if you were Prime Minister for a week? Plan your timetabled agenda for the week including the following:
   - the places you would visit and why?
   - the speech you would give to the Australian people about the responsibilities of living in a democracy
   - the laws you would introduce to Parliament
   - who you would like to meet and why?
   - and any other important points you believe should be on the agenda.
   Present your plan in an oral research report using multimedia.

2. How does living in a democracy compare to living in other systems of government? Choose two other political systems and compare them with democracy. You may need to interview people who have lived, or are living, in different political systems, read newspaper articles, and research information from the Internet, to help support your ideas. Use a graphic organiser such as a three-circle Venn diagram to help organise your thoughts. Present your research in an oral presentation with a supporting written or multimedia report.

3. Can freedom be measured? Design a survey form to discover how your peers, family and other adults value freedom? What would make them feel that they weren’t free? How would they feel if someone tried to take away their freedom? Conduct your survey, analysis and present the data you collect. Present your research in an oral presentation with a supporting written or multimedia report.
Students who are gifted and talented are found in full-time self-contained classrooms, magnet schools, pull-out programs, resource rooms, regular classrooms, and every combination of these settings. No matter where they obtain their education, they need an appropriately differentiated curriculum designed to address their individual characteristics, needs, abilities, and interests.

Developing an Effective Curriculum

An effective curriculum for students who are gifted is essentially a basic curriculum that has been modified to meet their needs. The unique characteristics of the students must serve as the basis for decisions on how the curriculum should be modified (Feldhusen, Hansen, & Kennedy, 1989; Maker, 1982; TAG, 1989; VanTassel-Baska et al., 1988).

It is difficult to generalize about students who are gifted because their characteristics and needs are so personal and unique. However, as a group they comprehend complex ideas quickly, learn more rapidly and in greater depth than their age peers, and may exhibit interests that differ from those of their peers. They need time for in-depth exploration, they manipulate ideas and draw generalizations about seemingly unconnected concepts, and they ask provocative questions.

A program that builds on these characteristics may be viewed as qualitatively (rather than quantitatively) different from the basic curriculum; it results from appropriate modification of content, process, environment, and product (Maker, 1982).

Modifying Content

Content consists of ideas, concepts, descriptive information, and facts. Content, as well as learning experiences, can be modified through acceleration, compacting, variety, reorganization, flexible pacing, and the use of more advanced or complex concepts, abstractions, and materials. When possible, students should be encouraged to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity. Their learning characteristics are best served by thematic, broad-based, and integrative content, rather than just single-subject areas. An entire content area arranged and structured around a conceptual framework can be mastered in much less time than is traditionally allotted (VanTassel-Baska, 1989). In addition, such concept-based instruction expands opportunities to generalize and to integrate and apply ideas. (See Bruner, 1966, Man: a Course of Study Macros for an example of a thematic, integrated curriculum.)

Middle and secondary schools are generally organized to meet student needs within content areas. Providing an interdisciplinary approach is another way of modifying curriculum. Jacobs and Borland (1986) found that gifted students benefit greatly from curriculum experiences that cross or go beyond traditional content areas, particularly when they are encouraged to acquire an integrated understanding of knowledge and the structure of the disciplines.

Modifying Process

To modify process, activities must be restructured to be more intellectually demanding. For example, students need to be challenged by questions that require a higher level of response or by open-ended
questions that stimulate inquiry, active exploration, and discovery. Although instructional strategies depend on the age of the students and the nature of the disciplines involved, the goal is always to encourage students to think about subjects in more abstract and complex ways. Activity selection should be based on student interests, and activities should be used in ways that encourage self-directed learning. Bloom's Taxonomy of Educational Objectives (1956) offers the most common approach to process modification. His classification system moves from more basic levels of thought, such as memory or recall, to more complex levels of analysis, synthesis, and evaluation. Farnes (1966), Tab (1962), and others have provided additional models for structuring thinking skills. Every teacher should know a variety of ways to stimulate and encourage higher level thinking skills. Group interaction and simulations, flexible pacing, and guided self-management are a few of the methods for managing class activities that support process modification.

Modifying Environment

Gifted students learn best in a receptive, nonjudgmental, student-centered environment that encourages inquiry and independence, includes a wide variety of materials, provides some physical movement, is generally complex, and connects the school experience with the greater world. Although all students might appreciate such an environment, for students who are gifted it is essential that the teacher establish a climate that encourages them to question, exercise independence, and use their creativity in order to be all that they can be.

Modifying Product Expectation and Student Response

Teachers can encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas. For example, instead of giving a written or oral book report, students might prefer to design a game around the theme and characters of a book. Products can be consistent with each student's preferred learning style. They should address real problems, concerns, and audiences; synthesize rather than summarize information; and include a self-evaluation process.

Assessing Curriculum Effectiveness

In their synthesis of curriculum effectiveness studies and effective practice, VanTassel-Baska et al. (1988) suggested that differentiated curriculum would respond to diverse characteristics of gifted learners in the following three ways:

1. By accelerating the mastery of basic skills through testing-out procedures and reorganization of the curriculum according to higher level skills and concepts.
2. By engaging students in active problem-finding and problem-solving activities and research.
3. By providing students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.

Curriculum development is a dynamic, ongoing process. Special attention needs to be paid to articulation, scope, and sequence to avoid gaps and repetition through grade levels; ensure that the understandings and skills we expect children to develop fit together; and assure that children are provided with the knowledge and skills that will prepare them for the future. Periodic evaluations of curriculum effectiveness allow corrections to be made when needed, and they are essential if curriculum is to meet the long-term needs of gifted students for increasingly complex and challenging opportunities.

Conclusion

The curriculum committee of the Leadership Training Institute (Passow, 1982) developed seven guiding principles for curriculum differentiation that reflect the considerations described in this Digest.

1. The content of curricula for gifted students should focus on and be organized to include more elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
2. Curricula for gifted students should allow for the development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.

3. Curricula for gifted students should enable them to explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.

4. Curricula for gifted students should encourage exposure to, selection, and use of appropriate and specialized resources.

5. Curricula for gifted students should promote self-initiated and self-directed learning and growth.

6. Curricula for gifted students should provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.

7. Evaluations of curricula for gifted students should be conducted in accordance with the previously stated principles, stressing higher level thinking skills, creativity, and excellence in performance and products.

Developing curriculum that is sufficiently rigorous, challenging, and coherent for students who are gifted is a challenging task. The result, however, is well worth the effort. Appropriately differentiated curriculum produces well-educated, knowledgeable students who have had to work very hard, have mastered a substantial body of knowledge, and can think clearly and critically about that knowledge. Achieving such results for one or for a classroom full of students who are gifted will produce high levels of satisfaction, not only for the students who are beneficiaries, but also for every teacher who is willing to undertake the task.

References


Module 5

Bronwyn MacLeod
Welcome!

You are about to start a Professional Development Course which will help you identify the gifted and talented students in your class or your school, and differentiate the curriculum to respond to their individual learning needs. You'll also be able to decide which of your students may benefit from various forms of ability or interest grouping and which may possibly be candidates for one or more of the many forms of academic acceleration.

About the Package

The course consists of six Modules

Each Module consists of three levels: Core, Extension and Specialisation. The Core levels of the six Modules are the heart of this course. The Core Modules contain essential information and practical advice and strategies to assist you to identify and respond to your gifted and talented students.

We strongly suggest that you complete the Core level of each Module.

Pre-tests

We are aware that teachers and school administrators will enter this course with a wide range of existing knowledge of gifted and talented education. To accommodate this range of knowledge and experience, we have started each Core Module, from Module 2 onwards, with a pre-test. We encourage you to take these pre-tests and, if you ‘test out’ on any Module at Core level, simply move on to the next Module. For example, if you ‘test out’ of Core Module 2 you will pass over that Module and move on to Core Module 3.

Extension and Specialisation Levels

Extension and Specialisation levels for each Module. Material covered in the Extension and Specialisation levels builds on the knowledge you will have gained from the Core level in each Module. Key issues are examined in greater depth and participants explore a wider range of issues in the cognitive and social-emotional development of gifted students. New identification, curriculum differentiation and program development techniques are introduced.

The Extension and Specialisation levels require teachers, counsellors and administrators to undertake further reading and practical activities to reflect on classroom practice, school practice and policy. They encourage participants to focus on their specific role in the school and prepare a brief action plan to demonstrate application or mastery of outcomes.

Schools may decide that completion of the course at Specialisation level would be a useful prerequisite for becoming the school’s Gifted Education Coordinator.
What will you learn in this course?

The course consists of six Modules:

**Module One: Understanding Giftedness**
Understanding the nature of giftedness and talent; what the terms mean; levels and types of giftedness. Cognitive and affective characteristics of gifted and talented students; ways in which these students may differ from their classmates - even if at first we don’t observe this.

**Module Two: The Identification of Gifted Students**
A range of practical identification procedures, with particular attention to procedures which are effective in identifying gifted students from culturally diverse and disadvantaged groups. We’ll be emphasising the use of a combination of approaches rather than a single measure such as IQ testing or teacher nomination used in isolation.

**Module Three: Social and Emotional Development of Gifted Students**
Understanding the social and emotional characteristics and needs of gifted students. Ways in which gifted students may differ somewhat from their classmates in their social and emotional development. Supporting gifted students and their parents. Teaching strategies and class structures which foster the development of positive social attitudes and supportive peer relationships in gifted students.

**Module Four: Understanding Underachievement in Gifted Students**
Understanding the causes of underachievement in gifted students. Identifying gifted underachievers and planning interventions designed to prevent and reverse cycles of underachievement.

**Module Five: Curriculum Differentiation for Gifted Students**
Teaching strategies and methods of curriculum differentiation which enhance the learning of gifted students in the regular classroom. Appropriate use of different enrichment models that international research has found to be effective with gifted and talented students. Practical applications of pre-testing, curriculum compacting and individualised programming.

**Module Six: Developing Programs and Provisions for Gifted Students**
Practical strategies for the establishment and monitoring of ability, achievement or interest grouping, and the many forms of accelerated progression. Particular attention will be paid to the effects of various strategies on students’ academic and social development.
Much of the material is suitable across teaching and learning contexts. This content is not specifically marked. However, content that may be applicable to your particular context is identified as follows:

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<thead>
<tr>
<th>Role</th>
<th>Classroom Teacher</th>
<th>Executive Staff</th>
<th>Principal</th>
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<th>Location</th>
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<tr>
<th>Mode</th>
<th>Self Study</th>
<th>Small Group</th>
<th>Whole Staff</th>
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Follow these symbols through the content to customise your learning path.

Each Module comes in two parts, each concluding with a practical exercise. We suggest that you complete the first and second parts a few days apart - unless this is not workable in your particular learning context. This will give you a chance to digest the information in Part 1 and work through the Reflective/Practical component.
Module 5
Curriculum Differentiation for Gifted Students

Welcome to the fifth Module for this Professional Development Course.

Module 5 is divided into two main sections, Module 5A and Module 5B, which in combination examine the key core issues of curriculum differentiation. You will find a pre-test at the beginning of each section which you are invited to complete before deciding the pathway you will take through each section. You are also encouraged to modify a unit of work that you currently teach as you work through the activities within this Module.

When working through this Module it is strongly advised that the most appropriate mode for professional development in all activities within the Module, is that of individual or small group. The small groups may be organised as faculty or grade teams. This will ensure that appropriate opportunities are provided for professional dialogue and reflection on the content of this Module.
Core Module 5A

Pre-Test

What do the terms 'differentiation' and 'curriculum compacting' mean to you? Spend a few moments to write your definitions below:
Briefly look at the examples of unit planning appropriate to your stage of teaching. Choose which one you think best depicts differentiated curriculum. Where can you see evidence of curriculum compacting occurring in these examples?

**Example One**

Ms Kobe is an English/History teacher in a large metropolitan selective co-educational senior secondary college (the college caters for Year 11 and 12 only) and Ms Kobe is teaching the top English class in Year 11.

In planning for the Term 3 units which involve a Shakespeare study and work on post-modernism, Ms Kobe has decided that she will assess her students’ prior learnings and skills to best address their needs in her teaching program. Her colleagues feel that this is unnecessary as she already has the top group but her experiences from the two previous terms have told her that this is still a mixed ability group.

Ms Kobe pre-tests them by asking the students to respond to two passages in a writing task. After analysing the results of the students’ writing, she decides to plan a unit which allows her students to choose pathways dependent on their confidence level, and their strengths and weaknesses as shown in the pre-test.

**Example Two**

Mr Wolfer’s Year 8 Science class is a mixed ability group in a boys’ high school in an inner city area. The school has experienced problems in the past with high levels of truancy but there has been an active program in place to address this situation and encourage the boys to set realistic goals and expectations for themselves.

The next unit Mr Wolfer has to teach the boys is a physics-based unit on energy, specifically looking at forces and motion. Many of the boys in his class have not engaged in the subject matter of the science teaching so far as they tell him that they can’t see the point of it to their lives. Mr Wolfer decides to set a real-world problem solving scenario as the assessment for the unit and gives the boys the option of working in small groups or by themselves to complete the task.

**Example Three**

For the last three years, Ms Manglick has been the only Visual Arts teacher in a small rural high school. Last year, she decided to visit a number of the primary schools that send students to her high school to observe the art being taught in the classrooms and to attempt to make seamless the transition from Primary level art to High School art.

Based on her observations, Ms Manglick decided to ask all of the primary teachers if they would allow their students to participate in a pre-test activity during the last weeks of their final primary year, so that she could better plan for the first Visual Arts unit the students would encounter in High School. The
Primary teachers were willing to help and from the information Ms Manglick gained from the pre-tests she planned a unit of work on the theme of ‘Change’ which allowed for two levels of activities using Bloom’s Taxonomy and in which students produced works for an exhibition held towards the end of their first year in secondary schooling.
Each of the examples described show elements of differentiation and while more information would be needed on each example to make a definite judgement on the level of differentiation and curriculum compacting, the scenario in the box (below) is the most exemplary instance of best practice in differentiation and curriculum compacting.

The criteria for judging your understanding of differentiated curriculum and compacting are:

**Strong understanding:** Identified the example which has three or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from the other two examples, such as lack of theme, pre-testing, curriculum model or compacting;

**Some understanding:** Identified an example with at least two or more elements of differentiation, including the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Identified at least two areas of omission from one other example, such as lack of theme, pre-testing, curriculum model or compacting;

**Little or no understanding:** Identified an example with one element of differentiation, such as the use of a theme, pre-testing, the use of a curriculum model such as Bloom’s Taxonomy and the compacting of unit outcomes. Unable to identify any areas of omission from any of the examples.

The following points about each example can be highlighted:

In Example One, Ms Kobe has demonstrated some elements of both curriculum differentiation and compacting in her planning for these units of work. Ms Kobe was correct in her understanding that even in a ‘top’ class there will be a variety of ability levels. She individually pre-tests her students skills in the writing response task and offers some compacting opportunities by allowing students to choose pathways of varying levels of activities dependent on their needs. While the pre-test appears to target skills outcomes, it is unclear whether students were also pre-tested on the knowledge outcomes associated with the Shakespeare study or post-modernism. Additionally, student confidence is not always correlated with student ability and/or performance and students may choose the easier pathway due to a lack of confidence but not to a lack of ability.

In Example Two, the use of a problem solving scenario is an excellent way to engage reticent learners in the unit topic and offering a choice of working individually or in small groups helps to differentiate the learning environment. It would also have been useful in this case, however, to pre-test the boys’ skills and understandings of the core unit outcomes prior to beginning the unit, to allow for some curriculum compacting where appropriate, and also to design a choice of activities at different levels of difficulty throughout the unit. There is no evidence of curriculum compacting in this example, as no pre-testing was conducted.
In **Example Three**, Ms Manglick initiated a process of communication with the local primary schools which allowed her to assess her students’ needs prior to their entry to the high school. It is important to note that this **pre-testing** activity might have also have been conducted on an orientation day or during the first week of high school. In doing this, Ms Manglick was able to plan a differentiated unit of work based on a theme, **two levels** of difficulty planned with **Bloom’s Taxonomy** and with a **real world audience** culminating activity. From the information given it is not clear if the pre-test was based on both content and skills outcomes for the unit, nor whether any curriculum compacting was undertaken.

**Choosing a Pathway**

Your responses to this pre-test task should have helped to:

- validate your current understandings of curriculum differentiation and compacting, if you identified the example of best practice.
- delineate the strengths or weaknesses of your understandings of curriculum differentiation and compacting, if you identified the majority of points.
- clarify the areas on which you need to focus while working through Module 5 Parts A and B, if you did not identify the features of differentiated curriculum such as pre-testing and curriculum compacting.

**Content Areas of Core Module 5: Part A and Part B**

**Core Module 5A** is divided into Parts 1 and 2 (NB If you feel you have a firm understanding of the basic tenets of differentiation following your responses to the pre-test, you may wish to omit Part 1 and move to Part 2 instead):

- Part 1 (page 8) examines definitions, issues and strategies of differentiation.
- Part 2 (page 15) examines compacting the curriculum through unit planning and pre-testing.

**Core Module 5B** is also divided into Parts 1 and 2 (NB Prestests at the beginning of this module will help you choose a pathway through both parts of the module):

- Part 1 continues the process of differentiation by examining two curriculum models - Bloom’s Taxonomy and the Williams Model.
- Part 2 examines additional strategies that can useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.
Outcomes

At the completion of this half of the Module you will be able to:

• explain the definition and purpose of differentiation, in relation to gifted students specifically.

• analyse the elements of differentiation present in a unit of work.

• describe the process of curriculum compacting.

• develop an outcomes-based pre-test for a unit of work you teach.
This Module introduces the concept of differentiation, and appropriate planning and teaching strategies to achieve differentiation in a classroom environment. Part 1 examines some definitions, and the purpose and need for planning a differentiated unit of work.

What is curriculum differentiation?

A ‘one size fits all’ syllabus rarely delivers what provisions it claims. Most state and territory syllabus documents are designed to meet the learning needs of the majority of students in any classroom. Some documents suggest that the ‘special learning needs’ students, as well as gifted students, may necessitate curriculum modification; however, the reality of initiating such modifications in classrooms of 30 or more students is often overwhelming to classroom teachers who may have no previous experience in planning a multi-layered program.

Curriculum differentiation can address this issue and help to cater for the different learning needs of students in any classroom structure. A number of definitions of curriculum differentiation exist, all of which highlight the same main issue:

Differentiated curriculum addresses the different learning styles and rates of learning of students in both mixed ability and self contained gifted classrooms.

Classroom structures at any level of schooling are rarely homogeneous and therefore a teacher-directed program set to only one style of learning or one pace of learning will generally fail to meet the needs of the majority of the students in the class.
“Essentially, the aim of differentiating instruction is to maximize each student’s growth by meeting each student where he or she is and helping the student to progress. In practice, it involves offering several different learning experiences in response to students’ varied needs.

Learning activities and materials may be varied by difficulty to challenge students at different readiness levels, by topic in response to students’ interests, and by students’ preferred ways of learning or expressing themselves.

This is not the individual education program (IEP) approach where there are different experiences for all 20-30 students in the class. Typically two to four different learning experience are offered by the teacher, or students are given opportunities to make their own choices.”

Who is curriculum differentiation for, and why use it?
Meeting the needs of all students in the variety of educational settings teachers may find themselves in, such as mixed ability and self-contained gifted classrooms, poses some interesting challenges for educators.

The often resorted to ‘teach to the middle’ approach may in many cases result in frustration for both students and teachers. Some students, often the gifted, experience the frustration of a curriculum that is lacking in challenge and moves too slowly, whilst other students, usually those with special learning needs, experience the frustration of a curriculum that moves too quickly and which lacks the scaffolding and structure on which they need to frame their learning. Such frustration sometimes leads to behaviours which are undesirable and non-productive. These behaviours are not always outwardly visible and disruptive. For some students their frustration is more evident in the level to which they become passive and withdrawn from the learning process.

Curriculum differentiation provides a framework that is better able to address the needs of all learners in the classroom and thus reduce some of the frustrations being experienced by both teacher and students. All students need to regularly experience that moment in their learning where they achieve a ‘personal best - a PB’. In the sporting arena, the achievement of a ‘PB’ is greeted with applause and accolade, and so should it be in the academic arena as well.

When specifically looking at the needs of gifted learners, three important issues of curriculum arise:

- Gifted students need a challenging curriculum that addresses their needs for pace and complexity.
- Gifted students require instruction and scaffolding for their learning but may not require the level of repetition and support needed by other less able students.
Gifted students who have not experienced a differentiated curriculum previously may challenge the process with the ‘it’s not fair that I have to do something that is different/harder/ has higher expectations’.

It is very important to establish with all students in your classrooms the understanding that they each have different learning needs and that in a differentiated classroom it is common for students to be using different thinking processes and creating different levels of products. This is not a matter of ‘unfair’ distribution of tasks but rather a system which is fair to all learners in terms of their respective needs.

**What are some of the strategies you can utilise to design differentiated curriculum?**

So, what are some of the strategies you can use to begin designing differentiated curriculum? Maker (1982) describes curriculum modifications for gifted students as encompassing four areas:

**Content modifications** for gifted students should:

- be abstract, complex, varied
- involve issues of organisation, study of people, methods of inquiry.

**Process modifications** for gifted students should:

- involve higher order thinking processes
- promote creative and critical thinking
- require problem solving
- involve group interaction
- have variable levels of pacing
allow for debriefing of the process
involve open-endedness
allow for freedom of choice.

**Product modifications** for gifted students should:
- involve real world problems
- be for real world audiences
- require real deadlines
- require transformation of learning
- involve appropriate assessment and evaluation
- involve extended or accelerated outcomes.

**Learning environment modifications** for gifted students should:
- be flexible and open
- encourage independent and intrinsic learning
- be accepting and non judgemental
- encourage complex and abstract thought.

Commonsense dictates that the areas of content, process, product and learning environment are where curriculum may also need to be modified for students with special learning needs. However, it is important to note that **teachers new to differentiation may choose to begin by differentiating content or process or product, rather than all of them, until they are both familiar and comfortable with the strategies.**

Additionally, the following strategies will also assist the process of differentiation:
- Assessing students’ prior skills and understandings (see Part 2 of Module 5A).
- Using pre-assessment to compact the curriculum for students who have already mastered the core (see Part 2 of Module 5A).
- Using tiered assignments and/or assessment tasks (see Part 2 of Module 5B).
- Accelerating the pace for gifted students to allow for independent study on student interest (see the Extension level of this Module).
- Flexibly grouping to allow gifted students to work with like-minded peers (see Module 6).
- Designing independent research tasks (see Part 2 of Module 5B) where students learn how to develop and manage their independent learning skills. The degree of complexity of the project will depend on student readiness and independent research may begin as a paired project.
• Negotiating learning contracts where a written agreement between teacher and student results in students working independently. The contract helps students to set daily and weekly work goals and develop management skills. It also helps the teacher keep track of student progress (see Part 2 of Module 5B).

• Creating learning centres, particularly in early childhood and primary classrooms. It is important to note that a learning centre is not necessarily differentiated unless the activities are varied by complexity, taking into account different student ability and readiness. It is also important that students understand what is expected of them in any task they choose from the learning centre and that they are encouraged to develop time management skills to complete these tasks.

• Becoming a teacher as a facilitator rather than a director of learning.
Reflective/Practical Component

Having worked through Part 1 of this Module, how would you now define the terms compacting and differentiation? Do you need to modify your original definition? If so, re-work your definition in the space below.

Which aspects of differentiated curriculum would you find most difficult to implement?

Compare your responses.
Now evaluate the level of differentiation in a unit of work you have taught previously, or alternatively, a unit of work you want to teach. Use the questions below to guide you and note down some of your thoughts in the spaces provided.

Was/Is the content appropriate for the class?

- Was/Is the level of content offered suitable for each of the abilities within the range in your class?
- Did/Will you pre-test the outcomes for the content of this unit?
- Did /Will you make any changes to the content from your original program? Why?
- Might you change any of the content in any future teaching of the unit? Why or why not?

Were/Are the processes in the teaching toward the outcomes in this unit appropriate for the class?

- Was/Is the pace of instruction offered suitable for each of the ability groups in your class?
- Did/Will you pre-test the skills-based outcomes of the unit?
- Did/Will you make any changes to the higher order thinking skills from your original program? Why?
- Might you change any of the process strategies in any future teaching of the unit? Why or why not?

Were/Are the products required appropriate for the unit outcomes?

- Were/Are the types of products offered suitable for each of the ability groups in your class?
- Did/Will you make any changes to the products required from your original program? Why?
- Might you change any of the products in any future teaching of the unit? Why or why not?

Was/Is the learning environment appropriate for the class?

- Did/Will any of the ability groups in your class require modifications to the learning environment?
- Did/Will you make any changes to the learning environment from your original program? Why?
- Might you change any aspects of the learning environments in any future teaching of the unit? Why or why not?
What does the term ‘compacting the curriculum’ mean?

There are six key steps to curriculum compacting:

- identifying the outcomes
- pre-testing the outcomes
- eliminating the areas of repetition
- streamlining the learning experiences
- offering enrichment, extension and/or acceleration - matching student need to intervention
- documenting the process.

How do you incorporate curriculum compacting into unit planning?

In this section, you are encouraged to begin the process of curriculum differentiation and curriculum compacting by mapping a unit of work that you will teach in the near future.

Examples of unit planning for different levels of schooling can be found in the resource section of this Module and it is suggested that these may be useful as a model when mapping a differentiated unit for the first time.

Resource section:

Example of Secondary unit planning (page 52)

Two alternative methods might be used in this process, dependent on preference of planning as shown in the following flowcharts. NB: The examples show five contributing questions but this may vary from three to five depending on the time frame of the unit:
Method One

- Core contributing question + core assessable outcomes
- Core contributing question + core assessable outcomes
- Core contributing question + core assessable outcomes
- Core contributing question + core assessable outcomes
- Pre-testing core outcomes to establish prior understandings and skills of students
- Extended question + extended outcomes
Method Two

These methods differ only in the point at which the outcomes are involved in the planning process. Curriculum compacting occurs in the planning that follows the pre-testing and may involve extended outcomes, independent research projects and/or acceleration of outcomes. In Module 6, acceleration and grouping will be addressed in detail.

Method One is useful for units where the theme, or the ‘big idea’, is the first point in the planning process. In states where mandatory content outcomes must be addressed in the teaching and learning process, it may be more appropriate to use Method Two.
The following pages step out the two different methods of unit planning:

**Method One**

Using a concept map (page x), flowchart (page x) or a list (page x) from the resource section, work through the following steps (NB the given example is a generic unit of work for teachers which is based on the topic of curriculum differentiation):

**Step One:** Choose a theme which incorporates the basis of the unit. For example abstract nouns often serve as useful themes:

- Change
- Systems
- Growth
- Power
- Freedom
- Democracy
- Tolerance
- Persecution
- Traditions
- Survival
- Communication
- Justice
- Time
- Truth, and so on.

NB: Be careful not to mistake a topic for a theme; eg, ‘Electricity’ is a topic, ‘Systems’ is a theme.
Step Two: Construct a focus question which links to the theme. This question should set the focus for all students working on this unit, regardless of their ability level, and should require substantial thinking or study to answer it.

For example, on the theme of ‘Systems’, the focus question might be: ‘Does curriculum differentiation ensure learning for all?’ or ‘How and why is curriculum differentiation important?’

Step Three: The core contributing questions for the unit are constructed next. The number of questions needed depends on the length of the unit and the age group being taught.

For example, in an early childhood unit of work, teachers may decide that three questions are enough to address in a term’s unit of work, whereas teachers in primary classrooms may extend that to four or five questions throughout a term. One contributing question may take two to three weeks to address in early childhood or primary classrooms.

In secondary classrooms, where units may only be taught for half a term or less, contributing questions may be addressed in shorter time periods.

The contributing questions should be designed to support the theme and the focus question.

The key or assessable core outcomes are then matched to the core contributing questions. In some states, the core outcomes are also the assessable outcomes; however, in other cases there is a difference between assessable and indicative outcomes and teachers may choose to match only the assessable outcomes in the planning stage.

The following example illustrates the planning of the theme, focus question, contributing questions and outcomes for this Module of the Professional Development course on curriculum differentiation:
Step Four: Once the contributing questions have been established, a set of extended questions should be developed from the core contributing questions. These questions will be the framework for the extension activities designed for gifted students. NB: If differentiating for all levels in a mixed ability classroom, a set of support or structured questions may also be designed for students with special learning needs.

**Theme:** Systems

**Focus Question:** Does curriculum differentiation ensure learning for all?

**Contributing Question One:** Which students need a differentiated curriculum and why?

**Extended Question:** Is differentiation the only choice available to cater for student differences?

**Extended Question:** How do we measure the impact of curriculum differentiation on students?
Contributing Question Two: In what areas can we differentiate the curriculum?

   Extended Question: Is differentiation only effective if used in all areas of the curriculum?
   Extended Question: Are process modifications the most important part of curriculum differentiation?

Contributing Question Three: In what ways can pre-testing help differentiate the curriculum?

   Extended Question: Is pre-testing only effective when there are objective criteria to judge performance?
   Extended Question: Should pre-testing be matched with post-testing to judge learning gain?

Contributing Question Four: What models can we use to modify the curriculum for all levels of ability?

   Extended Question: Is any one curriculum model better than the others for differentiation and why?
   Extended Question: Are some models more appropriate for different levels of schooling and different subjects?

Contributing Question Five: What strategies can we use to differentiate the curriculum?

   Extended Question: Can freedom of choice be the best option for curriculum differentiation?
   Extended Question: Do students always choose appropriately difficult tasks?
What content outcomes do your students already know before beginning the unit of work?

What skills outcomes have your students already achieved prior to this unit of work?

Once the unit has been mapped out, the next step is to design ways to assess prior learning. In this design, it is important to:

- take into account the variety of student learning styles, so that all students have the opportunity to demonstrate what they understand and what skills they already possess.
- pre-test the key or assessable outcomes.
- pre-test students individually and not as a group or a class, to allow all students a chance to respond.
- make sure that students have encountered the style of pre-test previously, eg, if students have not used a Venn diagram before, teach them the skill first then use the strategy as a pre-test.

The following list of ideas may be helpful in the construction of pre-tests for your unit of work:

- Concept maps - Resource section page 53
- Venn diagrams - Resource section page 53
- Flow charts - Resource section page 54
- Draw a diagram, picture
- Written response
- Picture matching - Resource section page 54
Experimental design
Label a diagram - Resource section page 55
Multiple choice
Short answers
Essay response
Problem solving
Hypothesis-based responses
Cloze passage
Make a model
Hands-on activities
Bloom’s Taxonomy questions (one from each level)

Important points to remember

- Pre-tests can, and should, be administered well in advance of the start of the unit of work to allow time to differentiate the unit activities appropriately.

- Some students suffer from test anxiety and may not be able to respond to the pre-test activity to the best of their ability if they perceive that the pre-test will be reportable. It is often better to explain to your students that you are planning the next unit you will be teaching them and would like to find out if they know any of the content or if they can do any of the skills prior to beginning the unit. This way you can reassure the students that the purpose of the activity is to help with planning rather than to assess and report on them.

- Pre-tests should not be displayed in the classroom nor added to portfolios, as their purpose is for diagnosis of content and skills needs only.

- Students do not need to achieve 100% accuracy on a pre-test activity to demonstrate mastery of an outcome. **Accuracy or competency equating to 85% or greater demonstrates a mastery level for which extension is essential.**

- To evaluate student mastery of an outcome, objective criteria for each outcome being pre-tested should be developed. For example, what does a student need to include in a pre-test to be evaluated as ‘working at grade level’ and therefore a candidate for extension?

Pre-testing should not be a lengthy process:

For example, in secondary classrooms, where time is at a premium, it is important to ensure that pre-testing targets the assessable outcomes in an accurate way. In KLAS where two to three units may be taught in a term, it is time-efficient to pre-test all units at the same time, in the term prior to their implementation, using one lesson to do so and thus avoiding the disruption of having short pre-test activities in later lessons.
Choose at least two different styles from the suggested list (or any which are not mentioned) and design two outcomes-based pre-tests for the unit of work you have been mapping.

Trial your pre-tests with your class and collect work samples representing each level of the reporting descriptors, or grades, you use in your school.

For example:

- working towards grade, working at grade, working beyond grade
- experiencing difficulty, developing, competent, highly developed
- band one, band two, band three.

Module 5B Parts 1 and 2 will discuss ways of differentiating the curriculum for those students who have demonstrated some or all mastery of the outcomes you have pre-tested and who should subsequently work on the extended questions from the unit concept map.

Why use a curriculum model when differentiating the curriculum?

It is important that curriculum differentiation is based on the application of one or more models to carry out the instructional outcomes of the proposed program or unit of work. The model or models chosen should have research to support that they produce ‘substantial’ gains in the areas of academic, social, or emotional development. The models explained in Module 5B have been chosen because they meet these parameters.

References


Websites

Inspiration Software, Inc - Visual learning tools:
  www.inspiration.com

Houghton Mifflin: Education Place - graphic organisers in .pdf format to download:
  http://www.eduplace.com/graphicorganizer/
Core Module 5B

Pre-Test

How familiar are you with the strategies of Bloom’s Taxonomy and the Williams Model? By completing the following pre-tests you will have the opportunity to decide which pathway you need to take through this part of Module 5:

Bloom’s Taxonomy

Read through the activities for your level of teaching and identify which of Bloom’s strategies is represented by each.

1. In your own words, describe the physical and emotional attributes of adolescence.
2. Create a multimedia presentation that exposes the prevalent stereotypes of adolescence.
3. List the different methods scientists might use to study adolescence.
4. Adolescence is the most important stage of development. Do you agree or disagree? Why or why not?
5. Use a flowchart or other graphic organiser to model the changes, which occur during adolescence.
6. Examine the ways in which two different cultural groups view adolescence. How are these views similar or different?
The Williams Model

Read through the activities for your level of teaching and identify which Williams Model strategies are represented by each.

(Note that while the model offers 18 different teaching strategies, the pre-test targets a selection of 6 of these strategies.)

1. How is adolescence like a storm?

2. List the most important issues facing adolescents today.

3. How do scientists study adolescence? Investigate some of the different issues of adolescence currently being investigated by scientists.

4. Imagine you are an adolescent living in ancient times. Describe how your daily activities may have been.

5. A ‘rite of passage’ marks the transition from one stage of life to another. How important is this for adolescence?

6. Adolescence is only a state of mind promulgated by the media for commercial gain. Do you agree? Why or why not?
Bloom’s Taxonomy

Please note that the first answer for each question is from the original version of Bloom’s Taxonomy and the second from the revised version of the model.

The criteria for judging your understanding of Bloom’s Taxonomy are:

**Strong understanding:** Accurately identified five or six examples of Bloom’s strategies.

**Some understanding:** Accurately identified three or four examples of Bloom’s strategies.

**Little or no understanding:** Accurately identified two or fewer examples of Bloom’s strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of Bloom’s Taxonomy, you may choose to omit the section on Bloom’s Taxonomy and attempt the Williams Model pretest (page 26).

1. In your own words, describe the physical and emotional attributes of adolescence.
   COMPREHENSION / UNDERSTAND

2. Create a multimedia presentation that exposes the prevalent stereotypes of adolescence.
   SYNTHESIS / CREATE

3. List the different methods scientists might use to study adolescence.
   KNOWLEDGE / REMEMBER

4. Adolescence is the most important stage of development. Do you agree or disagree? Why or why not?
   EVALUATION / EVALUATE

5. Use a flowchart or other graphic organiser to model the changes, which occur during adolescence.
   APPLICATION / APPLY

6. Examine the ways in which two different cultural groups view adolescence. How are these views similar or different?
   ANALYSIS / ANALYSE
Williams Model

The criteria for judging your understanding of the Williams Model are:

**Strong understanding:** Accurately identified five or six examples of the Williams strategies.

**Some understanding:** Accurately identified three or four examples of the Williams strategies.

**Little or no understanding:** Accurately identified two or fewer examples of the Williams strategies.

Should you have found from your pre-test results that you had some, or a strong understanding of the Williams Model, you may choose to omit the section on the Williams Model and attempt Module 5B Part 2 (page 41).

1. How is adolescence like a storm?
   ANALOGY

2. List the most important issues facing adolescents today.
   ATTRIBUTE LISTING

3. How do scientists study adolescence? Investigate some of the different issues of adolescence currently being investigated by scientists.
   ORGANISED RANDOM SEARCH

4. Imagine you are an adolescent living in ancient times. Describe how your daily activities may have been.
   INTUITIVE EXPRESSION

5. A ‘rite of passage’ marks the transition from one stage of life to another. How important is this for adolescence?
   EVALUATE SITUATIONS

6. Adolescence is only a state of mind promulgated by the media for commercial gain. Do you agree? Why or why not?
   PROVOCATIVE QUESTION
Choosing a Pathway

Your responses to this pre-test task should have helped to:

- validate your current understandings of Bloom’s Taxonomy and the Williams Model if you correctly identified all of the activities.
- delineate the strengths or weaknesses of your understandings of Bloom’s Taxonomy and the Williams Model, if you correctly identified the majority of the activities.
- clarify the areas on which you need to focus whilst working through Module 5 Part B.

Content Areas of Core Module 5: Part B

Core Module 5B is divided into Parts 1 and 2:

- Part 1 continues the process of differentiation by examining the curriculum models of Bloom’s Taxonomy and the Williams Model.
- Part 2 examines strategies that can be useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.

Outcomes

At the completion of this half of the Module you will be able to:

- develop differentiated activities for gifted students using Bloom’s Taxonomy or the Williams Model.
- develop an independent study project using the Kaplan Model.
- select and apply appropriate strategies for implementing differentiation in your specific area of teaching.
This Module continues the process of differentiation by developing appropriate planning and teaching strategies using the curriculum models of Bloom’s Taxonomy, the Williams Model and the Kaplan Model.

**How do you extend students who have demonstrated competency in the outcomes based pre-tests?**

Passow (1988) proposed the following criteria to gauge whether the curriculum presented to gifted students is appropriate:

- **Would** all students **want to be involved** in such learning experiences?
- **Could** all students **be involved** in such learning experiences?
- **Should** all students **be expected to succeed** in such learning experiences?

The answer to these three questions should be ‘no’ if the curriculum is to be appropriate only for the gifted students in your class. If the answer is ‘yes’ then the curriculum is suitable for all students.

It is important to understand that all students benefit from enrichment opportunities and they should not be denied these opportunities. However, gifted students need to experience curriculum that is beyond this level of enrichment and extends their understandings and skills in complex and challenging ways.

**How do you extend students' critical thinking skills?**

*Judge a man by his questions rather than his answers.* Voltaire

Bloom’s Taxonomy (1956) was constructed as a means to develop the higher order thinking skills of students by taking them through a sequential hierarchical progression. Bloom intended the taxonomy to be applicable to all age groups, subject areas and ability levels, so you will also find the strategies he developed used in adult training.

However, it is also important to note that the amount of time that should be spent on the strategies at each level of the hierarchy differs in relation to the ability level and prior knowledge of students.

For example, the following diagrams, developed by Davis and Rimm (2004), illustrate the difference between the way Bloom’s Taxonomy should be used for core students and for gifted students.
This first version of the model is suitable for students working at the core level of the curriculum. Students working at the core level of the curriculum should have access to all levels of the taxonomy but should spend more learning time using the lower order strategies of knowledge, comprehension and application, as they work towards the higher order thinking skills.
While gifted students need to acquire, comprehend and apply the knowledge relating to any discipline, they may come with, or rapidly acquire, the knowledge base and it is more important for them to spend a greater proportion of their time analysing, synthesising and evaluating this knowledge.

**How do the six different levels of Bloom’s Taxonomy develop thinking skills?**

As Bloom’s Taxonomy is hierarchical, each level builds on the skills of the level before it. For example, in order for a student to apply the knowledge they have acquired, they must first be able to comprehend it. The following table provides a definition and examples of each level.

Note that the revised version of Bloom’s Taxonomy, by Anderson and Krathwohl (2001), is included in the brackets.
<table>
<thead>
<tr>
<th>Bloom’s strategy and definition</th>
<th>Examples of question stems</th>
</tr>
</thead>
</table>
| Knowledge (Remember): Mastery of facts, terminologies, conventions, trends, classifications, categories, methodologies, principles, generalisations, theories and structures. Retrieval of knowledge from long-term memory. | What did the ________ say about______?  
Who invented ________?  
When did ________ discover _____?  
Which ________ decided _____? |
| Comprehension (Understand): Translation, interpretation and extrapolation of knowledge. Construction of meaning from oral, written and graphical communication. | Who do you think ________?  
What was the main idea ______?  
Can you briefly outline ________?  
What does ________ show us? |
| Application (Apply): Application of previously encountered rules or concepts to new situations and the transfer of understanding to other concrete, real-life and hypothetical situations. | How could you illustrate _____?  
What questions would you ask __?  
How could you model ________?  
Which factors would you change? |
| Analysis (Analyse): Deconstruction of knowledge to be able to infer assumptions and points of view; distinguish fact from opinion and relative importance of details; identify underlying motives, frameworks of ideas, problems, tone and mood; recognise fallacies, bias and purpose; relate cause and effect. | How is _____ similar to _____?  
What must you know for _____ to be true?  
What was the underlying theme of ______?  
How did ______ compare with ______? |
| Synthesis (Create): Creation of new and unique products by combining elements of understanding; recognition of elements in new patterns or structures. Product may result from hypothesising, designing and constructing unique communications, plans, abstract relationships. | What would happen if _________?  
Can you design a ____ to ______?  
How many ways can you ______?  
Can you see a possible solution to ________? |
| Evaluation (Evaluate): Ability to make judgements, choices or decisions based on predetermined standards or criteria from internal and/or external evidence. | How effective is ____________?  
Do you believe ________? Why or why not?  
What do you think about ________? Justify your position.  
What changes to ______ would you recommend? |

Adapted from Gross, MacLeod, Drummond & Merrick (2001); Anderson & Krathwohl (2001).
How does this apply to classroom practice?

The important thing is to not stop questioning. Albert Einstein

Bloom’s Taxonomy strategies can be used in a variety of ways in the classroom and do not always need to lead to a physical product. For example, questions framed from the taxonomy might be used as discussion starters and the taxonomy itself may be taught to the students to provide them with a greater understanding of the requirements of each level within it.

The following strategies are suggested as some possible ways of implementing Bloom’s Taxonomy in the classroom:

- Discussion starters
- Small group activities
- Independent research tasks
- Contract sheets which allocate a different proportion of questions at different levels
- Pre-tests
- Post-tests
- Assessments
- Learning centres

Examples of Bloom’s Taxonomy activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations.
What are some of the strategies you can use to develop students’ creative and divergent thinking skills?

An excellent model to develop creative and divergent thinking skills with students is the Williams Model (1993). This three-dimensional model focuses on:

**Dimension One:** the subject matter of the curriculum;

**Dimension Two:** the teaching strategies that stimulate positive learning behaviours;

**Dimension Three:** the development of cognitive-intellective and affective-temperament behaviours of students, using the following strategies:

- Fluency - measured by number of responses to a theme
- Flexibility - measured by the variety of changes or categories
- Originality - measured by degree of unusual or uncommon responses
- Elaboration - embellishment or expansion of the idea
- Risk-taking - willingness to try different or difficult things
- Curiosity - ability to seek many alternatives, depth of study
- Complexity - capacity to explore or discover
- Imagination - power to visualise, dream or conceive forms of action symbolically
The following table lists the 18 teaching strategies from Dimension Two of the model:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: ‘Necessity is the mother of invention’. When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories.</td>
</tr>
<tr>
<td>Listing</td>
<td></td>
<td>Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the ‘Brotherhood’ use the five-pointed star as their symbol of recognition?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>Provocative</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it?</td>
</tr>
<tr>
<td>Question</td>
<td></td>
<td>What does a ‘Renaissance man’ have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women’?</td>
</tr>
<tr>
<td>Examples of</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives?</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Examples of</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used?</td>
</tr>
<tr>
<td>Habit</td>
<td></td>
<td>Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Organised Search</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood’? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Skills of Search</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Tolerance for Ambiguity</td>
<td>Open-ended questions – ‘what if…?’</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
<tr>
<td>Intuitive Expression</td>
<td>Expressing emotion through the senses; guided imagery; role-playing</td>
<td>Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather. You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police?</td>
</tr>
<tr>
<td>Adjustment to Development</td>
<td>Examine or playback mistakes or failures</td>
<td>As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched? Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success.</td>
</tr>
<tr>
<td>Study Creative Process</td>
<td>Analyse the traits of creative people, creative processes or creative products</td>
<td>Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions? Learn about the work of one of the female artists attached to the ‘Heidelberg School’.</td>
</tr>
</tbody>
</table>
| Evaluate Situations | Analyse implications or consequences, extrapolate from ideas or actions | A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why?

The spice trade, coffee trade and now the drug trade – how have plants altered the course of history?

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| Creative Reading Skill | Generate novels ideas by reading | Read Journey to Antarctica by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent?

Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition?

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| Creative Listening Skill | Generate novel ideas by listening | Interview an inventor to discover when he or she became interested in inventing new things or ideas.

Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time?

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| Creative Writing Skill | Generate novel ideas in writing | Rewrite a fairytale so there is no reference to numbers.

Write a short story for Louisa Lawson’s magazine, The Dawn.

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| Visualisation | Express ideas in three-dimensional or non-traditional formats | Help to plan and create a mural for your class based on the book.

Construct a scale model of the Roman Forum or the Athenian Acropolis.

---

Adapted from: Gross, MacLeod, Drummond & Merrick (2001) and Gross, MacLeod & Pretorius (1999).
Examples of Williams Model activities for a variety of KLAs may be found in the Resource section under each level of schooling. While these will not apply directly to all subject areas, the style of questioning should be applicable to most teaching situations:

Resource section: Secondary selected examples of Williams Model activities.

- English: Resource section page 65
- History: Resource section page 65
- Geography: Resource section page 66
- Mathematics: Resource section page 66
- Science: Resource section page 67
- Technics: Resource section page 67
- PD and Health: Resource section page 68
- Music: Resource section page 68
Reflective/Practical Component

Using as models examples of either Bloom’s Taxonomy or the Williams Model from the support materials, develop differentiated activities for gifted students in your classroom. These activities should relate to the extension questions you developed for the concept mapping of your unit.

Use the Bloom’s Taxonomy (page 69) or Williams Model blank matrix (page 70) found in the Resource section as a scaffold to construct these activities. It is not necessary to write all strategies for each unit of work but it is important to ensure that your students access a variety of strategies throughout the unit.
Part 2 examines some of the ways of implementing differentiation in the classroom and introduces the Kaplan Model as a scaffold for developing independent research projects for gifted students.

What are some ways that curriculum differentiation can be implemented in the classroom?

A variety of strategies may be used to implement curriculum differentiation in the classrooms:

- **Pre-testing** (see Module 5A).
- **Compacting** (see Module 5A).
- **Developing tiered instruction** - the teacher develops a series of activities based on the same area of study but hierarchical in nature and complexity. Students begin activities at a level appropriate to their ability.
- **Negotiating contracts** - an agreement between the student, teacher and sometimes parent that results in the student working independently with varying levels of guidance.
- **Designing independent study or research projects** - a research project where students learn how to develop the skills for independent learning. The degree of help and structure will vary between students and depend on their ability to manage ideas, time and productivity.
- **Utilising paired and small group work** - expectations that the students work together in the collection, analysis and organisation of information but that each student prepares an individual product to demonstrate that learning has taken place.
- **Introducing future studies** - predicting, hypothesising, problem solving, finding possible solutions and hindsight.

- **Initiating negotiated curriculum** - students set their own topic, time span, and ways of presenting work.

**How do you develop Independent Study or Research Projects for gifted students?**

Kaplan (1979) listed the following principles as a guide in making curriculum decisions for gifted students:

1. Focus on major issues and concepts.
2. Emphasis on a large knowledge base.
3. Use of activities that show how subjects relate.
4. Emphasis on in-depth research.
5. Teaching of thinking skills.
6. Higher order thinking incorporated into all instruction.
7. Increased complexity and pace.
8. Focus on student self-direction.
The Kaplan Model (1986) examines curriculum differentiation in the areas of content, process, product and learning environment and the model provides an excellent scaffold for developing theme-based independent research or study projects.

In an independent investigation:
1. Students are attempting to answer a question through research.
2. Students need to use a variety of resources.
3. Students need to communicate their findings in an effective manner.

To do so, students must:
- review the literature to find out what is already known about the topic.
- generate questions about a self-selected or teacher-selected topic.
- select one question.
- formulate one or more hypotheses about the question.
- design a way to answer the question or assess whether or not the hypothesis is true.
- collect and analyse information.
- form conclusions about the question or hypothesis.
- present conclusions to an appropriate audience.
- present questions for further research.

The following are the steps of development of such projects. (NB the given example is a generic independent research task for teachers which is based on the topic of curriculum differentiation, introduced in Module 5A). You may like to use the blank Kaplan Grid (pg __) from the Resource Section to develop an independent research project for your unit of work as you work through this section.

Step One: Choose a key word, theme and discipline/s on which to base the project. Note that it is often appropriate to use the theme of the core unit of work being implemented. It may be necessary to choose two key words to create more complex projects.

Key Words

<table>
<thead>
<tr>
<th>Kinds</th>
<th>Relationship</th>
<th>Types</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Purpose</td>
<td>Style</td>
<td>Conditions</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>Importance</td>
<td>Characteristics</td>
</tr>
</tbody>
</table>
### Themes

<table>
<thead>
<tr>
<th>Power</th>
<th>Death</th>
<th>Leisure</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Work</td>
<td>Courage</td>
<td>Life</td>
</tr>
<tr>
<td>Freedom</td>
<td>Peace</td>
<td>Commitment</td>
<td>Conflict</td>
</tr>
<tr>
<td>Family</td>
<td>Responsibility</td>
<td>Violence</td>
<td>Love</td>
</tr>
<tr>
<td>Invincibility</td>
<td>Sound</td>
<td>System</td>
<td>Religion</td>
</tr>
<tr>
<td>Hate</td>
<td>Creation</td>
<td>Silence</td>
<td>Invention</td>
</tr>
<tr>
<td>Wisdom</td>
<td>Morality</td>
<td>Evaluation</td>
<td>Energy</td>
</tr>
<tr>
<td>Friendship</td>
<td>Fairness</td>
<td>Infinity</td>
<td>Emotion</td>
</tr>
<tr>
<td>Conservation</td>
<td>Pollution</td>
<td>Tradition</td>
<td>Happiness</td>
</tr>
<tr>
<td>Destruction</td>
<td>Law&amp;Order</td>
<td>Happiness</td>
<td>Suffering</td>
</tr>
<tr>
<td>Truth</td>
<td>Knowledge</td>
<td>Beauty</td>
<td>Ignorance</td>
</tr>
<tr>
<td>Spirituality</td>
<td>Justice</td>
<td>Survival</td>
<td>Equality</td>
</tr>
<tr>
<td>Loyalty</td>
<td>Healing</td>
<td>Tolerance</td>
<td>Growth</td>
</tr>
<tr>
<td>Values</td>
<td>Education</td>
<td>Time</td>
<td></td>
</tr>
</tbody>
</table>

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Step Two:
Choose the core or extended outcomes to be addressed by the project from the appropriate syllabus documents.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Step Three**: Determine the research skills to be developed by this project.

**Research Skills**

- Taking notes
- Using a classification key
- Interviewing
- Using reference resources
- Computerised bibliographic research
- Reporting research
- Designing a research method
- Establishing criteria to judge
- Using a retrieval system
- Using a card catalogue
- Taking a survey
- Observing detail through verbal/visual description
- Using journals, magazines, newspapers
- Writing abstracts
- Analysing, interpreting data
- Outlining
- Substantiating with evidence
- Using fiction and non-fiction

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A</td>
<td>Designing a research method;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 1 Module 5B</td>
<td>Establishing criteria to judge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Step Four:** Choose a critical and creative thinking skill to be developed through the project. These skills may be selected from Bloom’s Taxonomy and the Williams Model (see Module 5B Part 1):

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of Systems</td>
<td>Module 5A Outcome 1</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module 5B Outcome 2</td>
<td>Establishing criteria to judge</td>
<td>Evaluate situations</td>
<td></td>
</tr>
</tbody>
</table>

**Step Five:** Choose a product or choice of products, which will reflect the outcomes, and skills of the project. The following list may be useful but is by no means exhaustive:

- Self-evaluation
- Editorial
- Opinion
- Debate
- Story
- Written report
- Diagram
- News article
- Chart
- Advertisement
- Cartoon
- Model
- Recipe
- Illustration
- Invention
- Mobile
- Television show
- Map
- Structure
- Diorama
- Puppet show
- Sculpture
- Pantomime
- Puzzle
- Set of photographs
- Magazine
- Simulation
- Newspaper
- Play
- Book
- Demonstration
- Tape
- Teaching lesson
- Filmstrip
- Computer program
- Recommendation
- Scrapbook
- Letter
- Research report
- Journal
- Bulletin board
- Panel discussion
- Exhibit
- Poem
- Oral presentation
- Value statement
- Graphic representation
- Survey questionnaire
- New game
**Step Six:** Develop an implementation sequence for the project in consultation with the student or students involved.

For example:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Outcomes</th>
<th>Research Skill/s</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Effect of</td>
<td>Module 5A</td>
<td>Designing a research method</td>
<td>Analysis</td>
<td>Research report - multimedia</td>
</tr>
<tr>
<td>Systems</td>
<td>Outcome 1</td>
<td>Establishing criteria to judge</td>
<td>Evaluate situations</td>
<td>format</td>
</tr>
<tr>
<td></td>
<td>Module 5B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcome 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Implementation Sequence:

1. Students will develop a differentiated unit of work to implement with their class in order to answer the question: How do we measure the impact of curriculum differentiation on students?
2. Students will design a research method.
3. Students will develop criteria for measuring curriculum differentiation’s impact on students.
4. Students will collect data to analyse.
5. Students will analyse data and draw conclusions.
6. Students will create a multimedia presentation as a synthesis of their findings.

Resource section: Secondary example of Kaplan Model independent research projects.

Resource section page 73
Self Assessment

If you have not yet done so, continue the modification of your unit of work by adding an independent research task for gifted students, using the blank Kaplan Model Grid (page 72) in the Resource section.

Alternatively, develop an implementation plan which maps out the timeline of the unit (as shown in the Kaplan grid example (page 73).

For further reading – An interesting article on differentiation by Sandra Berger may be found after the Resource Section should you like to further explore the elements of differentiating the curriculum.
Further References
Websites
Professional Support and Curriculum. NSW Department of Education and Training:
The Learning Place: EQ Gifted and Talented Education:
Resources
Theme: Change
Focus Question: Is adolescence a time of life that all experience equally?

- Which factor has the greatest influence and why?
- Can adolescence be avoided or missed?
- How and why do cultures treat adolescence in similar or different ways?
- Was adolescence recognised by past cultures and/or civilisations?
- What are the physical, emotional and intellectual attributes of adolescence?
- Do all present cultures recognise the time of life called adolescence?
- How and why do "rites of passage" relate to adolescence?
- What factor did longevity play in the experience of adolescence in the past?
- Why would scientists be interested in studying adolescence?
- What elements of adolescence can we measure scientifically?
- Is the recognition and measurement of adolescence restricted to human beings?
- What images or stereotypes of adolescence are present in the arts?
- In what ways is adolescence represented in the creative arts?
- How and why does the media determine the way adolescence is represented?
- Is adolescence valued equally by all cultures?

Method One

Concept Map

Flow chart

Simple Flow Chart

Complex Flow Chart
List

Theme:
Focus Question:

Contributing Question One:
Extended Question:
Extended Question:

Contributing Question Two:
Extended Question:
Extended Question:

Contributing Question Three:
Extended Question:
Extended Question:

Contributing Question Four:
Extended Question:
Extended Question:

Contributing Question Five:
Extended Question:
Extended Question:
Construction of pre-tests for your unit of work

Concept Map

Venn diagram
Flow chart

Simple Flow Chart

Complex Flow Chart

Picture matching

Books

Sheet Music

Lion
Label a diagram

- Trunk
- Leaves / Canopy
- Branch
- Grass
Secondary selected examples of Bloom’s Taxonomy activities

**Secondary English: Shakespeare’s World**  
**Theme: Power**  
**Focus Question:** How and why did the events and people of Shakespeare’s world influence his writing?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Develop a timeline of Shakespeare’s life, highlighting important events, both personal and historical.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Construct a database of Shakespeare’s plays which includes a précis of the plot, the date it was written, the date it was first performed, and any the locations of professional performances in present times.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Develop and perform a modern day version of a scene from a Shakespearean play.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Present day directors of Shakespeare’s plays bring his work to life on the modern stage often using contemporary influences, whilst retaining the original text. What are some of these influences and how do they compare with the influences of Shakespeare’s times?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Create a script for a new play to be based on the theme of ‘Power’, which appropriates scenes from a number of Shakespeare’s plays.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Shakespeare’s writing is more powerful now than it was during his lifetime. Agree or disagree? Justify your response with supporting evidence from critical reviews of his work during his life and current times.</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
Secondary Computing Studies/ Information and Software Technology
Spreadsheets
Theme: Systems
Focus Question: How do spreadsheets help to solve problems?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Identify and name the relevant chunks of information on the provided charts relating to the time taken by individuals and small teams to complete a range of tasks.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Define the mean, median, mode, and standard deviation of the data in the provided charts.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Using formulas and pivot tables to convert the given data into a chart.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Compare the two sets of data on the charts. What trends can you predict from either? Which tasks are better completed by individuals? Which tasks are better completed by small teams? What additional data might change your predictions?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Design a predictive spreadsheet, using macros to decide task completion rates and individual and team effectiveness.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>How effective was the use of spreadsheets in solving these problems?</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
## Secondary Geography/SOSE: Global Environments

**Theme: Change**  
**Focus Question:** How can we impact on global environments through local community projects?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Identify a local environment and find maps, photos, tables and any other relevant data which tell of the history and current use of this environment.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Prepare a summary report on the current use and state of this local environment.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Construct 2D maps and diagrams, along with a topographic map, of this environment.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Analyse the care and management of a local environment. How does the management of this environment compare on a national and/or global level?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Develop a proposal to undertake a local collaborative community environmental restoration project. Your proposal must take into account all stakeholders and be based on your own action research fieldwork.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Evaluate the impact of local community environmental projects on global environments, by examining the case studies of at least two such projects.</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
Secondary History: World War I

Theme: Change  Focus Question: How did World War I impact on Australians now and then?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Make a timeline of the key events of WWI, including those events that impacted directly on Australia and the Australian people.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Develop a slideshow of images from WWI which illustrates the sequence of events leading up to, during, and immediately following WWI.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Construct a model of one of the WWI battlefields to demonstrate the strategies and outcome of the battle.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Which event of World War I was the most important for Australia? Write a newspaper article which analyses Australia’s involvement in this event.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>With no more surviving Anzacs to tell the story of the Great War, how will future generations remember their contributions and sacrifices? Create a website to pay tribute to the Anzacs and to help future generations understand this time in Australia’s history.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>In the decade following the Great War many had the firm conviction that it should be ‘the war to end all wars’. Evaluate this conviction in the light of today’s current global situations. Support your views with historical and current evidence.</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
Secondary: Languages other than English - French  
Theme: Systems  
Focus Question: How do French and English words and phrases compare

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>Match the nouns and verbs to the correct illustrations.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Match the sentences to the illustrations.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Write a phrase in French to complete the sentence.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Translate the phrases or sentences into English.</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Write a story in French to match the picture.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Are there words or phrases in French which when translated into English do not hold the same meaning or intent? Why or why not?</td>
</tr>
</tbody>
</table>

Bronwyn MacLeod, 2004.
**Secondary Mathematics: Geometry**

**Theme:** Systems  
**Focus Question:** How does an understanding of geometry assist in construction and design?

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>What is the formula for the number of bars in a triangulated sphere, in terms of the number of vertices?</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>How does this formula relate to other rigid frameworks in 3-space?</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Build rigid and non-rigid geometric structures. Explore them. Where are rigid structures used? Find unusual applications.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Are there plane frameworks (rigid bars and flexible joints) that are rigid but contain no triangles? Are all triangulated spheres rigid?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Consider a plane ‘grid’ composed of squares made of bars and joints. Which diagonals of squares will make this rigid? What is the minimum number? Can you give a recipe for deciding which diagonals will work?</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>Are triangulated spheres the strongest framework for construction? Support your answer with examples from design and architecture.</td>
</tr>
</tbody>
</table>

**Adapted from:** CMS – Canadian Mathematical Society  
Secondary Science: Chemistry  
Theme: Change  
Focus Question: Can salt water save our planet?

<table>
<thead>
<tr>
<th>Bloom's Taxonomy Strategy</th>
<th>Example Activity or Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/ Remember</td>
<td>List the effects of drinking sea water.</td>
</tr>
<tr>
<td>Comprehension/ Understand</td>
<td>Develop a flowchart to illustrate the changes that occur to cell walls in the human body when they come into contact with salt water.</td>
</tr>
<tr>
<td>Application/ Apply</td>
<td>Construct an experiment to turn salt water into fresh water.</td>
</tr>
<tr>
<td>Analysis/ Analyse</td>
<td>Compare the results of the experiment with other methods of converting salt water to fresh water. Which method is the most effective?</td>
</tr>
<tr>
<td>Synthesis/ Create</td>
<td>Imagine you have been stranded on a deserted island and you have only minimal amounts of fresh water with you. Propose a plan of action to create enough fresh water on which to survive whilst waiting for rescue.</td>
</tr>
<tr>
<td>Evaluation/ Evaluate</td>
<td>In a country where fresh water is a dwindling resource, what alternatives are there? Evaluate methods of salt water conversion being used in other countries of the world. Would any of these would work in Australia? Why or why not? Can salt water save our planet?</td>
</tr>
</tbody>
</table>
Secondary selected examples of Williams Model activities.

**Secondary**  
**Williams - English**  
Theme: Power  
Focus Question: Is the power of a speech in the writer’s hands or the speaker’s voice?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>The greatest good and the greatest evil have come from speeches. How can this be true?</td>
</tr>
<tr>
<td>Provocative question</td>
<td>The most powerful speeches in literature have been delivered by men. Do you agree or disagree? Use evidence from literature you have studied to support your response.</td>
</tr>
<tr>
<td>Evaluation of situations</td>
<td>Identify the five most important speeches you have read in literature. Which speech is the most important and why?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if you could rewrite one of the speeches delivered in <em>To Kill a Mockingbird</em>? Which one would you rewrite and why? How would this affect the telling of the story?</td>
</tr>
<tr>
<td>Skills of search</td>
<td>Construct an annotated bibliography of websites which focus on famous speeches from literature.</td>
</tr>
<tr>
<td>Creative reading skills</td>
<td>Read Atticus Finch’s closing argument in <em>To Kill a Mockingbird</em> and then watch the speech as given in the film version of the play. Which has the greater impact and why?</td>
</tr>
</tbody>
</table>

**Secondary**  
**Williams - History**  
Theme: Prejudice  
Focus Question: Is prejudice a thing of the past?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative listening skills</td>
<td>Listen to the speeches given by people such as Martin Luther King Jnr, Nelson Mandela, Malcolm X, and Eddie Mabo. What do these speeches have in common? In what ways do they differ?</td>
</tr>
<tr>
<td>Provocative question</td>
<td>Does prejudice have to be experienced in order to understand it? How can we learn from the past?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if there were no differences in people’s skin colour? Which events of the past may have been avoided?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>What would have happened if the European settlers in Australia had understood the Indigenous people and their way of life?</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>Give three historical examples of prejudice. Do these examples exist in current times? Why or why not?</td>
</tr>
<tr>
<td>Examples of change</td>
<td>Which figures in history fought against prejudice and succeeded in bringing about change because of their beliefs?</td>
</tr>
</tbody>
</table>
Secondary
Williams - Geography
Theme: Multiculturalism
Focus Question: How does the proximity of Asia affect Australia and the Australian way of life?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>Discuss the statement: ‘Multiculturalism: can’t live with it, can’t live without it.’</td>
</tr>
<tr>
<td>Provocative question</td>
<td>Can we live without Asia? Why, or why not?</td>
</tr>
<tr>
<td>Examples of change</td>
<td>How have changes in political systems affected our relationships with and understanding of Asian cultures? Choose two different Asian countries to use as case studies.</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>What might have happened if the Aboriginal people had engaged in a greater level of trade with Asian nations prior to the European settlement?</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is Asia like a tapestry?</td>
</tr>
<tr>
<td>Creative writing skills</td>
<td>Develop an advertising campaign to develop a greater acceptance of multiculturalism among the Australian population.</td>
</tr>
</tbody>
</table>

Secondary
Williams - Mathematics
Theme: Systems
Focus Question: Probability

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>List the ten most important events in your life which you can describe using statements of probability.</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>Many people read their horoscopes on a daily basis to find out what may happen to them during that day. What is the chance that these readings can be accurate? Test out your ideas.</td>
</tr>
<tr>
<td>Evaluation of situations</td>
<td>How many times do you have to repeat an experiment to be able to predict its results with accuracy? Design an experiment to test your idea.</td>
</tr>
<tr>
<td>Provocative question</td>
<td>If probability is always a matter of chance why do people develop systems of predicting results?</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Develop a lesson plan to teach the idea of probability to younger students.</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is probability like a recipe?</td>
</tr>
</tbody>
</table>
### Secondary

**Williams - Science**

Theme: Change

Focus Question: Why do forces affect our lives?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>Develop a list of the forces that you encounter in your everyday life.</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>Can all forces be explained? Discuss the work of at least two scientists who investigated forces and motion.</td>
</tr>
<tr>
<td>Evaluate situations</td>
<td>Which of Newton’s laws is the most important? Are the laws still important today?</td>
</tr>
<tr>
<td>Adjustment to development</td>
<td>Develop an hypothesis as to whether momentum is greater in linear or centrifugal motion. Test your hypothesis in an experiment you design. Discuss your findings.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Design a model which demonstrates one of the forces you encounter in your daily life.</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is momentum like a light bulb?</td>
</tr>
</tbody>
</table>

### Secondary

**Williams - Technics**

Theme: Systems

Focus Question: What systems ensure the success of design and construction?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute listing</td>
<td>List the most important elements of design under at least three appropriate headings.</td>
</tr>
<tr>
<td>Provocative question</td>
<td>A good design is always the result of creative teamwork. Discuss, with reference to designs from four different categories.</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is construction like a following a road map?</td>
</tr>
<tr>
<td>Skills of search</td>
<td>Research the awards for innovation and design in Australia. What criteria are involved to win these awards? Who judges their success?</td>
</tr>
<tr>
<td>Creative writing</td>
<td>Develop a proposal to apply for funding to develop a design you would like to create.</td>
</tr>
<tr>
<td>Study the creative process</td>
<td>Investigate the work of a designer in a field of interest to you, eg, graphics, architecture, clothing, etc. Where does the designer get his/her motivation from? What skills does the designer need?</td>
</tr>
</tbody>
</table>
Secondary
Williams - PD/Health
Theme: Change
Focus Question: In what ways does alcohol change our bodies?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intuitive expression</td>
<td>Role play a discussion between your friends when it is discovered that someone you know is an alcoholic.</td>
</tr>
<tr>
<td>Visualisations</td>
<td>Develop an advertising campaign to raise awareness among teenagers of the issues of alcohol abuse.</td>
</tr>
<tr>
<td>Organised random search</td>
<td>Interview at least ten different adults about their opinions on the use of alcohol by teenagers. Do their opinions have any common elements?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if the negative effects of alcohol could be controlled or even eliminated? What positive effects would remain?</td>
</tr>
<tr>
<td>Evaluate situations</td>
<td>How important is research into the impact of alcohol on our bodies? Explain, using one area of research as support.</td>
</tr>
<tr>
<td>Examples of habit</td>
<td>Is alcohol abuse an example of a bad habit or a disease?</td>
</tr>
</tbody>
</table>

Secondary
Williams - Music
Theme: Change
Focus Question: Is ‘popular’ music generation specific?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provocative question</td>
<td>Popular music cannot be separated from the popularity of the performer. Without the popularity of the performer, the music would not be heard. Do you agree or disagree? Why?</td>
</tr>
<tr>
<td>Adjustment to development</td>
<td>Examine the rhythm pattern of a popular song from a different era than your own. Compare this to a present day ‘popular’ song. What similarities and differences can you notice? Why might this be?</td>
</tr>
<tr>
<td>Analogy</td>
<td>How is ‘popular music’ like a recipe? Like a tessellation?</td>
</tr>
<tr>
<td>Tolerance for ambiguity</td>
<td>What if ‘American Bandstand’ had not been developed? Discuss the possible implications and alternatives.</td>
</tr>
<tr>
<td>Study creative process</td>
<td>What inspires the composers and lyricists of ‘popular’ music? Choose two composers or lyricists from different decades and compare their motivations for the creative process.</td>
</tr>
<tr>
<td>Attribute listing</td>
<td>List the key characteristics of ‘popular music’. Use this list to identify the ‘popular music’ of at least three different decades. What music from these decades was therefore not categorised as ‘popular’?</td>
</tr>
</tbody>
</table>
## Bloom's Taxonomy Blank Matrix

<table>
<thead>
<tr>
<th>Bloom Strategy</th>
<th>Activity or activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/Remembering</td>
<td></td>
</tr>
<tr>
<td>Comprehension/</td>
<td></td>
</tr>
<tr>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>Application/</td>
<td></td>
</tr>
<tr>
<td>Applying</td>
<td></td>
</tr>
<tr>
<td>Analysis/</td>
<td></td>
</tr>
<tr>
<td>Analysing</td>
<td></td>
</tr>
<tr>
<td>Synthesis/</td>
<td></td>
</tr>
<tr>
<td>Creating</td>
<td></td>
</tr>
<tr>
<td>Evaluation/</td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td></td>
</tr>
</tbody>
</table>
William’s Model Blank Matrix

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradox</td>
<td>A statement that appears to contradict itself, but that may be true.</td>
<td>Discuss the statement: ‘Necessity is the mother of invention’. When can performance-enhancing drugs limit performance?</td>
</tr>
<tr>
<td>Attribute</td>
<td>Inherent open-ended properties or identities</td>
<td>List your earliest memories. Who were the true ‘geniuses’ of the Renaissance period in Italy?</td>
</tr>
<tr>
<td>Listing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analogy</td>
<td>Finding similarities between things or situations that might otherwise be different</td>
<td>How is a lever like a friend? How is Othello like a puppet?</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>Gaps or missing links in knowledge</td>
<td>Why did the ‘Brotherhood’ use the five-pointed star as their symbol of recognition? If Vashti had not been a part of this story, would the series of events recounted in the book have unfolded?</td>
</tr>
<tr>
<td>Provocative</td>
<td>Inquiry to incite exploration and curiosity</td>
<td>Antarctica is rich in minerals; should we mine it? What does a ‘Renaissance man’ have to be able to do, to get such a title? Are there any modern ‘Renaissance men or women’?</td>
</tr>
<tr>
<td>Question</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples of</td>
<td>Show the dynamics of things, modifications, alterations or substitutions of things</td>
<td>How did the invention of scissors change our lives? Trace how family structure has changed during the 20th and 21st centuries.</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples of</td>
<td>Recognition of habit-bound thinking</td>
<td>Study and explain alternative sources of energy to drive machines. Who invented them and are they widely used? Were the Impressionists right in protesting the dictates of the Academy?</td>
</tr>
<tr>
<td>Habit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organised</td>
<td>Structured case study for new courses of action</td>
<td>Who were the members of the Pythagorean ‘Brotherhood’? Create a means for collecting and displaying all the centres, agencies and organisations in your state which deal in one way or another with the circulatory system.</td>
</tr>
<tr>
<td>Random Search</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skills of</td>
<td>Research on something done before; trial and error on new ways</td>
<td>How do we remember things? Design an experiment to test the memory of the other people in your family. Set up an experiment to detect acid rain effects on granite monuments.</td>
</tr>
<tr>
<td>Search</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerance for</td>
<td>Open-ended questions – ‘what if…?’</td>
<td>What if Scott had made it to the South Pole first? What would happen if the Earth’s orbit moved closer to the Sun?</td>
</tr>
<tr>
<td>Ambiguity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intuitive Expression</td>
<td>Expressing emotion through the senses; guided imagery; role-playing</td>
<td>Write a poem or paint a picture that depicts the emotions you feel with a particular type of weather. You have been unjustly convicted of a crime. How do you feel about the legal system, the magistrate, your lawyer, the police?</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Adjustment to Development</td>
<td>Examine or playback mistakes or failures</td>
<td>As a civilisation, what have we learned from the past that has meant that Antarctica has remained relatively untouched? Study the various theories of how the pyramids were built or engineered and look for evidence that initial wrong thinking led to ultimate success.</td>
</tr>
<tr>
<td>Study Creative Process</td>
<td>Analyse the traits of creative people, creative processes or creative products</td>
<td>Research the life of Leonardo da Vinci, with a specific focus on his role as an inventor. What processes did he undertake to design, test and record his inventions? Learn about the work of one of the female artists attached to the ‘Heidelberg School’.</td>
</tr>
<tr>
<td>Evaluate Situations</td>
<td>Analyse implications or consequences, extrapolate from ideas or actions</td>
<td>A new law has been passed which restricts all households to the use of three electrical appliances, apart from lighting. What three machines would you choose and why? The spice trade, coffee trade and now the drug trade – how have plants altered the course of history?</td>
</tr>
<tr>
<td>Creative Reading Skill</td>
<td>Generate novels ideas by reading</td>
<td>Read Journey to Antarctica by Meredith Hooper. Do you think this journey is the last challenge left in the exploration of this continent? Read about the lives and times of the female Impressionists. What was there about this time that allowed some of them to achieve recognition?</td>
</tr>
<tr>
<td>Creative Listening Skill</td>
<td>Generate novel ideas by listening</td>
<td>Interview an inventor to discover when he or she became interested in inventing new things or ideas. Listen to music composed during the Renaissance. Does this music seem to coincide with or complement the art work of the time?</td>
</tr>
<tr>
<td>Creative Writing Skill</td>
<td>Generate novel ideas in writing</td>
<td>Rewrite a fairytale so there is no reference to numbers. Write a short story for Louisa Lawson’s magazine, The Dawn.</td>
</tr>
<tr>
<td>Visualisation</td>
<td>Express ideas in three-dimensional or non-traditional formats</td>
<td>Help to plan and create a mural for your class based on the book. Construct a scale model of the Roman Forum or the Athenian Acropolis.</td>
</tr>
</tbody>
</table>
### KAPLAN MODEL Planning Grid

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Implementation Sequence**
Secondary example of Kaplan Model independent research projects.

KAPLAN MODEL Planning Grid – Secondary Example

<table>
<thead>
<tr>
<th>Theme/Concept</th>
<th>Outcome/s</th>
<th>Research Skills</th>
<th>Productive Skills</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>Appropriate state or territory outcome</td>
<td>Establishing criteria to judge Substantiating with evidence</td>
<td>Problem solving Analysis</td>
<td>Multimedia presentation and/or web page</td>
</tr>
</tbody>
</table>

**Implementation Sequence**

Implementation Plan: For one period per week over one term, students whose curriculum has been compacted following pretesting work individually on this Independent Research Project.

Activities: Students choose one of the following tasks and develop a multimedia presentation and/or web page which demonstrate(s) their research findings:

- How and why do cultures treat adolescence in similar or different ways? Investigate at least two different cultural groups from a western and developing nation in your research.

- Is adolescence valued equally by all cultures? Conduct a survey or questionnaire to research at least three different cultural perspectives. Develop criteria to judge the data produced by your survey. Present your conclusions.

- How and why do the media determine the way adolescence is represented? Examine print, visual and auditory media in your research. Draw conclusions from your research and evaluate the causal attributes.

- How and why do ‘rites of passage’ relate to adolescence? Define the term ‘rite of passage’. Research current and past examples of ‘rites of passage’ from at least three different cultural groups. Draw conclusions as to the ‘rites of passage’ experienced by today’s youth.

- Which factor, physical, emotional or intellectual, has the greatest influence on the attributes of adolescence, and why? Investigate the research into the various attributes of adolescence in science and social science. Develop criteria to judge which factor has the greatest influence. Draw conclusions.

Share your findings with your peers and the ‘expert’ panel, by presenting your multimedia product and/or web page, and responding to questions from the panel.
Students who are gifted and talented are found in full-time self-contained classrooms, magnet schools, pull-out programs, resource rooms, regular classrooms, and every combination of these settings. No matter where they obtain their education, they need an appropriately differentiated curriculum designed to address their individual characteristics, needs, abilities, and interests.

Developing an Effective Curriculum

An effective curriculum for students who are gifted is essentially a basic curriculum that has been modified to meet their needs. The unique characteristics of the students must serve as the basis for decisions on how the curriculum should be modified (Feldhusen, Hansen, & Kennedy, 1989; Maker, 1982; TAG, 1989; VanTassel-Baska et al., 1988).

It is difficult to generalize about students who are gifted because their characteristics and needs are so personal and unique. However, as a group they comprehend complex ideas quickly, learn more rapidly and in greater depth than their age peers, and may exhibit interests that differ from those of their peers. They need time for in-depth exploration, they manipulate ideas and draw generalizations about seemingly unconnected concepts, and they ask provocative questions.

A program that builds on these characteristics may be viewed as qualitatively (rather than quantitatively) different from the basic curriculum; it results from appropriate modification of content, process, environment, and product (Maker, 1982).

Modifying Content

Content consists of ideas, concepts, descriptive information, and facts. Content, as well as learning experiences, can be modified through acceleration, compacting, variety, reorganization, flexible pacing, and the use of more advanced or complex concepts, abstractions, and materials. When possible, students should be encouraged to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity. Their learning characteristics are best served by thematic, broad-based, and integrative content, rather than just single-subject areas. An entire content area arranged and structured around a conceptual framework can be mastered in much less time than is traditionally allotted (VanTassel-Baska, 1989). In addition, such concept-based instruction expands opportunities to generalize and to integrate and apply ideas. (See Bruner, 1966, Man: a Course of Study Macros for an example of a thematic, integrated curriculum.)

Middle and secondary schools are generally organized to meet student needs within content areas. Providing an interdisciplinary approach is another way of modifying curriculum. Jacobs and Borland (1986) found that gifted students benefit greatly from curriculum experiences that cross or go beyond traditional content areas, particularly when they are encouraged to acquire an integrated understanding of knowledge and the structure of the disciplines.

Modifying Process

To modify process, activities must be restructured to be more intellectually demanding. For example, students need to be challenged by questions that require a higher level of response or by open-ended
questions that stimulate inquiry, active exploration, and discovery. Although instructional strategies depend on the age of the students and the nature of the disciplines involved, the goal is always to encourage students to think about subjects in more abstract and complex ways. Activity selection should be based on student interests, and activities should be used in ways that encourage self-directed learning. Bloom's Taxonomy of Educational Objectives (1956) offers the most common approach to process modification. His classification system moves from more basic levels of thought, such as memory or recall, to more complex levels of analysis, synthesis, and evaluation. Parnes (1966), Taba (1962), and others have provided additional models for structuring thinking skills. Every teacher should know a variety of ways to stimulate and encourage higher level thinking skills. Group interaction and simulations, flexible pacing, and guided self-management are a few of the methods for managing class activities that support process modification.

Modifying Environment

Gifted students learn best in a receptive, nonjudgmental, student-centered environment that encourages inquiry and independence, includes a wide variety of materials, provides some physical movement, is generally complex, and connects the school experience with the greater world. Although all students might appreciate such an environment, for students who are gifted it is essential that the teacher establish a climate that encourages them to question, exercise independence, and use their creativity in order to be all that they can be.

Modifying Product Expectation and Student Response

Teachers can encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas. For example, instead of giving a written or oral book report, students might prefer to design a game around the theme and characters of a book. Products can be consistent with each student's preferred learning style. They should address real problems, concerns, and audiences; synthesize rather than summarize information; and include a self-evaluation process.

Assessing Curriculum Effectiveness

In their synthesis of curriculum effectiveness studies and effective practice, VanTassel-Baska et al. (1988) suggested that differentiated curriculum would respond to diverse characteristics of gifted learners in the following three ways:

1. By accelerating the mastery of basic skills through testing-out procedures and reorganization of the curriculum according to higher level skills and concepts.
2. By engaging students in active problem-finding and problem-solving activities and research.
3. By providing students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.

Curriculum development is a dynamic, ongoing process. Special attention needs to be paid to articulation, scope, and sequence to avoid gaps and repetition through grade levels; ensure that the understandings and skills we expect children to develop fit together; and assure that children are provided with the knowledge and skills that will prepare them for the future. Periodic evaluations of curriculum effectiveness allow corrections to be made when needed, and they are essential if curriculum is to meet the long-term needs of gifted students for increasingly complex and challenging opportunities.

Conclusion

The curriculum committee of the Leadership Training Institute (Passow, 1982) developed seven guiding principles for curriculum differentiation that reflect the considerations described in this Digest.

1. The content of curricula for gifted students should focus on and be organized to include more elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
2. Curricula for gifted students should allow for the development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
3. Curricula for gifted students should enable them to explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
4. Curricula for gifted students should encourage exposure to, selection, and use of appropriate and specialized resources.
5. Curricula for gifted students should promote self-initiated and self-directed learning and growth.
6. Curricula for gifted students should provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
7. Evaluations of curricula for gifted students should be conducted in accordance with the previously stated principles, stressing higher level thinking skills, creativity, and excellence in performance and products.

Developing curriculum that is sufficiently rigorous, challenging, and coherent for students who are gifted is a challenging task. The result, however, is well worth the effort. Appropriately differentiated curriculum produces well-educated, knowledgeable students who have had to work very hard, have mastered a substantial body of knowledge, and can think clearly and critically about that knowledge. Achieving such results for one or for a classroom full of students who are gifted will produce high levels of satisfaction, not only for the students who are beneficiaries, but also for every teacher who is willing to undertake the task.

References


