

GIFTED AND TALENTED EDUCATION  
PROFESSIONAL DEVELOPMENT PACKAGE FOR TEACHERS

# Module 5



Early Childhood



Bronwyn MacLeod



**Australian Government**  
Department of Education,  
Science and Training

THE UNIVERSITY OF  
NEW SOUTH WALES



**GERRIC**

Gifted Education Research, Resource and Information Centre

ISBN 0 642 77487 0

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#### **Production Information and Credits**

This package was initiated and funded by the Australian Government Department of Education, Science and Training (DEST), and designed and produced at UNSW.

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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:

<b>Role</b>	Classroom Teacher 	Executive Staff 	Principal 
<b>Location</b>	Urban 	Rural 	
<b>Mode</b>	Self Study 	Small Group 	Whole Staff 

## 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 5: Curriculum Differentiation for Gifted Students

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# 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**

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 'Fairytale' 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 be useful to implement differentiation and the use of the Kaplan Model as a scaffold to develop independent research tasks.

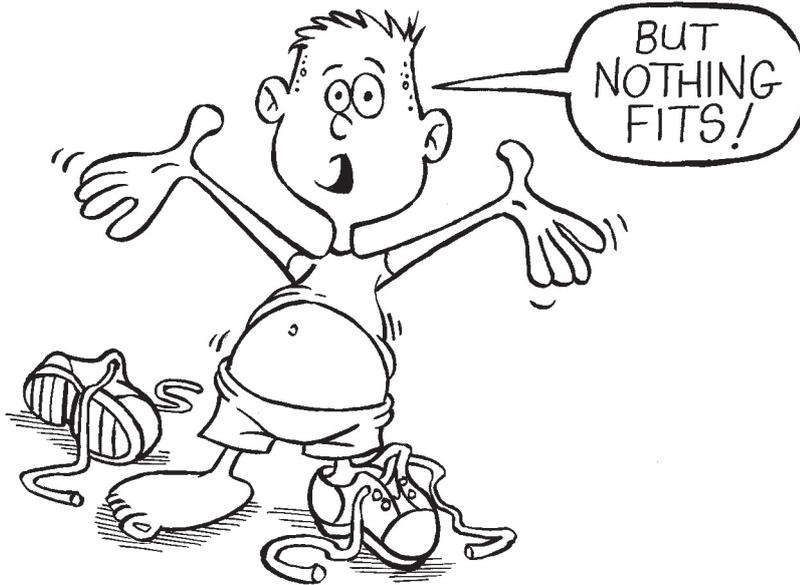
## **Outcomes**

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

- 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.”

Kiernan, L. (1996). *Differentiating Instruction*. (Lesson One. pgs 3 – 4). Alexandria, VA: Association for Supervision and Curriculum Development. Also found at: <http://www.ascd.org>

## 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.

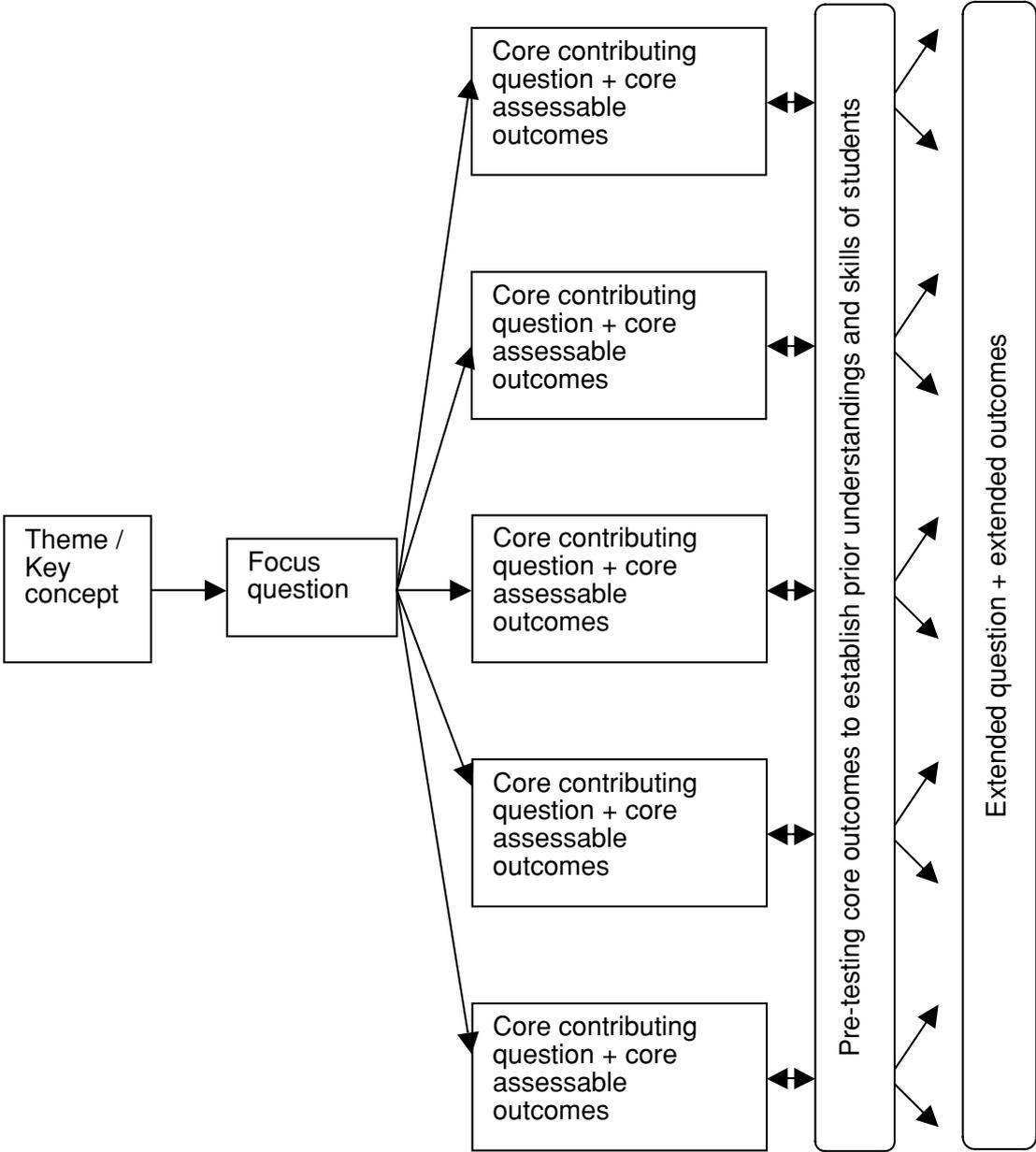


**Resource section:**

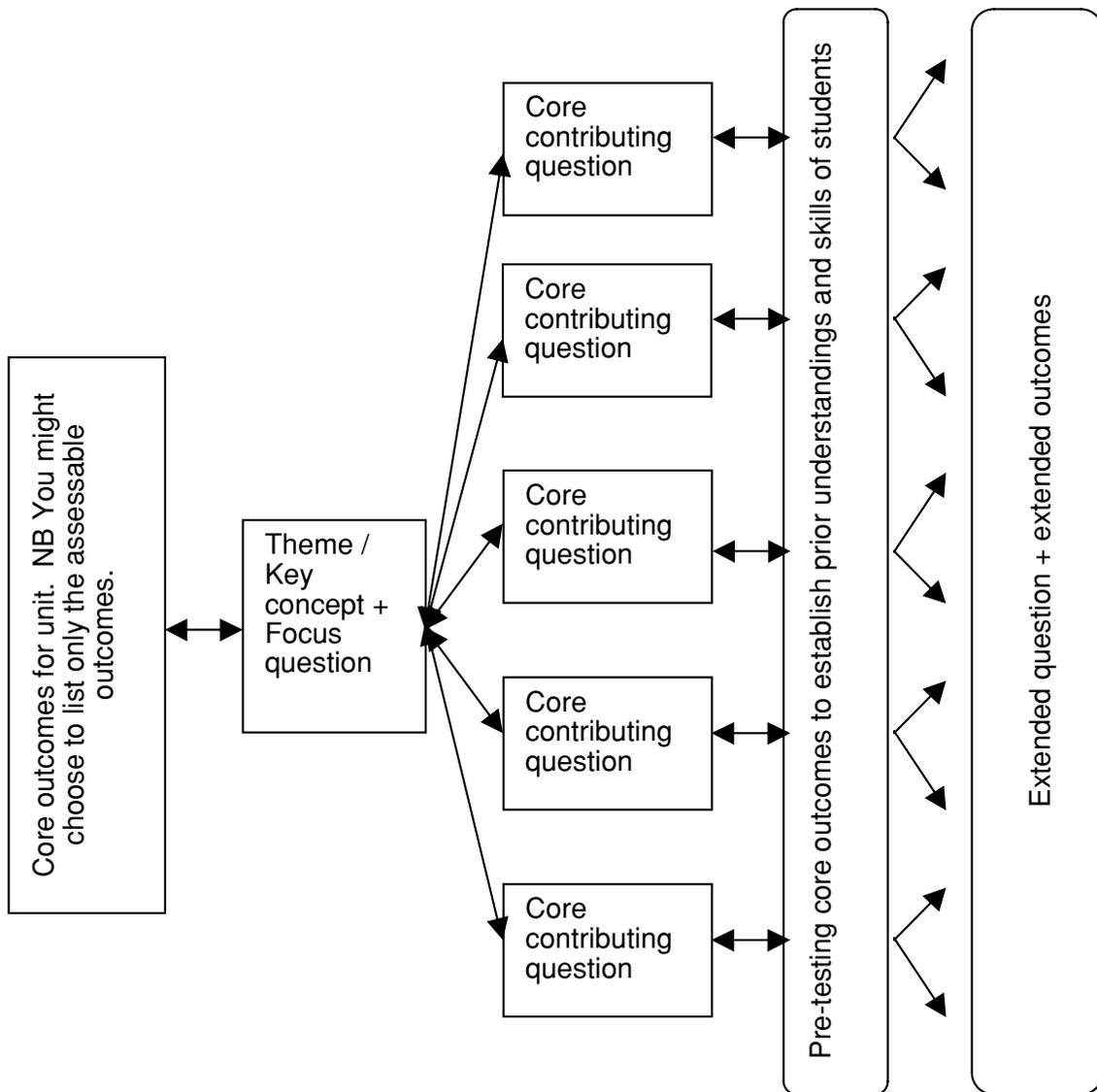
Example of Early Childhood unit planning (page 50)

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**



## 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

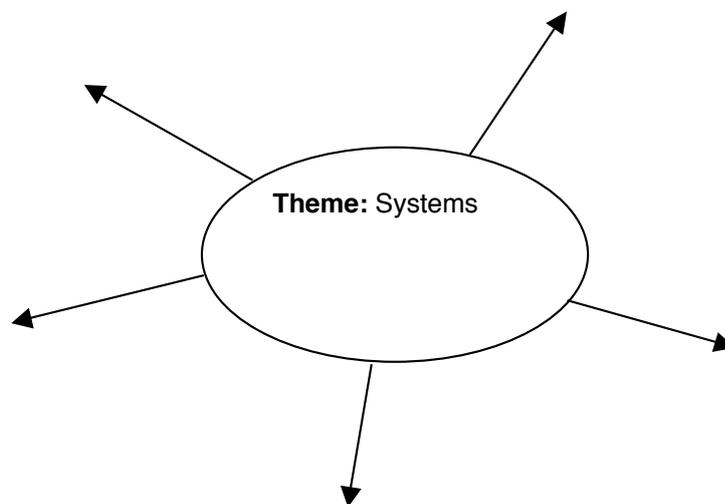


Using a concept map (page 51), flowchart (page 51) or a list (page 52) from the resource section, work through the following steps (NB the given example is a generic unit of work for teachers which is based on the topic of curriculum differentiation):

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

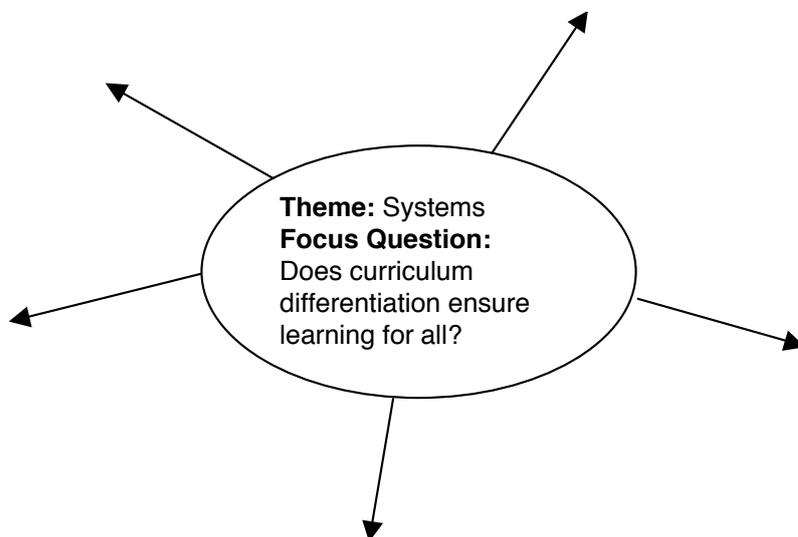
- Change
- Systems
- Growth
- Power
- Freedom
- Democracy
- Tolerance
- Persecution
- Traditions
- Survival
- Communication
- Justice
- Time
- Truth, and so on.

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.

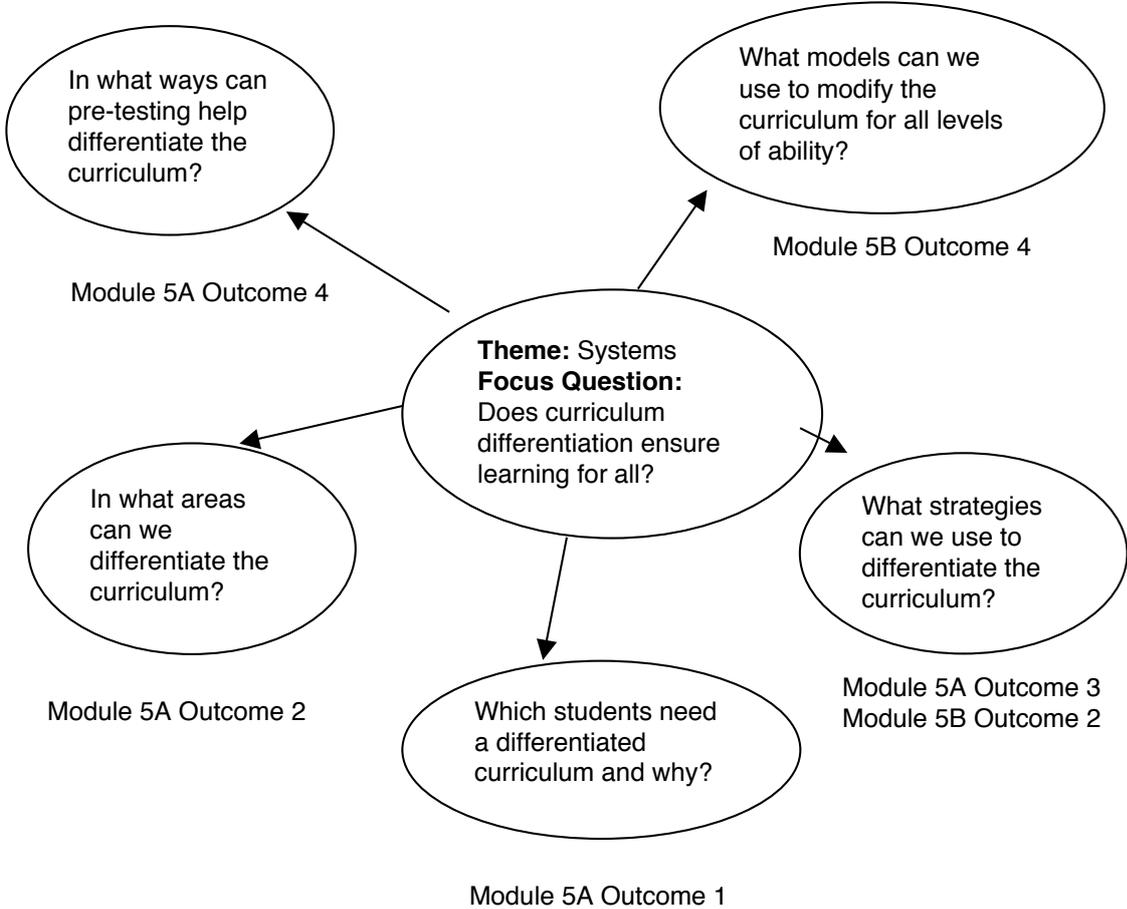
For example, in an early childhood unit of work, teachers may decide that three questions are enough to address in a term's unit of work, whereas teachers in primary classrooms may extend that to four or five questions throughout a term. One contributing question may take two to three weeks to address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

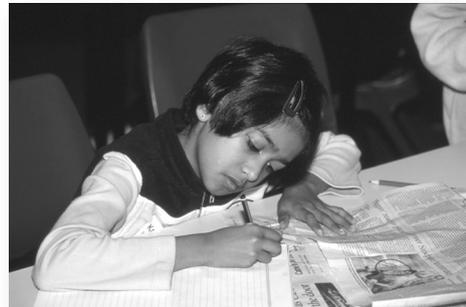
**Extended Question:** Is any one curriculum model better than the others for differentiation and why?

**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.

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

- Bloom, B. S. (Ed.), Englehart, M. D., Furst, E.J., Hill, W.H., & Krathwohl, D. R. (Eds.) (1956) *Taxonomy of educational objectives: Handbook I: Cognitive domain*. New York: Longmans Green.
- Gardner, H. (1983). *Frames of mind: The theory of Multiple Intelligences*. New York: Basic.
- Gardner, H. (1993) *Multiple Intelligences: The theory in practice*. New York: Basic.
- Maker, J. (1982). *Curriculum development for the gifted*. Austin, TX: PRO-ED.
- Tomlinson, C. (1996). *Differentiating instruction for mixed ability classrooms: A professional inquiry kit*. Alexandria, VA: Association for Supervision and Curriculum Development.

#### Websites

- Inspiration Software, Inc - Visual learning tools:  
[www.inspiration.com](http://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 living 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 PartB.

## 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.



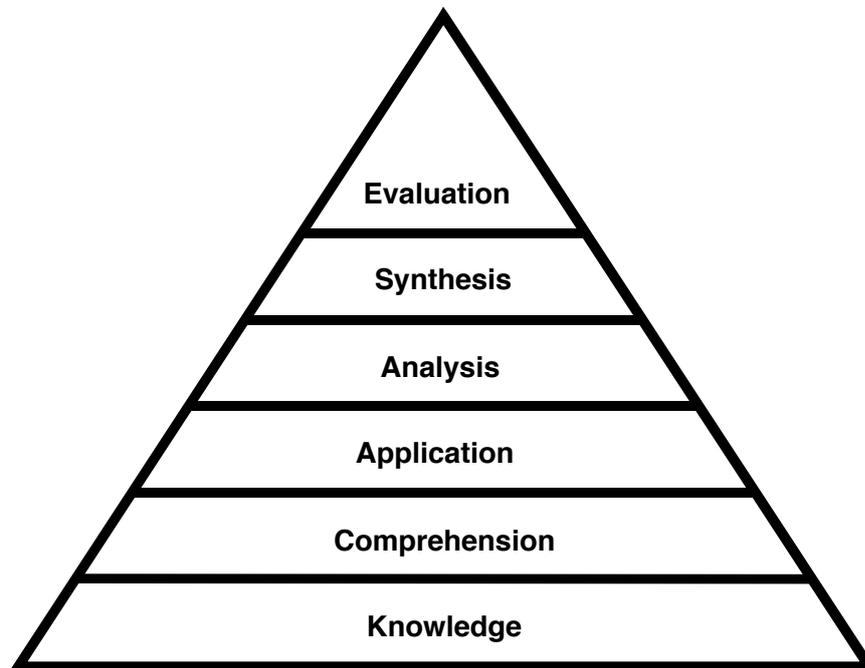
## How do you extend students' critical thinking skills?

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

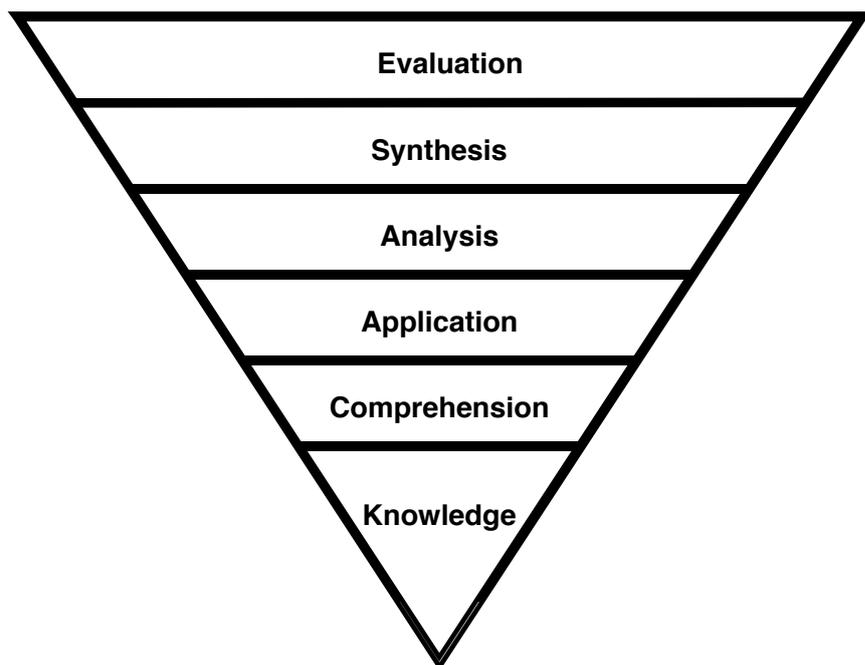
Bloom's Taxonomy (1956) was constructed as a means to develop the higher order thinking skills of students by taking them through a sequential hierarchical progression. Bloom intended the taxonomy to be applicable to all age groups, subject areas and ability levels, so you will also find the strategies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

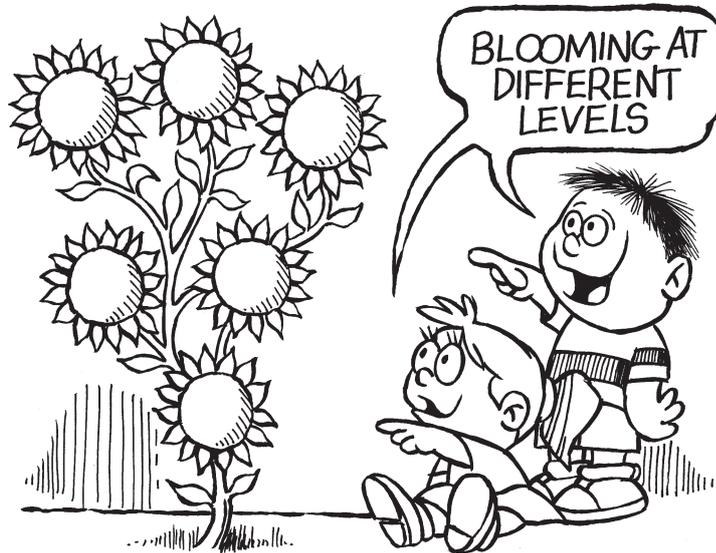
Note that the revised version of Bloom's Taxonomy, by Anderson and Krathwohl (2001), is included in the brackets.

Bloom's strategy and definition	Examples of question stems
<p>Knowledge (Remember): Mastery of facts, terminologies, conventions, trends, classifications, categories, methodologies, principles, generalisations, theories and structures. Retrieval of knowledge from long-term memory.</p>	<p>What did the _____ say about _____?</p> <p>Who invented _____?</p> <p>When did _____ discover _____?</p> <p>Which _____ decided _____?</p>
<p>Comprehension (Understand): Translation, interpretation and extrapolation of knowledge. Construction of meaning from oral, written and graphical communication.</p>	<p>Who do you think _____?</p> <p>What was the main idea _____?</p> <p>Can you briefly outline _____?</p> <p>What does _____ show us?</p>
<p>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.</p>	<p>How could you illustrate _____?</p> <p>What questions would you ask _____?</p> <p>How could you model _____?</p> <p>Which factors would you change?</p>
<p>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.</p>	<p>How is _____ similar to _____?</p> <p>What must you know for _____ to be true?</p> <p>What was the underlying theme of _____?</p> <p>How did _____ compare with _____?</p>
<p>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.</p>	<p>What would happen if _____?</p> <p>Can you design a _____ to _____?</p> <p>How many ways can you _____?</p> <p>Can you see a possible solution to _____?</p>
<p>Evaluation (Evaluate): Ability to make judgements, choices or decisions based on predetermined standards or criteria from internal and/or external evidence.</p>	<p>How effective is _____?</p> <p>Do you believe _____? Why or why not?</p> <p>What do you think about _____? Justify your position.</p> <p>What changes to _____ would you recommend?</p>

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:

Strategy	Definiton	Examples
Paradox	A statement that appears to contradict itself, but that may be true.	Discuss the statement: 'Necessity is the mother of invention'. When can performance-enhancing drugs limit performance?
Attribute Listing	Inherent open-ended properties or identities	List your earliest memories. Who were the true 'geniuses' of the Renaissance period in Italy?
Analogy	Finding similarities between things or situations that might otherwise be different	How is a lever like a friend? How is Othello like a puppet?

Discrepancy	Gaps or missing links in knowledge	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?
Provocative Question	Inquiry to incite exploration and curiosity	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'?
Examples of Change	Show the dynamics of things, modifications, alterations or substitutions of things	How did the invention of scissors change our lives?  Trace how family structure has changed during the 20th and 21st centuries.
Examples of Habit	Recognition of habit-bound thinking	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?
Organised Random Search	Structured case study for new courses of action	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.
Skills of Search	Research on something done before; trial and error on new ways	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.
Tolerance for Ambiguity	Open-ended questions – 'what if...?'	What if Scott had made it to the South Pole first?  What would happen if the Earth's orbit moved closer to the Sun?

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 novel 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.

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**

Kinds	Relationship	Types	Function
Changes	Purpose	Style	Conditions
Effect	Value	Importance	Characteristics

## Themes

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

For example:

Theme	Outcomes	Research Skill/s	Productive Skills	Product
Purpose and Effect of Systems				

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

For example:

Theme	Outcomes	Research Skill/s	Productive Skills	Product
Purpose and Effect of Systems	Module 5A Outcome 1 Module 5B Outcome 2			

**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:

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

**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:

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

**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:

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

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.

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### Websites

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

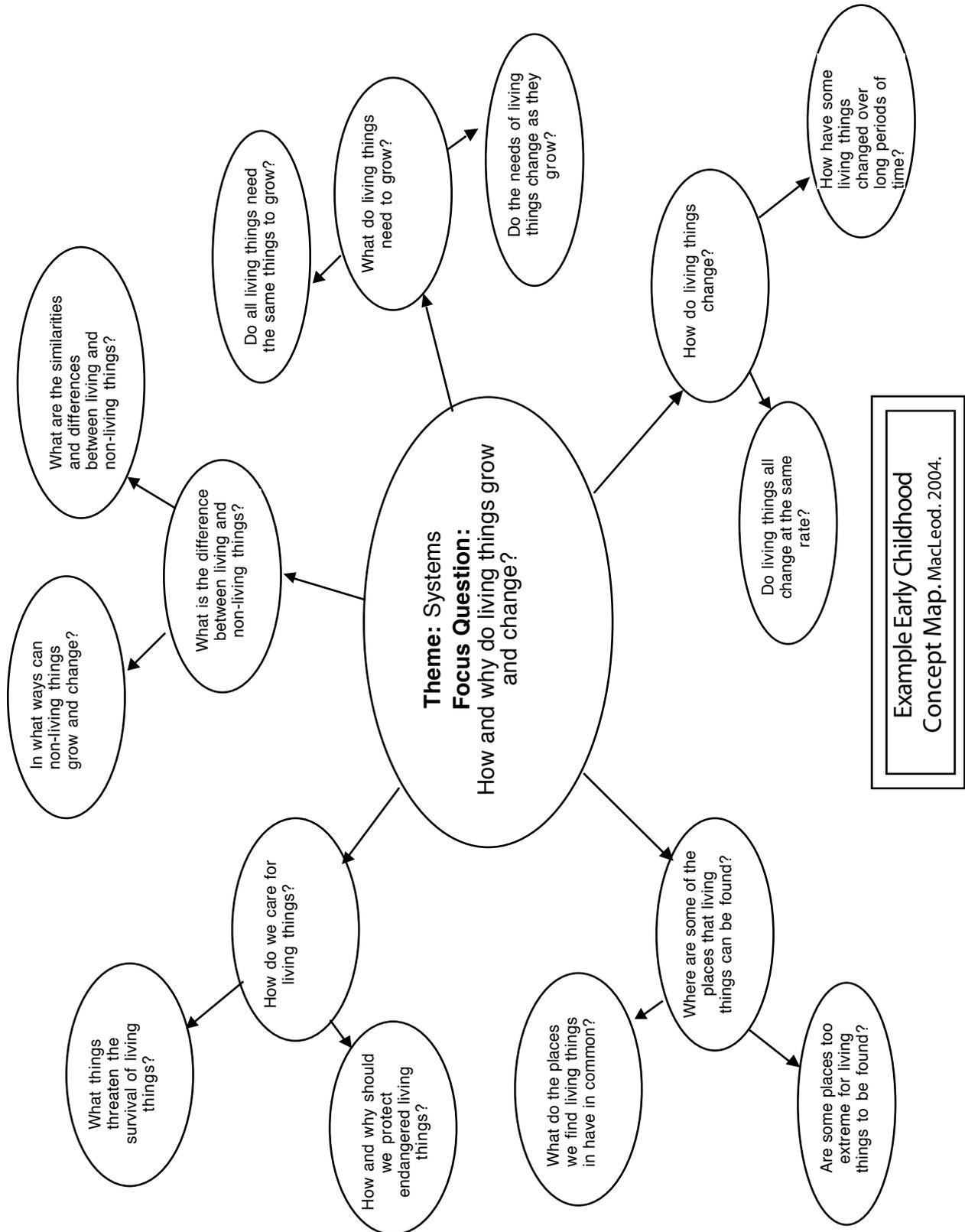
<http://www.curriculumsupport.nsw.edu.au/gats/index.cfm?u=3&i=34>

The Learning Place: EQ Gifted and Talented Education:

[http://www.thelearningplace.com.au/default\\_suborg.asp?orgid=23&suborgid=158](http://www.thelearningplace.com.au/default_suborg.asp?orgid=23&suborgid=158)

# Resources

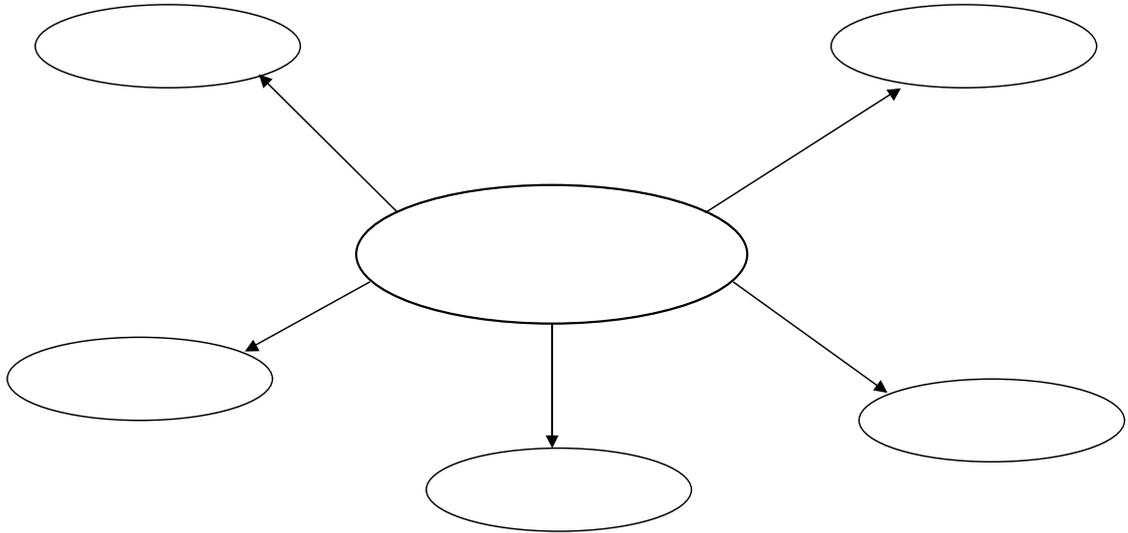
Example of Early Childhood unit planning



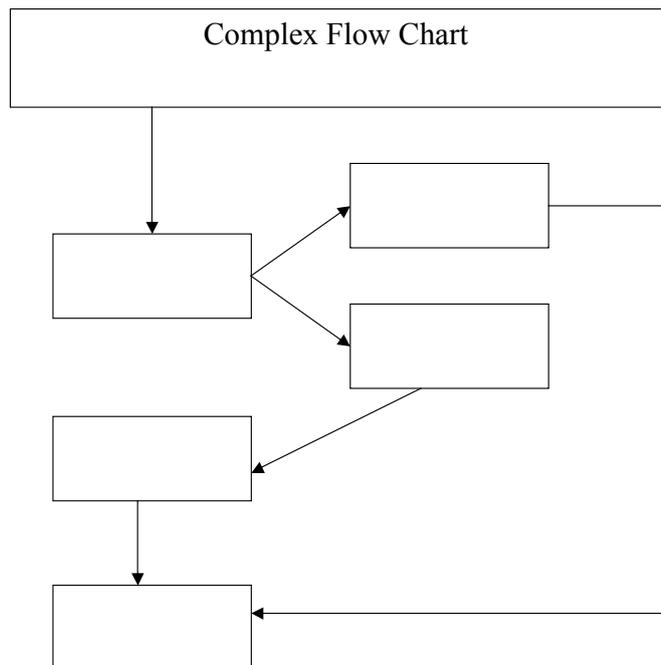
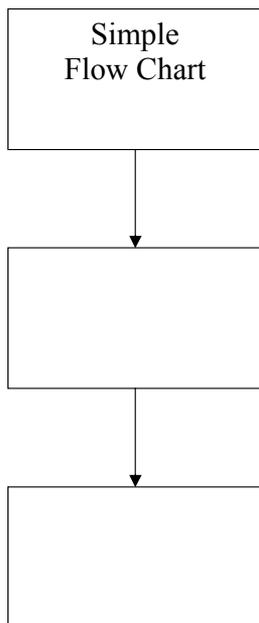
Example Early Childhood  
Concept Map. MacLeod. 2004.

## Method One

### Concept Map



### 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:**

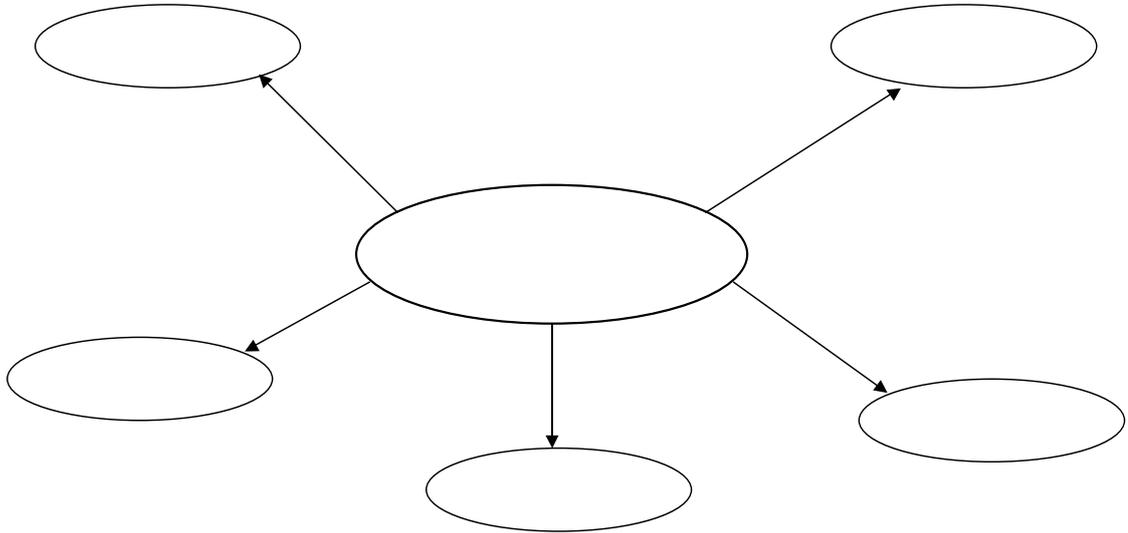
**Contributing Question Five:**

**Extended Question:**

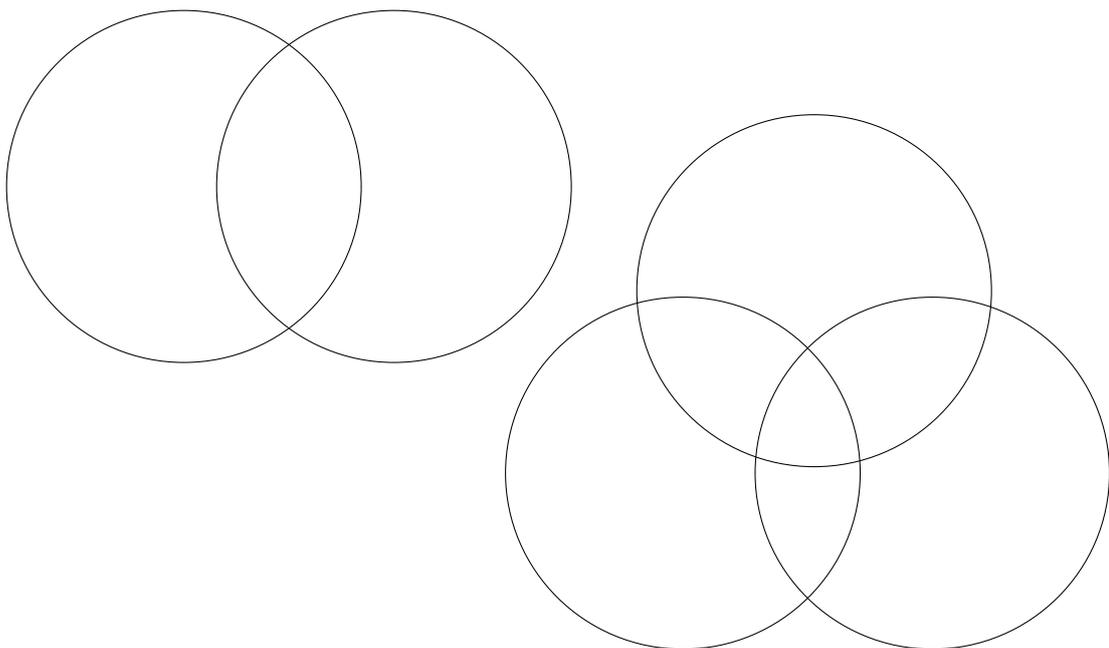
**Extended Question:**

## Construction of pre-tests for your unit of work

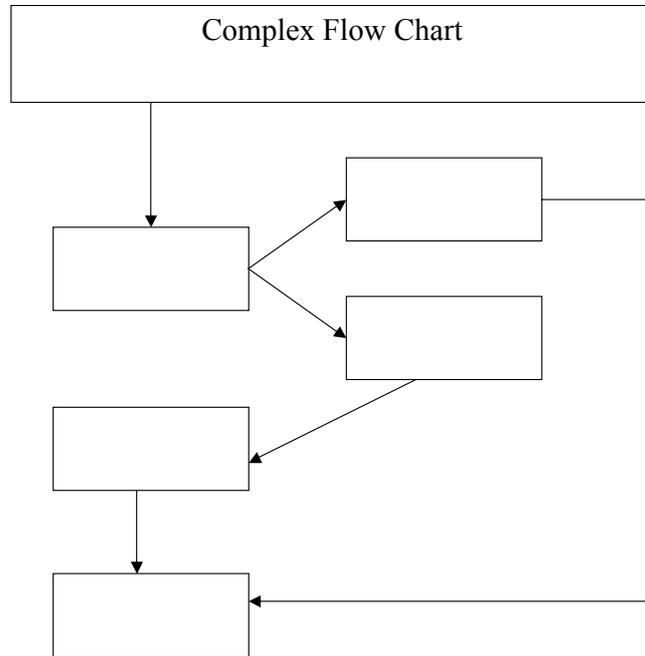
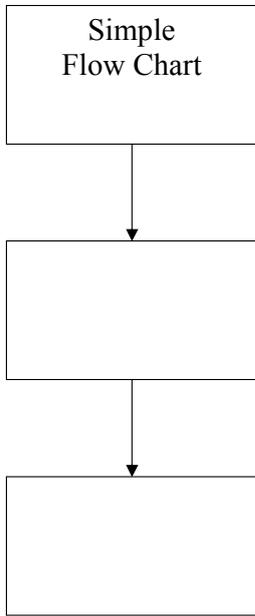
### Concept Map



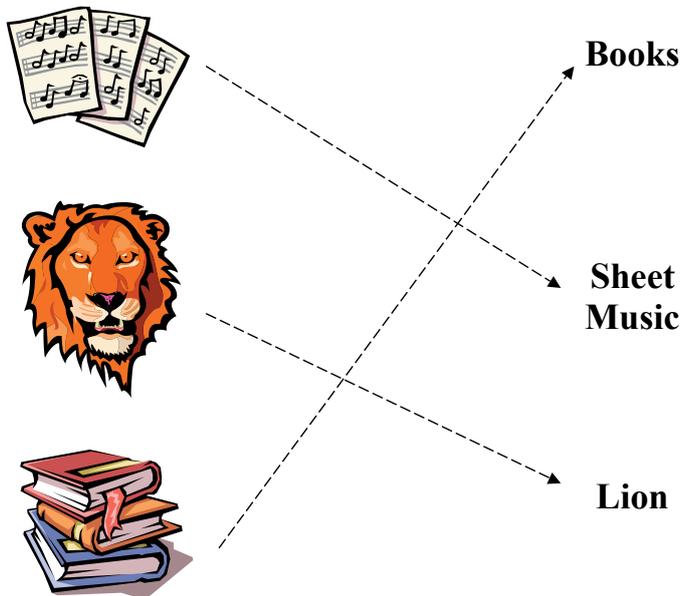
### Venn diagram



**Flow chart**



**Picture matching**



Label a diagram



**Early Childhood selected examples of Bloom's Taxonomy activities.****Literacy**

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

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

Micklethwait, L. (1992). *I Spy: An Alphabet in Art*. London: Harper Collins. ISBN: 0-00-664184-9

**Bronwyn MacLeod, 2004.**

## Numeracy

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

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

Micklethwait, L. (2004). *I Spy: Shapes in Art*. London: Harper Collins. ISBN: 0-00-713133-x

**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?

Strategy	Activity
Analogy	How is our community like an airport?
Creative listening skills	What sounds can you hear in your community? Find a way to make some of those sounds with recycled materials.
Visualisation	Help to plan and create a class mural of your community.
Intuitive expression	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.
Attribute listing	List the most important services that help to make our community work.
Tolerance for ambiguity	What if you were a _____ for the day? What would you do? What would you change? How would you feel?

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

Strategy	Activity
Paradox	Patterns are everywhere but do we really notice them?
Skills of search	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.
Evaluation of situations	Triangles can make almost any pattern. Find a way to prove this by drawing as many patterns as you can using triangles.
Tolerance for ambiguity	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.
Visualisation	Create a class exhibition of all the patterns that can be found in your school.
Analogy	How is a sunflower like an orange?

## Bloom's Taxonomy Blank Matrix

<b>Bloom Strategy</b>	<b>Activity or activities</b>
<b>Knowledge/ Remembering</b>	
<b>Comprehension/ Understanding</b>	
<b>Application/ Applying</b>	
<b>Analysis/ Analysing</b>	
<b>Synthesis/ Creating</b>	
<b>Evaluation/ Evaluating</b>	

## William's Model Blank Matrix

Strategy	Definiton	Examples
Paradox	A statement that appears to contradict itself, but that may be true.	Discuss the statement: 'Necessity is the mother of invention'. When can performance-enhancing drugs limit performance?
Attribute Listing	Inherent open-ended properties or identities	List your earliest memories. Who were the true 'geniuses' of the Renaissance period in Italy?
Analogy	Finding similarities between things or situations that might otherwise be different	How is a lever like a friend? How is Othello like a puppet?
Discrepancy	Gaps or missing links in knowledge	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?
Provocative Question	Inquiry to incite exploration and curiosity	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'?
Examples of Change	Show the dynamics of things, modifications, alterations or substitutions of things	How did the invention of scissors change our lives? Trace how family structure has changed during the 20th and 21st centuries.
Examples of Habit	Recognition of habit-bound thinking	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?
Organised Random Search	Structured case study for new courses of action	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.
Skills of Search	Research on something done before; trial and error on new ways	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.
Tolerance for Ambiguity	Open-ended questions – 'what if...?'	What if Scott had made it to the South Pole first? What would happen if the Earth's orbit moved closer to the Sun?

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 novel ideas by reading	Read <i>Journey to Antarctica</i> 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, <i>The Dawn</i> .
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**

<b>Theme/Concept</b>	<b>Outcome/s</b>	<b>Research Skills</b>	<b>Productive Skills</b>	<b>Product</b>
<b>Implementation Sequence</b>				

**Early Childhood example of Kaplan Model independent research projects.**

**KAPLAN MODEL Planning Grid – Early Childhood Example**

Theme/Concept	Outcome/s	Research Skills	Productive Skills	Product
Systems	Appropriate state or territory outcome	Observing detail through verbal/visual description	Analysis Evaluate situations	Labelled flowchart or concept map
<p style="text-align: center;"><b>Implementation Sequence</b></p> <p>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.</p> <p>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).</p> <p>Activities for gifted individual/small groups:</p> <p>Children choose one of the following questions and develop an hypothesis as to what they think will be the answer to the question.</p> <ul style="list-style-type: none"> <li>• Do all living things need the same things to grow? Choose two different types of living things to observe.</li> <li>• Do living things all change at the same rate? Choose two different types of living things to observe.</li> <li>• Are some places too extreme for living things to be found? Choose one living things to observe in a variety of extreme places.</li> </ul> <p>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.)</p> <p>Children set up their experiment, drawing or writing descriptions of their procedure and initial observations.</p> <p>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.</p> <p>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.</p>				



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# Differentiating Curriculum for Gifted Students

Author: Sandra L. Berger  
1991

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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.

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