New Zealand Centre for Gifted Education

Empowering Extraordinary Minds

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E-Resource for Contributing Schools

Inside

New Zealand Centre for Gifted Education
Ph 04 576 9243
Email office@nzcge.co.nz

What we have been learning:
Conceptual Development

Our Curriculum has three content strands: conceptual development is concerned with developing students' abilities to work with abstract and complex ideas; personal development focuses on helping students understand themselves, manage any issues which arise from their abilities, and effect positive change for themselves and others; talent development provides time, space and resources for children to pursue interests, passions and talents, moving towards expertise.

The conceptual development learning strand of the NZCGE Curriculum is grounded in the work of Roberts and Roberts (2005), Van Tassel Baska and Stambaugh (2006) and Erickson (2002). The research in gifted education advocates the use of concepts and generalisations, building through to learning about core and complex understandings. Conceptual learning is essential for gifted students, who are generally global thinkers, able to grasp abstract ideas and underlying principles quickly.

To assist with planning and collegial support, all MindPlus classes study the same concept each year, although the contexts covered are up to teachers and students to decide. Students are scaffolded through class and group inquiries until they are able to complete an independent inquiry into a context that fits the current concept.

This year, our concept is PATTERNS. This is one of four universal themes recommended for study by gifted students by Professor Joyce Van Tassel Baska and forms part of our 4-year cycle of CHANGE, SYSTEMS, PATTERNS and DISCOVERY.

"All around us are facts that are related to one another. Of course, they can be regarded as separate entities and learned that way. But what a difference it makes when we see them as a pattern! . . . They begin to make sense. The world becomes a more comprehensible place."

Murray Gell-Mann, American physicist.

Some of the big ideas we will be exploring this year in our study of PATTERNS are:

- Patterns predict.
- Patterns repeat.
- Patterns maintain order.
- Patterns show organization – natural or cultural.
- Patterns occur in nature and/or are arranged by people.
- Patterns create beauty, order, strength and/or survivability.
- Patterns can change.
- Patterns can be observed.

Patterns are everywhere, but we have found that students mostly think of them in relation to art, decoration and maths. At MindPlus, we will be going broader and looking at patterns in such contexts as population settlement, archaeology, behaviour, sleep, music, animal markings, weather, time, construction, and culture.

Ultimately, while students will acquire knowledge about different examples of patterns, the goal is to deepen their understanding of all patterns. They use the knowledge they learn to test the veracity of their initial big ideas about patterns, proving or disproving with evidence, and to formulate new understandings both about patterns in general and about the specific patterns they have delved into in depth. Novak (1995) states that concept-based learning has three advantages: "First, knowledge... is retained longer - much, much longer in many instances. Second, [it] adds to the capacity for easier subsequent learning of related material. Third, [it] facilitates new related learning even after forgetting has occurred."

In your own classroom, you can enhance your student's learning at MindPlus by encouraging them to look for patterns in content they are learning at school and discussing how their big ideas about patterns relate to the material they are studying.

References:

Erickson, H. L. (2002). *Concept-based curriculum and instruction: Teaching beyond the facts*. Thousand Oaks, CA: Corwin Press.
Novak, J. D. (1995). Concept mapping to facilitate teaching and learning. *Prospects*, 25(1):79-86.
Roberts, J. L. and Roberts, R. A. (2001). Writing units that remove the learning ceiling. In Karnes, F. A. and Bean, S. M. (Eds.), *Methods and materials for teaching the gifted* (pp. 213-251), Waco: Prufrock Press, Inc.
Van Tassel-Baska, J.& Stambaugh.T. (2006). *Comprehensive Curriculum for Gifted Learners* (3rd ed.). Boston, USA: Allyn and Bacon.

Some quick tips on differentiating for gifted learners ...

Content

Differentiating instructional material involves more than giving a Year 3 student a Year 6 book and having them read the same basic facts they already know with slightly higher vocabulary. Consider these options when selecting resources:

Breadth of Knowledge
Guide your student to exploring side topics that complement the general focus of your unit study. This is a good choice when you're concerned that a younger student might not have the emotional maturity to handle certain topics too deeply.

Depth of Knowledge
Dig deeper into the topic at hand. Go beyond the basic facts that are generally covered in your year level curriculum and let your student study the details most people might not know about.

Complexity of Thought
Some kids are ready to work with primary sources and actual research articles so they can tackle the process of reducing down complex ideas into their essence of thought.

Abstract Thinking
Focus on bigger concepts that tie ideas together.

Process

More than just the question of do you let a child self-study and call it differentiation, process focuses on the interactive "how" of learning.

Open Ended Questions
Open ended questions focus on thinking about what is being learned versus just regurgitating facts and are a great choice for gifted learners.

Inductive Reasoning
Inductive reasoning is the process where children wade through numerous examples and try to come up with a "rule" that explains why the "fact" occurs. While it is a process of learning through discovery, this approach still requires involvement from an adult facilitator.

Providing a Rationale
If you know gifted kids, then you know they can have strong opinions. Challenge them to rationalize their opinion or provide justification for why they think a certain answer is correct.

Team Problem Solving
The key to using this technique is to make sure the team is made of up like-minded intellectual peers who are all equally invested in the process of learning. Socratic discussions, a problem-based learning experience, or creative problem solving contests are just a few examples of this type of process option.

Product

The guiding principle for picking an appropriate differentiated product is to keep it real! Consider the skills and time it will take for a student to complete a particular project and their interest in those required skills.

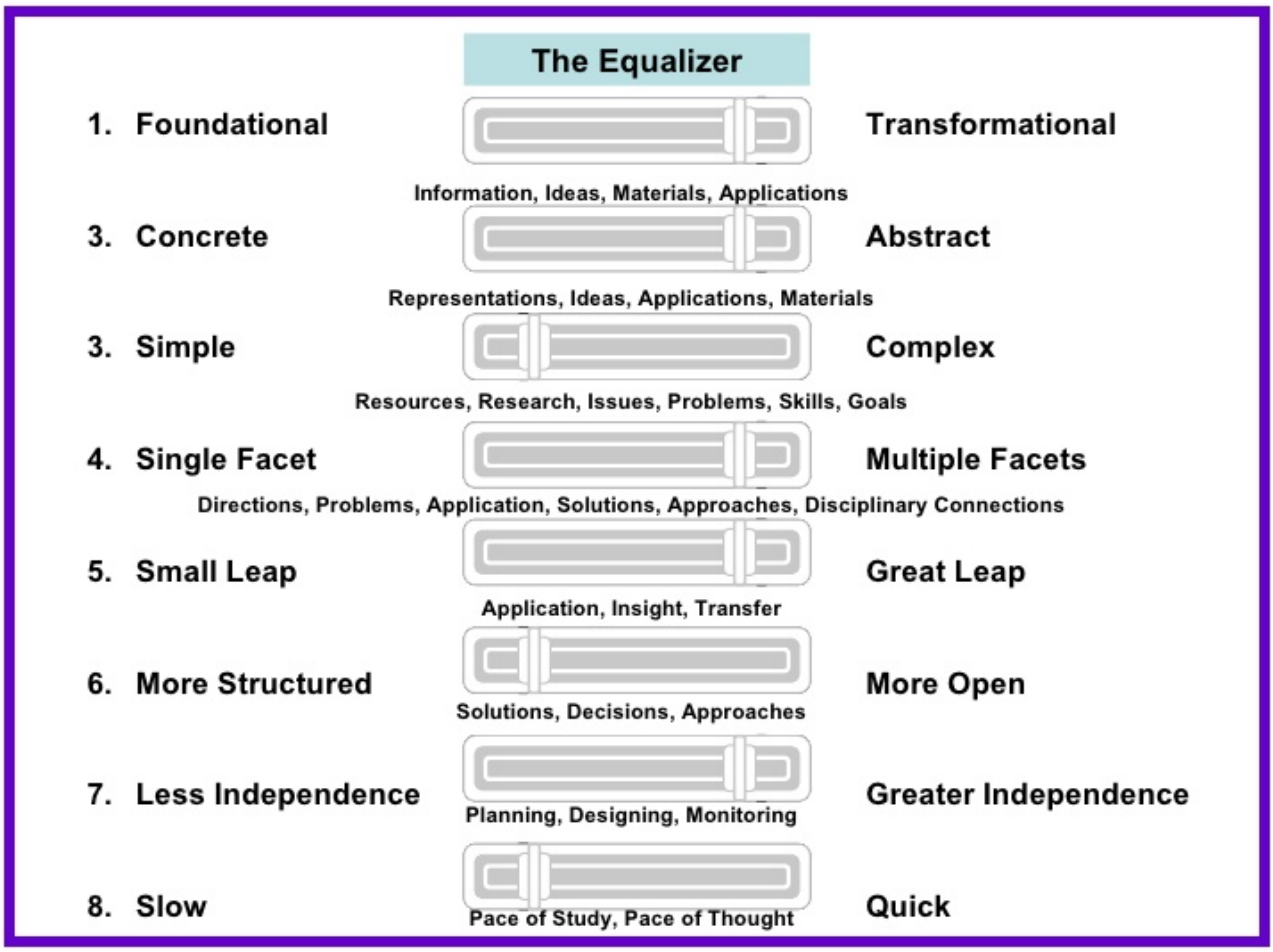
Real-World Problems
Paying attention to current events may spark an idea that your gifted kids can sink their teeth into – such as how do you preserve antiquities in war-torn countries or who owns NZ's water.

Real-World Products
Keep in mind the technology age we live in today. Web 2.0 tools offer you an amazingly rich set of options for how students can package, present, and share their knowledge with others.

Self-Selection
Give the students a list of possible, high quality choices which push their thinking critically and creatively, and let them pick what interests them most.

Peer Evaluation
Learning to give and take constructive criticism is a valuable life skill – and especially important to leadership training. It's important, however, to make sure the evaluations are coming from individuals who can actually grasp the ideas that are being communicated by your gifted student.

Carol Ann Tomlinson's continuum-style approach, represented in the graphic model she calls the equalizer, is a useful tool to help teachers plan for differentiated learning. The goal of this approach is to equalize the opportunity for each learner to encounter an appropriate level of challenge while learning about the same concept and essential understandings. The equalizer identifies a variety of instructional elements that can be modified to challenge students at different levels of readiness. Tasks which are appropriately differentiated for gifted students tend to the right hand side of the diagram.



Carol Ann Tomlinson C A, (2001), How to Differentiate Instruction in mixed-ability classrooms (2nd ed); Alexandria, VA: ASCD.

Something to use in your classroom ...

HEXAGONAL THINKING

Hexagonal thinking can be used to determine a student's depth of prior knowledge and understanding before starting to learn. It can also be used as a learning experience prompt to increase and deepen understanding, and to create new understanding by introducing hexagons with additional content, and as a post-assessment by comparing students' initial arrangements with their final ones.

10 Reasons to Try Hexagonal Thinking

1. Simple
Hexagonal Thinking is simple yet powerful. Students can make their thinking visible by writing ideas on a hexagon and then working in collaborative groups to form connections by tessellating the hexagons.

2. Encourages empathy
As groups rearrange the hexagons in a variety of ways, they begin to see how others view the world–the very definition of empathy.

3. Brings new ideas to light
I wasn't convinced of this until I tried it, but the shape of the hexagon itself allows for more creative connections due to the number of sides and the way your eyes and brain search over the whole thinking map to seek connections. When you make a list or work in boxes, the linear thinking that follows can be quite effective and speedy, but for creativity hexagons win.

4. Stimulates rich discussion
Communication skills are strengthened since the thought experiment ideally requires collaboration. Students must communicate and petition one another while they reposition ideas and ultimately come to a consensus.

5. Makes big problems digestible
Bite-size pieces ... give students structure and space to make sense of big concepts.

6. Gets students moving
Discussions can get pretty lively as students reposition different hexagons to represent new connections.

7. Gives everyone a voice
Students who may not feel comfortable responding to a question in front of the whole group are able to contribute and discuss connections in smaller groups as the map unfolds. English language learners and students with exceptionalities can participate at their level of comfort too.

8. Can be used in any content area and with any age group
The driving question could be related to any topic for any grade level. Just be sure to have a question or problem with enough meat to stimulate a variety of perspectives and solutions.

9. Can become a visual support for future learning
Students can refer back to the thinking map either as a visual on the classroom walls, or as a digital artifact. This can help bring back mental models around the concept or inspire new connections, continuing learning on topics far beyond their scheduled coverage time.

10. Makes metacognition tangible
The physical act of writing down an idea and placing it into the connected thoughts of peers is powerful and supports not only individual metacognition, but also nurtures a collaborative culture of thinking. Plus, it allows students to utilize 21st century skills with their learning - the 4 c's of collaboration, creativity, communication and critical thinking.

Adapted from https://tracyannclark.com/2014/09/23/10-reasons-to-try-hexagonal-thinking/

If you use SOLO Taxonomy in your classroom, Pam Hook's wiki has some great information on ways to extend the use of Hexagons with SOLO, as well as a template for generating hexagons:

http://pamhook.com/wiki/SOLO_Hexagons#SOLO_Hexagons

If you are interested in learning more about how to use depth and complexity tools to increase rigour in your teaching programme and challenge your learners even more, NZCGE is presenting half-day taster workshops in Rotorua and Hamilton (April break), and Wairarapa and Dunedin (July break) to introduce teachers to the Depth and Complexity Framework.

To find out more, or to register, visit our website www.nzcge.co.nz