Empowering Excellence: Leading the Way for Gifted Students

Session 2: What practises are used to identify excellent outcomes for the multiple types of gifted learning profiles?

John Munro

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What practises does your school use to identify excellent outcomes for the multiple types of gifted learning profiles?

Leading to empower excellence

What does excellence look like in the formal education context?

The consistent generation of excellent outcomes in one or more domains

- High grades, test scores, or academic awards.
- Mastery of advanced curriculum topics
- Advanced, Creative problem-solving, innovative solutions
- Original productions in arts, science, technology

Our pathway: Session 2

Identifying excellent outcomes → Identifying the potential for generating excellent outcomes → Identifying excellent outcomes on classroom tasks

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Review: Session 2

Identifying excellent outcomes

↓

Identifying the potential for generating excellent outcomes

↓

Identifying excellent outcomes on classroom tasks

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To empower excellence we need to identify it

A key aspect of empowering excellence is being able to identify it.

There are two aspects of this

Identify excellent outcomes

Identify the potential to generate excellent outcomes, that is gifted learning potential

We need to identification that matches each type of giftedness
How can we do this in the classroom?

	convergent	nonverbal	practical
outcomes			
potential			

How is excellence operationalized? Most studies use standardized test scores on academic and aptitude tests:

- top 1-2%.
- top 10%.

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Are the outcomes excellent?

Useful to examine this from two perspectives:

Has the student produced high level or advanced achievements or outcomes that could be talented?

Assess and evaluate the student's achievements or outcomes

Has the student displayed ways of knowing, thinking and learning that are high level or advanced?

Assess and evaluate the student's ways of knowing, thinking and learning

Assessment contexts of formats	Evaluate the student's outcomes	Evaluate the student's ways of knowing, thinking and learning
Tests, norm-referenced tasks in taught domains		
Tests, norm-referenced tasks of potential		
Extended curriculum open-ended tasks		
Productions, performances		
Complex problem solving, investigations		
Observation of classroom learning		
Modified assessment conditions		

Trigger for identification → Is the student gifted? Analyse students' outcomes → What gifted characteristics does the student show? Analyse the student's knowing and thinking → Under what conditions does student show gifted characteristics ?

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Outcomes trigger the identification process

Student outcomes trigger the identification process. Teachers or parents suspect a student may be gifted in particular ways. It can be triggered by:

- High achievement in practical contexts outside of the classroom
- High level academic outcomes on group achievement tests
- **Trigger for identification**
- Parent observations of advanced outcomes or development
- High, unexpected achievement in productions open-ended outcomes in any areas of endeavour for example, in the arts, drama, music, design, technology, computers, literature, sport or science. These may be done outside regular classrooms.
- High level learning and thinking in the classroom

The 'trigger' events may be unexpected. Settings and educators need to be ready to initiate the formal identification protocol. .

A school needs to be sensitive to these triggers

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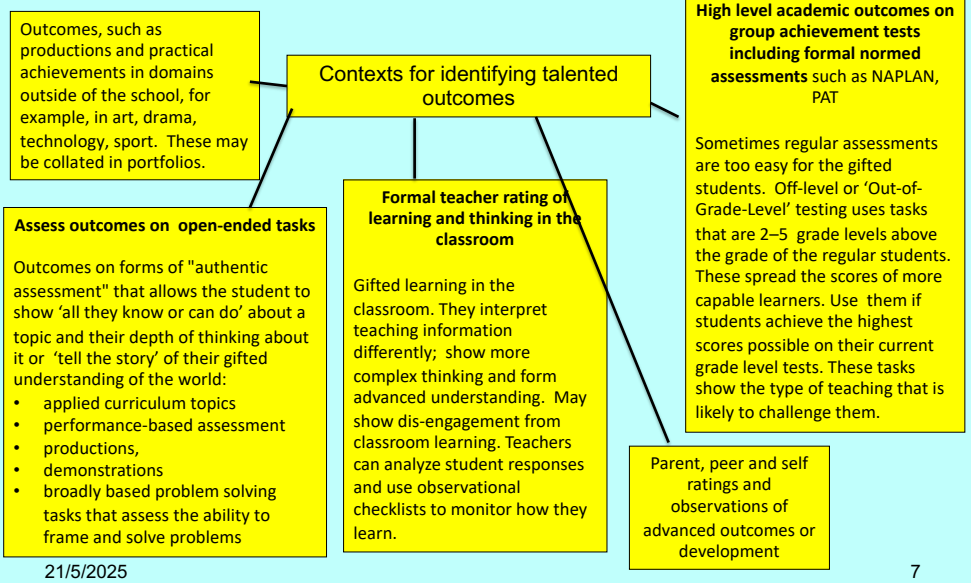
Assess and evaluate the student's achievements or outcomes



The types of tasks used to identify giftedness

Categories of giftedness	Types of tasks						
	academic achievement tests	tests of reasoning	creative thinking tasks	diffuse problem-solving	practical achievements, productions	non-cognitive features	classroom learning behaviours
academic giftedness	X	X				X for cognitive pursuits	X rapid academic learning and high-level retention
creative intellectual giftedness		X	X	X creative solutions	X	X for creative pursuits	X creative approach to learning
practical giftedness			X For practically oriented tasks	X from a practical perspective	X	X for real-life, practical applications	X learns best in practical contexts
gifted under-achiever		X		X when the effect of the learning difficulty is excluded	X for achievements that don't require academic learning skills	X for non-academic pursuits	X learns best when scaffolded to deal with learning difficulties

The types of tasks used to identify giftedness

Categories of giftedness	Types of tasks						
	academic achievement tests	tests of reasoning ability	creative thinking tasks	diffuse problem-solving	practical achievements, productions	non-cognitive features	classroom learning behaviours
giftedness in minority cultures	X for knowledge a learner's	X for nonverbal thinking	X for knowledge a learner's		X for outcomes a learner's	X for culturally relevant	
giftedness with co-occurring psychological issues		X	X for personally selected contexts		for outcomes selected by the learner	X for personally selected pursuits	X learns best when psychological issues is managed
giftedness and disengages from formal education		X	X for personally selected contexts		X for outcomes selected by the learner	X for personally selected pursuits	X learns best when engaged in self directed learning

My focus today: identification in the classroom to empower excellence for nonverbal and performance gifted students

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Designing an authentic assessment task Year 4 History

History Levels 3 and 4 ACHHK063: The role that people of diverse backgrounds have played in the development and character of the local community.

Context: Newcomers to Australia have changed our culture and how we live our lives in a multitude of ways. They have added to what we wear and eat, the music we enjoy, the books we read, the films and art we watch, how we think, how we solve problems and what we expect from life. Your community has benefitted from people coming from other societies and cultures. We can learn a great deal about what the newcomers bring and how they contribute to our communities.

How have the contributions newcomers, either individuals or groups from diverse backgrounds shaped or enriched your local community? Analyse the historical and social impacts of these contributions and suggest ways in which young people can learn from them. Present your findings creatively in ways that help Fourth Graders understand the value of diversity in building exciting, alive and communities that are continually improving.

Investigate the following:

- Background: Where they came from and their reasons for joining the community or society.
- Contributions: What they achieved or created and how it impacted the community or society.
- Challenges: Any obstacles they faced due to their background.
- Legacy: How their contributions continue to influence the community or society today.

Analyze how the individual's or group's background influenced their contributions. Evaluate the broader implications of their work on the community, such as promoting inclusion, innovation, or social cohesion

Present your findings in a creative and thoughtful way. Options include:

- A documentary-style video or digital story.
- essay combined with images (photos, drawings, infographics).
- A model, diorama, or artwork with a written explanation
- A podcast or interview reenactment of their story.

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Rubric for assessing task Year 4 History task

Attribute	4	3	2	1
appropriate to the intended purpose and its intended audience?	Achieves its purpose imminently well in an innovative, sophisticated and engaging way	Achieves its purpose well in a reasonably conventional way	Partially achieves its purpose	Does not achieve its intended purpose
breadth and comprehensiveness of the knowledge, and coverage	Comprehensive, in-depth research; includes multiple perspectives and reliable sources.	Thorough research; includes multiple sources and relevant perspectives.	Some research; includes a few sources but lacks depth or varied perspectives.	Limited research with minimal sources and perspectives.
Depth, analysis and evaluation of the ideas	Insightful analysis; clearly connects background to contributions and evaluates broader impacts.	Clear analysis; connects background to contributions with some evaluation of broader impacts.	lacks depth; some connection between background and contributions	Minimal analysis; weak connection between background and contributions.
Creativity and novelty of the ideas	Highly creative, engaging, and innovative ideas not typical of this age	Creative and engaging ideas	Limited creativity and innovation of ideas	Minimal creativity
Organisation of the ideas in terms of 'big' ideas? and its intended audience	Content organised around clearly identified key inferred themes, has excellent coherence and organization;	Clear and coherent organization with one main idea	Clear and coherent, largely around the given theme	Partial organisation of ideas
Reflection on Diversity	Profound and thoughtful reflection; demonstrates a deep understanding of diversity's importance.	Thoughtful reflection; demonstrates an understanding of diversity's importance.	Basic reflection; demonstrates some understanding of diversity's importance.	Limited or superficial reflect-ion, lacks under-standing of diversity's importance.

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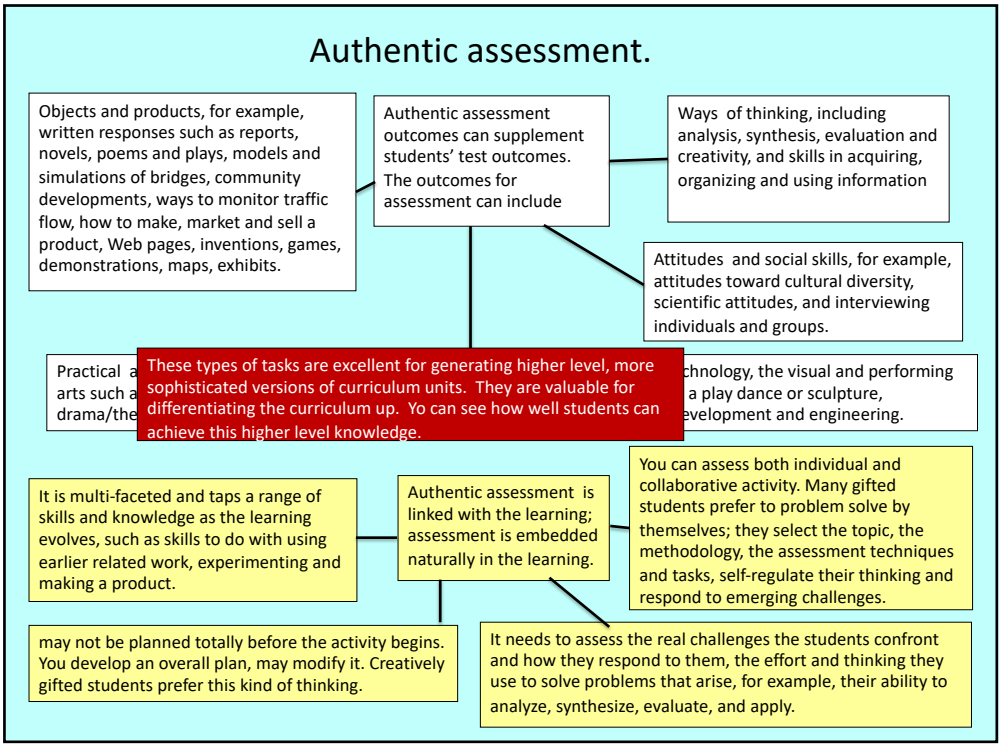
Authentic assessment.



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General rubric form for scoring authentic tasks

Each outcome is scored on a range of attributes that assess its quality. A general format for a rubric is here.

You can judge whether, for each criterion, the quality of the outcome is typical of

- the top 5% of the student's cohort (it is exceptional = 5),
- the top 5−20% (very high = 4),
- 20−30% (well above average = 3),
- 30−40% (above average = 2) or
- average (= 1).

Attribute of the outcome : The extent to which the outcome shows evidence of:	Rating
• being appropriate and relevant to the goal or intended purpose. How clear is the intended purpose, function or goal of the product? How well does it take account of its intended audience?	1 2 3 4 5
• breadth of knowledge, the comprehensiveness of the coverage, the range of ideas covered. What is the breadth of understanding of the topic?	1 2 3 4 5
• depth of knowledge, for example, the sophistication of ideas, the extent to which ideas or skills have been	1 2 3 4 5
• analysed and evaluated • used, applied or transferred from another area • Used to infer implications or possibilities, • synthesized or combined two or more ideas into a bigger idea • make analogy with other topics	1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
• Creativity, novelty, unexpectedness, using ideas or objects innovatively • interpreting the goal in innovative, unusual ways. How novel, innovative, original, creative is the outcome for this age level.	1 2 3 4 5 1 2 3 4 5
• the skill to pursue, select, organise and use the relevant information. How well are the aspects of the outcomes organised in terms of its intended purpose, Does it show 'big' ideas?	1 2 3 4 5
• task commitment and focus	1 2 3 4 5

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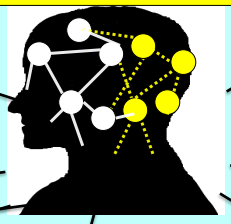
The knowledge /understanding to look for

The understanding that underpins excellent outcomes



Richer, more elaborated and differentiated networks of ideas, more inferred concepts gained through fluid analogistic reasoning.

Concepts organised into 'propositions' that express more semantically complex relationships

The propositions are organised around one or more inferred main or big ideas, sometimes hierarchically.

The interpretations can be tested or investigated.

When given the opportunity, they can modify, rationalise and update their interpretation. It becomes 'validated knowledge'. The students now 'know more

The students are motivated intrinsically to evaluate them, for example, by asking questions, researching or acting.

The interpretations are speculative and may include propositions that are logically inaccurate at the time.

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Your turn

Our pathway: Session 2

To what extent does your school regularly

- use a range of assessments for identification that match the multiple ways of being gifted? In what ways could identification be improved by using a broader range of assessment formats?
- look for evidence of excellent outcomes in a range of assessment formats and provide students with the opportunity to show all that they know or can do about a topic or skill area?

Some teachers and schools prefer to standard tests rather than open-ended tasks for identifying excellent outcomes. How could you help them see the value of these?

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What thinking patterns → this type of understanding of the teaching information?

interpret new information rapidly, scan and chunk it more efficiently

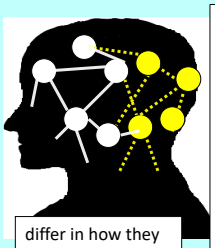
use their conceptual networks, automatically. retain knowledge in gifted domains efficiently in working memory

think in larger steps, manipulate multiple ideas at once, and in several directions vs work on single ideas sequentially.

categorise issues and problems more efficiently, 'see' inconsistencies and frame up intellectual challenges or questions.

Analyse and evaluate their intuitive theories, spontaneously, ask complex questions about them→ modify them

organize and re-organize the ideas in their new understanding in more complex ways, infer the main idea/s in information more rapidly



differ in how they are programmed by the teaching. Some are easily programmed and need fewer learning experiences to acquire an idea. Others, are more 'self programming'.

Use more complex thinking strategies;

- infer spontaneously, more flexibly and broadly, look for big picture patterns and relationships, and see the implications of their decisions and actions
- link ideas in novel, lateral, unexpected ways, use 'far transfer' thinking, cross topic boundaries, make fluid analogies between unrelated topics,
- form subjective patterns and personal rules, solve problems in unusual or novel ways
- Use imagination or fantasy and show 'intellectual playfulness'

Use metacognition spontaneously and efficiently to direct, monitor, self-regulate their learning activity, plan how they will learn by setting learning goals

Use the affective infrastructure necessary to learn independently when given the opportunity; focused, intense interest in topics, self-motivated to think and learn about them, maintain focus and persistence

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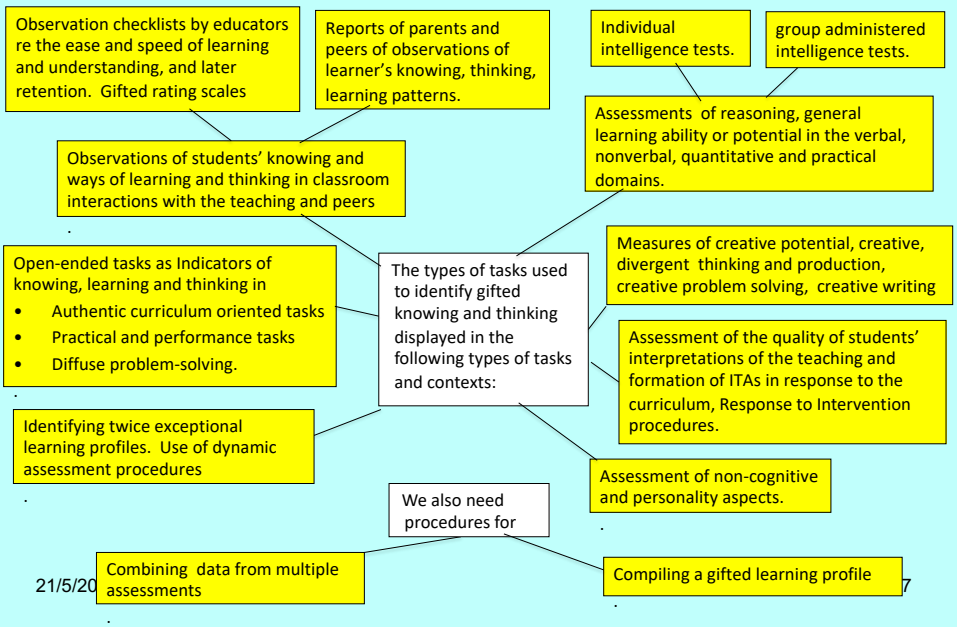
Measures for assessing gifted learning potential



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General rubric form scoring activity during authentic tasks.

A general rubric form that could be modified to generate rubrics for scoring authentic assessment outcomes for evidence of a student's gifted learning capacity and the extent to which their outcome is talented.

Dimension	During the activity the extent to which the student	low high 1 2 3 4 5
Activity focused on the outcome	Showed breadth and depth of their understanding of the topic?	1 2 3 4 5
	Generated novel, innovative, original, plausible possibilities?	1 2 3 4 5
	Interpreted and targeted the intended purpose, function or goal of the product?	1 2 3 4 5
	Was able to organise aspects of the knowledge in terms of the intended purpose, for example, manipulate details within 'big' ideas?	1 2 3 4 5
	Took account of its intended audience?	1 2 3 4 5
Thinking and activity that led to the outcome: evidence the student…	inferred possibilities, synthesised, make analogies, thought creatively has analysed, evaluated, compared?	1 2 3 4 5
	retained several ideas that once?	1 2 3 4 5
	applied ideas?	1 2 3 4 5
	monitor and self-regulate their thinking activity?	1 2 3 4 5

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General rubric form scoring activity during authentic tasks.

Dimension	Attribute of the outcome and its	low high 1 2 3 4 5
Ability to manage and direct the activity: evidence the student….	selected and refined the topic they investigated?	1 2 3 4 5
	decided the methodology used to investigate the problem or issue?	1 2 3 4 5
	knew how to plan and implement their response to it?	1 2 3 4 5
	selected, organized and used relevant background information and data to develop the outcome, shown diversity in data collection?	1 2 3 4 5
	monitored, reviewed and modified their on-going activity?	1 2 3 4 5
	responded to challenges as they worked through the tasks?	1 2 3 4 5
Evidence of emotional engagement: evidence the student	invested effort and thinking in solving problems that may arise	1 2 3 4 5
	showed intrinsic academic motivation, task commitment and focus.	1 2 3 4 5
	engaged collaboratively when necessary	1 2 3 4 5
	showed positive attitudes and social skills, eg., attitudes toward cultural diversity, scientific attitudes	1 2 3 4 5

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Use diffuse social problem solving to see gifted thinking

A situation that needs to be improved

Australia's most famous natural landmark is the Great Barrier Reef. It is home to the star of *Finding Nemo* and thousands of other fish. Reptiles, amphibians, coral, birds and marine mammals live there. Their survival depends on the Reef.

Over the years, areas of the GBR have changed. Some reefs that used to be colourful and strong are now grey and crumbling. They are dying.

Things have changed around the reef. Fishing boats catch more fish from the reef than they are allowed by law. This breaks up the food chain. It causes an imbalance to life on the reef. Some species increase in number. Others may die off.

An example is the Crown of Thorns starfish. It eats the coral. There used to be other fish that ate the starfish. Many of these fish have been caught and there is less control over the starfish. They now eat the coral reef faster than the coral can grow back.

Ships travelling near the reef also damage it. Thousands go through the reef every year. They pollute the water and hurt the reef. They cause another problem. The water around the reef is shallow and large ships often can't fit into the ports. To make the ports deeper, the ocean floor was dug up. The sand and dirt were dumped on top of some reefs. These reefs could not breathe and died. Yet, the shipping business creates jobs. It also brings in billions of dollars into the Australian economy.

Environmentalists and scientists around the world fear for the future of the GBR. They have put pressure on the government to better protect it so it does not disappear. Expert, David Booth, said, "The science is clear. Not enough is being done to help. Almost half the coral has been killed in the last few decades." This affects all the species that need the reefs to survive.

Imagine the government asks you to help think of ways to improve the quality of the Great Barrier Reef and prevent more damage. The economy is also important to the government. Suggest ways you might tackle the problem, possible solutions, limitations etc.

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Use diffuse social problem solving to see gifted thinking

How students use their knowledge and thinking in an integrated, directed way to solve authentic cultural problems.

Problem solving helps gifted students show their ability to

- link ideas in richer, more differentiated and elaborated ways, show 'far transfer' links between concepts.
- reflect on what they know and to link problems or issues with what they know.

This ability typifies Sternberg's practical and tacit knowledge.

The complex social problems :

- are ill-defined, may need to be clarified and lack a single solution path.
- describe a scenario. The student needs to work out what the problem is.
- need adaptive responses to new or changing situations.
- may involve several issues in the context, for example, some groups affected positively and others negatively.
- the information needed to solve them may not be obvious or readily available.

Their' responses and solutions on the open-ended problem solving task can be scored in terms;

- the breadth and depth of ideas displayed,
- the complexity of links,
- the relevance of ideas,
- evidence of lateral or divergent thinking,
- the fluency and flexibility of reasoning

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How to probe each aspect of problem solving

You need to tell us the story of how you will fix the situation by answering these questions. They ask you to think about different parts of the situation? Say as many things as you can think of for each answer.

The student identifies and describes	Cue questions students answer
• the main problem	What do you think is causing the problem?
• a possible solution.	What would the situation look like when the problem is solved?
• the actions needed to solve the problem.	What would you do to solve the problem? List as many things as you can.
• the information/assistance you would need to solve problem.	What do you need to know to do these things? You can say these as questions you want to.
• obstacles and difficulties in implementing their solution	What things might make it hard to solve the problem? List as many as you can.
• ways of overcoming them.	What could you do you to overcome these difficulties?
• people likely to be affected by your problem solving activity.	Pretend you have solved the problem. Which groups of people may be affected by this?
• how your solution would affect the community.	What effect do you think your actions would have on these groups?
• how to monitor the effectiveness of the actions you took to solve it.	How could you tell if your solution was working?
• The steps in the solution are integrated and coherent.	Check that your answers fit together

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Administration of the diffuse problem.

Procedures for scoring each criterion.

Each response was scored in terms of its cognitive complexity;

- the relevance of ideas
- the number of relevant ideas or fluency and
- the complexity of the thinking (literal versus inferential, divergent, far transfer).

		fluency	
Cognitive complexity		1 idea	1+ ideas
	Literal	Accurate literal interpretation of the problem using *single* piece of information (1 mark)	Accurate literal interpretation of the problem using *multiple* pieces of information (2 marks)
	Low inferential	Plausible inferential interpretation of problem that comprises one inferred idea that extends *specific events* mentioned in the text (3 marks)	Plausible inferential interpretation of problem that comprise two or more inferred idea that extend *specific events* mentioned in text (4 marks)
	High inference	Plausible inferential interpretation of the problem that comprises one inferred idea made within topics that were *not explicitly* mentioned (5 marks)	Plausible inferential interpretation of the problem that comprise two or more inferred ideas made within topics that were *not explicitly* mentioned (5 marks)

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The assessment rubric

To what extent does the student:

Assess each response using the key

Unpack and understand the problem	• recognize 1+ aspects of problem • Say the problem with plausible ideas not explicitly stated, interpret issues in unique ways
infer plausible solution	• frame up viable, plausible solution, • evaluate it from various perspectives.
infer the solution pathway, actions needed to solve the problem	• plan a comprehensive solution pathway rather than a partial solution, • infer, transfer ideas from between contexts, show divergent thinking,

problem	1 idea	1+ ideas
literal	1	2
low inferential	3	4
high inferential	5	6

solution	partial	comprehensive
literal	1	2
low inferential	3	4
high inferential	5	6

	1 idea	1+ ideas
Literal partial	1	2
Literal comprehensive	3	4
Inferential partial	5	6
Inferential comprehensive	7	8

You can create social problem scenarios for topics in every domain.

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Assess creativity potential

High-level outcomes usually include an element of novelty. As well as assessing the creative quality of a student's outcomes, schools can assess a student's creative thinking ability - students' creative potential.

Tests of creative potential assess the ability to think creatively about verbal and figural scenarios such as

- thinking divergently,
- making associations,
- constructing, and combining broad categories,
- working on many ideas simultaneously.

Tests include the

- Torrance Tests of Creative Thinking (TTCT),
- Remote Associates Test (RAT),
- Alternate Uses
- Test of Creative Thinking (TCT-DP)
- Evaluation of Potential Creativity

Outcomes are scored in terms of their:

- fluency: the breadth of knowledge, using the number of responses
- flexibility of thinking; the breadth of thinking creatively and divergently make novel associations, to analyse, evaluate and synthesize
- originality; the 'uncommonness' or uniqueness of the outcomes
- elaboration: the quality of the links or associations made between ideas, how divergent they are
- resistance to premature closure; how prepared the individual is to continue to investigate possibilities
- usefulness; how practical and relevant are the outcomes.

Torrance verbal creativity scores predict creative achievements better than IQ scores assessment 20 years later.

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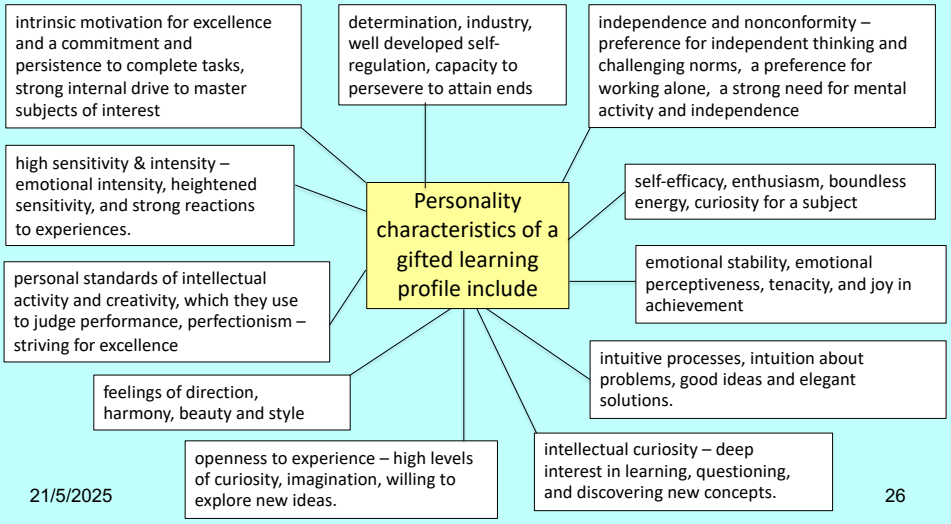
Personality aspects of a gifted learning profile.

Personality assessments can provide valuable insights into how an individual approaches learning, problem-solving, and challenges.



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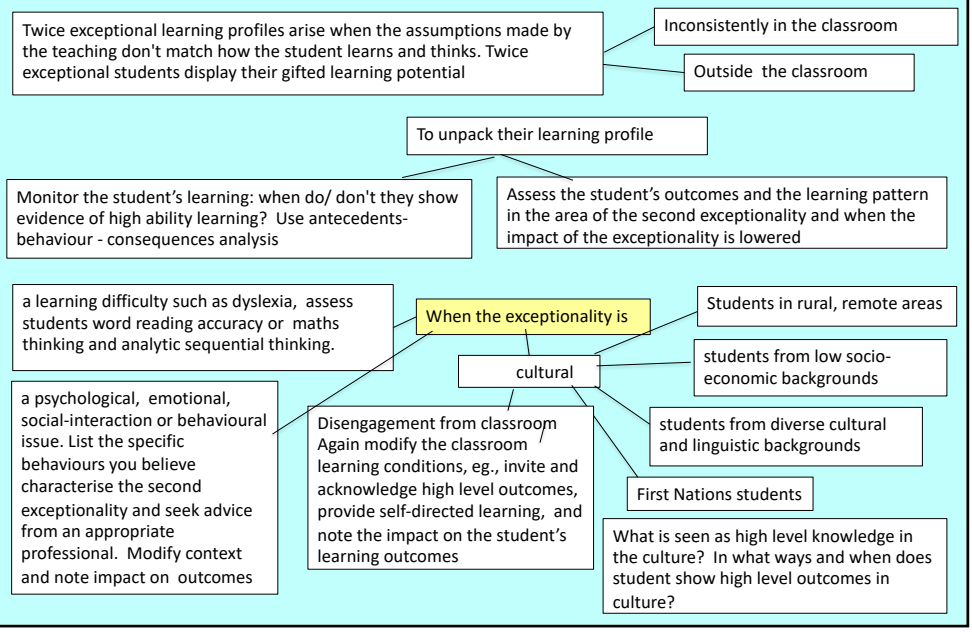
Identifying types of twice exceptional learning profiles



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An observational checklist to assess a student's interpretation of classroom instruction.

Dimen -sion	Characteristic of learning a topic. How often does the student …..	What would it look like in a classroom?	Never 1 2 3 4 5 Always
Quality of their understanding	• show high understanding, extend the taught ideas to form more complex and differentiated relationships between concepts?		1 2 3 4 5
	• see novel connections between ideas quickly, take the ideas apart, link ideas in lateral, broad unexpected ways?		1 2 3 4 5
	• form personal, intuitive understanding of a topic that leads to creative, novel outcomes?		1 2 3 4 5
	• infer spontaneously subjective patterns and personal rules from the teaching rather than use the taught patterns?		1 2 3 4 5
	• think in 'larger chunks' of knowledge, skip steps in their thinking, retain more ideas in their thinking space at once?		1 2 3 4 5
	• form 'big ideas' more rapidly and in self initiated ways by synthesizing at a higher level and.		1 2 3 4 5
	• transfer their knowledge across content boundaries, make unusual or 'far transfer' links, link topics that seem unrelated to others?		1 2 3 4 5

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An observational checklist to assess a student's interpretation of classroom instruction.

Dimen -sion	Characteristic of learning a topic. How often does the student …..	What would it look like in a classroom?	Never Always 1 2 3 4 5
Quality of their thinking	• use higher level more complex thinking strategies spontaneously, selectively and more flexibly?		1 2 3 4 5
	• interpret the teaching information more quickly and efficiently, 'see' uncertainty or inconsistencies between it and what they know?		1 2 3 4 5
	• frame up challenges or questions more easily, see possibilities spontaneously, ask complex questions about ideas ?		1 2 3 4 5
	• self-manage and direct their learning spontaneously and independently, set goals, plan how they will learn, monitor or self-check, review progress, operate as a 'intuitive philosopher'?		1 2 3 4 5
	• organize and re-organize their new understanding in more complex ways?		1 2 3 4 5
	• solve problems in unusual or novel ways?		1 2 3 4 5
	• use imagination or fantasy, show 'intellectual playfulness'?		1 2 3 4 5
	• be easily programmed by the teaching and need fewer learning experiences to learn an idea?		1 2 3 4 5

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An observational checklist to assess a student's interpretation of classroom instruction.

Dimen -sion	Characteristic of learning a topic. How often does the student …..	What would it look like in a classroom?	Never Always 1 2 3 4 5
Quality of emotional engagement	• show focused, intense interest in a topic?		1 2 3 4 5
	• show self – motivation to think and learn about the topic?		1 2 3 4 5
	• show goal orientation, commitment, determination, perseverance, tenacity and persistence to complete tasks?		1 2 3 4 5
	• show a strong need for mental work, industry?		1 2 3 4 5
	• show pursuit of excellence, a desire for self advancement?		1 2 3 4 5
	• show positive self efficacy?		1 2 3 4 5
	• show curiosity, fascination, for the subject?		1 2 3 4 5
	• show enthusiasm, emotional stability and joy in achievement?		1 2 3 4 5
	• show high energy levels during the learning?		1 2 3 4 5

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Your turn

Empowering excellence in your school in identifying a gifted learning potential

To what extent does your school regularly use a range of assessments for identifying the range of ways of being gifted? Are some ways of being gifted preferenced over others? In what ways could identification of gifted potential be improved by using a broader range of assessment formats?

Evaluate the use of the diffuse social problem solving type of activity to identify the use of gifted thinking and knowing. What would you see as the advantages and limitations of using this type of task? Would you see a place for them in your provision?

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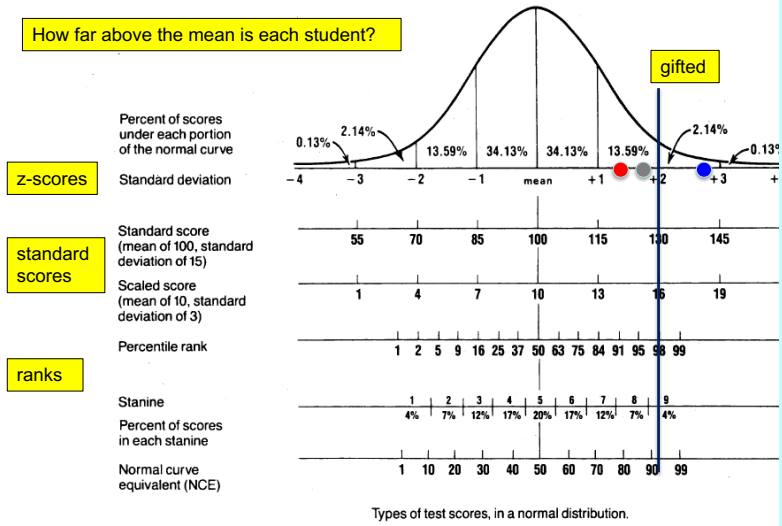
Using classroom tasks to identify excellent outcomes

How far above the mean is each student?

gifted



Types of test scores, in a normal distribution.

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Using classroom tasks to identify excellent outcomes

Example : The Mungo Lakes Activity

Prior to teaching the unit I

- outlined the topic verbally and showed the pictures
- used entry-level or pre-unit assessment tasks that assess students' ability to

infer relevant vocabulary; assess the breadth of their vocabulary	infer ideas that might be mentioned in the teaching	imagine themselves in the context (What would they see/hear/do?)	reflect on the actions they would use, the challenges they might face, the problems they would need to solve	suggest questions they might be able to answer having learnt the topic.
Verbal	All types	Nonverbal	Practical	All types

I identified plausible responses and categorized each response in terms of

The level of inference it showed

- Literal - provided in the information given– 1 mark
- Near inferential- adds new ideas within the given context– 2 marks
- Far transfer-recognises that the context could be different-3 marks

The total number of responses - how rich or broad a student's knowledge on entry to the teaching.

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Are any outcomes in the Mungo Lakes activity in the excellent range?

We'll work on the criterion of scores in the top 10 percentile range are excellent.

Name:	Raw score		z-score
P	3	First we work out the average or mean for the set of raw scores. Use Excel.	-0.52
W	4	Mean = 4.4	-0.09
A	5	Second , work out standard deviation for the set of scores. Use Excel.	0.35
T	7		1.22
F	6	SD = 2.3	0.78
E	6		0.78
Al	2	Convert each raw score to SD score or z-score	-0.96
An	2		-0.96
X	8	Z-score = (raw score – mean) ÷ SD	1.65
Es	8		1.65
Li	4	For a raw score to be in the top 10 percentile range, its z-score needs to be at least 1.27.	-0.09
Ja	2		-0.96
Ar	2	Select any z-scores that are more than 1.27	-0.96
Sk	8		1.65
An	8		1.65
Lim	4		-0.09
Ei	1		-1.39
SA	3		-0.52
T	4		-0.09
My	5		0.35
Le	1		-1.39

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Any outcomes in the excellent range?

What things do you think you might you learn?

Name:	Student response	raw score		
P	How to identify an old community like lakes, house, people	2	Mean – 2.1	-0.07
W	How they live and what they eat 12	3		0.60
A	How hot was it and what food was there	2	SD = 1.5	-0.07
T	History	1		-0.73
F	How many layers there was	2	Z-score = (raw score- 2.1) / 1.5	-0.07
E	History of lake mungo	1		-0.73
Al	About Dr Jim bowler	1		-0.73
An	I think I'll learn more about how the lakes and how they might of dried up. 1+2	3	Select any z-scores that are more than 1.27	0.60
X	About the history of Australia and a bigger dive into climate change. Also about the mungo people and mungo lady. 1+3+1+1	6		2.60
Es	I think we will learn about how life was 40,000 years ago	1		-0.73
Li	How long to It took them to find Mungo Lady	1		-0.73
Ja	I think we would learn about the history about mango lake and also what Dr Jim Bowler does in his life and what he finds what he does it, we would maybe learn about the mango woman.	4		1.27
Ar	How long it took for the layers to cover the water and how the mungo lady. 3+1	3		0.60
Sk	I think we might Learn about Dr Jim bowler. We also might learn about the setting and the people that used to live there and how they lived.	4		1.27
An	I think we might learn about the history of lake mungo	1		-0.73
Lim	You might learn about that lady they found.	1		-0.73
Ei	I might learn about how the lakes were carved. I would also learn about what tools where used and how you would live. 3+1+1	5		1.93
SA	Gold	0		-1.40
T	About the mango woman	1		-0.73
My	About the history of Australia	1		-0.73
Le	About the mungo people	1		-0.73

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Are any outcomes in the Mungo Lakes activity in the excellent range?

What challenges do you think the people at Lake Mungo needed to deal with? What problems might they have needed to solve? What things did they need to do to live there?

Name:	Student response	raw score		
P	Paradise, good fishing,	6	Mean = 3.24	1.60
W	Dusty ancient dry	3		-0.14
A	Old and rusty starving	2	SD = 1.72	-0.72
T	Accent lakes	1		-1.30
F	Hut, rusty, dusty and dirty	2	Z-score = (raw score- 3.24) / 1.72	-0.72
E	Desert, wilderness, hot	3		-0.14
Al	Hard	1	Select any z-scores that are more than 1.27	-1.30
An	Ancient, Beautiful, flat,	5		1.02
X	Very little food. Lack of health. Productive	4		0.44
Es	Scarce, harsh, conundrum, beautiful,	4		0.44
Li	Beautiful, small, amazing	5		1.02
Ja	There might of been a very massive lake and maybe there were little cabins around the lake	6		1.60
Ar	Ok	0		-1.88
Sk	I would describe it as a sandy place. Ancient, interesting, and boiling.	4		0.44
An	Old, antique , one of a kind, ancient	3		-0.14
Lim	Dusty, flat, hot, dry and blue waster	5		1.02
Ei	Deserted, hot, mines, dusty, loud, lack of water and hard work.	3		0.44
SA	It is so old	1		-1.30
T	Dry, Old, Red, bony,	4		0.44
My	Dry, Old, Red, Historical,	4		0.44
Le	The lake would have been very warm	1		-1.30

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Were any outcomes in the Mungo Lakes activity in the excellent range?

What challenges do you think the people at Lake Mungo needed to deal with? What problems might they have needed to solve? What things did they need to do to live there?

Name:	Response	Raw score
P	Drought, food, fishing	3
W	Hunt and kill and live in huts made out of wood	4
A	Hungry and thirsty trying too get food hunting for food too eat and get water	5
T	Some challenges might be hard to find food and water probably hot and they need branches and leaves	7
F	Floods , overflows and bugs	6
E	They would face challenges with hunting, sleeping and drinking	6
Al	Kill animals	2
An	They might of had to challenge the lakes and Tahoe hot it might of been	2
X	Get through winter. When food is scarce. Tools. Food. Medicine.	8
Es	They needed to find food but maybe as the world got warmer their home became more dryer and shade and water was scarce.	8
Li	Not finding fish. Look for more food	4
Ja	They wouldn't of had that much food to eat	2
Ar	Heat poor living	2
Sk	I think they might have been a bit hungry and have to hunt to eat. They would have to build huts and shade to block out the sun.	8
An	They need to deal with wild creatures. Problems like drought or no food	8
Lim	A change would be finding food and water	4
Ei	Hot no water find water so have to dig for water.	1
SA	Mite tiers they you'd see ponds.	3
T	Survive and take care of each other	4
My	Drought, Survive and help the earth so they can live	5
Le	The lake would have been very warm	1

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An example of each student's response to each of the questions

Name:	5. What questions might you be able to answer at the end of learning about it?	
P	How to discover an old civilisation	2
W	Well most if I listen	0
A	How hot it was and dusty and how it would feel like being around it and if it's hard or not	2
T	What the lake is called where it is and about how the lakes disappeared	3
F	Why there was a frozen river, the big holes and the bones	2
E	I might be able to learn about how the solved the challenges and how they lived	2
Al	Lots of good stuff	0
An	Maybe how big are the lakes	2
X	Who the mungo woman is? How lakes have been covered up? What did the mungo people do? Are there any more mungo people?	9
Es	How people lived 40,000 years ago and the problems the faced.	2
Li	What the lake was used for	2
Ja	What would you think would it look like 40000 years ago	1
Ar	Almost every question	0
Sk	I would be able to answer questions about dr Jim bowler. And about the mungo lady.	2
An	How the people and animals survived. How they got water and travelled	4
Lim	How hard it would be to live back there	1
Ei	How they live and why.	1
SA	Not sure	0
T	The mango woman lived a long time ago	1
My	How they used to survive	1
Le	The lake would have been very warm	1

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Convert between z-scores. WISC standard scores and percentile ranks

Z-Score	WISC Standard Score	Percentile Rank
2.00	130	98
1.93	129	97
1.87	128	97
1.80	127	96
1.73	126	96
1.67	125	95
1.60	124	95
1.53	123	94
1.47	122	93
1.40	121	92
1.33	120	91
1.27	119	90
1.20	118	88
1.13	117	87
1.07	116	86
1.03	115.5	85
1.00	115	84

Z-Score	WISC Standard Score	Percentile Rank
3.20-3.33	148- 150	>99.9
3.07-3.20	146- 148	99.9
2.93	144	99.8
2.87	143	99.8
2.80	142	99.7
2.73	141	99.7
2.67	140	99.6
2.60	139	99.5
2.53	138	99
2.47	137	99
2.40	136	99
2.33	135	99
2.27	134	99
2.20	133	99
2.13	132	98
2.07	131	98
2.00	130	98

To work out the percentile ranks for z scores less than 1.0, you can use the online calculator at https://measuringu.com/calculators/pcalcz/ .

On that page you enter the z=score in the box and click the 'one-sided' button. Then click 'Submit'. The percentile rank is under the **Percent of Area** diagram.

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Set of z-scores

I have calculated the set of z-scores for each of the five tasks for each student.

Z-score	%ile rank	
above 1.27	above 90th	
above 2.00	above 98th	
above 2.27	above 99th	

	1 learn?	2 words?	3 visualise?	4 problems	5 questions	Sum of z-scores
P	-0.07	1.61	0.01	-0.73	0.05	0.88
W	0.59	-0.14	-1.39	-0.28	-1	-2.22
A	-0.07	-0.72	-0.22	0.17	0.05	-0.78
T	-0.71	-1.30	-0.92	1.07	0.57	-1.29
F	-0.06	-0.73	0.241	0.62	0.05	0.13
E	-0.71	-0.14	0.01	0.62	0.05	-0.16
Al	-0.71	-1.31	-1.16	-1.19	-1	-5.36
An	0.58	1.03	-0.93	-1.19	0.05	-0.44
X	2.53	0.44	0.94	1.53	3.74	9.18
Es	-0.71	0.44	0.94	1.53	0.05	2.25
Li	-0.71	1.02	-0.46	-0.28	0.05	-0.36
Ja	1.23	1.61	-1.15	-1.19	-0.48	0.03
Ar	0.58	-1.89	-0.92	-1.19	-1	-4.41
Sk	1.23	0.44	1.41	1.53	0.05	4.67
An	-0.71	-0.14	2.39	1.53	1.11	4.12
Li	-0.71	1.03	-0.929	-0.28	-0.47	-1.36
Ei	1.88	0.44	0.95	-1.63	-0.47	1.16
SA	-1.363	-1.31	-0.92	-0.73	-1	-5.32
T	-0.71	0.44	0.94	-0.28	-0.47	-0.07
My	-0.71	0.44	0.48	0.17	-0.47	-0.09
Le	-0.71	-1.31	0.71	0.17	0.58	-0.56

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Your turn

Empowering excellence in your school in identifying excellent outcomes in classroom tasks

To what extent does your school regularly use classroom tasks to identify excellent outcomes?

What procedures does it use to combine data from multiple sources?