



ELEMENT Domain 4 - Personalise and Connect Mathematics Learning

4.3 Element 4.3 - Apply and assess learning in authentic contexts

The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:

| Strategy | From Information to Understanding | |
|-----------|--|--|
| Technique | Many ways of knowing: Ask students to construct general rules by identifying patterns. | |
| Level | Before | After |
| Primary | 1. $3 + 5$ 2. $4 + 7$ 3. $2 + 4$ 4. $9 + 5$ 5. $11 + 5$ 6. $4 + 9$ etc | 1. Three girls and five boys were at a party. How many children were at the party? 2. $4 + 7$ 3.  <p>Represent each problem on the think board, in a picture, using materials, in a number sum and in a word problem, and write the answer in the middle. You may do the tasks in any order. Reference This think board is from the 'Maths for Learning Inclusion' resource, but similar versions can be produced for any topic.</p> |
| Secondary | Calculate: a. $2/5 + 3/7$ b. $7/9 - 2/5$ c. $3/4 \times 1/3$ d. $5/9 \div 1/3$ | $2/5 + 3/7$ $7/9 - 2/5$ $3/4 \times 1/3$ $5/9 \div 1/3$ For each of the fraction questions above: <ul style="list-style-type: none"> • Use any appropriate numerical process to calculate solutions to the questions. • Create a diagram or a physical representation that would support you to calculate the solution or convince someone (or yourself) that your solution is correct. • Write a word problem/ describe a situation in which this calculation could be relevant. |

How do you think the technique Many ways of knowing might support Element 4.3 - Apply and assess learning in authentic contexts?

There are many ways to articulate this relationship. One response to this question has been provided on the next page.



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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:



How does the technique **Many ways of knowing** support *Element 4.3 - Apply and assess learning in authentic contexts?*

In each of the examples, students are challenged to transfer between abstract mathematical representation and an authentic context. In this way the teacher supports students to apply their learning to an authentic context. Refer to 4.4 (multiple modes) to see why multiple representations, in multiple modes, assists authentic assessment.

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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:

Strategy**From Information to Understanding****Technique**

Generalise: Ask students to construct general rules by identifying patterns.

Level**Before****After**

| | | |
|--|--|--|
| <p>Primary</p> <p>Write each number and find it on your 100s chart:</p> <p>Build each number using MAB blocks:</p> <p>17</p> <p>26</p> | | <p>Choose one row (or part of a row) in your 100s chart, eg 23, 24, 25, 26. Make each of those numbers in that row using MAB blocks</p> <p>Make sure that you have exchanged as many ones blocks as you can for 10s rods.</p> <ol style="list-style-type: none"> 1. Explain how the number 24 relates to the blocks representation? <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Further support:</p> <p>How does the '2' part of the number 24 relate to the blocks that you have used?</p> <p>How does the '4' part of the number 24 relate to the blocks that you have used?</p> </div> <ol style="list-style-type: none"> 2. Repeat for 25, then 26 etc. Does this connection work for the next number (25) and the next number (26)? 3. Look at another number on this row. Do you know how many 10s and how many ones blocks you will need to represent that number? Explain to a partner how you know. 4. Would your rule (explanation) work on the next row and the next row? Would your rule always work? |
| | | <p>Find the area of each of the following triangles:</p> <p>Leigh thinks that each of these triangles cover half the area of the rectangle that is drawn around it. What do you think? (You can cut and rearrange the pieces of copied versions of these triangles to test)</p> <ul style="list-style-type: none"> • Will a triangle always be half the area of the rectangle that's drawn around it, or do these pictures show special cases? • Could you describe a rule that would always work for calculating the area of a triangle? • How can the formula for the area of a rectangle be used to help you to write a formula for the area of a triangle? <div style="text-align: right; margin-top: 20px;"> </div> |

How do you think the technique Generalise might support Element 4.3 - Apply and assess learning in authentic contexts?

There are many ways to articulate this relationship. One response to this question has been provided on the next page.



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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:

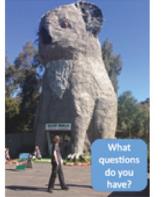


How does the technique **Generalise** support *Element 4.3 - Apply and assess learning in authentic contexts?*

Students may be able to generalise without support. When teachers provide students with the opportunity to generalise, they gain insight into the depth of students' understanding.

**ELEMENT** Domain 4 - Personalise and Connect Mathematics Learning**4.3 Element 4.3 - Apply and assess learning in authentic contexts**

The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:

| Strategy | From Procedural to Problem Based | |
|-----------|---|--|
| Technique | Students identify the problem to solve: Give additional information that is not required to do the task. | |
| Level | Before | After |
| Primary | <p>This giant model koala is so big that it has a shop built inside of it. How many times taller is the koala than the little girl?</p>  | <p>Look at this photograph. What questions do you have? Sort your questions into mathematical and non-mathematical questions.</p> <p>Which mathematical question would you like to solve?</p>  |
| Secondary | <p>My four-wheel drive car is 240 cms wide. My city car is 165 cms wide. Express the ratio of the width of the four-wheel drive to the city car</p>  | <p>Look at this photograph. What questions come to mind?</p> <p>Sort your questions into mathematical and non- mathematical questions.</p> <p>Which mathematical question would you like to solve?</p>  |

How do you think the technique Students identify the problem to solve might support Element 4.3 - Apply and assess learning in authentic contexts?

There are many ways to articulate this relationship. One response to this question has been provided on the next page.

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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:



How does the technique Students identify the problem to solve support Element 4.3 - Apply and assess learning in authentic contexts?

This element does not mean that the context must always reflect a real-life context, but it is certainly one way to achieve this.



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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:



| Strategy | From Procedural to Problem Based | |
|-----------|--|---|
| Technique | Providing insufficient information (at first): Give a perplexing problem and slowly provide information as needed. | |
| Level | Before | After |
| Primary | <p>This bucket holds 10 litres when filled to the top. The dotted line shows the water level in the bucket.</p> <p>How much water do you think is in the bucket?</p>  | <p>Roughly how much water do you think was poured over this man?</p> <p>What information do you need in order to find out? What else?</p>  |
| Secondary | <p>The radius of the London Eye is 60m.</p> <p>Calculate:</p> <ol style="list-style-type: none">The diameter of the wheelThe circumference of the wheelThe time taken for one revolution of the wheel if it travels at an average speed of 0.3m/s  | <p>In the year 2000 the London Eye became the world's tallest Ferris wheel.</p> <p>Approximately how long do you think a journey on the London Eye might take?</p> <p>Convince me/ someone who thinks differently to you. What do you need to know to be sure of your accuracy?</p>  |

How do you think the technique Providing insufficient information (at first) might support Element 4.3 - Apply and assess learning in authentic contexts?

There are many ways to articulate this relationship. One response to this question has been provided on the next page.



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The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:



How does the technique **Providing insufficient information (at first)** support *Element 4.3 - Apply and assess learning in authentic contexts?*

Applying mathematics in real world contexts requires the identification of information that is necessary to work towards the answer, therefore students need to develop skills in identifying necessary information. Students can practice identifying necessary information in real and abstract contexts.