

## 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? The teacher can, of course, identify the question or when appropriate provide opportunities for different groups of students to work on different questions.</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? The teacher can, of course, identify the question or when appropriate provide opportunities for different groups of students to work on different questions.</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.

**ELEMENT** Domain 4 - Personalise and Connect Mathematics Learning**4.3** Element 4.3 - Apply and assess learning in authentic contexts**How does the technique *Students identify the problem to solve* support *Element 4.3 - Apply and assess learning in authentic contexts*?**

Element 4.3 'Apply and assess learning in authentic contexts', does not mean that the context must always reflect a real-life context, although using real-life contexts is certainly one way to achieve an authentic context. In terms of trying to achieve an authentic context in mathematics we can ask ourselves, 'Does the presentation of the problem make the mathematics problem 'real in the students mind?'

This notion of 'making it real in the students mind' comes from the Dutch research RME (Realistic Mathematics Education), which became known as 'Real-World Mathematics Education'. Marja van den Heuvel-Panhuizen states that, " The reason why the Dutch reform of mathematics education was called "realistic" is not just the connection with the real world, but is related to the emphasis that RME puts on offering the students problem situations which they can imagine. The Dutch translation of the verb "to imagine" is "zich REALISeren." It is this emphasis on making something real in your mind that gave RME its name. For the problems to be presented to the students this means that the context can be a real-world context but this is not always necessary. The fantasy world of fairy tales and even the formal world of mathematics can be very suitable contexts for a problem, as long as they are real in the student's mind."

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## 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

**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"> <li>The diameter of the wheel.</li> <li>The circumference of the wheel.</li> <li>The time taken for one revolution of the wheel if it travels at an average speed of 0.3m/s.</li> </ol> 	<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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## 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.