

ELEMENT

Domain 4 - Personalise and Connect Mathematics Learning

4.1

Element 4.1 - Build on learners' understandings

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

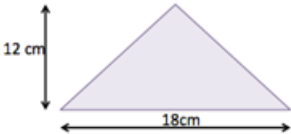
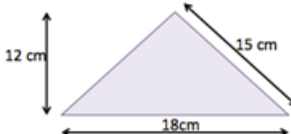


Strategy

From Procedural to Problem Based

Technique

Include some irrelevant information: Give additional information that is not required to do the task.

Level	Before	After
Primary	<p>What is the value of $500 + 60 + 4$</p>	<p>Which of these is worth 564? Tick as many boxes as you need to.</p> <p>$5 + 6 + 4$ <input type="checkbox"/></p> <p>$50 + 60 + 40$ <input type="checkbox"/></p> <p>$500 + 40 + 6$ <input type="checkbox"/></p> <p>$500 + 60 + 4$ <input type="checkbox"/></p>
Secondary	<p>Calculate the area of the triangle.</p> 	<p>Calculate the area of the triangle.</p> 

How do you think the technique **Include some irrelevant information** might support *Element 4.1 - Build on learners' understandings*?

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



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**How does the technique *Providing insufficient information (at first)* support *Element 4.1 - Build on learners' understandings*?**

When teachers provide questions in which only the necessary information is given, they can make incorrect assumptions about the students' understanding. For example, in the Secondary Years, area of a triangle question, before the transformation a student could successfully answer the question by recalling that they need to multiply two measurements together and half that amount. This is an incomplete understanding, but can lead to the correct answer. The transformed example, with just one additional measurement, challenges the student to consider which dimensions are necessary when calculating the area of a triangle. The triangle looks to be close to a right angle triangle, but there is no labelling to verify this. This assumption would lead to an incorrect solution, revealing more about the student's understanding than the initial question.

Knowing where the learner's understanding is, supports the teacher to build on their understanding appropriately.



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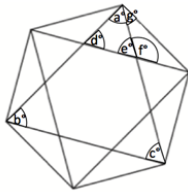



Strategy

From Procedural to Problem Based

Technique

Let students identify the steps: Provide multi-step problems and do not state all the steps.

Level	Before	After
Primary	<p>A movie ticket for one adult costs \$12. A movie ticket for one child is three quarters of the cost for an adult. a. What's the cost for one child? b. What's the cost for four children? c. What's the cost for a family of two adults and four children?</p>	<p>A movie ticket for 1 adult costs \$12. A movie ticket for a child is three quarters of the cost for an adult. What's the cost for a family of two adults and four children?</p> <p>This question is based on a NAPLAN question. Many NAPLAN questions are multi-step problems and do not state all the steps.</p>
Secondary	<p>This design is drawn inside a regular hexagon. Calculate the marked angles.</p> 	<p>This design is drawn inside a regular hexagon. What is the size of the angle marked a?</p>  <p>This question is from a NAPLAN paper. Many NAPLAN questions are multi-step problems and do not state all the steps.</p>

How do you think the technique **Let students identify the steps might support *Element 4.1 - Build on learners' understandings*?**

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



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**How does the technique *Let students identify the steps* support *Element 4.1 - Build on learners' understandings*?**

When students are challenged to identify possible steps they are provided with the opportunity to use skills they already have, therefore teachers gain an insight in to the students' current capacity to use and apply their mathematics. Teachers can support students to access skills that they may have, but have not brought to the task, by asking questions such as, 'Can you recall seeing a problem similar to this one?' or, 'Do you remember when we learned about....' or, 'Could you try using.....'.

Importantly, when we build on the students' understanding in this way, the students can reveal both appropriately applied understanding and misconceptions. This provides the teacher with a platform from which they can appropriately respond to students.