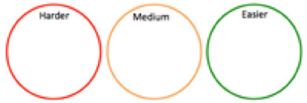
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Closed to Open**
Technique	**Different perspectives:** Have students explore different points of view.

Level	Before	After
Primary	Answer these questions: 4 x 3, 7 x 3, 9 x 3 etc up to 12 x 3	Think about how you would sort the following multiplication questions into three levels of difficulty: Harder, medium, easier:1 x 3, 2 x 3, 3 x 3 etc up to 12 x 3  • Deal out the x3 cards and work in a group to place each card in the place that best describes its difficulty for you. Do you all agree? • Take turns to move a card to a different section if you think it has a different level of difficulty for you. Explain why you find it hard/easy. Did anyone find their opinion changed when listening to the ideas and reasoning of others?
Secondary	Answer these questions: Half of 32 0.25 x 68 ¼ of 48 ¼ of 32 32 x 0.5 ½ of 32 68 divided by 4 48 x 0.25	Individually, sort the following questions into at least two groups of your own choosing. Half of 32 0.25 x 68 ¼ of 48 ¼ of 32 32 x 0.5 ½ of 32 48 x 0.25 68 divided by 4 In pairs, share your individual thinking and try to find at least one more way to sort this collection of questions. Share your thinking with another pair. Share your thinking with the class. • Did anyone else sort the questions in the same ways as you? • Did anyone else sort the questions differently from you? • Why might they have sorted their questions like this? Check with the students who presented that grouping. Summarise the connections that have been made.

How do you think the technique Different perspectives 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.

Element 4.1 - Build on learners' understandings

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

How does the technique Different perspectives support *Element 4.1 - Build on learners' understandings?*

When students share and examine different their perspectives, they naturally bring their current understanding to the question. This supports the teacher to identify the students' prior learning and respond appropriately.

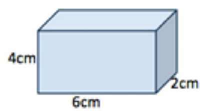
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Closed to Open
Technique	**Many Entry Points:** Have students work backwards by providing the outcome first.

Level	Before	After
Primary	1. Use unifix cubes to measure the length of your book. 2. How many unifix cubes do you need to balance a packet of pencils? 3. How many unifix cubes can be stacked in this box?	The answer is: 'I used 20 unifix cubes to measure it.' 1. What might I be measuring? Think of more possibilities. What else? What else? .... 2. Are all your examples the same type (eg length)? Can unifix cubes be used to measure those same objects in a different way? How? …How else? What could an object be if it was measured using 20 cubes?
Secondary	**Calculate the volume of this rectangular prism** 	The volume of the object is 24cm^3. What shape could the object be and what are its dimensions? OR The volume of a rectangular prism is 24cm^3. What could its dimensions be?

How do you think the technique Many entry points 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Many entry points support *Element 4.1 - Build on learners' understandings?*

When there are multiple entry points to a problem, students will often enter at a level than most suits their current understanding. This provides the teacher with the opportunity to notice and respond to the students' thinking and design questions that will challenge students to move to a higher level. For example, in the Secondary Years prism example, students could access this volume problem by:

- rearranging and recording the position of 24 centimetre cubes
- drawing images to support them to think about building layers of cubes to make a total of 24
- using an understanding of the formula for volume of a rectangular prism (_ x _ x _ = 24) and applying a 'trial and improvement' approach to generating three digits that multiply together to make 24
- as above, but applying a methodical process to identify all combinations
- applying an understanding of the formula, factors of 24 and a methodical process to establish combinations efficiently
- as above, but extending to include dimensions that are not integers etc.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Closed to Open
Technique	**Many solutions:** Ask questions which have many solutions. Stretch thinking by adding or removing constraints.

Level	Before	After
Primary	Work out: 4 + 6 =…… 5 + 7 = ………. 2 ½ + 4 ½ =……. 7 ¼ + 2 ¾ =………	The solution is 12. What could the question be? • Aim to find at least 20 different solutions. Add the following constraints: 1. You can only use addition. 2. You can only use two values in your calculation. 3. Flipped calculations don't count as different solutions in this problem.
Secondary	Write the linear equation which has: a. gradient of 6 and a y-intercept of 3 b. gradient of 3 and a y-intercept of 2 c. gradient of 5 and a y-intercept of -2	Write down some equations that have a y-intercept of 3. 1. If you sketched the graph of your equations, which direction would they slope? Are there any solutions that slope the other way? (Eg downwards left to right, rather than upwards) 2. What if each equation that you write down must have a steeper gradient than the previous one? 3. What if the coefficient of x cannot be a whole number? 4. What if the equation isn't linear?

How do you think the technique Many solutions 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Many solutions support *Element 4.1 - Build on learners' understandings?*

Teachers can use 'adding constraints' to challenge students to explore solutions that were not included in their initial response, but represent a suitable step. In this way, adding constraints, challenges students to build on their understanding.

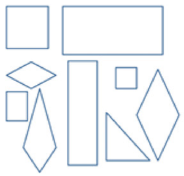
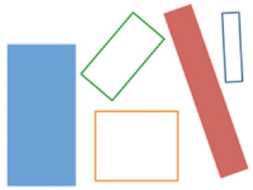
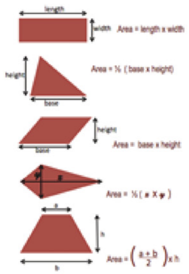
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Information to Understanding**
Technique	**Compare and contrast:** Ask students to identify similarities and differences.

Level	Before	After
Primary	Rectangles can look different. Can you recognise different types of rectangles? Colour all 5 rectangles: 	These shapes are all rectangles. What's the same about all of the rectangles? What's different about them? Would it help if you cut the shapes out and moved them around? Do rectangles need to be long and thin? Do rectangles need to have sides that are horizontal/vertical? 
Secondary	A review of area calculations: Using these formulae, find the area of the shaded regions. 	**A review of area calculations:** 1. Label the dimensions that you might measure to calculate the area of each of these polygons and write the formula that you would use. 2. Check with a partner to see if you have the same/ different ideas about: a. the dimensions that you would measure. b. how they would be used in the formula. 3. What's the same about each of the formulae? What's different about them? (Did you notice that all formulae involve multiplication of two lengths? The triangle and kite also involve a multiplication by ½) Why?) 4. What's the same about the dimensions that you have labelled? What's different about them? (Did you notice that the dimensions are always perpendicular to each other) Why? 

How do you think the technique Compare and contrast 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Compare and contrast support *Element 4.1 - Build on learners' understandings?*

'Compare and contrast' questions are both a way to observe existing understanding and a way to build new understanding. In this way, 'compare and contrast' questions support teachers to actively seek out what students already know and understand.

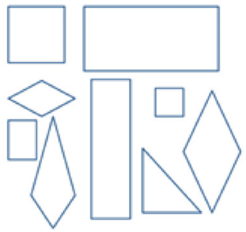
ELEMENT **4.1**

Domain 4 - Personalise and Connect Mathematics Learning

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 Information to Understanding**
Technique	**Make connections and find relationships:** Have students make meaning by asking them to connect pieces of information.

Level	Before	After
Primary	Shapes worksheet Colour the squares blue and the rectangles red 	I'm thinking of a shape and it has 4 sides. What might it look like? Share your ideas. • What if it has 4 straight sides? Does that make you think differently about what you could have drawn before or what the shape might be now? Share your ideas. • What if I it has four straight sides and it's a long thin shape. What do you think now? Could it be a square? This structure may help you to explain your thinking: • Because I know... I also know… • If … then...
Secondary	Scientific notation is a way of writing numbers when they are too big or too small to be written in decimal form. A number written in scientific notation is written as a number between 1 and 10 (inclusive) and multiplied by a power of 10. Eg: • 700 = 7 x 10^2 • 530 000 000 = 5.3 x 10^8 **Copy and complete:** a. 73 000 = …x 10^4 b. 25 300 000 = 2.53 x… c. etc	Use your smartphone calculator (or watch what happens on a shared device) when you calculate: 5,200,000 x 2,300,000. Now rotate your device. Can you see two different views? **Discuss** 1. What do you think happening here? 2. What connections can you see? 3. What do you think ' e+13' might mean? Test out your ideas on some other values. 4. If 'Screen 2' was showing '530 000 000', What might 'Screen 1' show? 5. If 'Screen 1' was showing '2.53e+7', What might 'Screen 2' show? Find out about 'Scientific notation'  Screen 1 Screen 2 A smartphone calculator has been used for these screenshots. (In screen 2 device has been rotated sideways)

How do you think the technique Make connections and find relationships 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Make connections and find relationships support *Element 4.1 - Build on learners' understandings?*

'Connections' questions are both a way to observe existing understanding and a way to build new understanding. In this way, these questions support teachers to actively seek out what the students already know and understand. Teachers can then respond in an appropriate way.

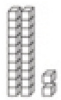
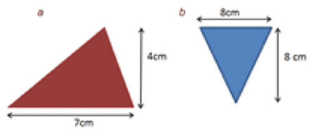
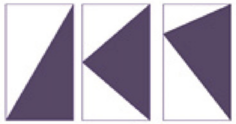
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Information to Understanding**
Technique	**Generalise:** Ask students to construct general rules by identifying patterns.

Level	Before	After
Primary	Write each number and find it on your 100s chart:  ____ Build each number using MAB blocks:  ____ 17 26	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 Make sure that you have exchanged as many ones blocks as you can for 10s rods. 1. Explain how the number 24 relates to the blocks representation? Further support: How does the '2' part of the number 24 relate to the blocks that you have used? How does the '4' part of the number 24 relate to the blocks that you have used? 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?
Secondary	Find the area of each of the following triangles: 	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)  • 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?

How do you think the technique Generalise 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Generalise support *Element 4.1 - Build on learners' understandings?*

Tasks that support students to make generalisations are both a way to observe existing understanding and a way to build new understanding. In this way, 'generalisation' questions support teachers to actively seek out what students already know and understand, so the teacher can respond appropriately.

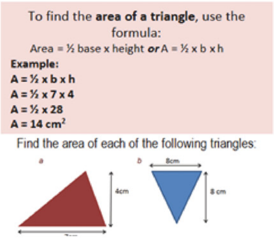
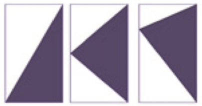
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Tell to Ask
Technique	**Socratic questioning:** Have students work backwards by providing the outcome first.

Level	Before	After
Primary	Multiplying by decimals is easy, just follow these two steps: 1. First, multiply the numbers normally, ignoring the decimal points. 2. Then, count the total number of decimal places in both numbers, and put that many decimal places in the answer.	Using a calculator, work out answers to questions a, b, c and d: a. 6 x 0.5 b. 3 x 0.5 c. 8 x 0.5 d. 5 x 0.5 e. 6 x 5 f. 3 x 5 g. 8 x 5 h. 5 x 5 Discuss 1. What do you notice about the solutions to these questions? Are the solutions larger or smaller than the value being multiplied by 0.5 Is that surprising? Will that always be the case? Could you test that out? 2. Why do you think that x 0.5 might be like finding half of the amount? 3. What do you think will happen if you multiply by 0.25? What makes you think that? How could you test that idea? 4. Do some more thinking about multiplying by decimals by asking your own 'what if?' questions 5. What ideas do you have now about multiplying by decimals? Do other people think the same or differently to you at the moment? 6. Look at the first questions that you tried (a, b, c, d). How do the questions (e, f, g, h) relate to them? What connections can you see between the answers to these two sets of questions? Use your observations to think of a way to make multiplying by decimals easier. Does your idea work if there are two decimal places in the question Eg 6 x 0.05?
Secondary	Area of a Triangle: To find the area of a triangle, use the formula:  To find the **area of a triangle**, use the formula: Area = ½ base x height *or* A = ½ x b x h **Example:** **A = ½ x b x h** **A = ½ x 7 x 4** **A = ½ x 28** **A = 14 cm²** Find the area of each of the following triangles: 	 **What do you notice about these three shapes?** Which triangle do you think coveres most/least of the area of the rectangle? Why do you think that? How sure do you feel at the moment? Look at the top picture - How much of the rectangle do you think the tirangle covers? What led you to that belief? How could you check that out/convince me? How much of the rectable area do you think the triangles in the other two pictures cover? How could you check your thinking out/ convince yourself / convince me? Would it help if you could cut the pictures up and move pieces around? Try that if you think it will help you. How does the area of the triangle relate to the area of the rectangle in these three pictures? Would that always be the case with triangles? How could you check that thinking out? Examples of Socratic questions can be found online: http://courses.cs.vt.edu/cs2104/Summer2014/Notes/SocraticQ.pdf

How do you think the technique Socratic questioning 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Socratic questioning support *Element 4.1 - Build on learners' understandings?*

Tasks that use Socratic questioning to support students to make connections between superficially unrelated ideas is one technique for building on learners' understanding. For example, in the Primary Years example, the 'after' task supports students to see that multiplying by a decimal, relates to calculating a fraction of a quantity and sometimes, a decimal calculation can be more easily computed if thought of as a fraction calculation. This example builds on students' understanding of fractions and integrates their existing skills with the new learning about decimals. In the 'before' task the new learning about decimals is not connected to prior learning. In the Secondary Years example, the 'after' task supports students to build on their existing understanding about calculating the area of a rectangle, through extending their understanding to a triangle.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Tell to Ask
Technique	**Explore before explain:** Ask students to try their ideas first.

Level	Before	After
Primary	Example 1: Calculate 45 ÷ 3 $3\overline{)4{}^{1}5}$ = 15 Example 2: Calculate 72 ÷ 4 $4\overline{)7{}^{3}2}$ = 18	How can you divide larger numbers? Think about what you understand about division. Work with a partner, to have a go at one (or both) of these questions: Calculate 45 ÷ 3 Calculate 72 ÷ 4 Check your answers with a calculator.
Secondary	Simplify: $\frac{a}{2}+\frac{2a}{3}$ $=\frac{a\times 3}{2\times 3}+\frac{2a\times 2}{3\times 2}$ $=\frac{3a}{6}+\frac{4a}{6}$ $=\frac{3a+4a}{6}$ $=\frac{7a}{6}$ Questions: 1. $\frac{b}{5}+\frac{5b}{10}$ 2. $\frac{c}{2}+\frac{2c}{7}$	Use your skills with adding fractions, to challenge yourself to work with fractions that include variables. Work with a partner, to have a go at these two questions. 1. $\frac{b}{5}+\frac{5b}{10}$ 2. $\frac{c}{2}+\frac{2c}{7}$ Prompts: • How would you usually add fifths and tenths? • Would it help if you tried some fraction addition without variables? • Would it help if you drew a diagram?

How do you think the technique Explore before explain 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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Explore before explain support *Element 4.1 - Build on learners' understandings?*

When students are challenged to explore possible approaches to a new type of problem they bring their current skills and understanding to the problem, provided they are not 'paralysed by fear' of being wrong. Students are more likely to start (and make progress with) an unfamiliar problem if they approach it with a growth mindset. They are more likely to 'stick with' an unfamiliar problem if they know the teacher values their thinking and reasoning, not just a correct solution. Teachers can support the development of a growth mindset approach through making clear statements about expectations. For example, 'This is a new type of problem, so I'm not expecting you to already know exactly what to do, but I do expect you to have a go, to try some different ideas and share your thinking and challenges.' When teachers provide students with the opportunity to 'explore before the teacher explains' and students feel safe to 'have a go', the teacher is able to both observe and build on students' understanding.

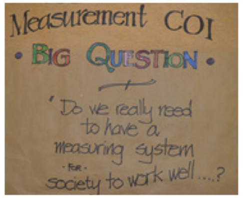
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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 Tell to Ask**
Technique	**Use dialogue:** Ask students to interact and build meaning through learning conversations.

Level	Before	After
Primary	The teacher asks: • Why do we measure things? • What things do we measure? • What do we measure with?	The teacher asks: **Do we really need to have a measuring system?**  Community of Inquiry(COI) /Philosophy for Children(P4C) discussion. Listen to and respond to each other's ideas/ questions/ wonderings Possible prompt questions to initiate discussion: • What's a measuring system? • Is one type of measurement more important than another? • What form of measurement could we live without/ did we live without? Why change? • Could we estimate measurements in cooking? Would we still need a measuring system to do that? COI process can be found online eg http://museumvictoria.com.au/education/community-of-inquiry/
Secondary	Teacher: "I've noticed that some people are trying to add fractions by adding the numerators, then adding the denominators." $\frac{b}{5} + \frac{5b}{10} = \frac{6b}{15}$ This does not lead to the correct answer. The way to add fractions is: Start by finding the lowest common denominator...	What do you think? Does: $\frac{b}{5} + \frac{5b}{10} = \frac{6b}{15}$ Discuss your thinking with a partner. Think about these questions: 1. Do you think that $\frac{6b}{15}$ is more or less than $\frac{5b}{10}$? Would you expect that? 2. Could you test this for different values of b? If possible, discuss your ideas with another pair who thinks differently to you. 3. Share your ideas with the class. Has anyone changed their mind about $\frac{6b}{15}$ being the solution? Ask someone who has changed their mind to share their thinking about why they did that. What are other possible solutions? How could we test the accuracy of our ideas?

How do you think the technique Use dialogue might support *Element 4.1 - Build on learners' understandings?*

After reflecting on this question, compare your response to the answer on the next page

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

How does the technique Use dialogue support *Element 4.1 - Build on learners' understandings?*

When students engage in purposeful dialogue with each other, it is possible for them to build each others' understanding. However, it is also important to appreciate that students can compound each other's misconceptions. This highlights the crucial role of the teacher in listening to student dialogue, identifying examples of understanding and misconceptions and then drawing together and clarifying thinking. Alternatively the teacher can create groups of students who hold different views and through challenging them to convince each other of their process/idea it is sometimes possible for students to resolve their misconceptions during such dialogue.

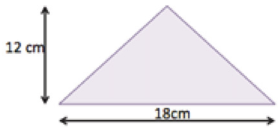
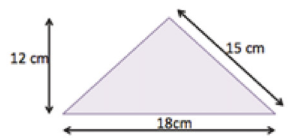
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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	What is the value of 500 + 60 + 4	Which of these is worth 564? Tick as many boxes as you need to. 5 + 6 + 4 ☐ 50 + 60 + 40 ☐ 500 + 40 + 6 ☐ 500 + 60 + 4 ☐
Secondary	Calculate the area of the triangle.  	Calculate the area of the triangle. 

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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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 4.1 - 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.

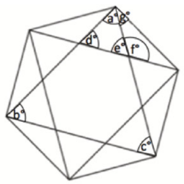
ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

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

Level	Before	After
Primary	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?	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? This question is based on a NAPLAN question. Many NAPLAN questions are multi-step problems and do not state all the steps.
Secondary	This design is drawn inside a regular hexagon. Calculate the marked angles. 	This design is drawn inside a regular hexagon. What is the size of the angle marked a?  This question is from a NAPLAN paper. Many NAPLAN questions are multi-step problems and do not state all the steps.

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.

ELEMENT 4.1

Domain 4 - Personalise and Connect Mathematics Learning

Element 4.1 - Build on learners' understandings

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

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.