ELEMENT **3.3**

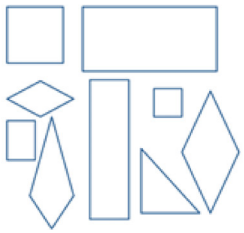
Domain 3 - Develop Expert Mathematics Learners

# Element 3.3 - Explore the construction of knowledge

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<br>Colour the squares blue and the rectangles red<br>  | I'm thinking of a shape and it has 4 sides. What might it look like? Share your ideas.<br>• 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.<br>• 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?<br>This structure may help you to explain your thinking:<br>• Because I know... I also know…<br>• 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.<br>Eg:<br>• $700 = 7 \times 10^2$<br>• $530\,000\,000 = 5.3 \times 10^8$<br><br>**Copy and complete:**<br>a. $73\,000 = \ldots \times 10^4$<br>b. $25\,300\,000 = 2.53 \times \ldots$<br>c. etc | Use your smartphone calculator (or watch what happens on a shared device) when you calculate:<br>5,200,000 x 2,300,000. Now rotate your device.<br><br>Can you see two different views?<br><br>**Discuss**<br>1. What do you think happening here?<br>2. What connections can you see?<br>3. What do you think ' e+13' might mean?<br><br>Test out your ideas on some other values.<br><br>4. If 'Screen 2' was showing '530 000 000', What might 'Screen 1' show?<br>5. If 'Screen 1' was showing '2.53e+7', What might 'Screen 2' show?<br>Find out about 'Scientific notation'<br><br>  <br>Screen 1<br>  <br>Screen 2<br><br>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 3.3 - Explore the construction of knowledge?***

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

ELEMENT 3.3

Domain 3 - Develop Expert Mathematics Learners

# Element 3.3 - Explore the construction of knowledge

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 3.3 - Explore the construction of knowledge?*

Looking for and identifying connections can be, both a way to construct knowledge and evidence of knowledge. When teachers ask 'connections' questions, they can support students to identify something they know or something they need to learn. Such questions can expose students to a new experience, as in the 'scientific notation' example. Teacher can support students to recognise the way in which looking for connections impacts on their construction of knowledge.