



ELEMENT 3.1

Domain 3 - Develop Expert Mathematics Learners

Element 3.1 - Teach students how to learn

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

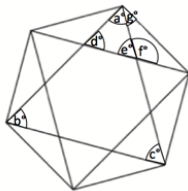
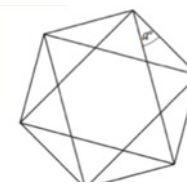


Strategy

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	<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 3.1 - Teach students how to learn*?**

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

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Domain 3 - Develop Expert Mathematics Learners

Element 3.1 - Teach students how to learn**How does the technique *Let students identify the steps* support *Element 3.1 - Teach students how to learn*?**

Not providing all the steps establishes opportunities for teachers to support students to 'learn what to try when they don't know what to do'.

When students are challenged to pave their own way through a problem teachers can support students to be meta cognitive about their progress with their learning. Teachers can drive the development of students asking questions (or making statements) such as:

- Can I break this down in to smaller steps?
- What could I try first?
- Am I heading in the right direction with this?
- How are other people/other groups doing this?
- I wonder if there is another way?
- I wonder if there is a more efficient way?
- I think I might need to stop and learn something new before I continue with this.

Some students can be 'paralysed' by fear of failure (making a mistake) when they are not provided with a procedure (steps) to follow. Having the confidence to begin to solve a problem is a necessary step to make in learning. It is a step that is not only required of us in test situations such as NAPLAN, but also in life.

Having the skills and disposition to initiate work on an unfamiliar problem is a component of learning how to learn. Students gain these skills and this disposition towards designing possible approaches (determining the steps) when it is part of their everyday experience of mathematics.