



ELEMENT Domain 3 - Develop Expert Mathematics Learners

3.4 Element 3.4 - Promote dialogue as a means of learning

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 | <p>Answer these questions: 4×3, 7×3, 9×3 etc up to 12×3</p> | <p>Think about how you would sort the following multiplication questions into three levels of difficulty: Harder, medium, easier: 1×3, 2×3, 3×3 etc up to 12×3</p> <p style="text-align: right;">  </p> <ul style="list-style-type: none"> 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 | <p>Answer these questions:</p> <table style="margin-left: 20px; margin-bottom: 10px;"> <tr> <td>Half of 32</td> <td>0.25×68</td> </tr> <tr> <td>$\frac{1}{4}$ of 48</td> <td>$\frac{1}{4}$ of 32</td> </tr> <tr> <td>32×0.5</td> <td>$\frac{1}{2}$ of 32</td> </tr> <tr> <td>68 divided by 4</td> <td>48×0.25</td> </tr> </table> | Half of 32 | 0.25×68 | $\frac{1}{4}$ of 48 | $\frac{1}{4}$ of 32 | 32×0.5 | $\frac{1}{2}$ of 32 | 68 divided by 4 | 48×0.25 | <p>Individually, sort the following questions into at least two groups of your own choosing.</p> <table style="margin-left: 20px; margin-bottom: 10px;"> <tr> <td>Half of 32</td> <td>0.25×68</td> <td>$\frac{1}{4}$ of 48</td> <td>$\frac{1}{4}$ of 32</td> </tr> <tr> <td>32×0.5</td> <td>$\frac{1}{2}$ of 32</td> <td>48×0.25</td> <td>68 divided by 4</td> </tr> </table> <p>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.</p> <ul style="list-style-type: none"> 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? <p>Check with the students who presented that grouping. Summarise the connections that have been made.</p> | Half of 32 | 0.25×68 | $\frac{1}{4}$ of 48 | $\frac{1}{4}$ of 32 | 32×0.5 | $\frac{1}{2}$ of 32 | 48×0.25 | 68 divided by 4 |
| Half of 32 | 0.25×68 | | | | | | | | | | | | | | | | | |
| $\frac{1}{4}$ of 48 | $\frac{1}{4}$ of 32 | | | | | | | | | | | | | | | | | |
| 32×0.5 | $\frac{1}{2}$ of 32 | | | | | | | | | | | | | | | | | |
| 68 divided by 4 | 48×0.25 | | | | | | | | | | | | | | | | | |
| Half of 32 | 0.25×68 | $\frac{1}{4}$ of 48 | $\frac{1}{4}$ of 32 | | | | | | | | | | | | | | | |
| 32×0.5 | $\frac{1}{2}$ of 32 | 48×0.25 | 68 divided by 4 | | | | | | | | | | | | | | | |

How do you think the technique Different perspectives might support Element 3.4 - Promote dialogue as a means of learning?

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



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3.4 Element 3.4 - Promote dialogue as a means of learning

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 3.4 - Promote dialogue as a means of learning?*

Sharing perspectives usually lends itself to purposeful student dialogue, providing students with opportunities to:

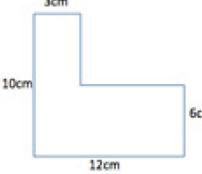
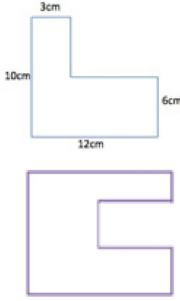
- learn from each other
- communicate their thinking and in doing so become aware of the depth of understanding that they have.



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3.4 Element 3.4 - Promote dialogue as a means of learning

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

| Strategy | From Closed to Open | |
|-----------|--|--|
| Technique | Many pathways: Ask for one problem to be solved in multiple ways , rather than multiple problems in one way . | |
| Level | Before | After |
| Primary | Calculate: $39 + 43$ | Find at least two different ways to do the calculation $39 + 43$ Share your methods with another student. Together, try to identify at least three different methods. <ul style="list-style-type: none"> • Identify which method is the most efficient for this calculation. • Identify which methods are best for mental calculation? • Identify if some methods would be better than others for addition sums with larger values. |
| Secondary | Calculate the area of this shape:  | Calculate the area of this shape in at least two different ways. <ul style="list-style-type: none"> • Share your methods with another pair of students. Work together to try to identify at least three different methods. • Do you think that one method was easier or more effective than another method? Why? • Would one of your methods be more efficient than another if the shape was like this one? Why/why not?  |

How do you think the technique **Many pathways might support **Element 3.4 - Promote dialogue as a means of learning?****

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



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3.4 Element 3.4 - Promote dialogue as a means of learning

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



How does the technique **Many pathways** support *Element 3.4 - Promote dialogue as a means of learning?*

Challenging students to identify 'many pathways' to a solution, will not automatically lead to the use of purposeful learning dialogue. However, once students have attempted to generate multiple pathways, teachers can use this opportunity to promote purposeful dialogue. Teachers can intentionally design processes through which students explain the pathways they have identified and rationalise if/why their different processes all work. Students need to be challenged to explore where the similarities and differences in their approaches lie.



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3.4 Element 3.4 - Promote dialogue as a means of learning

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 | <p>The teacher asks:</p> <ul style="list-style-type: none"> • Why do we measure things? • What things do we measure? • What do we measure with? | <p>The teacher asks: Do we really need to have a measuring system?</p> <p>Community of Inquiry(COI) /Philosophy for Children(P4C) discussion. Listen to and respond to each other's ideas/ questions/ wonderings</p> <p>Possible prompt questions to initiate discussion:</p> <ul style="list-style-type: none"> • 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? <p>COI process can be found online eg http://museumvictoria.com.au/education/community-of-inquiry/</p> |
| Secondary | <p>Teacher: "I've noticed that some people are trying to add fractions by adding the numerators, then adding the denominators."</p> $\frac{b}{5} + \frac{5b}{10} = \frac{6b}{15}$ <p>This does not lead to the correct answer. The way to add fractions is: Start by finding the lowest common denominator...</p> | <p>What do you think? Does: $\frac{b}{5} + \frac{5b}{10} = \frac{6b}{15}$</p> <p>Discuss your thinking with a partner. Think about these questions:</p> <ol style="list-style-type: none"> 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? <p>Ask someone who has changed their mind to share their thinking about why they did that.</p> <p>What are other possible solutions? How could we test the accuracy of our ideas?</p> |

How do you think the technique Use dialogue might support Element 3.4 - Promote dialogue as a means of learning?

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



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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 3.4 - Promote dialogue as a means of learning?*

The teacher can add value to activities in which students are using dialogue.

Examples of teacher actions include modelling and encouraging:

- use of paraphrasing
- articulating what you have heard from others
- 'piggybacking' on others' comments to extend an idea
- use of clarifying questions.

Examples of processes include:

- Community of Inquiry
- Paired Conversation
- Think, pair, share
- Short interviews: Working in pairs, students have a fixed amount of time to interview each other (perspective questions or connections questions work well for this)
- Five whys: In pairs or small groups use the 'five whys' to interrogate a mathematical process.