ELEMENT 2.1

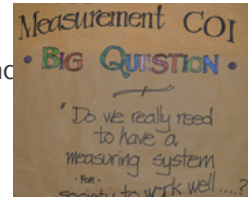
Domain 2 - Create Safe Conditions for Rigorous Mathematics Learning

Element 2.1 - Develop democratic relationships

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 promote discussion: (Use only if needed) • 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 2.1 - Develop democratic relationships?*

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 Use dialogue support *Element 2.1 - Develop democratic relationships*?

When using this transformation technique, the teacher shares power (develops democratic relationships) by designing opportunities for learning focused dialogue rather than taking complete and immediate control of the instruction of mathematical concepts and procedures. Purposeful use of dialogue can position students as creators of knowledge rather than receivers of information. This communicates to students that their current understanding is acknowledged, respected, valued and utilised. In this way, the relationship between teacher and student is more democratic than situations in which the teacher positions themselves as the sole provider of information.

In the Primary Years 'Community of Inquiry' (COI) example the teacher's role is one of provocateur and listener. When first initiating COI, teachers may also need to model behaviours that support the COI to function productively, for example; 'piggybacking' on ideas raised by others, respectfully challenging content rather than the person expressing a particular idea, willingness to change your perspective in light of new information, willingness to pose questions, as well as, contribute opinions and information etc.

COI process can be found online eg http://museumvictoria.com.au/education/community-of-inquiry/

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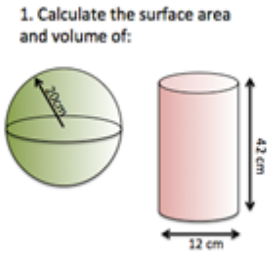
The following suggestions for practice are extracts from the 'Transforming Tasks' module on the Leading Learning resource:

Strategy Tell to Ask

Technique Student voice: Ask students to decide how they might do this best.

Level	Before	After
Primary	1. Before 2. Symmetry worksheet: 3. Draw two items of clothing, one symmetrical and one asymmetrical. 4. Describe two objects from the natural environment, one symmetrical and one asymmetrical. 5. State two modes or transport, one symmetrical and one asymmetrical etc.	The teacher poses a selection of questions, such as these: • Clothing. Symmetrical or not? • Nature. Symmetrical or not? • Modes of Transport. Symmetrical or not? • Symmetry- Necessary/unnecessary/useful or not? (Don't limit your thinking to line symmetry. You could consider rotational symmetry etc.) 1. Choose one of the questions above, or suggest a question that will enable you to show your understanding of symmetry. 2. How will you find out? 3. How will you show your ideas. 4. How will you work: individually, with a partner, or in a small group?
Secondary	Assessment Surface Area Test 	How could you demonstrate the depth of your understanding about calculating surface area? Enabling prompts: • Think of a context that you would like to apply this learning in. • Think of all of the skills that you'd like to be able to demonstrate. (Teacher can support the development of this list) • Think about the resources that you could use. • Do you want to develop your collaboration skills through working on a joint project, or do you want to work independently? • Share your ideas with the whole group, in case someone else likes your idea too. • Remember that connections to other maths topics or other learning areas can be made. (Negotiate)

How do you think the technique Student voice might support *Element 2.1 - Develop democratic relationships?*

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 Student voice support *Element 2.1 - Develop democratic relationships*?

When using this transformation technique, teachers establish a democratic relationship with students, through sharing power to make decisions about the way in which learning is conducted, or demonstrated.

Benefits in learning become obvious through considering the pattern of behaviour following the opportunity for students to have voice in their learning. Typically:

- students appreciate an opportunity to have choice in learning and therefore engage readily in the creation of a question, or way of working
- students become invested personally in that learning through having the opportunity to create their question, or approach to learning
- stick with challenges and are more resilient when problems arise due to being personally invested in question.

A critical element of empowering student voice in learning, involves the teacher providing enough time/support/provocation to enable the students to establish a question that is of genuine interest to them and is appropriately challenging.

The Primary Years example contains provocations that intiate student contributions. Students may connect with one of the suggested questions, in which case, they do not need to create their own question. The important component here is that the teacher is acknowledging the student as a capable decision maker.

To support the Secondary Years example teachers could use a selection of images, or objects, to inspire students.