

Mathematical Language

Maths Notes: Language # 1

Many of the problems students experience in mathematics are due to language. Consider for example the code-switching that must go on in a mathematics lesson. The teacher introduces a lesson on volume and the student thinks “isn’t that a control on the TV?”

Consider how many of the words we use in mathematics that having a different meaning in the ‘real world’ or how many words have more than one meaning. The word ‘more’ is a good example of a word that can imply either addition or subtraction depending on the way that it is used. If I said “Gemma had 4 pencils and then she was given 3 *more*. How many pencils does she now have?” you would expect to add 4 and 3. The word *more* may also involve subtraction as is the case in the following example: If Gemma has 8 pencils and I have 5 pencils, how many *more* pencils does Gemma have?

If that was enough to confuse the children, consider the specialised mathematical vocabulary that we use. If you do not realise that ‘sum’ means to add and ‘product’ means to multiply then any word problem that includes these terms will cause difficulties. The word *sum* is also often used to describe written algorithms.

When you also consider that many children experience reading problems, miss words or have difficulty comprehending the written work, the task of

teaching mathematics can become a bit daunting.

Strategies that may help: Mathematical Dictionaries

Most classrooms contain dictionaries to be used when trying to spell a word or find the meaning, so why not keep a few mathematical dictionaries on hand? I like *Maths terms and tables* by Bana, Marshall and Swan (2005). It contains simple descriptions of term and clear tables, charts and diagrams.

Brainstorm.

At the beginning of a topic brainstorm all the words the children associate with the topic. This is an excellent assessment technique as it helps you to find out what children know, what they don’t know and what misconceptions they might have. Closely allied with this technique is the use of concept maps and mind maps. These can be used as a Jenny Craig assessment technique—before and after.

Model correct use of language

I once remember overhearing a group of children in a maths lesson referring to eagles all the time. As it was term 2 I assumed they were talking about the West Coast Eagles, that was until I heard one of them say “4 + 7 eagles 11”. When I listened to the teacher it also sounded as though she was saying ‘eagles’.

Acknowledge Anomalies

Why is the distance around an object is referred to as the perimeter, except when it is a

circle? Is it incorrect to refer to the perimeter of a circle rather than the circumference?

Explain the origin of words

Consider the prefix *deca*. Where is it used? In words like *decade*, *decagon*. If students know the prefix *deca* means ten and the suffix *gon* comes from the Greek *gonia* or ‘angle, corner’, then they may be able to work out that a *decagon* has ten corners.

Newman Analysis

This technique was developed by a teacher who wanted to pinpoint where her students were experiencing language problems in mathematics. It is based on asking five questions to determine where the breakdown is occurring. See box below.

References

Bana, J., Marshall, L., & Swan, P. (2005). *Maths terms and tables*. Perth: Journey Australia and R.I.C. Publications.

Newman five-point error-analysis questions

1. **Reading:** “Please read the question to me. If you don’t know a word leave it out.”
2. **Comprehension:** “Tell me what the question is asking you to do.”
3. **Transformation:** “Tell me how you are going to find the answer.”
4. **Process skills:** “Show me what to do to get the answer. Tell me what you are doing as you work.”
5. **Encoding:** “Now write down the answer to the question.”

The views and interpretations expressed in this document are those of the author, Paul Swan.
I hope it helps; if not, pass it on.