

Developing Vocabulary in Maths

Rachael Lethbridge describes some strategies to improve deaf children's understanding of the language and vocabulary of mathematics

I have been asked several times why, as a maths teacher, I am spending so much time working on vocabulary. Isn't maths all about numbers? Of course, that's not the case. For some of our deaf students, their limited vocabulary can hold them back from reaching their mathematical potential. To illustrate this point, below are the first five questions from a GCSE paper:

1. Write 478 to the **nearest hundred**
2. Write down a **multiple** of 8 that is **between** 41 and 60
3. Change 1.5 **kilometres** to **metres**
4. Here is a **list** of numbers: 4 6 9 10 15 27 30 40
From the **list**, write down all the **numbers** that are **powers** of 3
5. Write 19% as a **fraction**

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I should state that the questions get harder as you progress through the paper. Without an understanding of mathematical vocabulary, you would be unable to answer any of these questions, no matter how good you were at manipulating numbers. Even an Oral Language Modifier would not be able to help. It might as well be written in another language.

Mathematics has one of the largest glossaries of technical language. Many words have different meanings in different contexts eg scale, mean, pi and irregular plurals (datum/data, index number/indices). Some words have many different forms eg multiple, multiples, multiply, multiplying, multiplies, multiplier, multiplied, multiply, multiplication (no wonder students prefer to use times!). Additionally, there can be many words to describe the same thing eg add, plus, total, sum, all together etc. To compound this difficulty, there are words misused in everyday language eg average (commonly used to describe something normal) and dice (technically a plural but used to describe a single die). For many deaf students, all these words and their word forms need to be taught explicitly.

At Mary Hare, all our maths teachers are QToDs or ToDs in training, so we are all aware of the importance of vocabulary acquisition for our deaf students. We work with an oral approach and plan opportunities for learning new language, both mathematical and world knowledge. We decided to track the students' vocabulary knowledge by adding vocabulary tests to our normal assessments. A selection of ten words is tested at the start of each topic test. The words were chosen to cover varying degrees of mathematical difficulty. Most of the words are then used within the test itself. We chose a format that was easy to mark and gave the students the best chance of success.



There is a clue with a one-word answer, like you would find in a simple crossword. The first letter of the word is given (and the number of letters if there could be more than one answer). For example:

Another word that can be used for times (x) is m.....

A shape with four sides is a q.....

Two different fractions that have the same value are e..... (10 letters)

When the tests have been completed and marked, students are given one word to correct (or an extension word if they got 10 out of 10). This is copied into the vocabulary section of their maths notebooks alongside the meaning. We have shared the vocabulary tests with our own Speech and Language Therapy Department, including a complete set of answers. They can then use these words in individual therapy sessions, outside of Maths lessons. Increasing students' exposure to new vocabulary is vital to consolidate. We make the most of corridors and classrooms for displays that challenge and inform students. This display (photo attached) of shape words has had all the vowels removed. Can you work them all out?

We first introduced the vocabulary assessments in September 2017. From two years of data we can see that the students are increasing their vocabulary knowledge over time. As a staff team the assessments give us a framework to work towards. Part of my dissertation will now be examining the recent GCSE papers to finely tune the vocabulary words that we use in our assessments.

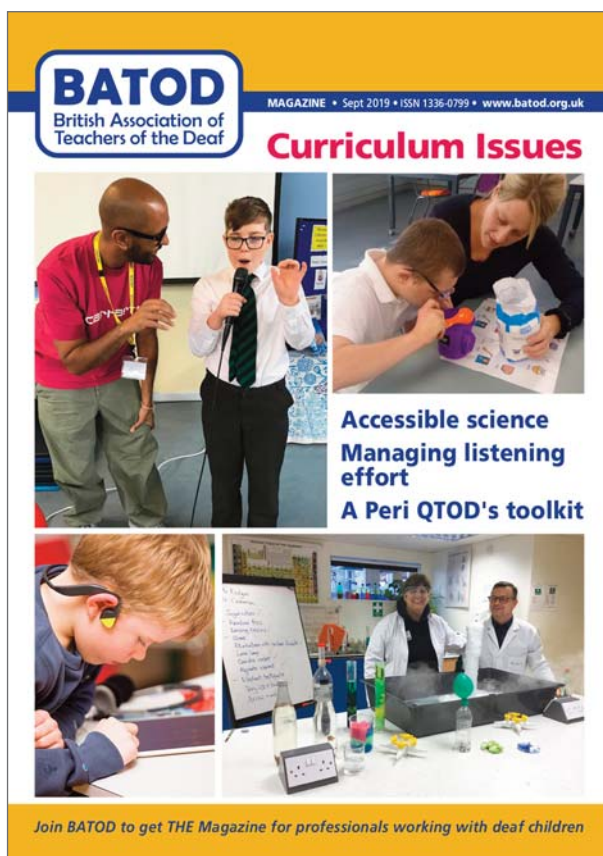


Rachael Lethbridge, Numeracy Coordinator, at Mary Hare School

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