

Classroom View

A teacher's experience of teaching the ICCAMS Maths lessons, by Helen Constantine, a secondary maths teacher working in east London

I teach a low attaining Year 7 Maths group, and before I was introduced to the [ICCAMS \(Increasing Competence and Confidence in Algebra and Multiplicative Structures\)](#) project, I would simplify the maths in my teaching as much as possible for my students. This worked for questions that didn't involve any real life context, but as soon as students were required to solve a problem, they struggled because they didn't have any experience in solving problems. I was a little fearful of allowing students too much thinking time in case it wasted time, and usually students who were faced with a challenging problem just asked me to come over and break it down for them anyway.

My first encounter in class with ICCAMS was with the Mathematical Stories and Models lesson:

Multiplicative Reasoning: Lesson 1A

Models and stories

Here is an expression involving 12 and 3:

Think of

- a. some ways of saying "12 × 3"
- b. some ways of calculating 12 × 3
- c. some diagrams that fit the expression
- d. some stories that fit the expression.

12 × 3

I initially thought the task would last ten minutes and I didn't see a lot of value in it, but when I asked students to come up with stories that would give me 12×3 , I was shocked at how much the class struggled with the task. I knew that if I said 3 bags cost £12 each so what is the total of all 3 bags, most of the class would be able to come up with the answer of £36. So, I thought they'd find the task easy, but most of their stories involved addition of 12 and 3 and there wasn't a single sensible story produced. The next task was to show a selection of diagrams that represented 12×3 in various ways and immediately students related these diagrams to real life. One story that stood out to me was for a diagram that had 12 rows with 3 small blocks in each row and the student, who could only produce $12 + 3$ stories previously, came up with the following:

He was unable to then determine what question he was trying to ask in his story, but it was a big improvement on his first attempt. Eventually all my classes went on to look at stories and models for bigger values such as 53×22 and used these diagrams and stories to help them determine how to answer the following question:

Changing expressions

Look at expression A ↓.

Imagine we add 1 to one of the numbers, so we get expression B ↓ or expression C ↓.

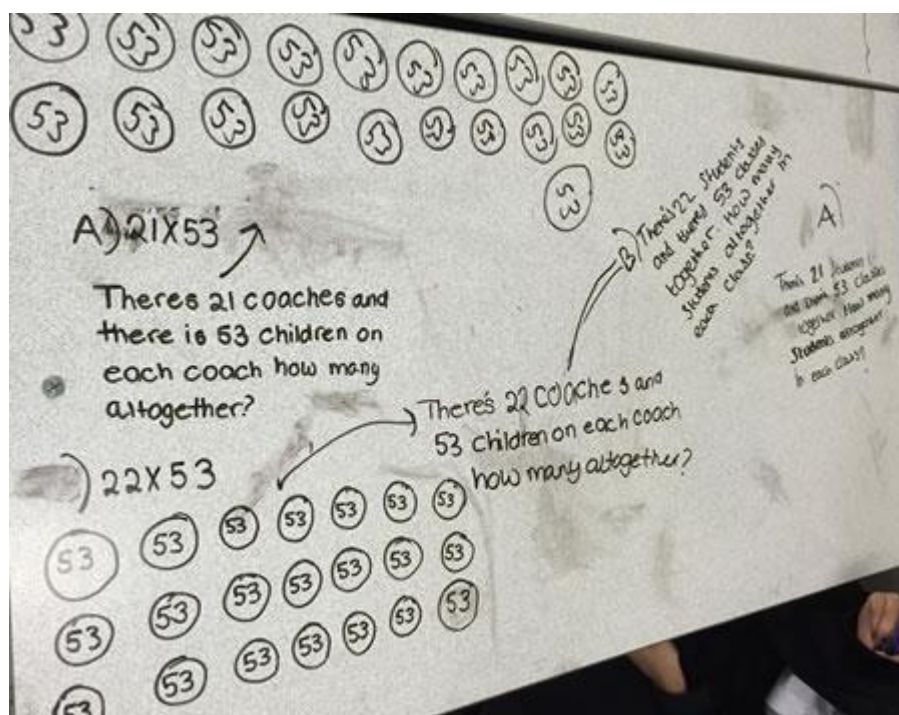
Which is larger, B or C?

A. 21 × 53

B. 22 × 53

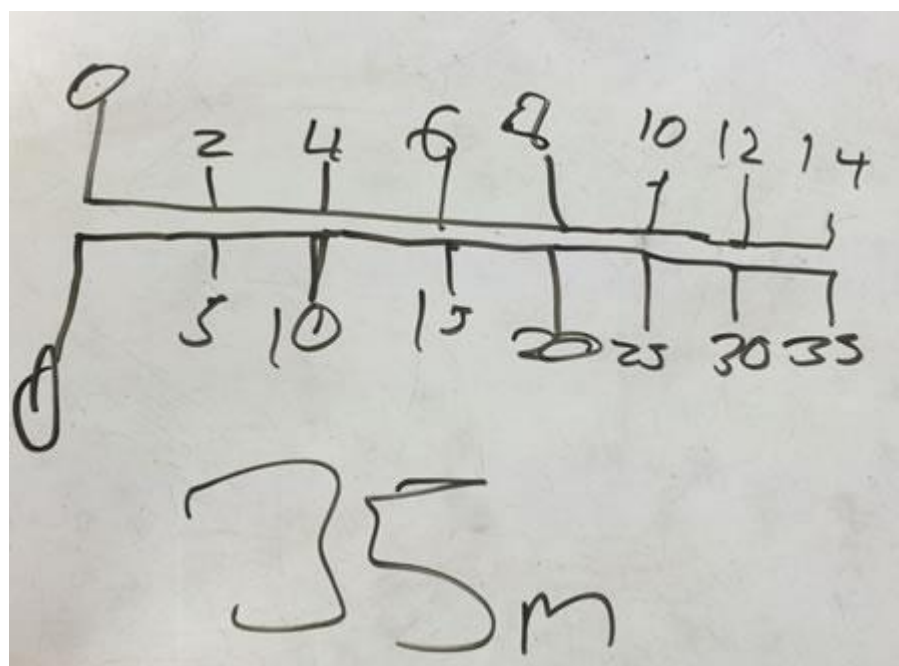
C. 21 × 54

These are the sorts of responses the students came up with:

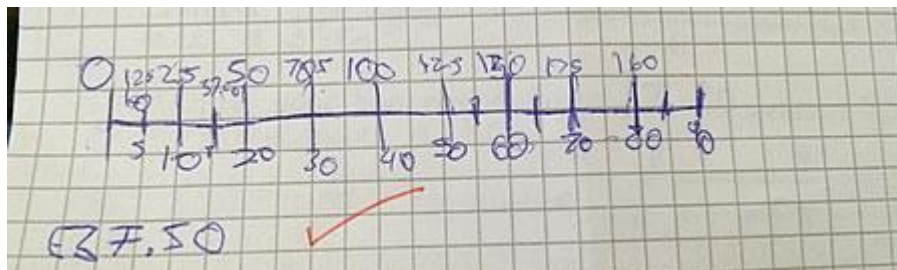


What has been most pleasing to see from all my classes is the variety of approaches I see when they attempt questions.

The student whose work is shown below was asked to find approximately how many centimetres in 14 inches if 6 inches was approximately 15 centimetres. Before looking at the [Westgate Close lesson](#) involving double number lines, the student (who correctly answered the question below) gave me an answer of 23 because 6in and 15cm have a difference of 9. The use of the double number line enabled him to visualise the problem and fill in other true equivalences that would help him reach the answer:



The student below used a double number line to calculate the cost of 15 calculators if 40 cost £100:



Students are given time to share ideas and encouraged to correct each other and compare answers and approaches within the ICCAMS lessons. I found the ideas in the lessons to be straight forward but the detail in the plans themselves meant I have been able to ask the right questions and react to each response in order to get a quick idea of where misconceptions lie and how best to address them. The lessons themselves are well thought out and there's a purpose and students can relate to what is being asked of them and draw on their own experiences to help them.