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TEACHING & LEARNING JOURNAL - EDITION 32

Metacognition In Maths

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I decided to investigate the use of metacognition techniques to teach 3D shapes. On the SOW, the topic of 3D shapes should last 4 lessons plus one for an orange book assessment.

I did this project with 7X3 maths, a group I shared with LON, which had just finished teaching 2D shapes. I teach 7X3 3 hours a fortnight.

I gave the questionnaire to 7X3 on Thursday 13 February 2020. All 27 pupils were present.

WESTBOURNE ACADEMY

Mathematics

Topic- 3D shapes

Look at the following statements. Think about yourself as a learner and tick the box which best represents how you feel about the topic:

No.		YES	NO	50/50
1	I know what my strengths are in this topic.			
2	I know what my weaknesses are in this topic.			
3	I can plan for tasks independently.			
4	When I make a mistake, I know why and can correct myself.			
5	I can use different strategies to do tasks.			
6	If I am stuck on something, I try to find a solution before I ask the teacher.			
7	I respond to feedback from my teacher by correcting my mistakes			
8	If I get something wrong in a lesson, I will try to think about how I can improve or understand how to do the task better.			
9	I can look for connections between different topics within the subject.			

I started teaching the topic after February half term, starting on Thursday 27 of February.

Week 1:

Lesson 1- a bridging lesson between 2D shape and 3D shape as some pupils hadn't covered 3d shapes in primary school.

Lesson 2- introduced 3D shapes, with names and terminology.

Lesson 3- Introduced 3D nets. Pupils to draw them one step at the time using a you tube video.

Lesson 4- continued with 3D nets. Pupils had to draw them on their own.

Lesson 5- introduced dimensions and unit of measurements as pupils had said they hadn't covered this at primary.

Lesson 6-revised the concept of area and linked it to volume and covered volume. Gave the second questionnaire due to the coronavirus outbreak. 4 pupils were absent.

Lesson 7- I was planning to cover volume fully.

Lesson 8- I was planning an assessment on 3D shapes.

Which techniques I used?

Constant revisiting past topics, previous lessons and showing links to previous topics.

Covering topics they hadn't all covered in primary school, like dimensions.

Breaking things down step by step.

Getting pupils to talk themselves aloud through the steps e.g.: step 1 I draw the inside lines, the I… etc.

Go through 2 worked example as a class rather than one. Writing all the steps and recalling them aloud one by one, like chanting it.

Pupils not allowed to ask me for help after initial explanation and worked examples. They had to ask their partner. They could only ask me if both were stuck.

Pupils had t mark each other's work at the end of each lesson. Had to tell me their strengths and weaknesses every lesson at the end.

Results

question	% yes	%no	% fiftyfifty
BEFORE	tot pupils 27		
1	15	11	74
2	59	22	22
3	22	11	67
4	11	30	59
5	41	7	52
6	67	11	22
7	26	30	44
8	37	11	52
9	30	19	52
AFETR	tot pupils 23		
1	83	9	9
2	83	0	17
3	87	0	13
4	26	9	65
5	74	0	26
6	87	0	13
7	83	4	13
8	43	4	52
9	35	13	52

As you can see from the tables the % of 'YES' went up for all questions. I am using % as some pupils were absent for the second questionnaire.

Q 4, 8 and didn't get as many 'YES' as the others. However, q 4 has 30% of 'NO' before and only 9 after, which means students opted for the '50/50', which is progress.

Q 8 and 9 '50/50' responses stayed the same so the movement was towards 'YES'. All the questions went down in the 'NO' responses. This shows that these pupils still rely on the teacher to remind them of connections and how to correct their work.

While pupils enjoyed doing this and felt more confident it took double the number the lessons to cover the same topic. Sometimes, like for the nets lessons, the worked examples lasted the whole lesson (1hour).

I do not have assessment data to see if this would have had a positive impact on assessment outcomes. This is due to the Coronavirus outbreak.

I would certainly use these techniques but maybe not spend as long recapping and re-covering topics but use homework to cover gaps.

Maria Graziani