

Story: [Mummy Math: An Adventure in Geometry](#)

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Setting of the class / school: A mixed ability Year 3 class at a primary school in Berkshire (UK)

Age group: 7-8 year olds (Year 3)

Number of children in the class: 27

Learning intention: To identify properties of 3D shapes

Key mathematical vocabularies: faces, angles, edges, vertices, geometric shapes

Resources needed: A copy of 'Mummy Math', concrete 3D shapes, clue sheets, answer sheets, and a 'mummy' (a toy figure wrapped in tissue paper)

Synopsis by the publisher:

The Zills family is summoned to Egypt to help find the hidden burial chamber of an ancient pharaoh. But when Matt and Bibi get trapped in the pharaoh's pyramid, they stumble upon an even bigger mystery. With only each other, their dog Riley, and the geometric hieroglyphics on the walls to help them, the twins must use their math skills to locate the burial chamber and the way out. Luckily, Matt and Bibi know their stuff when it comes to geometric solids, and so will the readers of this adventure in math!

DAY 1

Starter (15 minutes):

I started the lesson by reading the 'Mummy Math' story up to Page 7 ("Look at all these geometric solids"). I then asked the children to work in pairs to identify the 3D shapes on the wall of the pyramid (as illustrated on Page 7) and to match those 3D shapes with the concrete ones on their tables. The identification of 3D shapes by the children here provided me with a great formative assessment opportunity.

Main activity (20 minutes):

With the illustration on Page 7 of the book shown on the big screen, I asked the children to give me the name of the 3D shapes that they have explored with their partner, I then read the rest of Page 7 where the names of the 3D shapes are listed, and Page 8 ("Here's a mysterious message!"). The children were then given the same message on Page 8 ("There are many faces inside this pyramid that can guide you to me. Follow them.") on a folded piece of paper. They were given time to discuss this message with their partner to try to work out what it means. With the illustration of the Egyptians faces on Page 8 shown on the big screen, I asked the children to infer what this message means and to predict what Bibi and Matt are going to do next. This discussion was useful as it revealed the level of children's understanding of the concept of 3D shapes' 'faces'. We stopped our reading at the end of Page 8, and the children were then tasked to label, on a sheet in their book, all the 3D shapes that they have learnt today.

Plenary (5 minutes):

Once the children have completed their task, I carried on reading the story until the "What else has a face?" part on Page 11, leaving that question open to children to think about what Bibi means.

DAY 2

Starter (10 minutes):

I started the lesson by recalling the 3D shapes learnt from the day before and facilitated a discussion about what Bibi means when she says ("What else has a face?"), that is to use this opportunity to introduce the children to the difference between 'face' of a person and 'face' as a flat side of a 3D shape. In pairs, the children then explored and counted the faces of concrete 3D objects on their tables. (Although the story does not mention terms, such as *edges* and *vertices*, I decided to also talk about these terms anyway as an extension for those children who already have a sound knowledge of what faces are.)



Main activity (35 minutes):

I then read the story from where I left off yesterday on Page 11 to the clue shown on Page 12 (i.e. “A single face shows the way.”). With the answer in the text on the page hidden, the children were asked to look at the illustration on Page 12 of a mason cutting a block of limestone in the shape of a rectangular prism using a tool in the shape of a cone), and to discuss in pairs which object the clue could be referring to, and why it could not be the other object in the illustration.

The story contains a few more clues which Matt and Bibi need to follow to help them to get to the Pharaoh’s coffin and ultimately out of the pyramid. Each clue will lead to a 3D shape as the answer (e.g. “Look for 6 identical faces” for a cubical wooden box and “Enter under 5 faces” for a large tower made up of two different 3D shapes. Instead of reading the rest of the story now, I decided to bring the story to life by hiding these remaining clues around the classroom. Prior to the lesson, I had printed these clues on strips of paper (see Figure 1) and had hidden them under the corresponding shapes around the classroom (e.g. a traffic cone, a world globe, a model of the tower and a tissue box). When we were ready to begin this main activity, I explained to the children then they were going to help Matt and Bibi find the answers to the clues. We started with the first clue already found on Page 12. When the children had a chance to discuss and decided that the clue was about a cone, they then had to look for a cone in the classroom where they would find another clue that would lead them to another 3D shape in the story. (To help the children deciding which of the three towers (i.e. composite 3D shapes) in the story was the answer to the “Enter under 5 faces” clue, the children were, for example, encouraged to recreate those three towers using 3D shapes and to then discuss with their peers which of the towers is the answer to the clue [see Figure 2]).

Once each clue was found, both the clue and the same part of the story were read out to the class. I repeated the process until all the clues and all the relevant 3D shapes were uncovered and until the children found the ‘coffin’ (i.e. a tissue box) in the classroom. Inside it, a message rolled up for tomorrow’s lesson was hidden, which would then be read out tomorrow. (The message reads “Design a map to help Matt and Bibi get out of the pyramid. You should have 5 clues on your map.”) The children’s task for the remaining of this lesson was to label given 3D shapes with faces, vertices, and edges in their book.

Plenary (5 minutes):

I finished reading the rest of the story where, at the end, Matt and Bibi discover there is a map on the lid of Pharaoh’s coffin, which shows them the way out of the pyramid.

DAY 3

Starter (5 minutes):

As a class, we explored pictures of famous landmarks of and objects from Egypt (e.g. the Sphinx, pyramids, mummies and Hieroglyphics) as well as pictures of ancient Egypt to give the children some ideas of what can be seen and found in the country to help them in the main activity. I also reread the last page of the story, and reminded the children of the scrolled message they found in the ‘coffin’ (a tissue box) the day before before opening the folded piece of paper and reading the message.

Main activity (35 minutes):

Children were then told that they were going to create similar clues to the one displayed on the walls of the pharaoh’s tomb in the story that can help lead others to where the pharaoh’s coffin lies. They did this by creating their own five clues whereby all the answers to the clues had to be a 3D shape (see Figure 3). For example, “*I have 6 faces, they are all identical and I can be the shape of dice. What am I?*”. Once children had written the clues on a given template, they swapped it with a partner who had to use the clues to draw their answer on the back of a square-based pyramid net. Once all the clues were on the ‘inside’ of the pyramid, the children decorated the outside of the pyramid and then put the net together to create the pyramid (see Figure 4).



Plenary (5 minutes):

At the end of this lesson, children took turn sharing their pyramid and reflected on what they found easy or challenging with this activity.

Reflection:

I really enjoyed teaching mathematics through a story. Children love listening to stories and they were very engaged when listening to the Mummy Math story. Their favourite part of the lessons that definitely got them excited was exploring various 3D shapes in the classroom which had the clues hidden under them. Several children used some of the language found in the story when writing their clues, such as “identical faces”. Finally, I could have extended children’s mathematics learning by asking them to write their own mathematical story about 3D shapes or to write a sequel to Mummy Math story later in the week.

Figures:

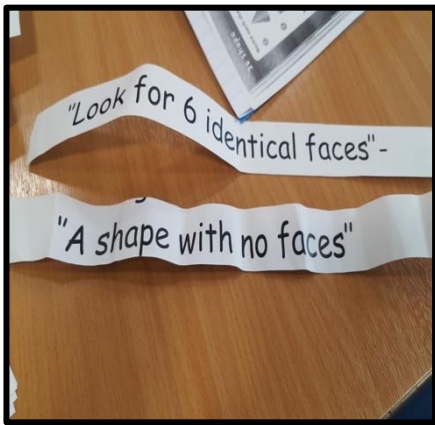


Figure 1: Some of the clues that were folded and hidden around the classroom.

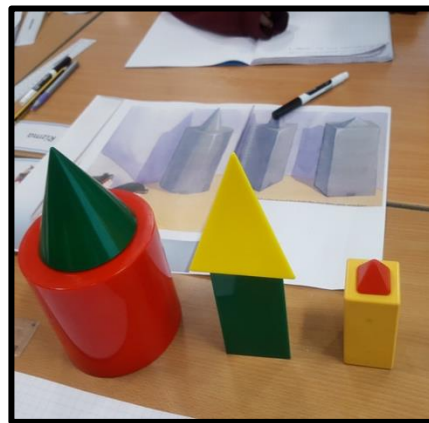


Figure 2: Children exploring the illustration in the story and building the shapes to help them with the clues.

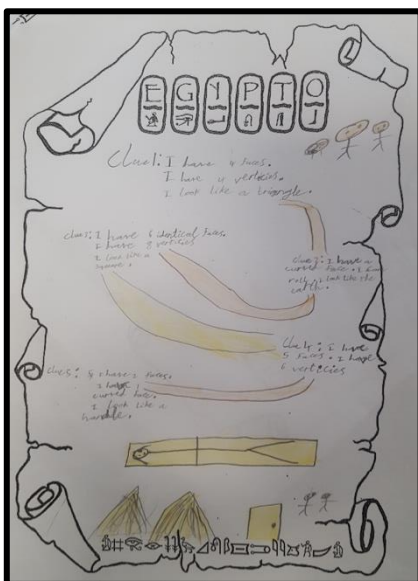


Figure 3: An example of the clues that some of the children created

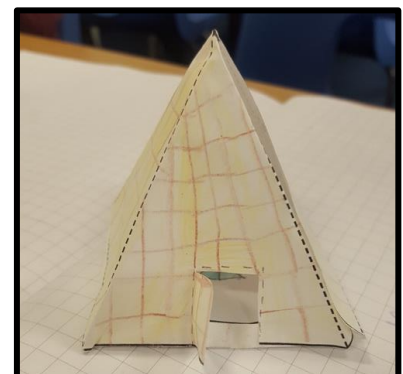
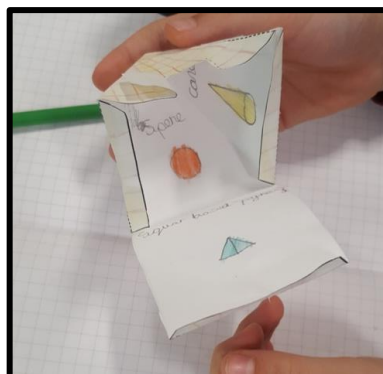


Figure 4: An example of the pyramids that some of the children made