

FLAT EARTH

Before reading this you may want to read my comments on 'permissible lies' in 'As if: truth and lies in fiction' on page 8. This session is based around the curriculum themes earth, sun and moon and direct and indirect evidence. In this session the teacher role-plays the ancient Egyptian thereby giving a dynamic and responsive voice to this figure of antiquity. The children role-play the time traveller, so you will need to think on your feet to be able to respond appropriately to the children's arguments and challenges. Their job is to demonstrate to the ancient Egyptian that the Earth is round and not flat. However, given that most of the evidence we have for this is only indirect, it is harder than they will at first think. For instance, if the children say 'that you just have to look in any book!' then you – as the ancient Egyptian – can say something like, 'Ah! But how do you know that the books speak the truth?' or, 'But all of the books in the Pharaoh's library state quite clearly that the Earth is flat'. It may take them a minute or two to work out what is meant by this.

Most direct evidence supports the view that the Earth is flat and this is precisely why this view was historically held by so many for so long: for instance, any landscape or horizon will not appear curved when observed from a ship. This often surprises the children but it is good if they start to realise for themselves that there are these difficulties, through a session like this rather than simply being told.

Aristotle (384–322 BCE) used the apparent movement of the constellations to speculate that the earth was in fact spherical and, later, Eratosthenes (276–195 BCE) surmised its shape by the angles cast by sunbeams.

He also calculated the circumference of the Earth on this basis with remarkable accuracy. I have heard children also make some compelling arguments such as, 'If the Earth was flat then when we look out across the sea we would be able to see America, on a clear day,' or that 'because ships disappear behind a horizon it shows that the Earth must be curved'. Of course, they would need to actually see these things before the arguments could be demonstrated, but the key thing is that these primary-aged children have thought of something that both they and the Egyptian could, in principle, perform and observe. It is therefore the sort of idea that shows a move away from the unreflective and unsupported assertion that 'the Earth must be round because thinking that it's flat is just stupid!' This comment is closer to how they can sometimes begin the debate.

The Story

You are a time traveller. And also a scientist and historian, specialising in ancient Egyptian languages and the history of science. You have decided to take a trip back in time using a time machine. Given your special interest in ancient Egypt you set the controls of your time machine for ancient Egypt: the year 2500 BCE, to be precise. [You could ask the class how long ago they think this would be.]

When the whirring and humming of your time machine finally stops you open the door and step outside. All your knowledge, and the reading you have done of this time, cannot prepare you for what you see when you actually arrive in ancient Egypt. What particularly strikes you is how new everything looks. And the colours! The statues and pyramids are not mere bare stone, they are coloured and some are even decorated. Quite amazing!

Being a scientist you seek out another who will share your interests. There aren't really any scientists in the sense that there are in your time, but you are able to find a person who is interested in similar things: in how things are and how things work. His name is Amun and once you get the hang of speaking a language you have only had to read before now, the two of you speak at length about a great many things such as cosmology (that is 'the origins of the universe') and the engineering skills and plans that were used to build the pyramids. You are amazed to discover that all the theories modern people have come up with about how the ancient Egyptians built the pyramids are all wrong – you can't wait to get home to write the definitive paper all about it!

Extension activity: research

Have the class research the various theories put forward about how the Egyptians actually engineered the building of the great pyramids such as the 'inside-out theory'.

Among the many things you talk about together you eventually come to the topic of the shape of the Earth. As you already know, the ancient Egyptians believed that the Earth was flat, not round as we think today. They also believed that it rests on a sea that stretches on forever in all directions.

Task Question: How will you persuade Amun that the Earth is in fact round and not flat? Can you?

(At this point the teacher should assume the role of Amun the Egyptian and enter into a role-played dialogue with the children – see above.)

Nested Questions:

- ✓ How do you know the Earth is round?
- ✓ Does the Earth look round?
- ✓ Could the Earth be flat and not round? Could you be wrong in thinking that it is round?

More advanced question: Does the ancient Egyptian hypothesis (alternative word: idea) that the earth rests on an infinite sea make sense?

Note: Amun, when he understands what we think, may object that our understanding is no different from his: we also posit (or are left with the problem of) an 'infinite sea' of space instead of water; but, in principle, he may say, it's the same idea.