The Philosophy Foundation
THINKING CHANGES

THINGS ARE NOT ALWAYS WHAT THEY SEEM

The Philosophy

This session is designed to inspire awe and wonder at the unusualness of the world around us and to inspire the idea that things are stranger than we might at first think and to get the children thinking along the same lines as many philosophers: that the world is not as it seems. Many of the pre-Socratics thought that the world was very different from how we perceive it through our senses. Although the children are very unlikely to come to as radical conclusions as the pre-Socratics, they may at least share their view to the extent that things are not always as they seem.

We suggest practising these before doing them with students!

For this session you will need some props ready:

- ✔ A table
- ✔ A large drinking glass that you can see through clearly
- ✔ A large jug full of water
- ✔ A piece of card and a marker pen
- ✔ An A4 piece of paper cut lengthways along the margin line so that you have a thin strip of paper
- ✔ Sellotape
- ✔ A pair of scissors
- ✔ A piece of A4 paper
- ✔ A 1 pence piece coin and a 2 pence piece coin
- ✔ A pencil

(Zeno's) Magic Arrow

Place a table somewhere they can all see the card and the glass when they are placed on the table

First of all, take the piece of card and fold it so that it stands up like a Christmas card. Draw a clear arrow with a thick marker pen pointing to the right on the piece of card so that it can be seen through the empty glass when the glass is placed in front of the card. Make sure the glass is about a foot in front of the card. Keep the jug of water ready but out of sight of the children.

Next, set the children the task of turning the arrow round so that it points to the left but they are not allowed to touch either the card or the glass and neither are they to move the table.

When you are ready pour the water into the glass and they will see the arrow change direction before their very eyes!

You can further demonstrate the same phenomenon of refraction by simply placing a straight pencil in the glass when it is full of water so that half the pencil is above the surface of the water and the other half below the surface. The pencil will appear to be broken or bent. When you do this it can produce a real sense of wonder at the commonplace.

http://homepage.usask.ca/~dln136/refraction/graphics/pencil_in_water.jpg

The Mobius Strip

Show them the strip of paper and explain that it has two sides like any other piece of paper. The task is to make this piece of paper have only one side. They are not to rip, scrumple or in any way damage the paper.

When you are ready, twist the paper once and loop it so that the ends meet and you should have a Mobius strip that is one continuous side of paper. You can demonstrate this by getting someone to draw a continuous line on one side. They should eventually return to where they started and if you then staighten out the strip a line will be seen on both sides of the paper.

Hint: to help you remember how to do this when in front of a class draw two faint dots, one on either end of the same side of the strip so that you can see both dots when you hold the strip flat out in front of you. Hold the paper with your thumbs on top and your forefingers underneath and without changing your grip on the paper simply bring the two dots together, joining the ends with a twist and a loop so that the dots are touching each other and cannot be seen.

Next, sellotape the strip together and say that you will cut the strip down the centre all the way along. Ask the children what they think will happen. Cut it and see it turn into a double-length Mobius strip, not, as might be expected, two loops interconnected. Extraordinary.

http://en.wikipedia.org/wiki/File:M%C3%B6bius_strip.jpg (http://en.wikipedia.org/wiki/File:M%C3%B6bius_strip.jpg)

The Shrinking Coin

Before the session draw carefully round a 1 pence piece in the centre of an A4 piece of paper. Cut out the drawing of the coin so that you have a hole in the centre the size of a 1 pence piece coin. Show the children what you have done. Take a 2 pence piece coin and ask them rhetorically whether they think they could fit a 2 pence piece coin through a 1 pence piece-sized hole. This is the task. Whenever someone thinks they can do it let them demonstrate how it is done. The stipulations are that they cannot touch the coin (only the paper to hold it) and the coin should not leave the paper. They must also not rip the paper.

When you are ready, or when someone manages it, demonstrate how it is done. Lightly fold, but not entirely, the paper across the centre with the coin resting in the hole. Then, whilst it is still lightly folded, fold it the other way across the centre so that the hole bends into 'a slot'. The coin should fall through relatively easily. There is a real knack to doing this, so practise it well before doing it in the classroom. For the trick's full effect it is important not to let the paper become ripped.

The Magic Finger

Tell the children, provocatively, that you will now show them something that they can see but isn't there! (Task-question for later: are they really seeing something that isn't there?)

This is a well-known illusion but requires no props. Simply hold your hands in front of your eyes, about twenty centimetres away with your index fingers pointing towards each other. Look centrally between your fingers but focus your eyes on an object about 15 feet in front of you. You should see a small, double-ended finger appear to float in the air between your real fingers.

Task Question 1:

- ✔ Do we see things how they are or only how they seem to us?

Task Question 2:

- ✔ Is seeing believing?

Task Question 3:

- ✔ Can we trust our senses?

Task Question 4:

- ✔ How do we know how something really is?

During this discussion I sometimes show the children pictures of microscope images that show things radically different from how they seem to us and then we have something to focus on with these task-questions. Use the Incredible Shrinking Machine thought experiment in this session (found in *Get Stuffed: fun with metaphysics*, in 'The If Machine') to help explore the microcosm in relation to these issues.