Chapter 10: Time and measurement
Hard-boiled egg?

Ratings

MESS  DANGER  DIFFICULTY 

Theme

Seeking truth

Equipment needed

Two eggs (one raw, one hard-boiled) of similar size and weight; permanent marker pens; flat-bottomed bowl; kitchen scales

Before you begin

Explain that in doing scientific experiments, making accurate observations is important to finding out the answer to questions we ask about what things are like or how something works. You are going to use different methods – without cracking the shells – to try and determine which of two eggs is raw, and which is hard-boiled. We are looking for any differences between the eggs that we can find.

Experimental method

Begin by marking the eggs 1 and 2 with the marker pen.

1. Weigh the eggs. Is one heavier than the other?
2. Put both eggs in water. Do they float or sink? Do you notice any difference in how they sit in the water?
3. While they are in the water, try and spin them. Do they behave differently?
4. Take them out of the water and place them on a smooth surface. Spin each of them and then stop them with your finger. How do they behave?

Based upon your observations, which egg is the hard-boiled one? Once you have made your choice, crack one on your head. You might want to have kitchen towel available just in case you make the wrong choice!

Big thinking

Whether hard-boiled or raw, the eggs should weigh about the same. They both should also sink in water, but while the hard-boiled egg lies on its side, the raw egg will lie more vertically. This is because the small amount of air inside the egg is free to move around and so goes to the top. Also, the hard-boiled egg will spin easily underwater, while the raw egg does not spin as well. On a smooth surface, both eggs will spin easily, but while the hard-boiled egg will stop when it is touched, the raw egg will continue to spin.

The difference in the behaviour of the eggs when they spin is that one is a solid, while the other is filled with a fluid. The hard-boiled egg spins at the same speed all the way through. When it is stopped, all parts of it stop at the same time. When the raw egg is stopped, only the shell is stopped – the inside fluid still spins, and this makes the shell start to spin again. This behaviour is the main way to determine if the egg is raw or hard-boiled.

Big questions

Read Luke 6:43–45: 'No good tree bears bad fruit, nor does a bad tree bear good fruit. Each tree is recognised by its own fruit. People do not pick figs from thorn-bushes, or grapes from briers. A good man brings good things out of the good stored up in his heart, and an evil man brings evil things out of the evil stored up in his heart. For the mouth speaks what the heart is full of.'

Talk about how we might know if people are trustworthy. We cannot look inside them, but we can look at how they behave and act towards others.