FAIR TESTING

LESSON OBJECTIVE
Sc1: Investigative skills 2d. Pupils should be taught to make a fair test or comparison by changing one factor and observing or measuring the effect while keeping the other factors the same

WHAT YOU NEED
- Photocopiable page 31, 'Fair Testing'
- Writing materials
- One large ball (e.g. football) and one small ball (e.g. marble)

INTRODUCTION

- Scientists always test theories by changing the factors involved.

WHOLE CLASS TEACHING

- Say the class is going to conduct a fair test.
- Ask: *Do heavy things fall faster than light things?*
- Ask them to predict what will happen if a large football and a small ball are dropped from the same height. *Will the larger ball reach the ground first?*
- Most of the class will probably say the football.
- Say: In around 1590 Galileo Galilei (1564–1642) climbed the Leaning Tower of Pisa and dropped two objects. Two balls of different masses, but similar shape and density were released together and hit the ground at the same time.

  Until then it was believed that heavy things fell faster than light things – if you drop a brick and a feather at the same time, the brick will hit the ground first. However this is because of differences in the amount of friction between these objects and the air around them, not because their masses are different. If this test was conducted on the Moon (in a vacuum), the feather and the brick would hit the ground at the same time.
- Now conduct the experiment holding the two balls high above your head at the same height. Ask: *Has anyone changed their mind?* (The balls will hit the ground at the same time if released simultaneously.)
- Now repeat the experiment standing on a table. Ask: *What variable has been changed?* (The height from which the balls were dropped.)
- Are the results the same or different?
- The class write up the experiment on photocopiable page 31.

REVIEW

- Read out some of the write-ups of the experiment. Has everyone reached the same conclusions?

DON'T PANIC!

- This is a very easy experiment to conduct in the classroom. The results are also quite surprising to many children. If you have a suitable group, you could get the children to try the experiment themselves.

MAIN POINTS

- Scientific tests have to be fair to be valid.
- You can make a test fair by changing one factor and noting the effect while keeping all the other factors the same.
- Never assume something; always question and test your ideas!

HOMEWORK

- With your revision buddy, plan a fair test to see whether slugs prefer damp or dry conditions. There should only be one variable; all the other factors should be constant.