Practical investigations

1 • Looking at forces   Planning & Conducting   Evaluating

Forces act all around you, all of the time.
Whenever the shape or motion of an object changes,
you know that an unbalanced force has acted.

Purpose

To observe a range of forces in action.

Timing   30 minutes

Materials

- lump of Plasticine®
- textbook
- tennis ball
- plastic cup
- pencil case
- ruler
- bucket
- retort stand and clamp
- spring with hanging mass
- hairdryer
- table tennis ball
- balloon
- woollen fabric
- magnet
- paperclip
- plastic straw

Procedure

1 Copy the table below into your workbook.

2 Complete each of the tasks in the table, recording your observations as you go.

Results

Record all your observations in the appropriate columns of your table.

Review

1 How did you know that a force was acting in each task?

2 List any objects that changed shape as a result of the force.

3 State whether any of these changes in shape were permanent.

4 Did the tennis ball change its shape at any stage of its journey?

5 Discuss whether a table tennis ball could remain stationary even when two people blow air on it from two straws.

Observing forces

Task	Changes observed in the motion or shape	What produced the force?
Prop up one end of a textbook with your pencil case or another object to make a ramp. Roll a tennis ball down it.		
Rub woollen fabric against an inflated balloon, and bring the balloon towards someone's hair.		
Point an end of a bar magnet towards a paperclip.		
Drop a tennis ball and try to catch it when it bounces.		
Blow a table tennis ball across a bench using a plastic straw.		
Use a straw to blow bubbles in water in a cup. (Do not drink it.)		
Push your pencil case across the bench using a ruler.		
Squash a lump of Plasticine.		
Push an inflated balloon into a bucket of water and then let the balloon go.		
Suspend a hanging mass from a spring that is fixed to a retort stand. Carefully extend the mass down 2 cm and then release.		
Balance a table tennis ball in stream of warm air directed upwards from a hairdryer.		