Chapter 7: How Things Work

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7.1 Activity 1 — Spinning Objects

Q1 Do you think all objects can spin? Make a list of a few objects that can spin.

No, not all objects can spin well. Objects that can spin include a coin, a bangle, a top (lattu), a pencil (balanced on its tip), a wheel, a ceiling fan, and a potter's wheel.

Q2 Collect the objects — coin, bangle, pencil, piece of stone, wooden spinner (top), eraser. Spin and observe them. Complete the observation table (I observe / I wonder / I think).

Sample answer: Coin — as it slows down, it begins to shake. Bangle — as time passes, the sound it makes changes (gets softer and then stops). Pencil — (fill in your own observation). Piece of Stone — (fill in your own observation). Wooden Spinner (Top) — (fill in your own observation). Eraser — (fill in your own observation). (This is an observation activity — complete the table based on what you actually see and wonder.)

7.2 Activity 2 — Making Spinners

Q1 Which of the spinners did not spin properly? Discuss the possible reasons.

The spinner with the toothpick away from the centre and the square spinner do not spin as well. When the hole is off-centre, the spinner is unbalanced on one side and wobbles instead of spinning steadily.

Q2 Have you noticed the position of the hole in the first two spinners? Did this difference in the position of the hole make a difference in the spinning of these spinners?

Yes. The first spinner has the hole at the centre, so it looks the same from all sides and spins steadily. The second spinner has the hole away from the centre, so one side is heavier than the other; this makes it wobble and not spin properly.

7.3 Activity 3 — Floating and Sinking

Q1 Did all the light objects float and all the heavy objects sink? Name the heavy objects that floated and lighter objects that sank.

No. An empty steel bowl is heavy but it floats because its shape traps air. An empty plastic bottle with a closed lid also floats despite having some weight. An iron nail is small and light compared to the bowl, yet it sinks. So weight alone does not decide whether an object floats or sinks; shape and what is inside also matter.

7.4 Activity 4 — Shape and Floating

Q1 Observe the aluminium foil when spread out, pressed tightly into a ball, and shaped into a cup. Do they float or sink? What do you observe?

Sample answer: Aluminium foil spread out floats. Aluminium foil pressed tightly into a ball sinks. Aluminium foil shaped into a cup floats. This shows that the same material can float or sink depending on its shape.

7.5 Activity 5 — Making Boats

Q1 Create a boat using paper, cardboard, ice-cream sticks, clay, adhesive tape, or other materials. Draw a picture of your boat design.

Sample answer: Design a flat-bottomed boat using cardboard pieces held together with adhesive tape, making the sides tall enough to keep water out. Draw your design before building it. (This is a hands-on activity — make and test your own boat.)

Q2 Compare your boat with others' boats. What are the strengths and challenges of your boat?

Sample answer: Strength — my cardboard boat is wide and stable, so it does not tip easily. Challenge — if the cardboard gets very wet, it becomes soft and may sink. I could improve it by coating the inside with tape to make it more waterproof.

7.6 End Questions

Q1 Enquire about something: When Ravi spins a spinner, he notices that it slows down and eventually stops. He is curious and asks his teacher questions. List at least two questions that he could ask.

Sample answer: (1) Why does the spinner slow down on its own — what force is making it stop? (2) Would the spinner spin for longer on a smooth surface than on a rough one? (3) Does a heavier spinner spin longer than a lighter one?

Q2 Figure it out (a): A figure is bending towards side 'A'. What should be done to balance it?

The figure shows a hanging mobile with crossed sticks. Side A (bottom-left) is lower than side B (top-right), which means side A is heavier. To balance it, add more weight to side B, or remove some of the hanging objects from side A, so that both sides become equally heavy and the sticks become level.

Q3 Figure it out (b): How would you make a floating object sink and a sinking object float?

To make a floating object sink, add weight to it or fill it with water so it becomes heavier and loses its air-filled space. To make a sinking object float, change its shape into a hollow cup or boat shape that traps air, or attach a lighter floating material such as a piece of cork or a sealed empty bottle to it.

Q4 Do an activity: Classify the objects — wax, cork, potato, marble, leaf, tomato, thermocol, eraser, pumpkin, candle, spoon, lemon, coin, ice-cube — into 'Things that float' and 'Things that sink'.

Things that float: wax, cork, leaf, thermocol, pumpkin, candle, lemon, ice-cube. Things that sink: marble, potato, eraser, spoon, coin. (Note: tomato and lemon are close to neutral — they generally float; a metal spoon sinks.)