How Things Work

Standard difficulty · 20 questions · 40 marks · Time: 54 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. A spinning coin starts to shake when it:
(a) is first spun **(b)** is lifted up **(c)** speeds up **(d)** slows down

2. Which of these FLOATS on water?
(a) candle **(b)** steel spoon **(c)** potato **(d)** key

3. Which of these SINKS in water?
(a) cork **(b)** plastic ball **(c)** leaf **(d)** potato

4. Which of these can spin?
(a) sponge **(b)** shoe **(c)** coin **(d)** brick

5. A cardboard spinner: when a square card is used,
(a) it starts to shake **(b)** the colours seem to mix
(c) it wobbles and does not spin well **(d)** it looks round while spinning

6. A top turns about 3 times every second. About how many times does it turn in 12 seconds?
(a) 36 times **(b)** 33 times **(c)** 15 times **(d)** 39 times

7. Meera dropped 10 objects into a bucket of water. 7 of them floated. How many sank?
(a) 4 objects **(b)** 17 objects **(c)** 3 objects **(d)** 7 objects

8. A paper boat carried 10 coins before it sank. A boat made of ice-cream sticks carried 3 times as many. How many coins did the stick boat carry?
(a) 40 coins **(b)** 13 coins **(c)** 30 coins **(d)** 27 coins

Section B — Short answer — 8 × 2 = 16 marks

9. Name four things that can spin.

10. Write "float" or "sink": (a) potato (b) plastic ball

11. Can it spin easily? Write "yes" or "no": (a) bangle (b) brick

12. What happens to a cardboard spinner when (a) it slows down (b) it is painted in two colours?

13. A house has 5 ceiling fans, each with 4 blades. How many blades spin when all the fans are on?

14. For a boat exhibition, each of 7 groups makes 5 boats. How many boats are there?

15. Meera's spinner spun for 24 seconds and Dhruv's for 27 seconds. Whose spun longer, and by how many seconds?

16. Each coin weighs 3 g. A walnut-shell boat sank when 4 coins were put in it. How many grams of coins did it hold just before sinking (with 3 coins)?

Section C — Word problems — 4 × 4 = 16 marks

17. How do you make a cardboard spinner? How can you test what makes it spin best?

18. Guess first, then sort into "float" and "sink": steel spoon, thermocol, leaf, coin, iron nail, cork. Then explain why weight alone does not decide.

19. Each of 6 groups made a boat. Each boat carried 13 coins, and the best boat carried 3 more than that. (a) How many coins did all the boats carry? (b) Give two ways to make a boat carry more without tipping over.

20. Draw a spinner for each case and write what you would see: (a) when it is painted in two colours (b) when the toothpick goes through a point near the edge

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Answer key

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Q	Answer	Working
1	(d) slows down	—
2	(a) candle	—
3	(d) potato	—
4	(c) coin	—
5	(d) it looks round while spinning	—
6	(a) 36 times	3 × 12 = 36
7	(c) 3 objects	10 − 7 = 3
8	(c) 30 coins	10 × 3 = 30
9	Any four: a coin, a bangle, a top (lattu), a ceiling fan, a potter's wheel, a bicycle wheel.	—
10	(a) sink (b) float	—
11	(a) yes (b) no	—
12	(a) it starts to shake (b) the colours seem to mix	—
13	20 blades	5 × 4 = 20
14	35 boats	7 × 5 = 35
15	Dhruv's, by 3 seconds	27 − 24 = 3
16	9 g	3 × 3 = 9
17	Cut a circle of cardboard, push a toothpick through its centre and spin it. Test by moving the toothpick away from the centre, changing the shape (square), or the toothpick length, and see which spins longest and most steadily.	—
18	Float: thermocol, leaf, cork. Sink: steel spoon, coin, iron nail. Material and shape also matter: a heavy log floats but a small nail sinks.	—
19	(a) 81 coins (b) Make the base wider and flat; spread the coins evenly; make the sides higher so water does not get in.	6 × 13 + 3 = 81
20	(a) the colours seem to mix (b) it wobbles and does not spin well	—

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