

Read this first

Ask before you explain. Explain only after they've tried.

Slow-fall helicopter

Air resistance and autorotation

Say	"Race a crumpled paper ball against your helicopter. Yours has to lose."
Ask first	"Long blades or short blades: which will fall slower?"
After: explain	Air rushing past the falling paper pushes on the tilted blades and turns them. Spinning blades sweep through more air, so there is more drag and a slower fall.
Look around	On the drive, spot a wind turbine. Its blades are tilted too, so moving air makes them turn.
Did you know	If a helicopter engine stops, pilots can let air spin the rotor to slow the descent. It is called autorotation, and every pilot practises it.
Close with	"What would you change to make it fall even slower?"

Paper bridge

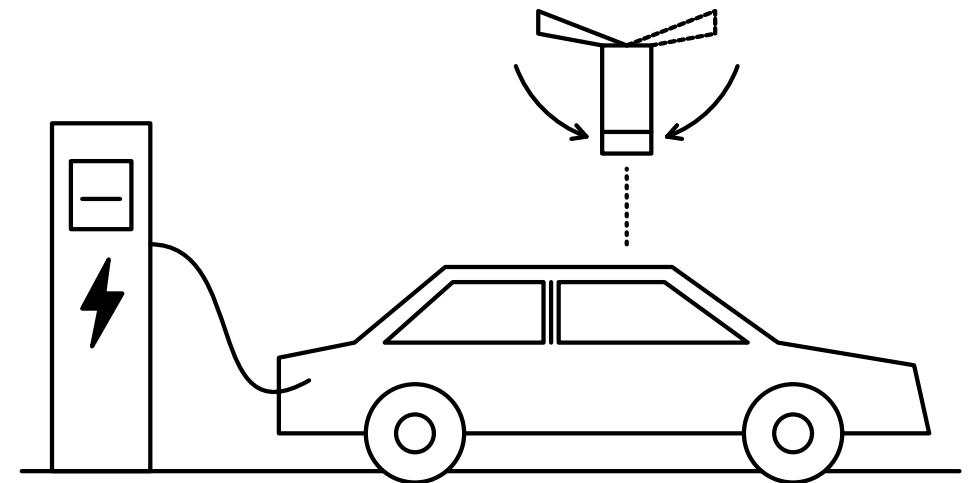
Shape beats material

Say	"One sheet of paper has to carry ten coins across that gap."
Ask first	"Flat or folded: which will hold more?"
After: explain	A flat sheet bends at the slightest weight. Folded into a zigzag, every fold is a small wall standing on its edge, and a wall on its edge is very hard to bend.
Look around	Run a hand along the car door or bonnet. The creases pressed into the thin steel are there to stop it bending.
Did you know	Corrugated cardboard boxes and steel roof sheets use the same trick: thin material, strong shape.
Close with	"What else could you fold to make it stronger?"

Safety Test the helicopter away from moving cars and charging cables.

Charging stop

20 minutes, 2 challenges, ages 9 to 12



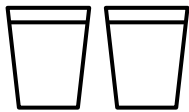
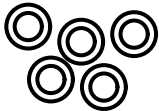
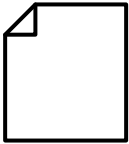
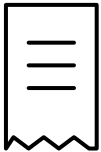
Pack the bag. Put the phones away.

Grown-ups: start on the back page.



Pack before you leave

One zip bag. Two minutes.

 paper cups 2	 coins, same size 10
 sheet of A4 paper 1	 receipt or paper strip 1

How it works

- 1 Grown-up reads the back page. One minute.
- 2 Phones go in the glovebox until the car is charged.
- 3 Kids follow the pictures. Grown-ups ask the questions.

Our results

Date _____ Place _____

Slow-fall helicopter

■□□	_____	seconds in the air	☐
■□□	_____	seconds in the air	☐
■□□	_____	seconds in the air	☐

🔍 We found the same idea in _____

Paper bridge

■□□	_____	coins held	☐
■□□	_____	coins held	☐
■□□	_____	coins held	☐

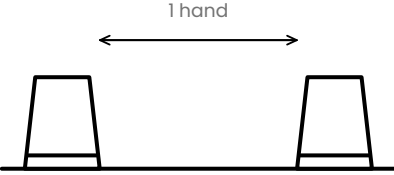
🔍 We found the same idea in _____

Best idea today

Next trip, we will try

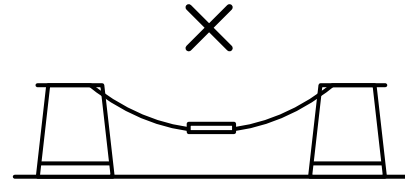
Engineers _____

1



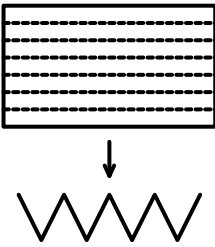
Cups upside down

2



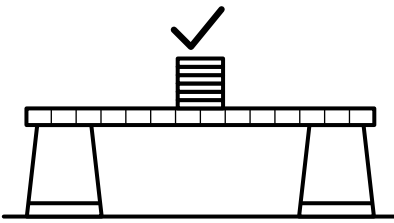
Flat sheet, 1 coin

3



Fold a zigzag, the long way

4



Add coins one by one

5 Count out loud. Last coin before it drops is your score.







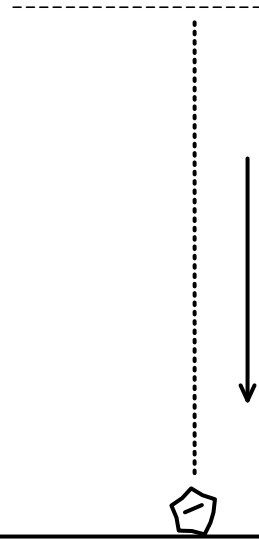




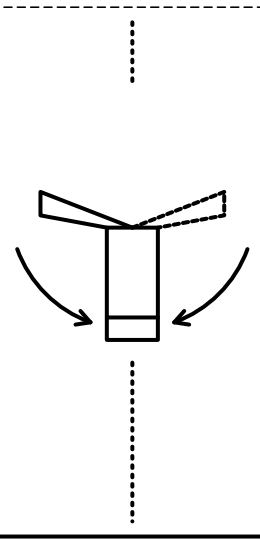

1
2
3
4
5
6
7
8
9
10

Slow-fall helicopter

5 minutes



lands first



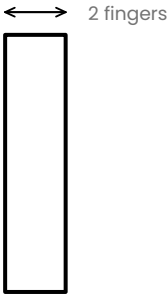
lands last = wins

Levels

- Beat the paper ball to the ground
- Stay in the air 2 seconds from sitting height
- Make one that spins the other way

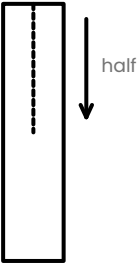
☐
☐
☐

1



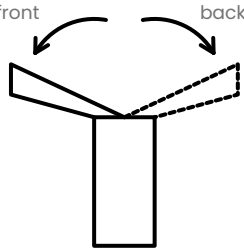
Tear a strip

2



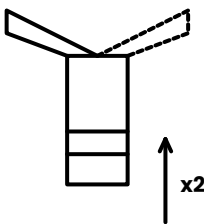
Tear down the middle

3



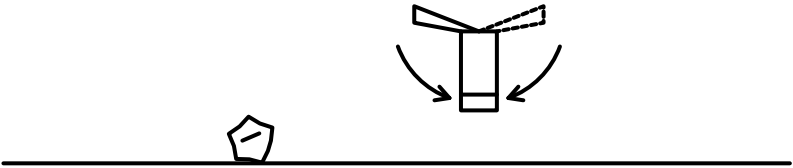
One flap each way

4



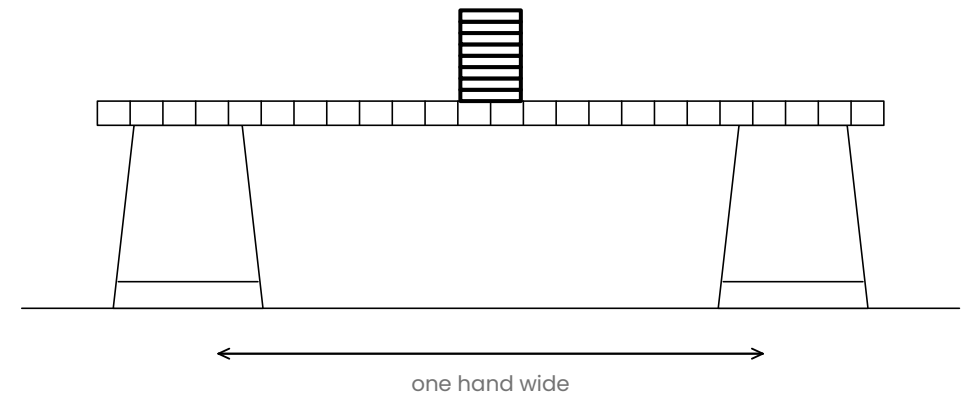
Fold the bottom up twice

5 Outside the car. Drop both together.



Paper bridge

12 minutes



Levels

- Hold 5 coins in the middle
- ■ □ Hold all 10 coins
- ■ ■ Same 10 coins, gap two hands wide

