

PUPIL WORKSHEET

Levers, pulleys and gears

Autumn 1 · Week 4 · Lesson A

Name: _____ Date: _____

Name levers, pulleys and gears, identify a lever pivot and explain the force-distance trade-off without claiming extra energy.

Explore three mechanisms. Point, speak, draw or write. Today's lever comparison is an adult demonstration; your own directed or practical comparison is Tuesday.

1. Find and explain a pivot

Use safe scissors or a drawing. Point to the turning point and name it. Then sketch the adult's simple lever and label EFFORT, PIVOT and LOAD.

- The turning point is called ____.
- On a wheelbarrow drawing, the turning point is ____.
- Sketch and label the lever below.

2. Name the mechanism and job

Write, draw, point or dictate as agreed with your teacher.

Classify each example. Say or write where it turns, or how it changes movement. A mechanism does not always reduce the force needed.

Example	Mechanism	Turning point or change
Wheelbarrow		
Scissors		
Spanner on a bolt		
Flagpole rope over top wheel		
Bicycle chain and cogs		

3. Sort gains and costs

Write, draw, point or dictate as agreed with your teacher.

Choose GAIN, COST, NEITHER or GAIN AND COST. Explain one choice. Always relate a benefit to the intended job.

Claim	Your category
Less effort force needed	
Hand travels farther	
Pull down instead of up	
Mechanism creates extra energy	
Slower turning, greater turning effect	

4. Explain the lever trade-off

Write, draw, point or dictate as agreed with your teacher.

Use the adult demonstration or labelled diagram. Compare the middle pivot and pivot nearer the load while keeping the same load, effort point and small load rise.

- What changes about the effort arm compared with the load arm?
- What may happen to the effort force?
- What must happen to hand travel for the same small load rise?

CHOOSE A RESPONSE ROUTE

Ways to show your understanding

Choose the route agreed with your teacher. You do not need to complete every route.

Supported

Point to the pivot and choose a named example of each mechanism. Use 'It helps by ____, but ____' with an adult.

Standard

Name lever, pulley and geared drive examples. Explain one gain and one cost using the lever comparison.

Stretch

Explain why fixed pulley direction change differs from force gain. Qualify the lever claim with the same load and rise and note a real-model limitation.

Stop after the explanation. Label and keep this work; Tuesday compares the two lever positions.