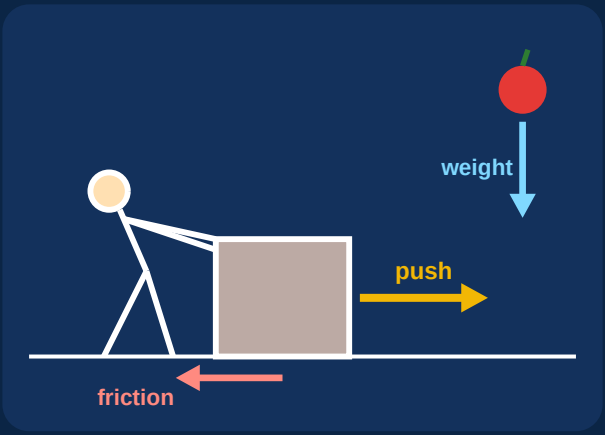
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YEAR 7 • PHYSICS

Forces

Homework Worksheet • KS3



Name: _____

Class: _____

Date: _____

Time: about 40 minutes

Total: 35 marks

Score: _____ / 35

Key notes – read these first

- A **force** is a **push** or a **pull** that acts on an object, because of an **interaction** with another object.
- Force is measured in **newtons (N)** using a **newtonmeter** (force meter).
- We show forces with **arrows**. The arrow points the way the force acts. A longer arrow means a bigger force.
- **Contact forces** act between two objects that are **physically touching**, e.g. friction, air resistance, water resistance, upthrust, tension.
- **Friction** acts between two touching surfaces and resists them moving against each other.
- **Non-contact forces** act between two objects that are **not physically touching**, e.g. gravity (weight), magnetic force, electrostatic force.
- **Balanced** forces are equal and opposite – no change in movement. **Unbalanced** forces change an object's speed or direction.

Instructions

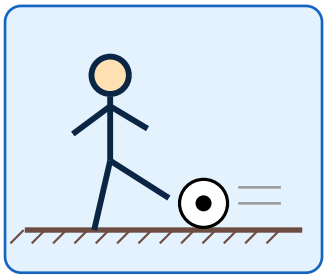
- Answer **all** questions in the spaces provided.
- Use a **ruler** to draw force arrows.
- The marks for each question are shown in brackets, e.g. **[2]**.
- Read the key notes above if you get stuck.

Section	Topic	Marks
A	What is a force?	13
B	Contact & non-contact forces	12
C	Force arrows & balanced forces	10
	Total	**35**

Forces are everywhere – every push and every pull counts!

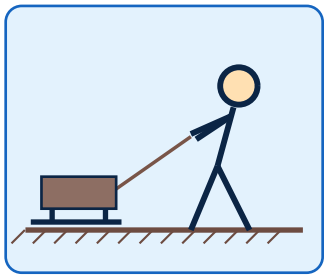
Section A – What is a force? 13 marks

1 Look at each picture. Is the force a **push** or a **pull**? Tick one box for each. [4]



(a) Kicking a football

☐ Push ☐ Pull



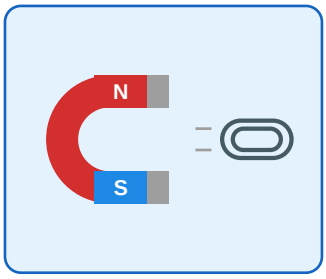
(b) Pulling a sledge

☐ Push ☐ Pull



(c) Moving a trolley

☐ Push ☐ Pull



(d) Magnet and paper clip

☐ Push ☐ Pull

2 Complete the sentences using words from the box. Each word is used **once**. Two words are not needed. [6]

push	pull	interaction	newtons	newtonmeter	shape	kilograms	metres

(a) A force is a _____ or a _____ .

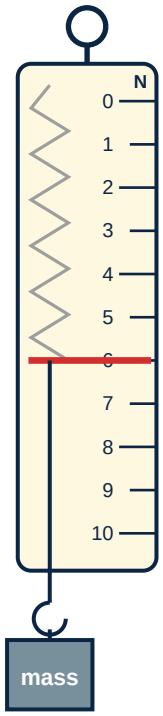
(b) A force acts because of an _____ between two objects.

(c) Force is measured in _____ (N).

(d) We measure force using a _____ .

(e) Forces can change an object's speed, direction or _____ .

3 Asha hangs a mass from the instrument shown below.



(a) Name the instrument Asha is using. [1]

.....

(b) Read the scale. What is the size of the force on the spring? Give the unit. [1]

.....

(c) Asha hangs a **heavier** mass on the instrument. What happens to the spring and to the reading? [1]

.....

.....

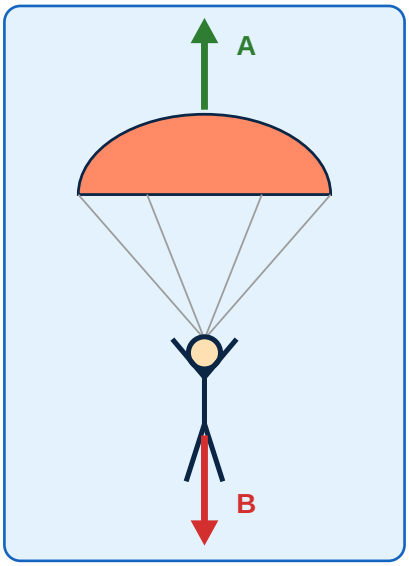
Section B – Contact and non-contact forces 12 marks

4 Sort the forces in the box into the correct column of the table. [3]

friction	gravity (weight)	air resistance	magnetic force
upthrust	electrostatic force	water resistance	tension

Contact forces (objects touching)	Non-contact forces (not touching)

5 Zara is falling with her parachute open. Two forces act on her, shown by arrows **A** and **B**.



(a) Complete the table. [4]

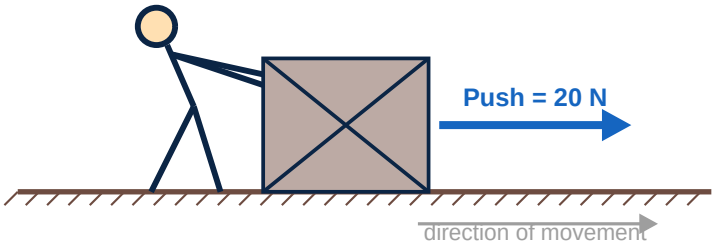
Arrow	Name of force	Contact / non-contact
A		
B		

(b) Gravity still pulls on Zara even though nothing is touching her. Explain why gravity is called a **non-contact** force. [1]

.....

.....

6 Leo pushes a heavy box across the floor. The box moves to the right.



(a) **Friction** acts on the box. On the diagram, draw an arrow to show the direction of friction. Label it **friction**. [1]

(b) Leo pushes the same box across three floors. Circle the floor that gives the **most** friction. [1]

smooth ice **carpet** **polished wood**

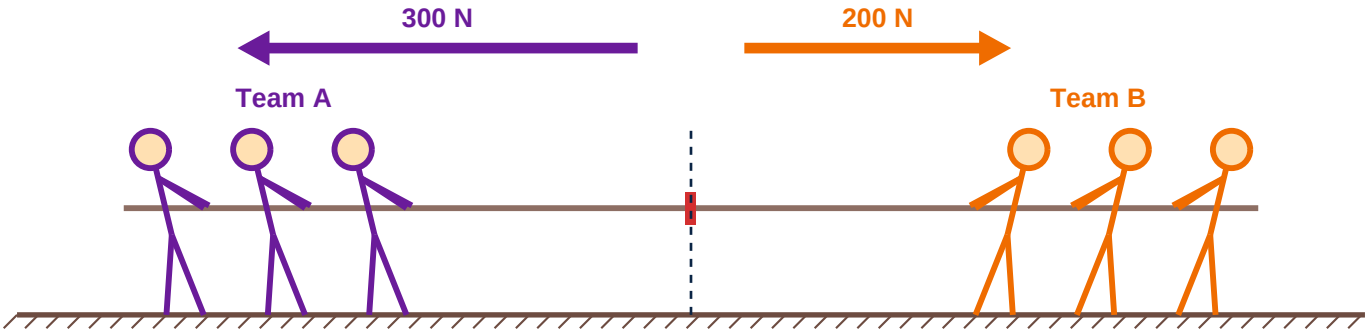
(c) Friction can be useful, but it can also be a problem. Give **one** example of each. [2]

Useful: .....

Problem: .....

Section C – Force arrows and balanced forces 10 marks

7 Two teams play tug of war. The arrows show the force each team pulls with. *Remember: a longer arrow means a bigger force.*

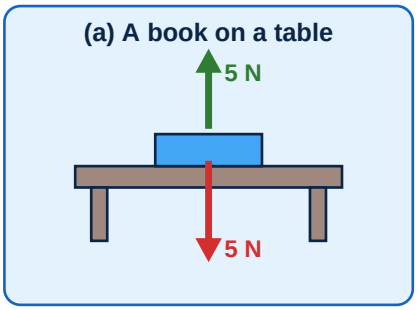


(a) Which team will win? Give a reason. [1]

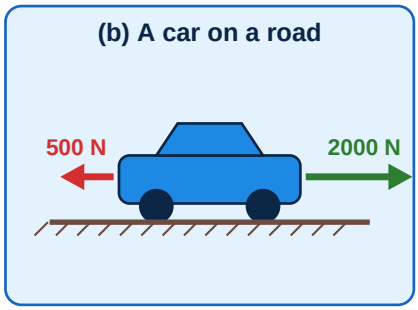
(b) Work out the difference between the two forces. Give the unit. *(300 N - 200 N)* [1]

(c) Both teams now pull with **250 N**. Are the forces balanced or unbalanced? What happens to the rope? [1]

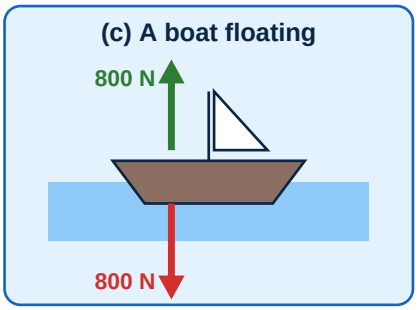
8 For each picture, tick whether the forces are **balanced** or **unbalanced**. [3]



☐ Balanced ☐ Unbalanced



☐ Balanced ☐ Unbalanced

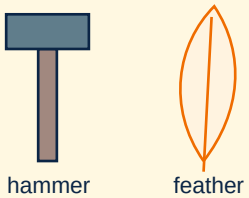


☐ Balanced ☐ Unbalanced

(d) Look at the car in picture (b). Will the car **speed up**, **slow down** or **stay at the same speed**? Explain your answer. [2]

CHALLENGE

9 Sam drops a hammer and a feather at the same time from the same height **on Earth**. The hammer lands first.



(a) Name the force that slows the feather down. Is it a contact or a non-contact force? [1]

(b) An astronaut did this on the **Moon**, where there is no air. Both objects landed at the same time. Explain why. [1]