Forces and Force Arrows

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Is gravity a contact or a non-contact force?

Step 1 · Do the objects need to touch?

No — the Earth pulls on you even when you jump in the air.

Answer: Non-contact

Check: Magnetic and electrostatic forces are also non-contact.

2. Now try one with the steps

A box is pushed right with 30 N. Friction is 10 N to the left. Find the resultant force.

Step 1 · Opposite directions

Step 2 · Direction

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is the unit of force? [1]

2. What instrument is used to measure force? [1]

3. Name two non-contact forces. [1]

4. On a force diagram, what does the length of an arrow show? [1]

5. A force of 10 N acts to the right and 4 N to the left. What is the size of the resultant force, in newtons? [1]

6. Forces of 5 N and 7 N both act to the right. What is the resultant force, in newtons? [1]

7. Forces of 20 N to the left and 20 N to the right act on a box. What is the resultant force, in newtons? [1]

8. In a tug of war, team A pulls with 300 N and team B with 280 N. What is the size of the resultant force, in newtons? [1]

9. A book rests on a table. Name the two forces acting on the book and give their directions. [2]

10. Forces act on a sledge: 15 N to the right, 6 N to the left and 4 N to the left. What is the size of the resultant force, in newtons? [2]

11. Name the contact force that slows a parachutist falling through the air. [1]

12. A boat's engine pushes 800 N forwards. Water resistance is 650 N and wind 50 N, both backwards. What is the resultant force forwards, in newtons? [2]

13. A magnet attracts a steel paperclip. Explain how this shows that forces are an interaction between two objects. [2]

14. Describe how to draw a force arrow for a 40 N push on a trolley to the left. [3]

4. Before you hand it in

Giving the resultant without a direction.
Write '20 N to the right', not just '20 N'.

Drawing arrows the same length for different forces.
Use a scale, e.g. 1 cm for 10 N, so bigger forces get longer arrows.

"The wall's push on me cancels my push on the wall."
Only forces acting on the SAME object can be added to find a resultant.