Forces, vectors and resultant forces

Name _____ Class _____ Date _____

A force is a push or pull caused by an interaction between two objects. Forces are **vectors**: they have size and direction.

KEY IDEAS

- **Scalar**: magnitude only (speed, distance, mass, energy). **Vector**: magnitude and direction (velocity, displacement, force, acceleration).
- **Contact forces**: friction, air resistance, tension, normal contact force. **Non-contact**: gravitational, electrostatic, magnetic.
- The **resultant force** is the single force with the same effect as all the forces acting together.

Section A · Recall

Grade 4–5

1 Sort these into scalars and vectors: speed, velocity, mass, force, distance, displacement. [3]

2 Give two contact forces and two non-contact forces. [2]

3 What is meant by a resultant force? [1]

Section B · Calculate

Grade 5–6

4 Calculate the resultant force in each case and give its direction. [4]

a 40 N to the right and 15 N to the left

b 20 N up and 20 N down

c A car with a 3000 N driving force and 1200 N of drag

d 10 N and 6 N both acting to the left

5 A book rests on a table. Name the two vertical forces acting on the book and explain why it doesn't move. [3]

Section C · Stretch

Grade 7+

6 A force of 50 N acts at 30° above the horizontal. Use a scale drawing to find its horizontal and vertical components. (Higher) [3]

Exam-style question

AQA style

7 A skydiver of weight 700 N is falling. At one moment the air resistance on her is 500 N.

a Draw a free body diagram showing the forces on the skydiver. [2]

b Calculate the resultant force and give its direction. [2]

c Describe how her motion is changing at this moment. [1]

Total: _____ / 21

How confident am I?	Not yet	Nearly	Got it
I can tell scalars from vectors	☐	☐	☐
I can name contact and non-contact forces	☐	☐	☐
I can calculate resultant forces	☐	☐	☐