

Topic: Forces

Lesson	Lesson Title
1	Introduction to forces
2	Force diagrams
3	Forces circus
4	Do your own forces investigation
5	Compression
6	Gravity
7	Forces and springs

The two links below take you to The Oak National Academy Lessons.

The lessons are an introduction to forces and force diagrams. You can watch more of the lessons if you have time.

The video lessons include tasks which are clearly explained.

<https://classroom.thenational.academy/lessons/what-are-forces-crw38r>

<https://classroom.thenational.academy/lessons/representing-forces-6hhpad>

Questions for you to complete and then mark.

Q1. Stefan is on holiday in the mountains. It is snowing.



- (a) (i) Stefan is snowboarding. Gravity acts on Stefan. **On the diagram below**, draw an arrow to show the direction of the force of gravity. 1 mark



one edge of

- (ii) When Stefan wants to slow down, he pushes the snowboard into the snow.

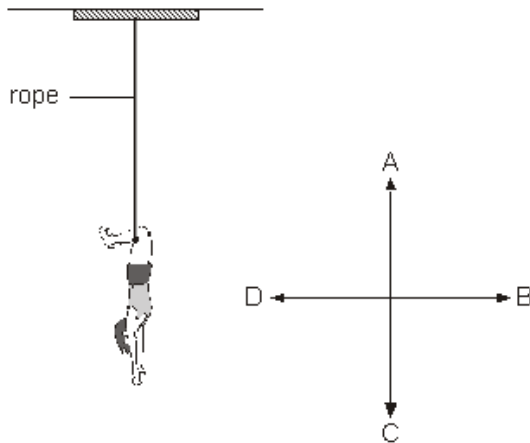


What force between the board and the snow makes him slow down?

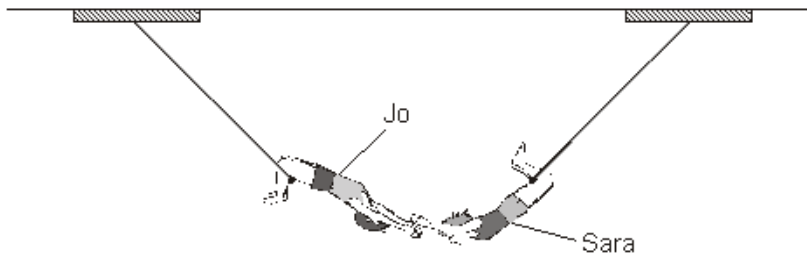
.....

1 mark

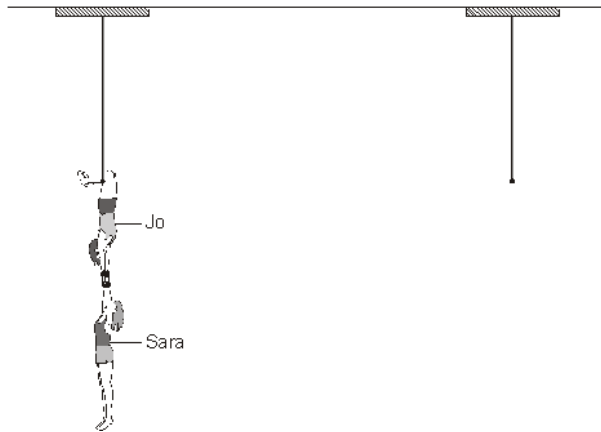
Q2. The diagram below shows Jo hanging on a trapeze (swing) in a circus.



- (a) (i) Which arrow, A, B, C or D, shows the direction of Jo's weight? 1 mark
- (ii) Which arrow, A, B, C or D, shows the direction of the force of the rope on Jo 1 mark
- (b) Sara swings towards Jo.



Sara lets go of her trapeze and Jo catches her.



(i) What happens to the downward force on the rope of Jo's trapeze? Tick the correct box.
1 mark

increases

decreases

stays the same

there is **no** force

(ii) Explain your answer.

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1 mark

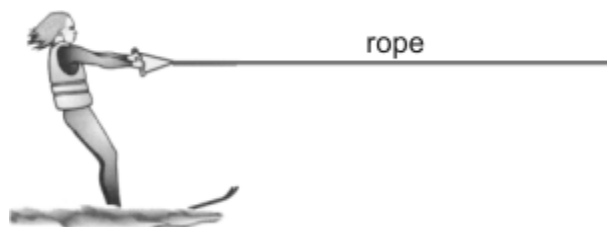
(c) Jo lets go of the trapeze and both Sara and Jo fall into a safety net below them.

What happens to the downward force on the rope when Jo lets go?

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1 mark

Q3.The drawing shows Amy water-skiing.



(a) (i) The rope is pulling Amy. Draw an arrow on the rope to show the direction of this force.
Label the arrow A.

1 mark

- (ii) Draw an arrow to show the direction of Amy's weight.
Label the arrow B.

1 mark

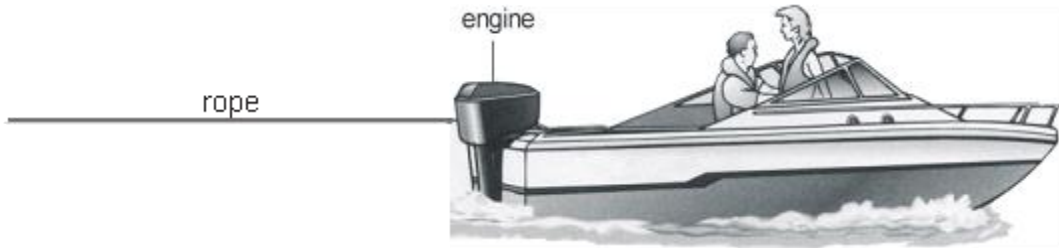
- (b) Give the names of **two** other forces which act on Amy or on her skis.

1.

2.

2 marks

The drawing below shows the speed boat which is pulling Amy along.



- (c) The rope which pulls Amy also exerts a force on the boat.
Draw an arrow on the rope to show the direction of this force.
Label the arrow C.

1 mark

- (d) The force of the engine on the boat is increased.
What effect will this have on the speed of the boat?

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1 mark

Q4.

Russell investigated the relationship between mass and weight.
He weighed five different masses using a force meter.

His results are shown in the table.

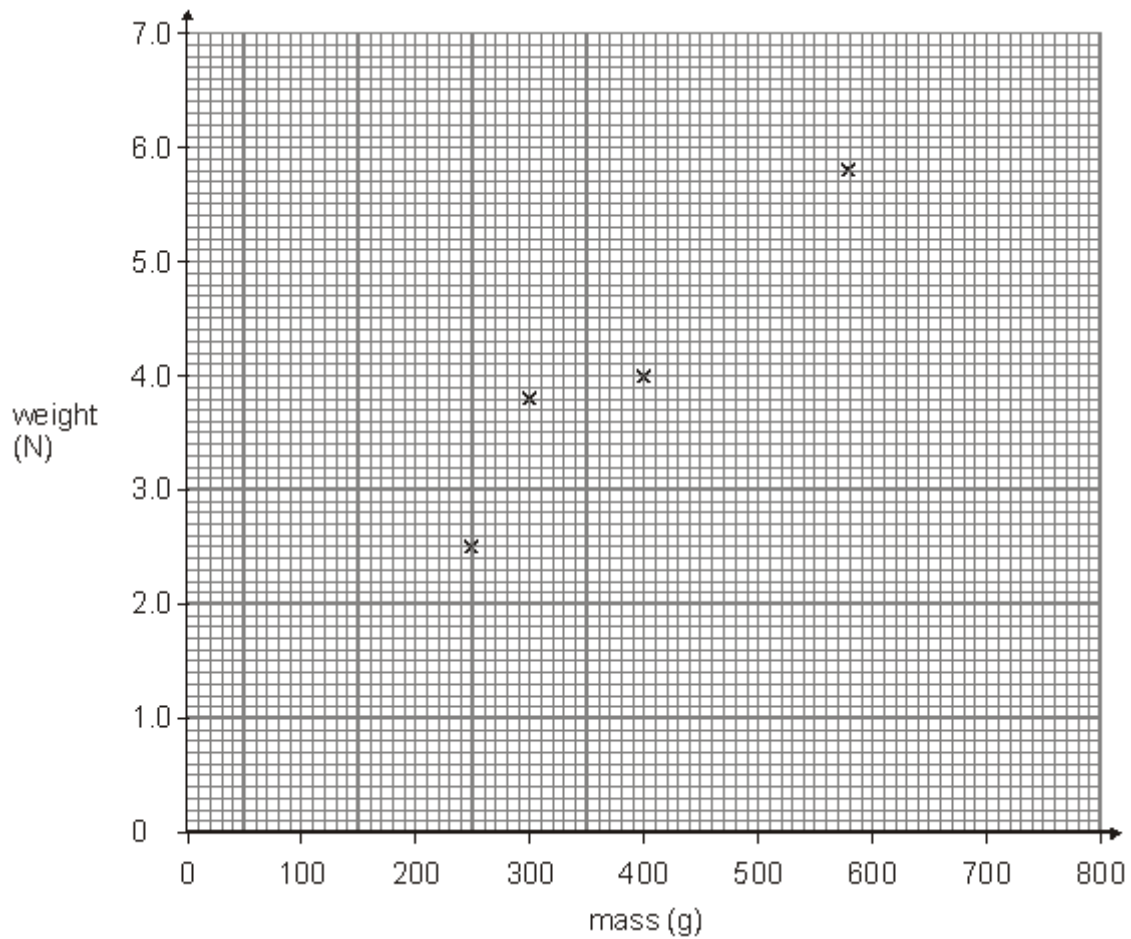
mass (g)	weight (N)
150	1.5
250	2.5
300	3.8
400	4.0
580	5.8

- (a) He plotted four of his results on a grid as shown below,

- (i) Plot the point for the 150 g mass on the graph.
(ii) Draw a line of best fit.

1 mark

1 mark



(b) One of the points Russell plotted does **not** fit the pattern.

Circle this point on the graph.

1 mark

(c) Use your graph to predict:

(i) the mass of an object weighing 6.5 N;

..... g

1 mark

(ii) the weight of an object of mass 50 g.

..... N

1 mark

(d) Give **one** reason why it is more useful to present the results as a line graph rather than a table.

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1 mark

