1 Part 2 Checkpoint Revision (Route A)

Task 1

A submarine is travelling at the same depth and at a steady speed.

1 Draw and label arrows to show the forces acting on the submarine.

2 Draw a diagram to show the forces on the submarine if it stays at the same depth but slows down.

3 Draw a diagram to show the forces on the submarine if it accelerates upwards but keeps moving forward at a steady speed.

1 Part 2 Checkpoint Revision (Route A)

Task 2

A student investigates how much friction is exerted on a block by different surfaces. The student uses a newtonmeter to pull the block across a carpet, wood, sandpaper, and tile.

She found that it took most force to pull the block across the sandpaper, followed by carpet, wood, and then tile.

Use your understanding of friction to explain why.

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Describe how friction between surfaces can be reduced.

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Task 3

1 Use the following words to complete the paragraph about how materials behave when they are deformed.

bonds **equal** **force** **compressed**
opposite **particles** **weight**

When you stand on the floor your …… exerts a …… on the floor. This pushes the …… closer together. The …… between the particles are ……. They push back and support you with an …… and …… force.

1 Part 2 Checkpoint Revision (Route A)

2 Mattresses often contain springs. Draw a diagram and label the forces to help describe and explain what happens to the springs when you sit on a mattress.

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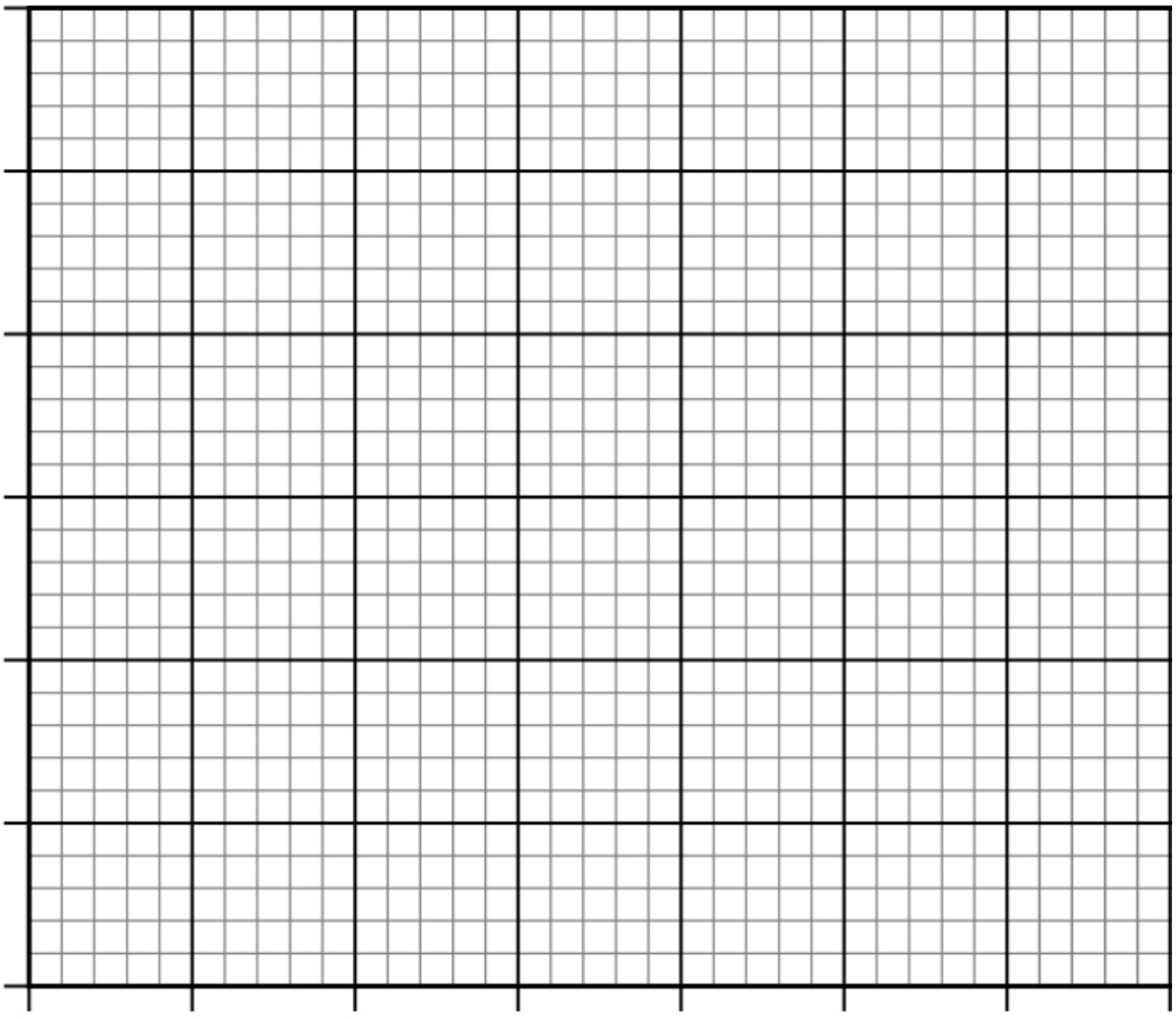
1 Part 2 Checkpoint Revision (Route A)

Task 4

A student uses a newtonmeter to stretch a spring and records the following data.

Force (N)	Extension (cm)
0	0
1	5
2	10
3	15
4	20
5	25
6	30

1 Plot the graph to show how the extension changes as you increase the force. Remember to label the axes.



2 Describe the relationship between force and extension.

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3 How much would the spring extend by if a force of 8 N were applied?

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Task 5

1 Sketch how the water would flow out of the holes in the bottles in the two diagrams below and explain the difference.

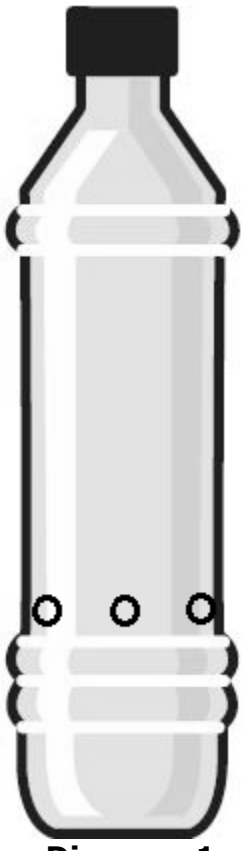

Diagram 1

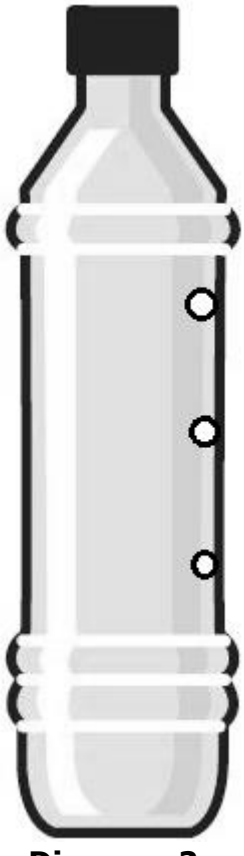

Diagram 2

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1 Part 2 Checkpoint Revision (Route A)

2 A boat floats in water. Describe how the pressure changes from the top of the water to underneath the boat and explain how this makes the boat float.

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3 The boat has an area of 5 m^2 and weighs 500 N. The boat sinks to a depth that allows the boat to float. Calculate the pressure at the bottom of the boat.

4 Complete the following table for different objects in water and decide whether the object will float, rise, or sink.

Weight (N)	Upthrust (N)	Rise, float, or sink?
20	20	
5	6	
8	6	

5 A student uses a newtonmeter to measure the weight of an object in air and then when it is suspended in water. The reading in air is 0.5 N.

Describe and explain what will happen to the reading in water if the object floats.

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1 Part 2 Checkpoint Revision (Route A)

Task 6

1 Circle the correct words to complete the sentences about stress.

A sharp knife has a **small / large** area so causes a **low / high** stress. Older knives become dull and are less good at cutting. This is because the area **decreases / increases / stays the same** and so the knife causes **a lower / a higher / the same** stress.

2 Explain how snowshoes stop you sinking in the snow.

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3 A box weighs 50 N and has an area 400 cm^2.

a Calculate the stress on the table it is resting on.

b Calculate the stress if the box is held by a ribbon of area 8 cm^2.