KS3 Forces Practice Exam Questions

1. There are two types of forces: contact and non-contact.

    a. Place **one** tick in each row to show whether the named force is a contact force or a non-contact force.

    [7]

Force	Contact	Non-Contact
friction		
air resistance		
gravitational		
upthrust		
magnetic		
reaction		
electrostatic		

    b. Select one word from the list below to complete the sentence. [1]

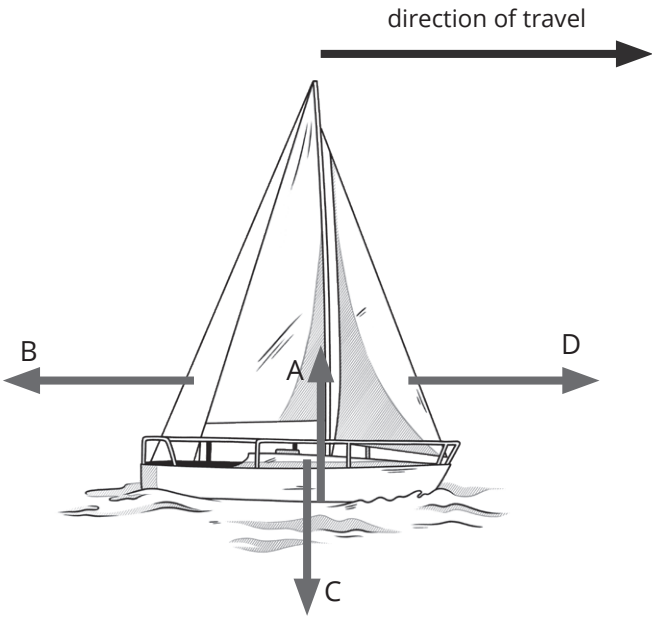   space   fields   gravity   zones

    Non-contact forces act in _____ , a special area where an object can experience a force.

    c. List three things that forces can do to an object. [3]

    Change the _____ of the object.

    Change the _____ of the object.

    Change the _____ of the object.

2. The diagram shows a sailing boat pulling out of a harbour.

    a. Give the letter of the arrow that represents upthrust. [1]

    _____

b. Which force is represented by arrow B? Tick **one** box.

air resistance ☐
gravity ☐
reaction ☐
driving force ☐ [1]

c. When the boat is travelling at a constant speed in the direction shown, which two forces must be balanced?
Give **two** letters. [2]

_____ and _____

d. As the boat passes out of the harbour, it accelerates (speeds up). One force is now larger than the other forces.
Give the letter of the force that is now the largest. [1]

_____

3. A skateboarder is investigating the effect that different surfaces have on the motion of a skateboard. They move a ramp onto different surfaces and measure the distance that the skateboard travels from the bottom of the ramp.
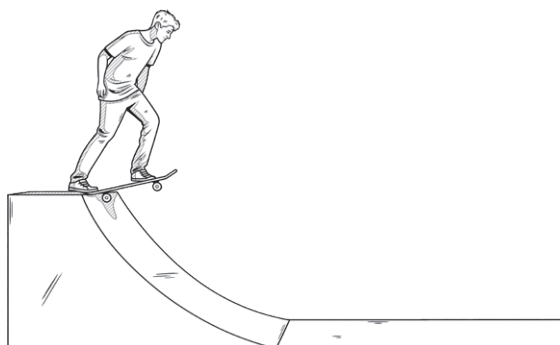
The table shows their results.

Surface	Distance Travelled (m)			
	Repeat 1	Repeat	Repeat 3	Mean
concrete path	8.1	8.5	8.0	8.2
paving slabs	7.5	7.4	7.6	
wooden decking	6.7	7.3	7.0	7.0
grass	1.0	1.2	0.9	1.0
artificial grass	3.1	3.2	3.0	3.1
sand	0.5	0.4	0.4	0.4

a. Name the independent variable in this investigation. [1]

_____

b. Complete the table by calculating the mean distance the skateboarded travelled on paving slabs.

[1]

_____

_____

c. Name a resistive force that acts on the skateboard. [1]

_____

d. State two things that will happen to the skateboard as a result of the forces acting on it.

1. _____

2. _____ [2]

The skateboarder compared the speed of the skateboard on concrete and on artificial grass.

e. On which surface did the skateboard slow down the quickest?
artificial grass ☐
concrete ☐ [1]

f. Explain why. [3]

_____

_____

_____

_____

4. A student measures the weight of their school bag using the equipment shown below.

a. Name this piece of equipment. [1]

_____

b. Look at the diagram below.
What is the weight of the bag? [1]

10N
15N
20N
25N
30N
35N
40N
45N
50N
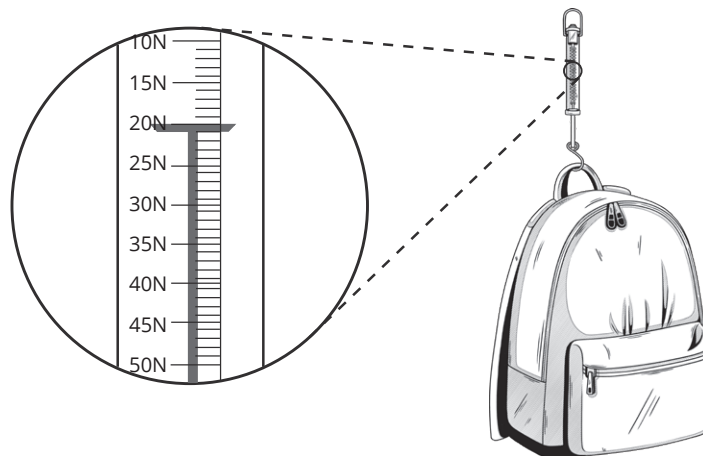
Weight = _____ N

c. Write down the equation that links gravitational field strength, mass and weight. [1]

_____

d. A second student measures the mass of their school bag as 2.3kg.

The gravitational field strength on Earth is 10N/kg.

Calculate the weight of the bag on Earth. Give the unit of measurement. [2]

_____

_____

_____

Weight = _____ Unit _____

e. The gravitational field strength on the Moon is 1.6N/kg. Explain what would happen to the mass and weight of a bag if it was taken to the Moon.
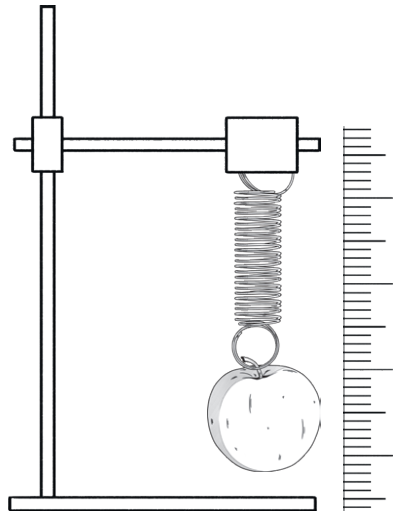
Mass would _____

because _____

Weight would _____

because _____ [4]

5. A student uses a spring to work out the weight of an apple. He sets up his equipment as shown below.

a. Write out the equation that links extension, force and spring constant. [1]

_____

b. The spring constant of the spring is 27N/m. The extension of the spring is 0.07m.

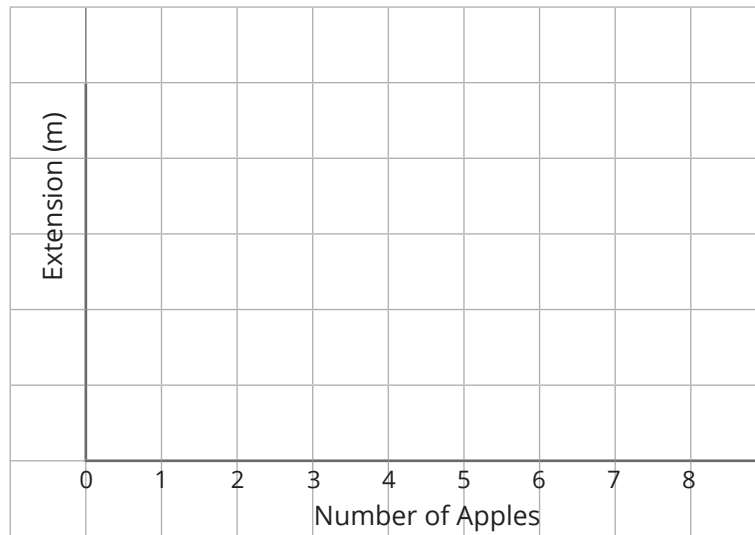Calculate the weight of the apple. Give the unit of measurement. [2]

_____

_____

_____

_____

Weight = _____ Unit _____

c. The student continues to add apples to the spring. It reaches its elastic limit once five apples have been added.
What is meant by the term 'elastic limit'? [1]

_____

_____

d. On the grid below, sketch the shape of the graph produced by the student's investigation.

[3]

KS3 Forces Practice Exam Questions **Answers**

1. There are two types of forces: contact and non-contact.

   a. Place **one** tick in each row to show whether the named force is a contact force or a non-contact force.

   [7]

Force	Contact	Non-Contact
friction	✓	
air resistance	✓	
gravitational		✓
upthrust	✓	
magnetic		✓
reaction	✓	
electrostatic		✓

   b. Select one word from the list below to complete the sentence. [1]
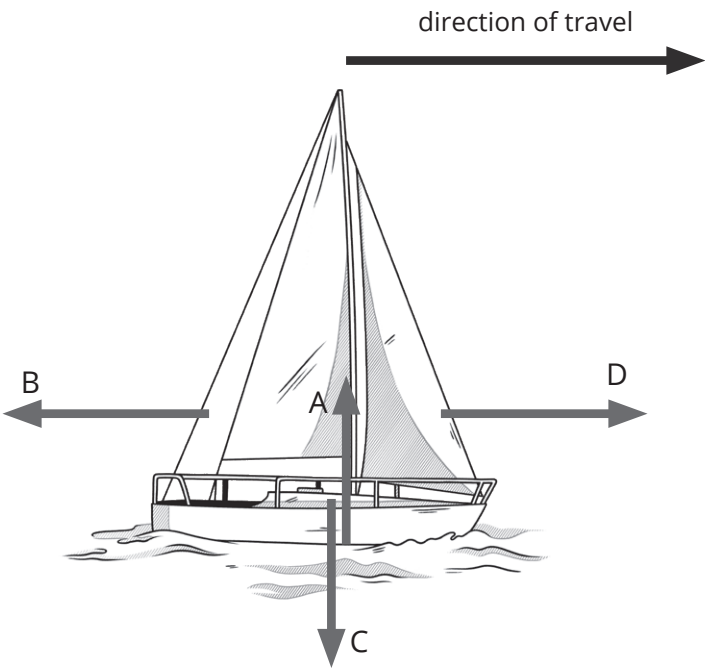
   space   fields   gravity   zones

   Non-contact forces act in **fields**, a special area where an object can experience a force.

   c. List three things that forces can do to an object. [3]

   Change the **speed** of the object.

   Change the **direction** of the object.

   Change the **shape** of the object.

2. The diagram shows a sailing boat pulling out of a harbour.

   direction of travel

   a. Give the letter of the arrow that represents upthrust. [1]

   A

b. Which force is represented by arrow B? Tick **one** box.

air resistance ✓
gravity ☐
reaction ☐
driving force ☐ [1]

c. When the boat is travelling at a constant speed in the direction shown, which two forces must be balanced?
Give **two** letters. [2]

B and **D**

d. As the boat passes out of the harbour, it accelerates (speeds up). One force is now larger than the other forces.
Give the letter of the force that is now the largest. [1]

D

3. A skateboarder is investigating the effect that different surfaces have on the motion of a skateboard. They move a ramp onto different surfaces and measure the distance that the skateboard travels from the bottom of the ramp.
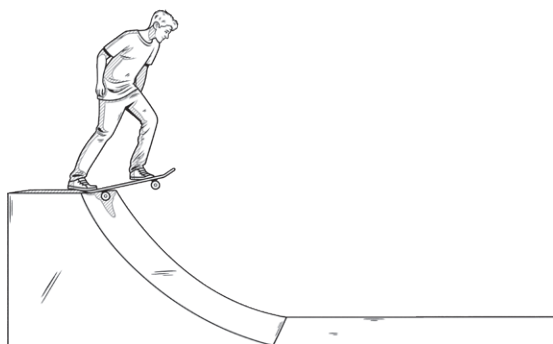
The table shows their results.

Surface	Distance Travelled (m)			
	Repeat 1	**Repeat**	**Repeat 3**	**Mean**
concrete path	8.1	8.5	8.0	8.2
paving slabs	7.5	7.4	7.6	**7.5**
wooden decking	6.7	7.3	7.0	7.0
grass	1.0	1.2	0.9	1.0
artificial grass	3.1	3.2	3.0	3.1
sand	0.5	0.4	0.4	0.4

a. Name the independent variable in this investigation. [1]

type of surface

b. Complete the table by calculating the mean distance the skateboarded travelled on paving slabs.
[1]

7.5 + 7.4 + 7.6 = 22.5
22.5 ÷ 3 = 7.5
Accept correct answer if written in the table.

c. Name a resistive force that acts on the skateboard. [1]

Any one from:

friction
air resistance

d. State two things that will happen to the skateboard as a result of the forces acting on it.

1. **The skateboard will slow down.**

2. **The wheels will heat up.** [2]

The skateboarder compared the speed of the skateboard on concrete and on artificial grass.

e. On which surface did the skateboard slow down the quickest?
artificial grass ☑
concrete ☐ [1]

f. Explain why. [3]

Award one mark for each of the following:

There is more friction on the artificial grass
Artificial grass is rougher than concrete
Artificial grass will grip the wheels of the skateboard more.

4. A student measures the weight of their school bag using the equipment shown below.
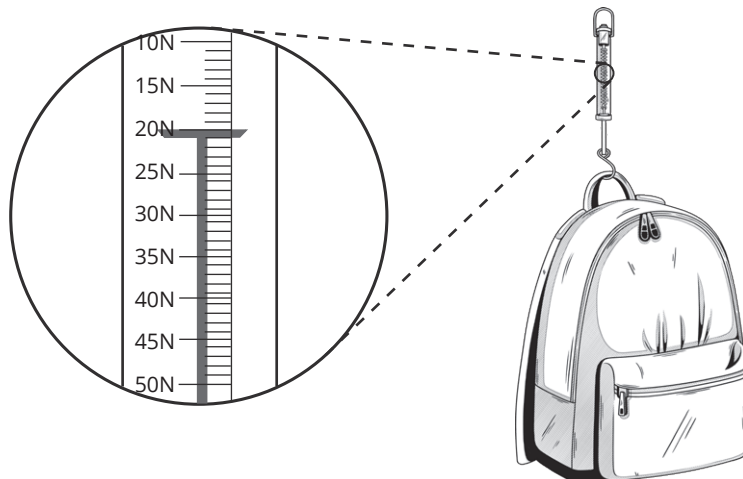

a. Name this piece of equipment. [1]

newton meter

b. Look at the diagram below.
What is the weight of the bag? [1]

Weight = **20**N

c. Write down the equation that links gravitational field strength, mass and weight.   [1]

   weight = mass × gravitational field strength

d. A second student measures the mass of their school bag as 2.3kg.

   The gravitational field strength on Earth is 10N/kg.

   Calculate the weight of the bag on Earth. Give the unit of measurement.   [2]

   2.3kg × 10N/kg = 23N

   Weight = **23 (1)**   Unit **N (1)**

   An answer of 23N with no working scores 2 marks.

   Allow error carried forward from part c. Award full marks if the equation given in part c. has been used correctly.

e. The gravitational field strength on the Moon is 1.6N/kg. Explain what would happen to the mass and weight of a bag if it was taken to the Moon.
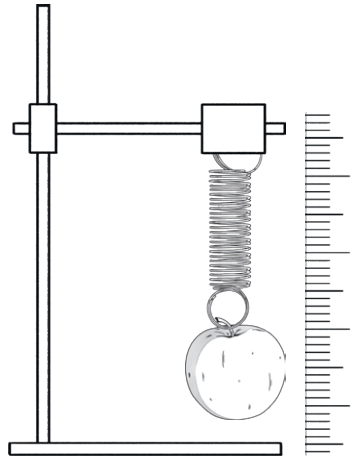
   Mass would **stay the same (1)**

   because **it is not affected by the gravitational field strength. (1)**

   Weight would **decrease (1)**

   because **the gravitational field strength on the moon is lower. (1)**   [4]

5. A student uses a spring to work out the weight of an apple. He sets up his equipment as shown below.

a. Write out the equation that links extension, force and spring constant.   [1]

   force = spring constant × extension

b. The spring constant of the spring is 27N/m. The extension of the spring is 0.07m.

   Calculate the weight of the apple. Give the unit of measurement   [2]

   27N/m × 0.07m = 1.89N

   Weight = **1.89 (1)**   Unit **N (1)**

   An answer of 1.89N with no working scores 2 marks.

   Allow error carried forward from part a. Award full marks if the equation given in part a. has been used correctly.
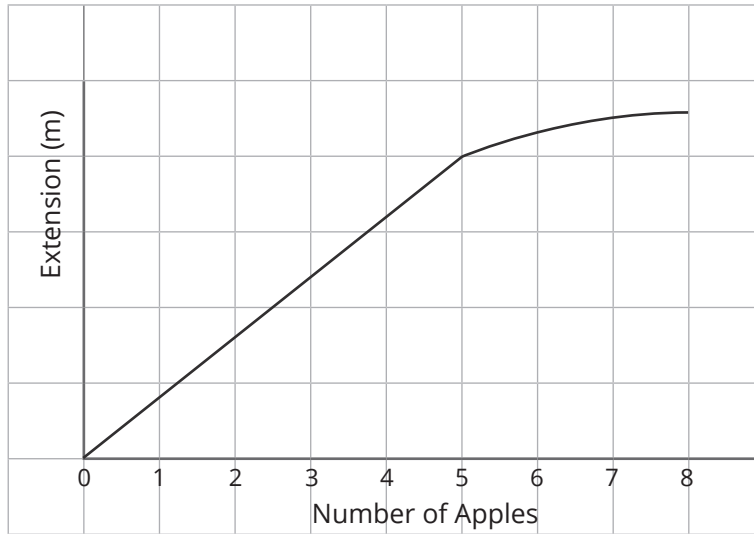
c. The student continues to add apples to the spring. It reaches its elastic limit once five apples have been added.
What is meant by the term 'elastic limit'? [1]

The spring will no longer go back to its original shape.

d. On the grid below, sketch the shape of the graph produced by the student's investigation.

[3]

Award one mark for each of the following:

a line that starts at the origin
straight line between 0 and 5 apples
line curves after 5 apples