

Mass and Weight

Exercise A

1. Write **mass** or **weight** next to each statement below to show what it is describing.

a)	The amount of 'stuff' in an object.	
b)	The force due to gravity acting on a mass.	
c)	Measured in newtons.	
d)	Measured in kilograms.	
e)	This value changes depending on the gravitational field strength.	
f)	This value stays the same when the location of the object changes.	

2. Give the direction in which a gravitational force acts.

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

a) Write down the equation which links gravitational field strength, mass and weight.

b) Calculate the weight of the objects below on Earth. Show your working.

mass = 1kg



weight = _____N

mass = 0.02kg



weight = _____N

mass = 0.06kg



weight = _____N

4. The gravitational field strength of the Moon is smaller than that of the Earth.

a) Suggest how the weight of an astronaut would be affected if they travelled to the Moon.

b) Explain your answer.

- c) An astronaut has a mass of 80kg. On the Moon, they have a weight of 128N. Calculate the gravitational field strength on the Moon.

gravitational field strength = _____ N/kg

Exercise B

1. An object has a mass of 24 890kg. The gravitational field strength on Earth is 9.8N/kg. Calculate the weight of the object. Give your answer to 3 significant figures. (3)
 2. An object on the Moon has a mass of 2.5kg and a weight of 4N. Calculate the gravitational field strength on the Moon. (3)
 3. The weight of a box of oranges is 112.7N. The box has a mass of 1.2kg when it is empty. The gravitational field strength on Earth is 9.8N/kg. Calculate the mass of the oranges. (4)
 4. The Mars rover was sent from Earth to Mars. The gravitational field strength on Earth is 9.8N/kg. The gravitational field strength on Mars is 3.7N/kg.
 - a. Explain how the weight of the rover was affected by moving from Earth to Mars. (2)
 - b. The weight of the rover on Earth is 8810.2N. Calculate the weight of the rover on Mars. (5)
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