KS3 SCIENCE · PHYSICS

Gravity and space: exam questions

Name _____
Total: 22 marks

1 State the unit of mass and the unit of weight. **[2 marks]**

2 Describe the difference between mass and weight. **[2 marks]**

3 A dog has a mass of 20 kg. The gravitational field strength on the Earth is 10 N/kg. Calculate the weight of the dog. Give the unit. **[2 marks]**

4 An astronaut has a mass of 70 kg. She travels from the Earth to the Moon, where the gravitational field strength is 1.6 N/kg. **[4 marks]**
(a) State her mass on the Moon.
(b) Calculate her weight on the Moon.
(c) Explain why she weighs less on the Moon than on the Earth.

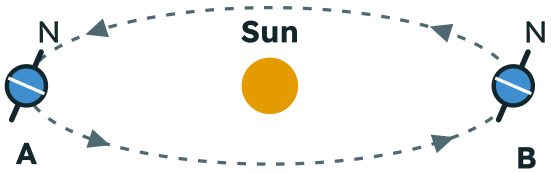
5 The size of the force of gravity between two objects depends on two things. State both. **[2 marks]**

6 Explain why the Moon stays in orbit around the Earth. **[2 marks]**

7 Write these in order of size, starting with the smallest: galaxy, planet, universe, solar system. **[1 mark]**

8 Explain why we have day and night. **[2 marks]**

9 The diagram shows the Earth at two points in its orbit, A and B. It is not to scale. N marks the North Pole. **[3 marks]**



(a) At which point, A or B, is it summer in the UK?
(b) Give two reasons why the UK is warmer in summer than in winter.

10 (a) State what a light year is. **[2 marks]**
(b) Explain why astronomers measure the distances to stars in light years and not in kilometres.

KS3 SCIENCE · PHYSICS

Gravity and space: mark scheme

Total: 22 marks

1 [2 marks]

- Mass: kilogram (accept: kg) **(1)**
- Weight: newton (accept: N) **(1)**

2 [2 marks]

- Mass is the amount of matter in an object **(1)**
- Weight is the force of gravity on the object (accept: the pull of gravity on it) **(1)**

3 [2 marks]

- 20 × 10 = 200 **(1)**
- Unit: N (accept: newtons) **(1)**

4 [4 marks]

- (a) 70 kg **(1)**
- (b) 70 × 1.6 **(1)**
- (b) 112 N **(1)**
- (c) The Moon has less mass than the Earth, so its gravity is weaker (accept: the gravitational field strength is smaller on the Moon) **(1)**

5 [2 marks]

- The masses of the objects **(1)**
- The distance between them **(1)**

6 [2 marks]

- The Earth's gravity pulls the Moon towards the Earth **(1)**
- Without this force the Moon would move away in a straight line (accept: the pull keeps bending the Moon's path into an orbit) **(1)**

7 [1 mark]

- Planet, solar system, galaxy, universe **(1)**

8 [2 marks]

- The Earth spins on its axis (accept: the Earth turns once every 24 hours) **(1)**
- The half that faces the Sun has day, and the half that faces away has night **(1)**

9 [3 marks]

- (a) A **(1)**
- (b) The Sun is higher in the sky, so its light is more concentrated (accept: the sunlight is more direct, or it is spread over a smaller area) **(1)**
- (b) The days are longer, so there are more hours of sunlight **(1)**

Do not accept "the Earth is closer to the Sun". The Earth is closest to the Sun in January.

10 [2 marks]

- (a) The distance that light travels in one year **(1)**
- (b) The distances are so big that the numbers in kilometres would be too large to work with easily **(1)**