

# 1

## 1 Part 1 Checkpoint Revision (Route A)

**Activate**  
for AQA

### Task 1

In this task you are going to calculate the weight of an astronaut if they were to stand on the surface of each of the planets in the solar system. Also rank the planets in order according to the weight of the astronaut (Heaviest = 1).

Fill in your answers in the table. There is space below for your working out.

Name of planet	Mass of astronaut (kg)	Gravitational field strength (N/kg)	Weight (N)	Rank
Mercury	70.0	3.7		
Venus	70.0	8.9		
Earth	70.0	10		
Mars	70.0	3.7		
Jupiter	70.0	23.1		
Saturn	70.0	9.0		
Uranus	70.0	8.7		
Neptune	70.0	11.0		

**Task 2**

In the space below draw a force diagram to show gravity acting on a planet orbiting a star.



What effect does the force of gravity have on the planet?

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**Task 3**

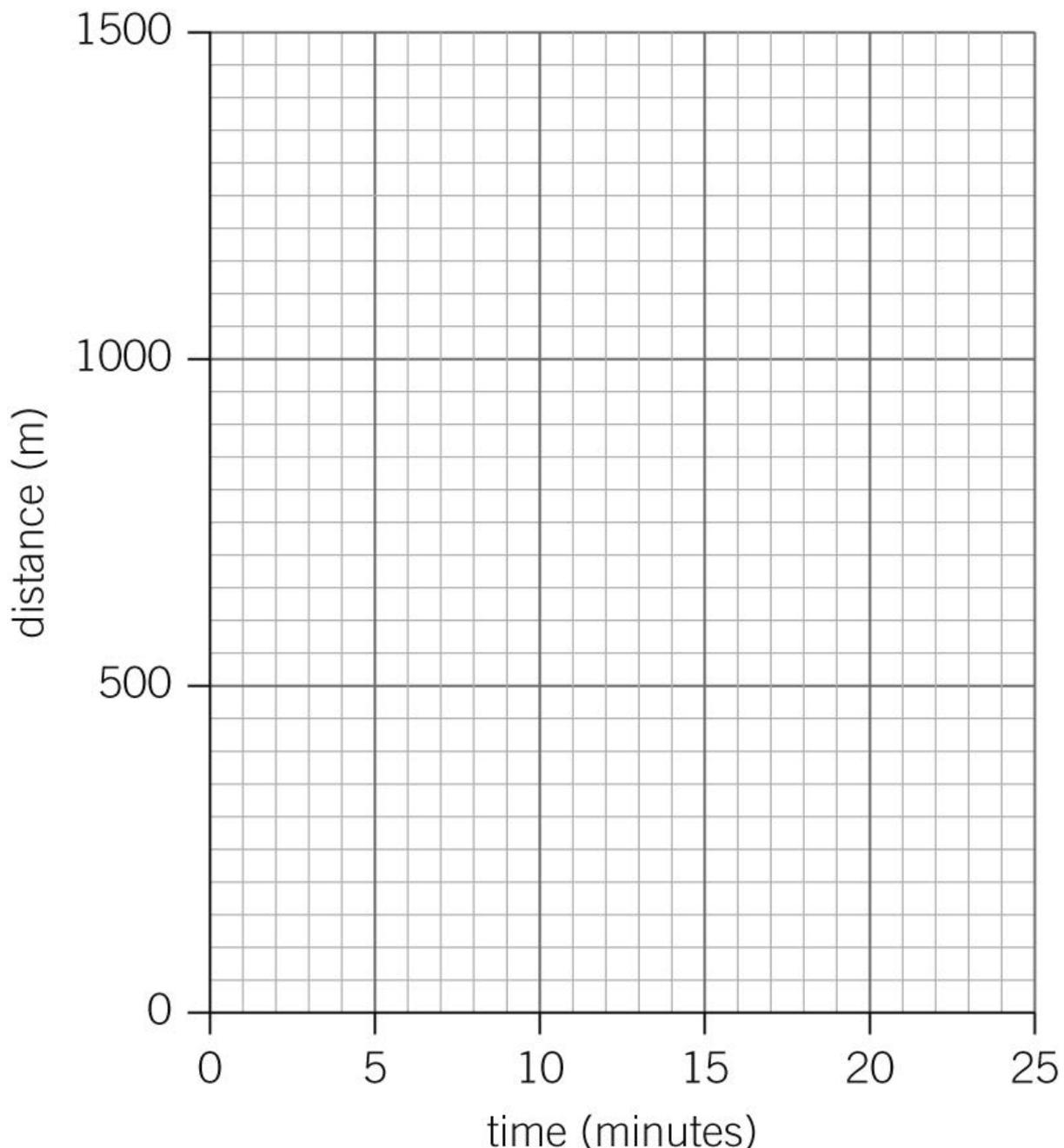
Circle the correct bold word to complete the sentences about relative motion.

- 1 The national speed limit for a car on a motorway and dual carriageway is 70 m.p.h. This means a car travelling at the national speed limit on a motorway appears to be travelling at 70 m.p.h. to a **stationary/moving** observer.
- 2 If a heavy goods vehicle is travelling in the same direction as the car, the speed the HGV driver views the car travelling at appears **slower/faster** than the speed of the car as observed by the stationary observer.
- 3 If a motorbike is travelling in the opposite direction to the car, the speed the rider views the car travelling at appears **slower/faster** than the speed of the car as observed by the stationary observer.

**Task 4**

Read the following description of Sally's walk home from school and draw a distance–time graph of the journey using the axes on the last page.

Sally leaves school and walks for 3 minutes to the set of traffic lights that are 250 m away. She waits for 1 minute for the lights to change before she crosses the road. She walks for another 6 minutes to the shop, which is 500 m away from the traffic lights. She stops outside the shop for 4 minutes to talk to her friend. Sally realises that she is late returning home, so she increases her speed to 100 metres per minute and briskly walks the final 700 m home.



**Task 5**

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

The gravitational field strength of the Moon is 1.6 N/kg.

The gravitational field strength on Mars is 3.7 N/kg.

Astronauts have visited the Moon, but they have not been to Mars. Apart from the increased distance between the Earth and Mars, another problem would be launching from the surface of Mars to come home.

1 Explain why it will be more difficult to lift off from Mars than the Moon?

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2 It is easier to lift off from the Moon than from Earth.

Explain why **and** suggest how it is possible for rockets to lift off from Earth.

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