

Forces Motion

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

A book sits on a table. Are the forces on it balanced?

Step 1 · Forces

Weight acts down; the table pushes up with the reaction force.

Step 2 · Motion

The book is not moving and stays still.

Answer: Yes — balanced (resultant = 0)

Check: Balanced forces do not mean 'no forces'.

2. Now try one with the steps

A car's driving force is 3000 N and resistance is 1800 N. What happens?

Step 1 · Resultant

Step 2 · Effect

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What are balanced forces? [1]

2. What happens to a stationary object when the forces on it are balanced? [1]

3. What happens to a moving object when the forces on it are balanced? [1]

4. A car's driving force is 2000 N and the resistive forces total 2000 N. Describe its motion. [1]

5. A car's driving force is 3000 N and resistance is 1800 N. What is the size of the resultant force, in newtons? [1]
- _____
- _____
6. What happens to a moving car if the resistive forces are bigger than the driving force? [1]
- _____
- _____
7. Explain why a football rolling across grass slows down and stops. [2]
- _____
- _____
8. A cyclist pushes forwards with 150 N. Air resistance is 90 N and friction is 40 N. What is the resultant force, in newtons? [2]
- _____
- _____
9. Just after jumping from a plane, why does a skydiver speed up? [2]
- _____
- _____
10. Explain why a skydiver eventually falls at a steady speed. [3]
- _____
- _____
- _____
11. When the parachute opens, the skydiver slows down. Explain why. [2]
- _____
- _____
12. What is needed to make a moving object change direction? [1]
- _____
- _____
13. A space probe in deep space switches its engines off. There is no air and almost no gravity. Describe its motion. [2]
- _____
- _____
14. A lift weighs 5000 N. The cable pulls up with 5400 N. What is the size of the resultant force, in newtons, and which way does it act? [2]
- _____
- _____

4. Before you hand it in

"If the forces are balanced, the object must be still."

A moving object with balanced forces keeps moving at the same speed and direction.

"A moving object needs a force to keep it moving."

A force is needed to change motion. Without friction or drag, a moving object would keep going.

"Steady speed means no force is acting."

A car at a steady 70 mph has a large driving force balanced by air resistance and friction.

Forgetting that turning needs a force.

Any change in speed OR direction needs an unbalanced force.