

# TOPIC 23.5.1

## BALANCED AND UNBALANCED FORCE

(FORCE = MASS X ACCELERATION)



★ **STEP 1: Click on the video below before answering the questions**



★ **STEP 2: Answer the following questions**

1) Choose the correct formula to calculate resultant force:

- A.  $F = F \times a$
- B.  $F = m \times a$
- C.  $a = F \times m$
- D.  $m = F \times a$

ANSWER

2) Choose the correct formula to calculate mass of an object:

- A.  $m = F \times a$
- B.  $m = a \div F$
- C.  $m = F \div a$
- D.  $m = m \times a$

ANSWER



3) State the most suitable unit for acceleration:

- A.  $\text{g/cm}^3$
- B.  $\text{N/kg}$
- C.  $\text{Km/s}^3$
- D.  $\text{Nm}$

ANSWER



4) A car of mass 1800 kg is brought to a halt.

The deceleration is  $2 \text{ m/s}^2$ .

What is the size of the force bringing the car to a halt?

- A.  $F = \frac{m}{a} = \frac{1800}{2} = 900 \text{ N}$
- B.  $F = \frac{a}{m} = \frac{2}{1800} = 0.001 \text{ N/kg}$
- C.  $F = m \times a = 1800 \times 2 = 3600 \text{ N}$
- D.  $F = m \times a = 1800 \times 2 = 3600 \text{ N/kg}$

ANSWER

5) A car has a mass of 840 kg.

The gravitational field strength  $g$  on Earth is  $10 \text{ N/kg}$ .

Calculate the force of the car.

- A.  $F = \frac{m}{a} = \frac{840}{10} = 84 \text{ N}$
- B.  $F = \frac{a}{m} = \frac{10}{840} = 0.02 \text{ N/kg}$
- C.  $F = m \times a = 840 \times 10 = 8400 \text{ N}$
- D.  $F = m \times a = 840 \times 10 = 8400 \text{ N/kg}$

ANSWER

6) A car has an acceleration of  $2.5 \text{ m/s}^2$ .

The force accelerating the car is  $3750 \text{ N}$

Calculate the mass of the car.

- A.  $m = \frac{F}{a} = \frac{3750}{2.5} = 1500 \text{ kg}$
- B.  $m = \frac{a}{F} = \frac{2.5}{3750} = 0.0007 \text{ kg}$
- C.  $m = F \times a = 3750 \times 2.5 = 9375 \text{ kg}$

ANSWER



- 7) A runner has a mass of 70 kg. At one time, the accelerating force produced by the runner is 175 N.

Calculate the acceleration of the runner  
(no need to show your working)

ANSWER =



- 8) A runner has a mass of 100 kg. At one time, the accelerating force produced by the runner is 95 N.

Calculate the acceleration of the runner  
(no need to show your working)

ANSWER =

- 9) The car has a mass of 1200 kg.

Calculate, in newton, the force needed to give the car an acceleration of  $0.3\text{m/s}^2$ . (no need to show your working)

ANSWER =

- 10) On Earth, a spacecraft has a weight (force) of 50 000 N.

The gravitational field strength at the Earth's surface is  $10\text{N/kg}$ .

Calculate the mass of the spacecraft.

(no need to show your working)

ANSWER =

★ **STEP 3:**

Click the button "FINISH" at the end of the paper after you have answered all the questions. Please type in your FULL NAME.