**Joseph Banks Secondary College**

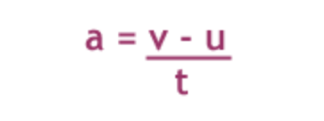
Year 9 Science: Space Academy

****

**Assessment type:** Test – Calculating the motion of objects

**NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Formula List:**



Acceleration:

Velocity: V = u + at

Displacement: S = ut + 0.5 x at2

For the above formulas the following values are apply:

a = acceleration (m/s)

u = initial/starting velocity (m/s)

v = final velocity (m/s)

t = time (seconds)

**Example:**

A horse accelerates steadily from rest at 4m/s2 for 3 seconds. What is its final velocity and how far has it travelled?

Initial Velocity: U = 0 m/s

Acceleration: a = 4m/s2

Final Velocity: V = ?

Time: t = 3 seconds.

To calculate final velocity we use V = u + at.

V = 0 + 4 x 3

V = 12 m/s

To calculate displacement we use S = ut + 0.5 x at2

S = 0 x 3 + 0.5 x 4 x 32

S = 0.5 x 36

S = 18m

Question 1:

A stone drops off a bridge which is 35 metres high. It takes 4.5 seconds to fall the distance. Find the speed with which the stone hits the river below.

Question 2:

An airplane accelerates down a runway at 3.20 m/s2 for 32.8 s until is finally lifts off the ground. Determine the distance travelled before take off.

Question 3:

A car starts from rest and accelerates uniformly over a time of 5.21 seconds for a distance of 110 m. Determine the acceleration of the car.

Question 4:

Mr Cooper is riding the Giant Drop at Dreamworld. If Mr Cooper free falls for 3.6 seconds, what will be his final velocity and how far will he fall?

Question 5:

A race car accelerates uniformly from 18.5 m/s to 46.1 m/s in 2.47 seconds. Determine the acceleration of the car and the distance travelled.

Question 6:

Rocket-powered sleds are used to test the human response to acceleration. If a rocket-powered sled is accelerated to a speed of 444 m/s in 1.83 seconds, then what is the acceleration and what is the distance that the sled travels?

Question 7:

A car traveling at 22.4 m/s skids to a stop in 2.55 s. Determine the skidding distance of the car (assume uniform acceleration).