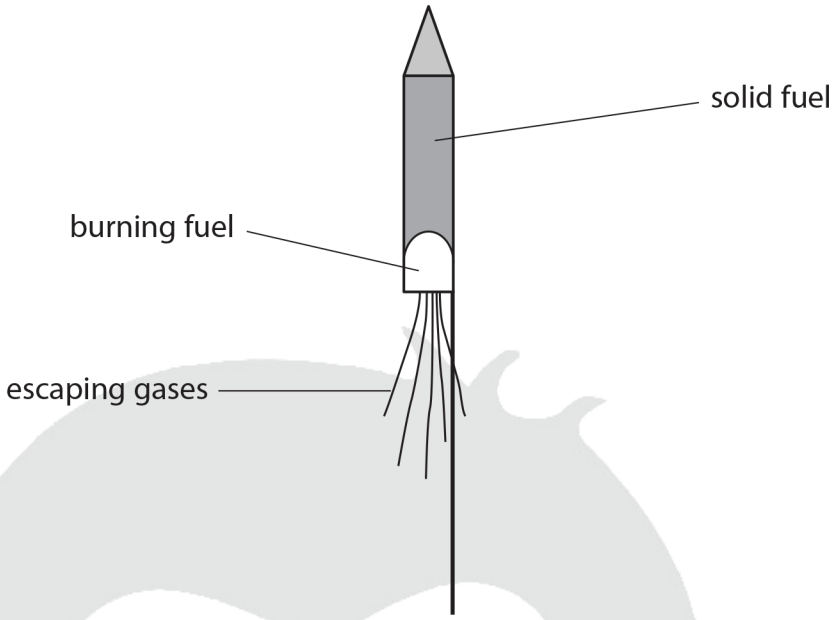
Work Sheet- 06

Date: 15/04/2020

1 (a) A firework rocket contains a solid fuel inside a cardboard tube.

The burning of the fuel creates a thrust to propel the rocket upwards.



(i) Scientists can refer to several different quantities when describing the motion of the rocket.

mass	gy	spe	orce

Only one of these quantities is a vector.

Complete this sentence using **one** of the words from the box.

(1)

The vector quantity is .....

(ii) Before the fuse is lit, the total weight of a rocket including fuel is 0.7 N.

The gravitational field strength is 10 N/kg.

Complete the sentence by putting a cross (☒) in the box next to your answer.

The total mass of the rocket including fuel is

(1)

☐ **A** 0.007 kg

☐ **B** 0.07 kg

☐ **C** 0.7 kg

☐ **D** 7 kg

Course Instructor: Farabi Fardin
E-mail: frbfardin@gmail.com

(iii) There is a resultant force on the rocket of 0.5 N upwards when it takes off.

The arrow on the diagram shows the size and direction of the force of gravity acting on the rocket when it takes off.

Add another arrow to the diagram to show the thrust produced by the burning fuel at the time the rocket takes off.

You should label the arrow with the size of the thrust.

(2)

(b) Another rocket has a total mass of 90 g when it takes off.
The acceleration of the rocket when it takes off is 3.3 m/s^2.

(i) Calculate the resultant force on the rocket when it takes off.

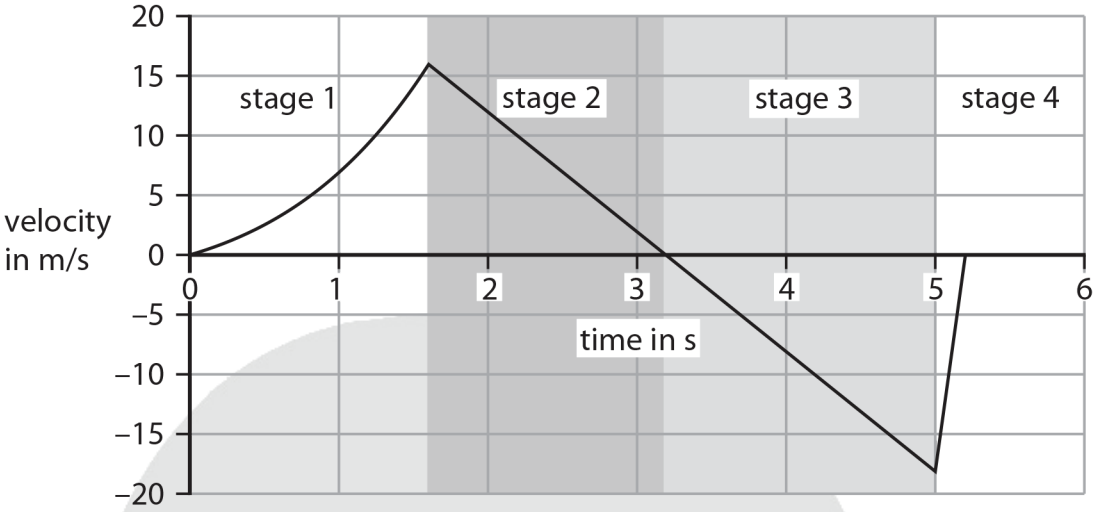
(2)

resultant force = ... N

*(ii) The rocket contains 50 g of fuel when it takes off.
The fuel burns and the rocket rises vertically.
After a while, there is no fuel left.
Eventually the empty rocket falls back to the ground.

The graph is a velocity–time graph for the rocket.

Four stages are labelled on the graph.



Explain why the velocity of the rocket changes as shown in the graph.

(6)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....