

The forces of model rocketry (junior science)

Questions

1) Three forces predominantly act on a model rocket

- a) Thrust
- b) Drag
- c) Gravity (weight)

i. How does the rocket create thrust?

ii. How does a rocket create drag?

iii. How can the force of gravity be minimised?

iv. What force or forces act against thrust?

v. How does the force of drag change with the speed of the rocket?



2) Which of the three forces mentioned above is a contact force and which are non-contact forces?

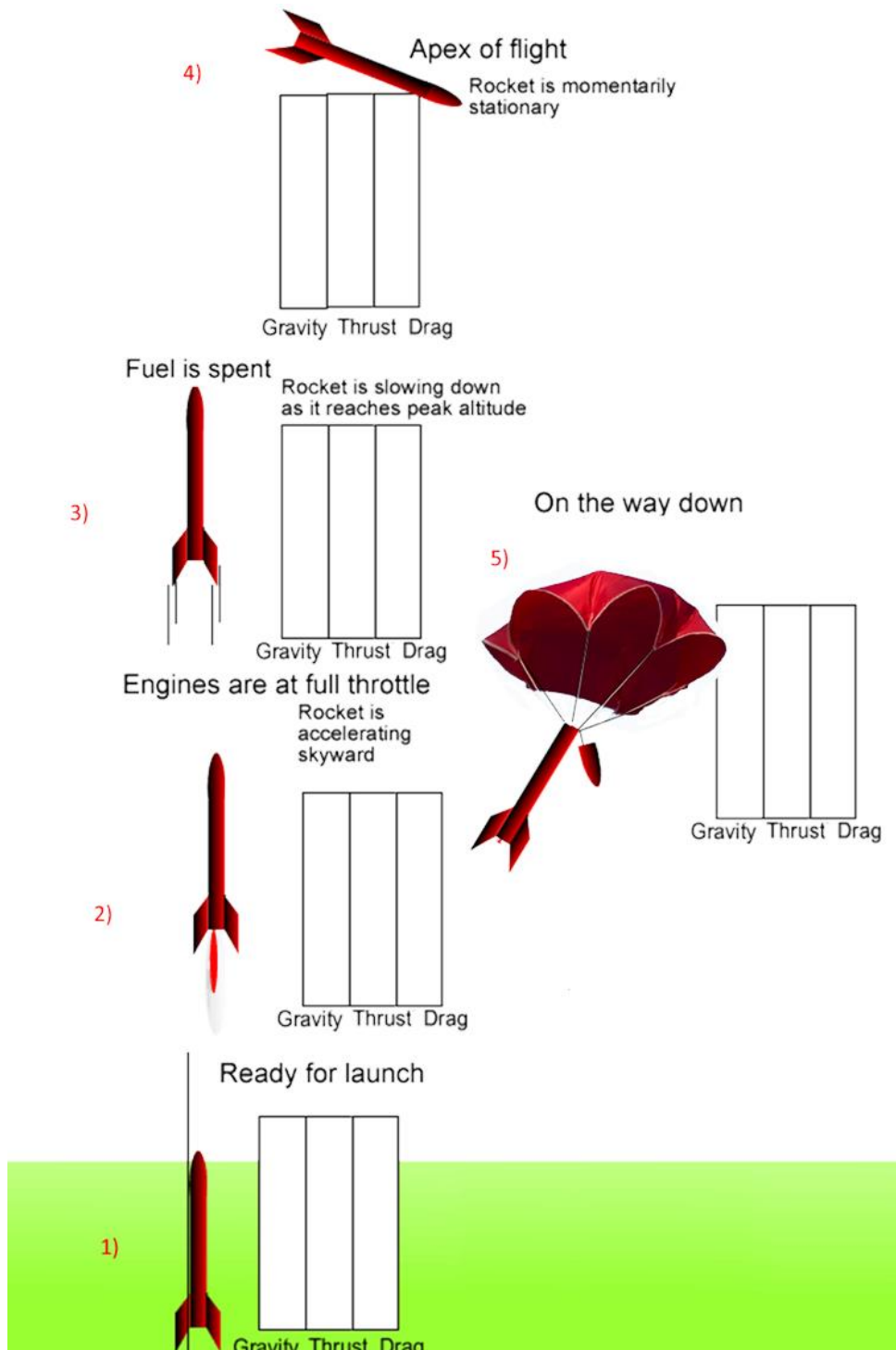
3) By shaping the nose cone, as shown on the right, the student building the rocket is trying to maximise the height reached by their rocket. Explain how?



4) How do I know that an unbalanced force is acting on this rocket?



- 5) Consider the 5 stages of a model rocket flight shown below.
- Shading the bar to show the intensity of each force during each stage of flight.
 - At which stage during flight is drag an unwanted force? Explain
 - At which stage during flight is drag a necessary force? Explain



Some “How”, “Why” and “What if” questions for students to consider before construction and launch.

In an attempt to construct a rocket that travels to its highest altitude possible and takes the longest time to descend with a parachute, encourage students to formulate questions and attempt to answer them by using some scientific reasoning gained through research or enquiry. Some examples are given below.

Will my rocket go higher and be just a stable in the air with 3 fins as opposed to 4 fins?

Are thin rockets better than wide bodied rockets?

I see other rockets with different shaped nose cones. How will the shape of my nose cone allow my rocket to travel higher than the others?

How will the parachute be deployed?

Are bigger parachutes better?

How does sanding and shaping the fins influence the height my rocket will achieve?

