we the curious
Show

Launch It KS2 + KS3 duration: 30 minutes

How do rockets make it all the way into space? Discover the story of Yuri Gagarin, the first person to travel into space. With whizzes, bangs, and rockets, this loud and exciting show investigates forces and explosions.

Key Words:

Forces, Space, Rocket science, Balanced and unbalanced forces, Gravity, Friction, Air resistance, Newton.

Learning objectives. Students will:

Learn about the forces, gravity, air-resistance, friction, and the principles of rocket motion.
Recognise that gravity pulls our mass towards the center of Earth resulting in a downward force.
Understand an object will not change its current speed and direction unless an external force acts on it (Newton's first law).
Observe that for every reaction there is an equal and opposite reaction (Newton's third law).
Observe that friction results in heat which can be observed through an infrared camera.
Recognise that in a rocket, there must be sufficient thrust to overcome the force of Earth's gravity.
Appreciate the significance of the first human being in space.

Content. Students will:

Discover the story of Yuri Gagarin, the first person to travel into space.
Investigate the force of gravity with a force plate and high-speed camera.
Observe air resistance demonstrated with a wind turbine and smoke machine (KS2) or wind tunnel and smoke machine (KS3).
Explore friction using an Infrared camera.
Have the opportunity to volunteer for many activities, including standing on the force plate, being a test pilot in a purple truck, and launching a vitamin C rocket.
See a hydrogen balloon reaction with oxygen and release lots of energy.
Experience a hydrogen rocket launch.
Engage in discussion and volunteer answers to questions.

Curriculum Links:

KS2
Working scientifically:
Using straightforward scientific evidence to answer questions.
Explore ideas and raise different kinds of questions, use relevant scientific language, communicate, and justify their scientific ideas.
Year 3: Forces and magnets
Compare how things move on different surfaces. Notice that some forces need contact between two objects.
Year 5: Forces
Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and gravity and the falling object.
Identify the effects of air resistance and friction that act between moving surfaces.
KS3
Physics: Forces
Forces as pushes and pulls arising from the interaction between two objects.
Balanced and unbalanced forces represented using force arrows.
Forces associated with friction between surfaces, resistance to motion of air and water.
Forces measured in Newtons.

Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion.

Potential Hazards and accessibility

Students are seated at a safe distance from the various loud bangs and explosions from a hydrogen rocket.
Possible trip hazard for volunteers stepping onto the force plate.
Some volunteer students will be pushed in small trucks.