

1.2 Energy to burn

Lesson outcomes

At the end of this activity students will be able to:

- share their ideas about what types of energy are visible during a rocket launch
- recognise that various changes indicate energy is involved
- identify that energy can be transformed.

What ideas might your students already have?

- students may be unfamiliar with identifying energy in everyday situations.
- students may associate energy only with living things.
- students may associate energy only with movement.
- students may equate energy only with fuel.

Key vocabulary:

Kinetic energy, gravitational potential energy, chemical energy, energy transfer.

Equipment list

Each CLASS will require:

- *Student Digital*

Each STUDENT will require:

- *Notebook*

Things to consider

Some forms of energy students might mention may overlap, such as movement (bulk movement of the rocket) and vibration. These are obvious examples of kinetic energy, but are different. Accept all different suggestions.

This activity should engage students, so allow their ideas free range. They should feel good at identifying when energy is at work.

Teacher content information

Forms of energy that could be identified include:

- sound
- light
- heat
- movement (kinetic energy)
- falling down (ice falling as it breaks away from the rocket)
- gaining height (escaping gravity; potential energy)
- gaining speed
- vibrations (one astronaut talks about this)
- electricity (there were many cables disconnecting and mention of switches)
- burning chemicals (lots of smoke)
- ice melting.

Lesson plan

Step 1: Ask the whole class what they think energy looks like. How can they tell if they are seeing energy? They may successfully identify situations where change is occurring. They may also identify some accepted forms of energy.

Note suggestions on the board and save for later referral.

Step 2: Tell students they will see a video of an historic rocket launch, Apollo 11 in 1969. Although the video might seem to them very old, it still shows the most powerful engine ever built. This is a good video as it involves obviously large amounts of energy.

Students should work in groups of two to four; whatever is convenient in your classroom.

In their **Notebook** students should write all energy examples. You can show the video twice for students to expand their lists.

Step 3: Run a small competition. Each group, in turn, offers one energy example from the video. Record them on the board, allocating one point for each new **Notebook** example.

Each group must offer a new example. On successive rounds it will be harder to find new examples.

Step 4: Teacher-led discussion. Ask students if they noticed that energy made things happen or produced changes. For example, light and sound where there was none before, movement, gaining height, shaking and chemical reactions.

Help students summarise identified types of energy.

- movement (kinetic energy); could include vibrations
- light
- sound
- heat
- chemical
- gaining height (also called gravitational potential energy)