**ACTIVITY: Introduction to rockets and space**

**Activity idea**

In this activity, students view a slide show presentation introducing some rockets, their purposes and distances travelled in space.

By the end of this activity, students should be able to:

* describe some rockets and their purpose
* begin to think about what they already know about rockets and space and what they want to find out
* describe the relative distances and sizes of the Earth, the atmosphere, the Moon and the Sun and relate this to distances travelled by some rockets.

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**Introduction/background**

Rockets have been used for hundreds of years. Over the last 60 years, they have been used increasingly to explore our atmosphere and space. Many uses have been beneficial for people, such as placing satellites into orbit. These satellites have been for such things as scientific investigation, weather monitoring or communication. Other rockets have been used to take people and probes towards the Moon and some probes deeper into space to explore asteroids, planets and the outer reaches of the solar system.

This slide show presentation is a chance to get some students thinking about the role of rockets and some of the things they have been used for. It is also a good opportunity for students to think about relative distances in space as they think about how far some rockets travel. A 10 cm model of the Earth is introduced and students are encouraged to think about relative sizes of and distances to:

* the thickness of the atmosphere/beginning of space
* the Moon
* the Sun.

Students are encouraged to record their own questions and to research answers to these.

**What you need**

* Access to the [Rockets and space](https://www.sciencelearn.org.nz/resources/402-introduction-to-rockets-and-space) slide show presentation
* 10 cm diameter ball as model of Earth
* Large size Oddfellows mints as models of the Moon (alternatively use a 2.5 cm ball)
* Post-it notes (a few for each student)
* Launch footage such as the [Space Shuttle launch](https://www.youtube.com/watch?v=4FROxZ5i67k), [*Juno* launch](https://www.youtube.com/watch?v=mYtDZ5Btp-A#t=27), [SpaceX launch of the Falcon Heavy](https://www.youtube.com/watch?v=99llRhH71vA), [Rocket Lab *Electron* launch](https://www.youtube.com/watch?v=sPcsZgmTRrg) or the launch scene from the film *Apollo 13* (at approximately 33 minutes)

**What to do**

1. Introduce the topic. Explain that, if students think of any questions during the session, they should write it on a Post-it note. These will be placed on the ‘What we want to know’ wall at the end of the lesson.
2. Show launch footage – [Space Shuttle launch](https://www.youtube.com/watch?v=4FROxZ5i67k), [*Juno* launch](https://www.youtube.com/watch?v=mYtDZ5Btp-A#t=27), [SpaceX launch of the Falcon Heavy](https://www.youtube.com/watch?v=99llRhH71vA), [Rocket Lab *Electron* launch](https://www.youtube.com/watch?v=sPcsZgmTRrg) or scene from *Apollo 13* (33 minutes).
3. Show the first part of the [Rockets and space](https://www.sciencelearn.org.nz/resources/402-introduction-to-rockets-and-space) side show up to and including the slide on the International Space Station. Encourage students to provide information about each of the rocket slides before clicking to reveal information. You may like to include additional rocket images or video footage from the NASA, ESA or other websites.
4. Show the second part of the slide show including the slides on distances in space. As you do this, hold up a 10 cm model of the Earth. For each of the following, ask students to vote on what they think the correct answer is (one vote per student). As you slowly move a pencil tip away from the surface of the Earth, have each student vote once by putting their hand up when they think your pencil is at the correct position.

* Earth’s atmosphere.
* Beginning of space.
* Altitude of the International Space Station.
* Size of the Moon (use a large mint).
* Distance to the Moon (have one student hold the mint and slowly walk away from the Earth while students use their one vote when they think it is at the correct relative distance (3 m).
* Size of the Sun (10 m – approximate size of classroom).
* Distance to the Sun (just over 1 km away – relate this to a known landmark from your classroom).

1. Ask what questions students have about rockets and space. Share these with the class. Add any extra questions on Post-it notes and then place all of these on the classroom wall.

**Extension ideas**

* Show some other rocket launch videos.
* Choose any question(s) of interest and research to find the answer and report back to the class, for example, what is your favourite Hubble Space Telescope image?
* A suggested follow-up lesson activity is [Effervescent canister rockets](https://www.sciencelearn.org.nz/resources/405-effervescent-canister-rockets).