Teacher Resource

Asteroid YR4

Focus Questions

Discuss the BTN story as a class and record the main points of the discussion. Students will then respond to the following:

1. How did asteroids form?
2. What two planets can most of the solar system's asteroids be found between?
3. What is the difference between an asteroid, meteoroid and a comet? Create a Venn diagram.
4. What asteroid hit Earth in 1908?
    a. The Chicxulub event
    b. The Popigai event
    c. The Tunguska event
5. It is possible for scientists to redirect asteroids. True or false?

Activity: See, Think and Wonder?

After watching the BTN Asteroid YR4 story, students will respond to the following questions:

- What did you SEE in this video?
- What did you LEARN from this story?
- What do you WONDER about this story?
- What QUESTIONS do you have about this story?

Activity: Q&A

Are you curious about asteroids? Students will make a list of questions they have about the BTN Asteroids YR4 story. Students will use the internet to find answers to their questions and share their findings with the class.

"How do we spot near earth asteroids?" – Watch this NASA explainer to find out how.

EPISODE 5
4 March 2025

KEY LEARNING
Students will learn about asteroids and how they move in space.

CURRICULUM
Science – Year 5
Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives.

The Earth is part of a system of planets orbiting around a star (the sun).

Science – Years 5 & 6
Scientific knowledge is used to solve problems and inform personal and community decisions.

Science – Year 6
The growth and survival of living things are affected by the physical conditions of their environment.

Science – Year 7
Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon.
Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available.

Activity: Orbits

Start this activity by asking your students “How do planets and asteroids move in space? What do you think it means for something to orbit?”. Discuss as a whole class or in small groups and then share and record your students’ ideas. Introduce your students to the following concepts in the context of asteroids and orbital paths to help in their understanding of asteroids and how they move through space. Start a class glossary about asteroids.

Trajectory | Orbital plane | Asteroid belt | Velocity

Elliptical path | Revolve | Rotate | Gravitational pull

Explain to students that planets and asteroids follow paths around the sun and introduce the term “orbital plane” - the imaginary flat surface in space in which an asteroid's orbit lies. Students will conduct their own research into how asteroids move in space using one of the following research questions or developing their own question.

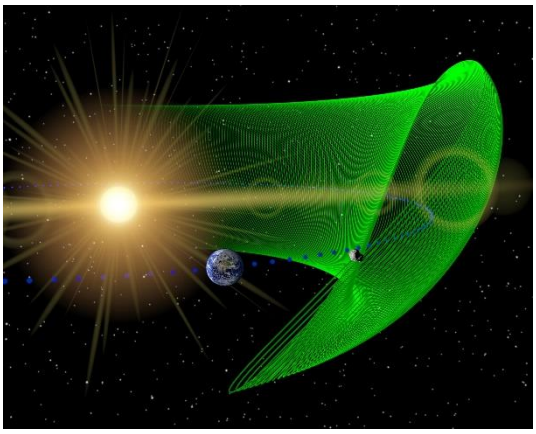
- Where can you find asteroids?
- Which two planets can most asteroids be found between?
- What do asteroids orbit?
- What is the shape of an asteroid’s orbit path?

Students will find a creative way to illustrate the orbital path of asteroids. Below are some examples of spirograph art to represent orbits that asteroids might follow.

Asteroid art

Students can use spirographs to show the movement of asteroids in space. Students can illustrate the elliptical orbits asteroids might follow within an orbital plane.

Represent the positions of the Sun, Earth, and Moon within the spirograph “orbits”. Use different spirograph shapes to represent differnet planets’ orbit within the solar system.



Trojan Asteroid Shares Orbit with Earth (Artist Animation) (*Source: NASA*)

Activity: Modelling the orbits of planets

In this NASA lesson, students explore the relationship between the masses of objects and the orbits they follow. They will make predictions and try to model different orbital scenarios using a gravity well model constructed in class.

Before starting this activity introduce and explain the following concepts to your students. Add these words to your class glossary about asteroids.

Gravity	Gravitational force	Mass	Velocity
Gravity well	Space-time	Orbital path	Gravitational pull

NASA Lesson

Modelling the orbit of planets

Grade levels: 6-12

Duration: 30-60 mins

Place a mass in the centre of the hoop. (*Source: NASA*)

A small sphere is pushed into orbit around the central mass. (*Source: NASA*)

Activity: Asteroid Belt

Begin this activity by asking your students “Have you ever wondered why the asteroid belt is between Jupiter and Mars? As a class or in small groups students will then investigate one or more of the following questions to learn more about the asteroid belt and how it formed.

- How did the asteroid belt form?
- When was it formed?
- What is it made of?
- What does it look like?
- What is the largest asteroid in the asteroid belt?
- Why are most asteroids found between Mars and Jupiter?
- What other questions do you have about the asteroid belt?

Students will then create their own visual representation of the asteroid belt.

Asteroid Belt Art Activity (*Source: Brainly Beginnings*)

Make a 3D poster of the solar system (bird’s eye view, A3 size) which includes the following elements. The sun, planets, asteroid belt, and orbital paths. What materials will you use to represent each feature (for example, foam balls, small rocks)? Add labels and a title to your poster.

Activity: Modelling Asteroids

Class discussion

Begin the lesson by asking the students what they know about asteroids and write their responses on the class whiteboard. The objective of this activity is to learn about the formation of asteroids, their composition, the location of asteroids and to create asteroid models. As a class look at images of asteroids. Ask students what they notice about their shape and their surface. Students will brainstorm in small groups and then share with the class.

Hands-on Activity

Use the following to help guide students' in creating their own asteroid. Encourage students to be creative but emphasise that their models should reflect their understanding of asteroids.

Step-by-step activity for students:

- Collect a range of materials that you can use to create your own asteroid model. For example, plasticine or clay, small rocks or pebbles, sand, beads, and aluminium foil.
- Make your asteroid using the materials you have collected. Add details like craters or other surface features.
- Give your asteroid a name! Write a report about your asteroid and include an explanation about why you chose the materials and design for your asteroid. Include the following in your report: origin of name, dimensions, mass, shape, composition, classification, distance from the Sun. Describe any interesting features about your asteroid.
- Present your asteroid model to the class. Present using Prezi or Canva.
- Hang your asteroid models in the classroom and create your own classroom asteroid belt. Consider adding the planets in the solar system to show where the asteroid belt is positioned in the Solar System.

Refer to this NASA Classroom Activity on Modelling an Asteroid.

Creative story writing

Once the asteroid is made, have students write a short creative story, which describes the asteroid's journey through space, where and when it originated and any interactions with planets.

Useful Websites

- Incoming Asteroid – BTN Newsbreak
- Asteroid Mining – BTN
- Australian space scientists play crucial role in monitoring 2024 YR4 asteroid that could hit Earth in 2032 – ABC News
- Asteroids – NASA
- Asteroid Watch – NASA