

Teacher Resource

Space Junk

Focus Questions

1. Retell the BTN *Space Junk Clean-up* story using your own words.
2. What is the name of the first satellite launched into space?
3. What year was the first satellite launched in Earth's orbit?
4. What type of space junk can be found orbiting Earth?
5. How many pieces of space junk the size of a marble or bigger is orbiting Earth?
6. How might a disaster involving space junk affect humans on Earth?
7. What does the RemoveDEBRIS junk collector look like? Describe.
8. How does the RemoveDEBRIS junk collector collect and remove space junk?
9. What will happen to the RemoveDEBRIS junk collector once it has completed its mission?
10. Illustrate an aspect of the *Space Junk Clean-up* story.

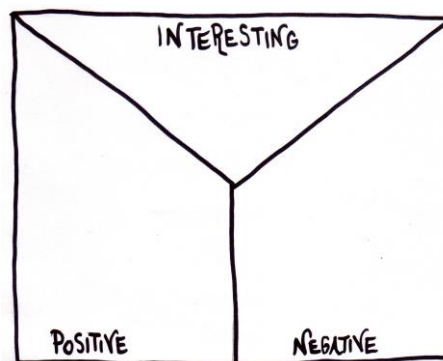
Activity

Note Taking

Students take notes while watching the BTN story. After watching the story, students reflect on and organise the information into three categories. What information about space junk was...?

- Positive
- Negative or
- Interesting

What is space junk? Come up with a class definition.



Glossary

Students will develop a glossary of terms that relate to space junk. Below are some key terms and concepts to get you started:

debris	orbit	atmosphere
satellite	collision	space junk

Key Learning

Students will investigate the problem of space junk and design an object to clean up space debris.

Curriculum

Science - Year 5

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

Scientific knowledge is used to solve problems and inform personal and community decisions.

Science – Years 5 & 6

With guidance, pose clarifying questions and make predictions about scientific investigations.

Science – Year 7

Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available.

Define: What do I want to know?

Key questions to research

Students can choose one or more of the following questions or come up with their own:

- How much junk is in space?
- What causes space junk?
- How long does space junk stay in orbit?
- What danger does space junk pose?
- Why is space junk a threat to humans on Earth?
- Why is it difficult to clean up space junk?
- What are some solutions to the space junk problem?
- Who is responsible for cleaning up space junk?

Locate: Where do I find the information?

What resources will help answer my questions? (Internet, people, resource centre, organisations, print). Discuss with students what a reliable source is.

Select: What information is important for the investigation?

Students may need support to sort through and select relevant information.

Organise: How do I make sense of the information?

Students can organise their research by creating main headings from their questions. Write each heading on a separate piece of paper. Record the information found for each question.

Present: How do we let others know about this information?

Each group needs to discuss then decide on the best way to present the information. Possibilities could include:

- A 'Did You Know' Facts sheet
- Infographic
- Oral presentation
- [Prezi](#) presentation
- Create an infographic using [Canva](#)

Evaluate: What have we learnt?

Each group reflects on what they have learnt about space junk during their investigation. Students will reflect on their learning and respond to the following.

- What I learned...
- What I found surprising...
- What I would do differently next time...

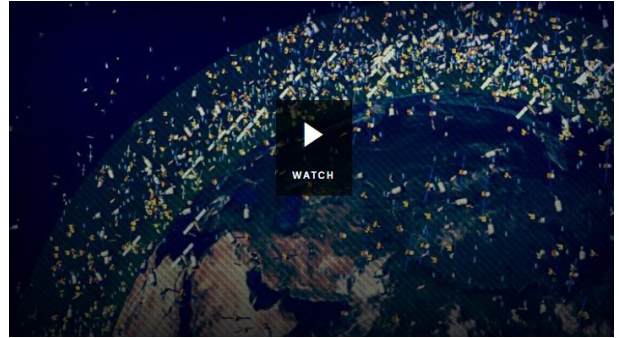
Activity

Solving the problem of space junk

In this activity students will design an object that can clean up space junk from the Earth's orbit. The BTN *Space Clean-up* story explained how a spacecraft successfully fired a harpoon into space junk that was orbiting Earth. Students can watch the videos below to get more ideas about ways to solve the problem of space junk. Ask students to create a labelled diagram of their design and an explanation of how the object cleans up space junk.



[How to solve the problem of space junk](#)



[BTN Space Junk](#)

Activity

Protecting the ISS from space junk

Begin with a class discussion to find out what students know about the International Space Station. Students watch the video [How NASA protects the ISS from space junk](#) then answer the following questions:

- What is the ISS?
- What risks does space junk pose to the ISS?
- The Space Debris Sensor measures pieces smaller than a _____.
- What does the sensor measure?
- What did you learn watching the video?



Activity

Space Junk Quiz

1. When was the first satellite launched
 - a. 1945
 - b. 1957
 - c. 1967

Answer - 1957

2. What was the first satellite called?
 - a. Sputnik 1
 - b. Satellite 1
 - c. Spacejunk 1

Answer - Sputnik 1

3. How many objects larger than a marble are orbiting earth?
- 100,000
 - 300,000
 - 500,000

Answer – 500,000

4. Space junk orbits at speeds of up to...
- 18,000 km per hour
 - 28,000 km per hour
 - 38,000 km per hour

Answer – 28,000 km per hour

5. Space junk is also called space debris.
- True
 - False

Answer - True

Create a Kahoot Quiz

Use [Kahoot!](#) to test students' knowledge about space junk. Quizzes can be created to recap learning or test personal knowledge. There is also the option to connect with classrooms around the world and play kahoot in real time.



Useful Websites

BTN – Space Junk

<http://www.abc.net.au/btn/classroom/space-junk/10531450>

ABC News – Harpoon successfully spears space junk in experiment to clean up tonnes of debris orbiting the Earth

<https://www.abc.net.au/news/2019-02-17/space-harpoon-fires-target-cleaning-space-junk/10819842>

NASA – Space Debris and Human Spacecraft

https://www.nasa.gov/mission_pages/station/news/orbital_debris.html

CleanSpace One – A Swiss satellite to tackle space junk

<https://www.youtube.com/watch?v=qTAv7TsnjzA>

NASA – Waste in Space Infographics

<https://www.jpl.nasa.gov/infographics/infographic.view.php?id=10929>

CBBC Newsround - What is space junk?

<https://www.bbc.co.uk/newsround/33795896>

CBBC Newsround - Everything you want to know about space junk

<https://www.bbc.co.uk/newsround/45571384>

CBBC Newsround - How to solve the problem of space junk

<https://www.bbc.co.uk/newsround/42173535>

NASA - Space junk in action

<https://youtu.be/IOwv1j-fUbo>