Teacher Resource Dark Sky Sanctuary

Q Focus Questions

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- 1. Retell the BTN *Dark Sky Sanctuary* story to another student.
- 2. What can you see when you look up at the night sky where you live? Discuss in pairs.
- 3. Where is Australia's first ever dark sky reserve? Find using Google Maps.
- 4. Why was this area chosen to become a dark sky reserve?
- 5. What is light pollution?
- 6. Why do astronomers call light pollution 'wasted light'?
- Complete the following sentence. One third of the world can't see the ______.
- 8. How does light pollution affect people's health?
- 9. How does light pollution affect wildlife?
- 10. What did you learn watching the BTN story?

Activity

Note taking

Students will practise their note-taking skills while watching the BTN *Dark Sky Sanctuary* story. After watching the story, ask students to reflect on and organise the information into three categories. What information in the story was...?

- Positive
- Negative or
- Interesting



Activity

Class Discussion

Hold a class discussion about the information raised in the BTN story. Use the following questions to help guide discussion:

- Why might the view of the night sky be different in urban versus rural areas?
- Why was the Swan Reach Reserve chosen as a Dark Sky Reserve?
- Before watching the BTN story, had you heard of light pollution?
- What is light pollution?
- What causes light pollution?
- Who or what is affected by light pollution?
- What are some problems with light pollution?

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Co Key Learning

Students will develop a deeper understanding of what light pollution is and its impact on stargazing. They will also explore, identify and investigate stars, planets and constellations.

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

Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives.

Science – Year 7

Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon.

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Glossary

Students will brainstorm a list of key words that relate to the BTN *Dark Sky Sanctuary* story. Students may want to use pictures and diagrams to illustrate the meaning and create their own glossary. Here are some words to get you started.

Constellation	Light Pollution	Astronomy	
Star	Observatory	Glare	

Activity

Research

Students will develop their own inquiry questions about astronomy and light pollution. The following KWLH organiser provides students with a framework to explore their knowledge on this topic and consider what they would like to know and learn.

What do l <u>k</u> now?	What do I <u>w</u> ant to know?	What have I <u>l</u> earnt?	<u>H</u> ow will I find out?

Students can investigate the following questions or develop their own.

- Does everyone see the same sky at night? Explain your answer.
- Why do we see different constellations at different times of the day?
- Why are Aboriginal people called the first astronomers and how did they use the sky as a calendar?
- How did the stars help Aboriginal people understand their universe?
- What are some solutions to light pollution? What can be done to reduce it?



Light Pollution

How does light pollution affect the visibility of stars? How does the visibility of stars differ in urban to rural areas? Discuss as a class.

• Create a planetarium in your room <u>using these simple instructions</u>. Explore and create a range of constellations seen in the Southern Hemisphere.

What does Earth look like at night? Students will brainstorm what they think Earth would look like at night looking down from space. Using the internet students will find images of Earth at night. <u>View these images</u> taken by a NASA satellite. Students will then respond to the following questions.

- What do you see?
- What do these images tell you about our energy usage at night?
- What surprised you about these images?
- Imagine if these photos were taken 100 years ago. Do you think they would look the same or different? Why?



Activity

Become an Amatuer Astronomer

Students will become familiar with finding constellations in the night sky. Explain to students that the stars move across the sky as one. Stars rise in the east and set in the west, just like the sun and moon do. The <u>following</u> <u>animation</u> shows stars moving through the night sky over a 24 hour period. The area of sky we see at night is determined by how far north or south of the equator we are.

Ask students to brainstorm a list of constellations that they know. Do they know how to find them?

Stargazing tips Check local weather conditions on the Bureau of Meteorology website Choose a location away from streetlights Take 10-15 minutes to let your eyes adjust to the dark Use a red light to preserve your vision (make one by covering a torch with red cellophane)

Activity

Stargazing Activities

Students will learn how to find their way around the night sky, spotting stars, planet and galaxies. The <u>ABC</u> <u>Science Sky Tour</u> has winter and summer tours or take a virtual tour.

Students will learn how to <u>Measure the sky with their hands</u>. Astronomers measure distances in the sky in degrees. Students follow the step-by-step instructions to learn how to use their hands to measure the sky in degrees.

Students will explore the night sky using interactive software. The <u>Stellarium</u> is a free planetarium for your computer. It shows a realistic sky in 3D. Students can explore the effect of light pollution on visibility.



<u>Google Sky</u> allows students to explore planets. Turn the `Sky' button on in Google Earth to change to sky view.

Bring the stars to your students by using an online application to discover and explore stars, planets and constellations in the classroom. Before starting this activity download a free app like <u>SkyView</u> onto your classroom hand held devices.

- Dim the lights in the classroom to create the feeling that it is nighttime. Students will sit on the ground with SkyView open on their hand-held device.
- Students will point their device at the sky to locate and identify planets, stars and constellations. There is the option to turn on night mode. Students can learn more about what they find by selecting a celestial body and tapping on it. Give students time to explore the night sky.
- Hold a class discussion. What did your students find?
- Students will choose one constellation that they want to learn more about. Students may want to consider choosing the zodiac constellation in which they were born. Students will develop their own question/s for inquiry, collecting and recording information from a wide variety of sources.





BTN Stories

Students can watch this <u>BTN story</u> and answer the following questions to learn more about light pollution.

- 1. What is light pollution?
- 2. How does light pollution affect the environment?
- 3. How can streetlights be changed to reduce light pollution?
- 4. What impact can artificial light have on the human body?
- 5. Describe the affect lights can have on some sea animals.
- 6. Give some examples of how light pollution can be reduced.
- 7. By reducing light pollution, we will have a better view of the_
- 8. What was surprising about this story?

Students watch the BTN Amateur Astronomer story and answer the questions.

- 1. At what age did Jonah get his first telescope?
- 2. Explain and illustrate how a telescope works.
- 3. What did Jonah experiment with to help him take photos high above the atmosphere?
- 4. Illustrate Jonah's experiment.
- 5. What happened to the balloon when it reached the stratosphere?
- 6. What galaxy does Jonah plan to photograph when he sends another balloon up into the air in a couple of months?
- 7. What did you learn from this story?

O Useful Websites

South Australia's River Murray Designated First International Dark Sky Reserve in Australia – International Dark Sky Association

https://www.darksky.org/south-australias-river-murray-designated-first-international-dark-sky-reserve-inaustralia/

SA's River Murray Dark Sky Reserve to become home of space traffic management facility – ABC News <u>https://www.abc.net.au/news/2020-06-23/swan-reach-soon-to-be-home-of-international-space-observatory/12379546</u>

Astronomical Society of South Australia – Light Pollution <u>https://www.assa.org.au/lightpollution</u>

Amateur Astronomer - BTN

https://www.abc.net.au/btn/classroom/amateur-astronomer/10526998

Light Pollution – BTN

https://www.abc.net.au/btn/classroom/light-pollution/10526576

History of Stargazing - BTN https://www.abc.net.au/btn/classroom/history-of-stargazing/10489030

Aboriginal Astronomy – BTN https://www.abc.net.au/btn/classroom/aboriginal-astronomy/10523908





