

LESSON TITLE: Reach for the Stars - Creating Constellations

T:4 WK:1 SUBJ: NST

GR: 7

LESSON 1 OF 8

Lesson Objectives:

- Embracing practical Intelligence
- Working with sources
- Observe and engage
- Constructing star patterns
- Measuring

Resources:

- **RES1:** Early Indigenous Star Knowledge
- **Video1:** How To Navigate Using the Stars
- **Video2:** Night Sky Navigation #2 Finding North in the Southern Hemisphere
- **Video3:** How to make 3D Constellations
- **Video4:** Make your own constellation!
- **WS1:** Constellation Worksheet (Each task card has a separate constellation video).
- **RES2:** Summary of constellations and fun quiz

Equipment:

- Black or dark paper/ paper plates
- Styrofoam cups

LESSON OUTLINE

Question hook: How do you feel when you look up at the night sky? Does it make you feel connected to something bigger than yourself? Why or why not?

1. Begin the lesson with the question hook. This will engage learners with the emotional connection that indigenous people have with the stars rather than a scientific approach.
2. **RES1:** "Early Indigenous Star Knowledge" and ask the question: **How did the indigenous people in South Africa use their knowledge of the stars for navigation?** The story suggests how important it was to know the 'movement of the stars in the heavens' in the past. (Actually, the earth moves and the stars stay still.))
3. **NB:** Ensure that the students realise that the stars stand still while the earth rotates; thus, we see the same stars on our trip around the sun.
4. **Video1:How To Navigate Using the Stars.** Watch the video, which helps one find north and south by using the stars.
5. **Video2:** (Optional) **Night Sky Navigation #2 Finding North in the Southern**

Hemisphere. Watch this video which explains in detail how to use the Southern Cross (Crux) to find the south. He explains the time-lapse change well.

6. **DWS/WS1:** There are 6 constellation cards. Divide the class into groups of at least 4 people. Groups may receive repeat copies of the same constellation card.
7. Each group needs to draw out their constellation on the worksheet and name the bright stars before making the model. Then two learners need to make the 3D constellation on black paper with stick-on stars, while the other two create constellations with styrofoam cups.
8. **Video 3: How to make 3D Constellations:** (Model type 1) FOUR groups need to make **black(dark) paper plate** constellations (be sure to label the major stars).
9. **Video 4: Make your own constellation!** (Model type 2) The other four groups need to make **styrofoam cup** constellations of the same star groups displayed on the work cards.
10. Each worksheet has a guide video and a link to the Stellarium website to find the different constellations. Just be aware that some of the 'Learn the Sky' videos are written for people from the northern hemisphere. You need only watch the first few minutes of each video.
11. Allow each group to present their constellation to the class.
12. Use the Stellarium website to help find and map each constellation.
<https://stellarium-web.org/> to find star constellations.
13. **RES2:** A summary of the constellations and a fun quiz are available.

ZED TECH	TECH LIGHT/ TECH LOADED
<ul style="list-style-type: none"> ● Read the story to the class. RES1: Early Indigenous Star Knowledge ● Watch Video1: How To Navigate Using the Stars ● Watch Video2: Night Sky Navigation #2 Finding North in the Southern Hemisphere ● Each learner in a group receives WS1 to complete with the group. ● Video3: How to make 3D Constellations (groups making paper plate models) ● Video4: Make your own constellation! (groups making styrofoam cup models) ● The teacher will watch the video and use 'Stellarium' to show each group the pattern of its constellation. 	<ul style="list-style-type: none"> ● Read the story to the class. RES1: Early Indigenous Star Knowledge ● Watch Video1: How To Navigate Using the Stars ● Watch Video2: Night Sky Navigation #2 Finding North in the Southern Hemisphere ● Share DWS1 with the class. Each group completes the relevant slide. ● Video3: How to make 3D Constellations (groups making paper plate models) ● Video4: Make your own constellation! (groups making styrofoam cup models) ● Use a device to view separate constellation videos and 'Stellarium'.

Assessment opportunities: n/a

REFERENCES UTILISED

Videos:

- Video1: Atlas Pro, **How To Navigate Using the Stars**, 2015, <https://www.youtube.com/watch?v=Bh5kHTBr0gU>
- Video2: Kenneth Kramm, **Night Sky Navigation #2 Finding North in the Southern Hemisphere,2015**, <https://www.youtube.com/watch?v=4VoYMUP23aI>
- Video3: Paper plate and gold stars: NikeKazi, 2029, **How to make 3D Constellation Project for kids easy and simple: science project, STEM project**, <http://www.youtube.com/watch?v=oQo6mv9JIWU>
- Video4: Star constellations from styrofoam cups: Scout Life magazine, **Make your own constellation! , 2021**, https://youtu.be/fl3Uax8og_k

Sources:

- Reference for constellations: Stellarium web, <https://stellarium-web.org/>

EXTRAS:

Models:

- Electric circuits of 4 constellations:
<https://www.youtube.com/watch?v=s-pdB0cRfzs>

Videos:

- (Explains the different names and cultures around constellations) **Grand Ledge Area District Library (GLADL), 2019, Sky Stories: Myths & Legends in the Stars**, <https://www.youtube.com/watch?v=CpfcPummFb4>
- Vector Globe, 2020, 15 Famous Constellations You Can See In The Night Sky | Animation, <https://www.youtube.com/watch?v=wWSJAG-5Llc>
- **In a world music kids, 2021, Meet the Constellations - of the Zodiac /A song about Astronomy/Space - By In A World and the Nirks™**, <https://www.youtube.com/watch?v=5IX9Ug3MzUo>

Websites:

- Stellarium Web, <https://stellarium-web.org/>,

Stellarium Web is an amazing website that allows you to explore the night sky from any location on Earth. With its user-friendly interface, you can navigate through the stars and constellations in real time. This website provides a 3D view of the sky, allowing you to zoom in and out to observe the stars up close. You can even adjust the time and

date to see how the constellations change throughout the year. Stellarium Web is a fantastic tool for learning about different star patterns and their names.

- NASA's Eyes on the Solar System, <https://eyes.nasa.gov/>

NASA's Eyes on the Solar System is a website that offers a wide range of interactive experiences, including exploring star constellations. This website provides a 3D simulation of the night sky, where you can view constellations from various angles. You can also learn interesting facts about each constellation by clicking on them. Additionally, NASA's Eyes on the Solar System offers educational resources and videos to deepen your understanding of the universe.

- SkyView, <https://skyview.gsfc.nasa.gov/>

SkyView is another fantastic website that allows you to explore star constellations in 3D. With its powerful search engine, you can enter the name of a specific constellation or star and instantly locate it in the night sky. SkyView provides stunning images captured by various telescopes, giving you a detailed view of the stars. You can also customise your experience by adjusting the colour and brightness of the stars. This website is an excellent resource for both beginners and astronomy enthusiasts.

- In-The-Sky.org, <https://in-the-sky.org/>

In-The-Sky.org is a comprehensive website that offers a variety of tools for exploring star constellations. This website provides a 3D map of the night sky, allowing you to navigate through the stars and constellations with ease. You can search for specific constellations, planets, or even satellites to observe their positions in real-time. In-The-Sky.org also offers a calendar feature, enabling you to plan your stargazing adventures ahead of time. This website is a treasure trove of information for anyone interested in star constellations.

Other many Skyview links

- https://skyview.gsfc.nasa.gov/current/help/where_do_i_find.html#starcharts
- <https://www.heavens-above.com/main.aspx>