**ACTIVITY: Constellations in the night sky**

**Activity idea**

In this activity, students learn about star constellations and that various cultures have their own names and legends about them. They will appreciate that identifying constellations and remembering where they are in relation to each other are important for wayfinding.

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

* explain what a constellation is
* explain what the Pleiades (Matariki) constellation is
* retell at least two of the legends attached to the Pleiades constellation
* explain why various cultures might have given names to stars and told legends about them
* describe the celestial sphere and why this knowledge is still useful (extra for experts).

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**Introduction/background**

The ancient navigators used the night sky to work out where they were and where they should go. The night sky was like a big dome that surrounded them. They noticed that stars were often in the same position relative to each other and so could be used to work out a position and set a direction. Groups or clusters of stars were more easily identified and could be lined up with other clusters or bright stars for this. We now call these clusters constellations.

In this activity, students can explore star constellations and then use their imagination to create a constellation and stories about it. This activity can be used with young primary students.

**What you need**

* A number of websites depicting constellations to suit your student age group (try to show shapes and names of constellations) and a data projector to show these to the class
* This website has [Pleiades images](http://adirondackastro.com/2013/01/m45-pleiadesseven-sisters/) to view and discuss.
* The [Pleiades (Matariki) legends](#Pleiades) or other sources of legends you have found
* Black paper
* Stars
* Gold, silver or white crayons or pens that will show on black paper

**What to do**

1. Look up star constellations images on the computer – show on a big screen to the class. Discuss what star constellations are and why people might have made up names, shapes and stories for them. Some example sites are:

* [www.space.com/15722-constellations.html](http://www.space.com/15722-constellations.html)
* [www.windows2universe.org/the\_universe/Constellations/constnavi.html](http://www.windows2universe.org/the_universe/Constellations/constnavi.html)
* [www.almanac.com/content/stargazing-finding-stars-and-constellations](http://www.almanac.com/content/stargazing-finding-stars-and-constellations)

1. Show the [Pleiades image](http://adirondackastro.com/2013/01/m45-pleiadesseven-sisters/) on a big screen. Talk about the science. What are stars? (Big exploding balls of plasma – ionised gas – held together by their own gravity.) Where did the Pleiades come from? What is their distance from Earth? How fast are they moving?
2. Tell the [Pleiades (Matariki) legends](#Pleiades) to the class. Discuss similarities and differences between the various cultures.
3. Have students use black paper and stars to make up their own constellation (or look for one to copy in the night sky).

* Lightly link the stars together with a pen or crayon that will show up on black paper to show the shape of the constellation.
* Name the constellation and write a legend about how it got into the sky.

1. Present legends in a class book.
2. Extra for experts: Have students describe the celestial sphere (see [The celestial sphere](http://link.sciencelearn.org.nz/resources/623-the-celestial-sphere)). This could be done at the start of the lesson – using an image of the night sky from the internet.

**Pleiades (Matariki)** **legends**

To help remember the star clusters, the clusters were given names and stories were told about them.

***Greek version of the Pleiades legend***

The ancient Greeks named seven stars they could see with the naked eye the Pleiades or the Seven Sisters (Maia, Electra, Alcyone, Taygete, Asterope, Celaeno and Merope).

The legend is that the seven sisters were the seven daughters of Atlas (a Titan who held up the sky) and Pleione (the protectress of sailing). After meeting the hunter Orion, the Pleiades and their mother became the object of his pursuit. He pursued them over the face of the Earth until Zeus changed them into a flock of doves, which he set in the heavens.

Only six stars are really obvious to the naked eye (the seventh comes and goes). The ancient Greeks explained the sudden disappearance of the seventh star in various ways – one being that all the Pleiades were consorts to gods, with the exception of Merope. She deserted her sisters in shame, having taken a mortal husband, Sisyphus, the King of Corinth.

***Māori version***

Ancient Māori called these same stars Matariki, which literally means ‘eyes of god’ (mata ariki) or ‘little eyes’ (mata riki). According to myth, when Ranginui, the sky father, and Papatūānuku, the Earth mother, were separated by their children, the god of the winds, Tāwhirimātea, became so angry that he tore out his eyes and threw them into the heavens. The eyes now watch over the land and its people.

***Hawaiian version***

In Hawaii, the seven stars were known as the Maka’hiki sisters. One of the seven sisters was lost at sea and returned months later. The appearance of the seventh sister happens around the time of Thanksgiving.

***Native American version***

A Native American legend tells of seven maidens who were being pursued by a ferocious bear. Kneeling to pray for help, they called upon the gods, who raised the ground where they were located high into the air. Angered, the bear clawed at the Earth in a vain attempt to reach them. After leaving huge claw marks in the unyielding earth, the bear gave up and retreated. The maidens were turned into stars and placed in the sky forever out of harm’s way.

***Japanese version***

The Japanese call the seven stars Subaru, which means ‘coming together’. If you look at the logo of the car company Subaru, you'll see a stylised symbol of the Seven Sisters, as ancient mythology meets modern industry.

***Australian version***

An Aboriginal version from the Dream Time is about seven beautiful sisters called the Maya-Mayi ([www.astronomydownunder.com/sisters.htm](http://www.astronomydownunder.com/sisters.htm)).

***Remembering where the clusters are***

Stories help people to remember star clusters. There are three clusters (constellations) of stars near the Pleiades, and to help new stargazers learn where they are, they are sometimes told that Orion the hunter is attempting to rescue the Seven Sisters who are being chased by Taurus the Bull.

***The Pleiades and seasons***

The Greek name Pleiades means to sail. In the ancient Mediterranean world, the day that the Pleiades cluster first appeared in the morning sky before sunrise announced the opening of the navigation season.

Māori use the reappearance of Matariki in June to herald the beginning of a new year. It indicates a change in season – into the colder winter months – an ideal time to plan for planting. Other cultures, such as the Zuni of New Mexico, also use these stars for seed planting – calling them Seed Stars.

***The Pleiades and science***

In both myth and science, the Pleiades are considered to be sibling stars. Modern astronomers say the Pleiades stars came from the same cloud of gas and dust some 100 million years ago. This gravitationally bound cluster of about 500 stars (strong telescopes are required to see them) looms some 450 light years away. These sibling stars drift through space together at about 40 km per second. Many of the Pleiades stars shine hundreds of times more brightly than our Sun. About 14 of these can be seen with the naked eye.