

12.2 Aboriginal Knowledge of the Solar System

In British Columbia, Aboriginal peoples' knowledge of the universe and solar system predates the knowledge of Western science. For example, practical knowledge of celestial bodies allowed Aboriginal peoples to accurately measure time and seasons and to track and map distances and locations long before the arrival of Europeans. Information gained through Aboriginal knowledge and Western science is often very similar. A very important aspect of Aboriginal knowledge is that of an interconnected universe. This concept is only beginning to be understood by Western science today.

Words to Know

holistic
lunar month
Western science

British Columbia is home to a rich diversity of Aboriginal peoples and cultures. Each of the different groups has its own unique systems of knowledge and understanding about the nature of the universe. However, all the systems have in common a world view that is **holistic**. This means that all aspects of the physical and spiritual universe are connected to form a whole. What occurs in one area (for example, the oceans) affects every other area (from community well-being to the weather thousands of kilometres inland). Aboriginal peoples know the universe to be a unity where all things are worthy of respect, all life forms are interconnected and related to one another, and balance and harmony are essential to the survival of all. This unity of all extends to the skies: to the solar system beyond Earth and the universe.

Did You Know?

The Kwakwaka'wakw call the Milky Way "the seam of heaven." They identify the constellation Orion and star pattern Pleiades as sea otter hunters and their canoes frozen in the night sky.

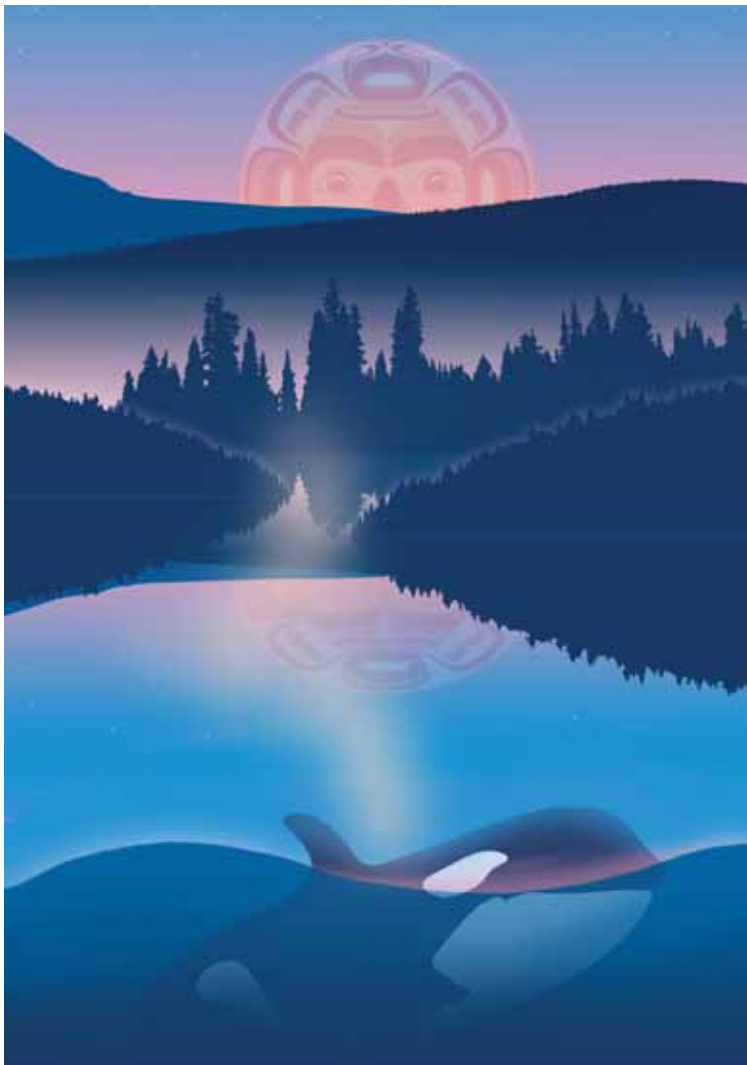


An Interconnected Universe

Aboriginal peoples, like Western scientists, have long observed the Moon, Sun, planets, and other celestial bodies and theorized about Earth's relationship with all of these bodies.

Among many Aboriginal peoples, existence is thought to be made up of a number of interconnected areas, or realms. Common realms include the undersea or sea world, the land world, the spirit world, and the sky world. In an interconnected universe, Aboriginal peoples know that these realms cannot be separated (Figure 12.16 on the next page).

Western science, the science you are learning about in this textbook, is based on the physical realm. It involves the study of phenomena that can be physically observed, measured, documented, and tested. Aboriginal knowledge can similarly be based on physical truth, but it also often uses knowledge gained from other realms. When everything is interconnected, the spiritual realm is as much a source of knowledge and truth as the physical realm. For example, Aboriginal peoples believe that knowledge gained through traditional means such as vision quests and sweat lodge ceremonies (times when people connect to the spirit realm) can be accepted and tested as readily as knowledge gained from direct observation.



Word Connect

A “vision quest” is a way that some people purposefully interact with the spiritual realm. Vision quests can be undertaken at specific periods of time and locations, and they may involve particular activities and conditions such as prayer, fasting, cleansing, and isolation.

Figure 12.16 *Connections*, by Coast Salish artist Darlene Gait, illustrates the Aboriginal view of an interconnected universe.

Aboriginal Knowledge of the Moon

Aboriginal peoples have long used knowledge of the Moon in their daily lives in the many environments of British Columbia. The success of Aboriginal fishermen on the coast, for example, depends on their knowledge of lunar phases and the Moon’s influence on various fish species, the weather, and ocean tides. Mariners navigating coastal waters (Figure 12.17) and harvesters of shellfish, kelp, and other intertidal resources must all be aware of lunar phases and the corresponding low and high tides.

Aboriginal peoples developed a means of tracking and forecasting time based on the **lunar month**. A lunar month is measured as the length of time from one new moon (or one full moon) to the next. The time for this cycle of phase change is equal to about 29.5 days. The Coast Salish, for example, traditionally use a 13-moon system in which each moon of the year is named and associated with a specific time of year, certain stories and teachings, certain types of weather, and particular economic and cultural activities. The Nuu-chah-nulth also used a 13-month lunar cycle that includes the four seasons and the summer and winter solstices.



Figure 12.17 Aboriginal canoes travelled from the length of British Columbia and Washington State to a recent gathering hosted by the Squamish First Nation.

Most Aboriginal peoples in British Columbia developed systems of lunar months. These were ways of keeping track of time according to the changing phases of the Moon. In this activity, you will learn about Aboriginal peoples' use and naming of lunar months.



April Moon: Geese Fly in a Flock, carving by Nuu-chah-nulth artist Tim Paul

What to Do

1. Research the system of lunar months used by the Aboriginal peoples of your area. Alternatively, research the lunar system used by Aboriginal peoples in another part of the province. Look for information:
 - in the library
 - at a museum or cultural centre
 - on the Internet
 - by talking to Aboriginal elders and other knowledgeable people
2. With the information you obtain, create a calendar (like the calendars hanging in your school or home) using local Aboriginal names of lunar months.

What Did You Find Out?

1. Compare an Aboriginal lunar calendar with the usual month-and-day calendar we use today (a Gregorian calendar). What is the most obvious difference between the two systems?



Figure 12.18 *Raven Bringing Light to the World*, a gilded bronze sculpture by Haida artist Robert Davidson, represents the story of how light came to the universe.

The Use of Planet and Star Positions

In many parts of British Columbia, Aboriginal peoples relied on “reading” the predictable positions of planets and stars in the night sky for information. With this knowledge, traditional hunters could determine their location on the land and traditional fishermen and mariners could determine their location on the ocean. Many Aboriginal hunters, fishermen, and others still use these methods of tracking and navigating distances today.

Knowing the position of celestial bodies at specific times of the year also gives Aboriginal peoples the ability to accurately measure the length of seasons. At one time, for example, observers in each Nuu-chah-nulth community tracked the daily movements of the Sun as it rose and set. Viewed from set locations, the Sun moved toward well-documented solstice positions on the horizons. These specific positions marked the Sun’s maximum northern and southern declinations.

The importance of the Sun, the Moon, and the stars is represented in many works by Aboriginal artists (Figure 12.18 on the previous page).

Aboriginal Knowledge and Western Science

Aboriginal knowledge of the universe is varied and plentiful. It has grown out of centuries of careful observation and experience as well as from knowledge of the interconnection of all realms of existence.

In many cases, Aboriginal knowledge has contributed to the knowledge of Western science. Aboriginal knowledge of the linkage between the phases of the Moon and tides, currents, and erosion along various parts of the British Columbia coast, for example, is now part of the overall body of knowledge about our coastline. Aboriginal observations of constellation movements are now part of the overall body of knowledge known as astronomy.

However, other aspects of Aboriginal knowledge have not been fully incorporated into Western science. In Aboriginal reality, for example, the Haida story of Raven bringing light to the world relates to the very origin of light. The merit of Nuu-chah-nulth people undertaking certain activities only when the Moon is waxing or when it is full has been proven by thousands of years of effective Nuu-chah-nulth application. Such Aboriginal knowledge, based on an interconnected universe in which both physical and spiritual realities are necessary, is only beginning to be understood today.



internet connect

To learn more about celestial-related stories of Aboriginal peoples in British Columbia, visit www.bcsience9.ca and follow the links.

12-2B Aboriginal Knowledge Through Stories

Find Out ACTIVITY

In this activity, you will learn about Aboriginal knowledge of the universe and the solar system by researching traditional British Columbia Aboriginal stories. Many such stories are deceptively simple yet are meant to be thought about over time and to teach important truths or lessons.

What to Do

1. Working with a partner, research two Aboriginal stories that relate to celestial bodies or the universe. If possible, research one local story and one from elsewhere in British Columbia.
2. Prepare and deliver an oral presentation to your class of one of the stories you researched. Use illustrations, music, lighting, costumes, or other props in your presentation.

What Did You Find Out?

1. What important information did you learn from the stories you researched? Was all the information directly provided, or did you have to infer or decipher some of it yourself?
2. What additional information did you learn from the stories presented by others in your class?
3. What information seems to be common to all or most of the stories?

Science Watch

Interview with Ki-ke-in



The Whaler's Dream is the work of Nuu-chah-nulth artist Ki-ke-in. It shows images from a Nuu-chah-nulth whale hunt.

Ki-ke-in (whose name means "long-sounding thunder") was born and raised in Huupachesat-h territory. His mother was a Hiikuulthat-h woman from the west coast of Vancouver Island. His father was from Kaa'yuuk'wat-h on the northwest coast of Vancouver Island. Ki-ke-in is well known for his knowledge of Nuu-chah-nulth history, culture, and

traditions. A highly creative individual, he carves, paints, sings, dances, composes music, and publishes history, biography, and poetry.

Q. What inspired you to make this painting?

A. Painting *The Whaler's Dream*, I was thinking about my ancestors. My great-grandfather was a whaler, and I thought about what went through his mind before he went out. Nuu-chah-nulth whalers used to spend months praying, fasting, bathing, scrubbing themselves, and begging that the Great Spirit Chief



Ki-ke-in

Under the Sea would let them have a whale. They knew that if they were clean, if they behaved properly, if their family was doing right, that whale was going to give itself to them. That's a very spiritual line of thought.

I thought, maybe a whaler, tired from fasting and bathing and the strict way that they went about their preparation, might be exhausted and aching to get out to sea, to be a part of the crew, to harpoon a whale, bring it ashore, and feed his people. Maybe he'd dream. Maybe he'd dream of his paddle, that it be strong. Maybe he would dream of weather—there's lightning and thunder and rain represented on the painting. Perhaps he would think how close they would get to the whale's dangerous big tail as it would come out of the water. Maybe he'd think of success and the dorsal fin of this humpback whale being cut off. For sure, he would think most of all about his harpoon. Are the ties on it strong? Is the harpoon head sharp? Have they tested the lanyard fibre that connects the harpoon head to the sealskin floats?

Perhaps he'd say, "I've been observing the Moon; this is the right cycle of the Moon for me to be going out. The Moon is calling the tides; the whales will be swimming toward us."

If they were to harpoon a whale and it should die offshore in the night, how would they come home? The North Star is the guiding light that our people use to navigate. So, with almost every design I've ever done, I've put the North Star somewhere in the design. I use it just everywhere because I think it is important for our people to continue knowing we need direction, a guiding light in our lives.

Questions

1. Ki-ke-in talks about preparations and practical considerations for whaling. How does this reflect a knowledge of the universe as an interconnected whole?
2. What Nuu-chah-nulth knowledge of celestial bodies does *The Whaler's Dream* illustrate or remind us of?
3. Research an animal or plant that Aboriginal peoples in your area hunt, cultivate, or gather. Find out how celestial bodies play a role in this activity, and what knowledge of celestial bodies is required.

Check Your Understanding

Checking Concepts

1. What does the term “holistic” mean?
2. What word could describe the systems of knowledge of the Aboriginal peoples of British Columbia?
3. What does the term “Western science” refer to?
4. How would knowledge of the phases of the moon aid someone working on or near the ocean?
5. Explain how knowledge of the positions and movements of the Moon, the stars, and the Sun would enable someone to tell time:
 - (a) in the day
 - (b) at night
6. Aboriginal people observed the summer and winter solstices with great interest. What did these times of year indicate for early people?
7.
 - (a) How is Aboriginal knowledge similar to Western scientific knowledge?
 - (b) What makes Aboriginal knowledge different from Western scientific knowledge?
11. Western cultures use a 12-month solar calendar. The early Aboriginal peoples of British Columbia used a 13-month lunar calendar. Explain why a lunar calendar was used.
12. Aboriginal people were able to determine the length of seasons by using positions of objects in space. Why would the length of a season be important to Aboriginal people?
13. Early Aboriginal peoples of British Columbia had no written language. Explain how traditions and knowledge of astronomy from past generations are known today.

Pause and Reflect

Ancient Aboriginal peoples used star and planet positions to guide activities such as hunting and fishing in their daily lives. In a few short sentences, describe the importance of tracking time for ancient people. What consequences would have arisen if Aboriginal people had not developed this skill?

Understanding Key Ideas

8. How would an understanding of positions of stars and planets in the night sky help Aboriginal people with activities such as hunting and fishing?
9. Explain how a person could tell when the solstice occurs from observation alone.
10. Explain what is meant by the statement “The universe is interconnected.”