

## 7. An Aboriginal View of Science

(Science 10; also appropriate for Science 4-7, Social Studies 4-7 and 8, and Science 9)

### SHARED LEARNINGS

- **Aboriginal societies valued the land and resources in distinct ways.**
- **Science as a total cultural expression has an important role in Aboriginal cultures.**
- **Relatedness of all things in the natural world is at the heart of Aboriginal cultures.**

### PRESCRIBED LEARNING OUTCOME

It is expected that students will:

- describe the interaction between scientific developments and the beliefs and values of society
- compare a variety of techniques used to learn about the Earth

### PURPOSE

To provide opportunities for students to:

- learn that our basic needs come from the four elements found within the natural world
- understand the Aboriginal world view including the interrelationship and interdependence of all creation
- investigate meaning, in an Aboriginal context, of specific words.

### SUGGESTED TIME FRAME

- two to three hours

### APPROACH

1. Present the story, "The Moose" to the class. You may do so by reading to/with the class or by memorizing the story and presenting it in a more traditional Aboriginal style of storytelling.
2. Discuss the story. Follow up the class discussion with the following questions:
  - Why do you think the story is called "The Moose?" (The word moose in the Ojibwe language—*anishinaabemoda*—means worm in English. The Ojibwe word for a moose is *mooz*.)

- What's in a name? (The Elders know that it is important not to judge a creature by its size or by the name it has been given.)
- What number is important in the story? (Four.)
- Why do you think this number is important? (The number four is sacred in Aboriginal cultures.)
- Where else in the story and in life would you find this number? (four elements: air, water, fire, rock / four seasons: spring, summer, autumn, winter / four parts of the life cycle: infant, child, adult, Elder / four directions: north, south, east, west / four gifts: mind, body, spirit, emotions / four peoples: red, white, black, yellow)
- What is the Aboriginal view of science and using natural resources expressed in the story? (The Elders say that owning more than what we need may be wrong because the environment is being destroyed in order to produce these material items. They say that "the earth belongs to the seventh generation, yet unborn." The Elders believe that:
  - everything is related and connected to all creation
  - our beliefs determine the way we behave
  - if we believe the earth is alive and sacred, then we will treat the earth with respect and caring
  - the resources that come from the earth can be used responsibly
  - pieces have connections and universal meanings
  - science is based on wonder
  - people must open up to new ways of knowing and new ways of perceiving.)
- How is this view of science and the natural world different from and similar to that of other cultures/peoples?
- What lessons did the worm learn? (to listen to the Elders; that we all have special gifts or talents that are not possessions but gifts from Mother Earth to be shared; that we must use resources responsibly)

- Define or explain the following words as they are used in the story (circle of life, element, gifts, talents, energy, philosophy, perspective, world view, intellectual, spiritual, emotional, physical, cooperation, balance, harmony, respect, inclusion, exclusion, empathy).
3. Have students write their own story or create their own diagram to demonstrate the understanding they have gained from reading "The Moose."

### ADDITIONAL ACTIVITIES

1. **The Circle** (energy cannot be created or destroyed but can be changed). Each student creates her or his own circle of life (the four elements). Have them draw a large circle on a blank sheet of paper, and divide the circle into fours. The first quadrant will represent air, the second water, the third fire, the fourth earth. Students write, draw, or use symbols to communicate how each element is part of all creation (e.g., air is essential for all living beings; the South American rainforest produces 40 percent of the oxygen on earth). How are we connected to this circle?
2. **Mural**. Divide the class into four groups. Each group makes a mural showing one element and its use and importance. Bring the groups together to create one mural that demonstrates the elements are connected to everything on earth.
3. **A Gift**. Each person has power (a gift). To help care for earth, water, air and the energy, what can we do in the classroom? school? home community? (year-long scientific projects)  
Encourage students to make a list and work on each project or task. Student activities may include:
  - gathering newspapers, glass bottles and tin cans for recycling (calculate how much energy is conserved by recycling)
  - planting a tree (calculate how much air the tree will filter in one day, week, month
  - researching energy flow and chemical recycling in the living world (e.g., photosynthesis)
  - creating a worm compost (study how earthworms enrich the soil)
  - walking, bicycling, or taking a bus (save energy); designing a future machine for travel that uses other forms of energy.

### 4. Four Elements. The story talks about four elements.

- What are the four elements that all things are made of? (air, water, fire, earth, or rock)
- Am I made from these four elements? (all living cells are 70-95 percent water, the rest consists of carbon-based compounds; we need oxygen to burn fuel in our bodies thus recycling energy [air, fire] from the elements we eat, drink, and breathe; the human body maintains a central core temperature; the human body consists of minerals like iron, zinc, copper, etc. [earth])
- What are some things we need and are essential to life? (e.g., water)
- What are some things we have that are not necessary for life? (e.g., TV)
- Is it fair for one person or group or nation to use more than their share of Mother Earth's resources?
- Are we using the resources in a respectful and responsible manner, which will ensure future use by the next generation?
- What is your gift?
- What is your truth?

### ASSESSMENT

Look for evidence of:

- students' understanding of the Aboriginal view of interrelatedness and interdependence in the natural world
- student participation in class discussions and activities
- students' understanding of the meaning of specific words from an Aboriginal perspective.

# THE MOOSE

The Old Ones remember the beginning time, a long time ago, when the universe was but a vision, and the creator saw all that now exists in a dream. Through this sacred vision the four elements—air, water, fire, rock—were brought together to create the earth, sun, stars, moon, and other living beings.

The Old People remind us that the four elements work together in a balanced harmony. All life depends on these elements because all life is made from them. Energy cannot be created or destroyed but can be changed.

The creator walked amongst the creation and spoke to the living beings and told them they were all given gifts, which they were to share with the world.

The eagle spread its wings and said, "Marvel at my gift, for I can fly high and bring our prayers to the creator."

The salmon swam from the fresh water rivers to the ocean and back again. The elated salmon spoke to the others, "I can transform and live in both waters, I will return every year to share myself with all living things."

The grandfather and grandmother trees converted energy from the sun and exchanged gases through their leaves and through their roots drew nutrients from the soil. The trees boasted to the others, "We will create food for everyone and clean the air we all breathe."

The two legged being considering itself the most gifted and announced, "I have been given the gift of dreams and I have seen the future. I will make cities and machines and I will harness great energies, which I will share with the world."

Finally, after the beings had discovered and shared their gifts with everyone, a worm crawled amongst them and asked, "What is my gift"? The others looked down in the direction of the muffled sound while the worm attempted to stand up straight to no avail, flopping over with each attempt, which made every creature laugh uncontrollably at this

pitiful sight. The two-leg being made a comment, "Upon my observations this creature seems to have no redeeming qualities or use." The others laughed even louder.

The worm, embarrassed, crawled away and hid itself in the earth. In the earth the worm realized its gift. The worm humbly accepted this gift and ate the leftovers the others did not want, transforming the waste into usable nutrients needed by plants and trees. The worms' work went on without notice until one day the worm returned to the surface.

The worm was horrified by the sight which now existed on the surface of the earth. Worm cried out to the eagle, "Brother eagle, where are all trees? Where are the salmon? Why is air so thick?" The eagle hung its head with shame and said, "Worm, oh worm, it was the two-leg beings who have clearcut the forest, they have overfished the waters and polluted the air but we are all to blame. The balance once spoken by the great law giver has been forgotten by all of us. Brother worm you alone have accepted your gift with humility and have guarded yourself from the greed of the surface world. Do you remember the truth once spoken by the creator?" The worm replied with a kind and forgiving voice, "My brother, the truth is very simple... the Old Ones remember."

## 8. Circle Lesson: The Interrelatedness of Everything in the Natural World

(Social Studies 8; also appropriate for Social Studies 4-7, and Science 8 and 10)

### SHARED LEARNING

- **Relatedness of all things in the natural world is at the heart of Aboriginal culture.**

### PRESCRIBED LEARNING OUTCOME

It is expected that students will:

- analyze how people interact with and alter their environments, in terms of population, settlement patterns, resource use and cultural development
- describe how societies preserve identity, transmit culture and adapt to change

### PURPOSE

- to introduce students to the Aboriginal concept of relatedness and that Aboriginal people see themselves as part of the land and the surrounding environment
- to help students understand why each Aboriginal culture is unique and how closely culture is related to the land.

### SUGGESTED TIME FRAME

- one hour, plus follow-up activities

### APPROACH

The instructional strategy used to convey this large and difficult concept is the circle. The circle is a universal symbol used by many Aboriginal cultures to reflect the "oneness" or "connectedness" that is a part of their lives. In this instance we will be using it as a metaphor for the land and animals that make up the natural world. (The following lecture has been developed by a teacher in Fort Nelson; contents should be adapted to the local area.)

### Lecture:

1. To understand traditional First Nations societies and how they lived with the land, not merely on it, we will use the circle. The circle is an important symbol to Aboriginal peoples.
2. Here is a circle which represents the land around me where I live traditionally. (Draw a circle on the board). Now I draw myself in the circle. Notice that I am not in the centre of the circle. Now what is in the natural world around me? Soil, water, fish, moose, caribou, pine trees, plants, berries, the sun etc. Draw images of these things in your circle.
3. Traditionally, people coexisted with nature and the animal life on an equal footing. (Draw lines from the human figure to the other components, describing how each was used traditionally, so that the whole circle becomes a web.) All things have their place in the circle, and Aboriginal people respect all components of the natural environment. They believe that Aboriginal people are part of the land and they depend on it for survival on a daily basis. They believe that one day they will return to the earth.

The surrounding land and animals help determine the culture of the people living there. Aboriginal people identify and hold in high regard those things in the environment that sustain them. Often the land and animals become a part of the spirituality of the people. The land is so important that it is woven into the culture of the inhabitants. The people and the land are part of the same whole.

For example: The importance of cedar and salmon in the coastal cultures, the buffalo in the plains cultures, and the moose and bear in the interior cultures. Not only are these things needed as foodstuffs or materials, but they are also part of the legends, artwork, and daily life. They are construction material for technology, and part of the spirituality of the people.

Even the pace of life is determined by the land. Aboriginal people seasonally migrate to match the hunting/fishing times or harvest time for berries. On a daily basis, you go about your routine depending on what kind of game you are hunting, what the weather is like, and so on.

The land around you determines everything about you. It defines you, and you are a part of it.

4. Now, imagine picking up this circle from the North and moving it to coastal BC. What would the natural world around you be like? What is found there? How would this change your day-to-day life? How would your spirituality be reflected? (After the student responses, go over elements of coastal culture they may have missed that reflect the natural world.)
5. Now move the circle to the plains area. (Have students answer the same questions as above.)

### ADDITIONAL ACTIVITY

Have the students research another geographic region and the natural elements found there. With this knowledge, have them speculate and estimate about the culture of the people who lived there traditionally. Provide students with accurate information about the traditional cultures found in the region. Were they far off? How were the natural elements part of that culture?

### ASSESSMENT

In class discussions, the circle activity, and follow-up activities, look for evidence of:

- student understanding of the important of the circle symbol in Aboriginal cultures
- increased student understanding of the Aboriginal concept of “the relatedness of all things in the natural world” with respect to the local area
- student ability to transfer the concept of relatedness to the new circles and to other geographic areas.