Focus:

Identify the difference between Western and Aboriginal science investigations and to understand and value an Aboriginal investigation model.

Curriculum Connection:

6.8.9.
- Recognize evidence of recent human activity, and recognize evidence of animal activity in a natural outdoor setting

- Recognize that evidence found at the scene of an activity may have unique characteristics that allow an investigator to make inferences about the participants and the nature of the activity, and give examples of how specific evidence may be used

- Investigate evidence and link it to a possible source

Key Learnings:

» Indigenous scientists gather evidence that naturally occurs in an environment to determine the set of circumstances (what is happening)

» Indigenous people also learn from nature to attempt to rectify detrimental imbalances that may occur

» Human activity in a natural setting can be detrimental if not undertaken in a way that honors the laws of nature (natural law)

» Through simple observations, including sight and sound changes, one can identify changes in an environment, what has caused those changes, as well as who may have been involved

Materials and Resources:

DVD/Online video "A Beautiful World"

www.sacredrelationship.ca/videos

Note To Teacher

Depending on how deeply the teacher wants to take this lesson it may be necessary to distribute the full lesson over 3 class periods on 3 consecutive days. One strategy is to do the launch and begin the large group component of the Activate steps on day one, complete the Activate step on day 2 and have students share the Connect step of the lesson on the third day.

Teacher Preparation:

A fundamental difference between Indigenous and Western Science lies in the approach to investigations. Generally, in Western Science a scientist develops a hypothesis and sets out to prove the hypothesis to be true through investigation.

Indigenous scientists take a humble learner approach in which the scientist observes, listens, and gathers all available information from within and around the situation; each piece of evidence is considered carefully. The investigation by an Indigenous scientist is not based on proving anything: rather it is to determine the reality of a situation based on the evidence available. Then, this evidence/reality is compared to information that has been learned over a long period of time through observation of the same situation. The current reality is compared to the new reality to determine: have there been changes? If so what are the changes? What has occurred during this time span that may have caused those changes?

DID YOU KNOW?

In the Indigenous worldview, Aboriginal people believe that there is no separation between the land/water and themselves. The underlying assumption could be stated like this: What we do to the water, we do to ourselves. Another assumption is that everything we do will have an effect on the next seven generations of people. In other words, our children, grand-children and great-grandchildren will suffer the consequences of the mistakes we make today. Indigenous scientists, therefore are very cautious in how they interact with the environment. The scientific methods are non-obtrusive (primarily observation) and must be respectful to the ecosystem.

In the Western worldview, there are many philosophies of science and therefore many different ways to do a scientific experiment. Many scientists hold the assumption that whatever negative consequence that comes from the development of technology, we can find a solution to that consequence with better technology. For example, the extraction of oil from the oil sands has resulted in the creation of many tailings ponds in Northern Alberta. These ponds contain trillions of gallons of polluted, toxic water. Western scientists believe that in the future, they will be able to develop scientific innovations to reclaim that water for human consumption.

Launch:

Begin the class by inviting students to imagine that they are lead scientists on an environmental investigation team and they just received a call stating that there were some concerns about a pond close by your community. Ask students how they would conduct an investigation into the activity that may have taken place at this pond so that they could report on the situation.

Facilitate a brief discussion with students taking their ideas and thoughts into account. Tell students that they will be viewing a short video with an Aboriginal scientist conducting his own investigation. Ask students to consider the similarities and differences when comparing their own ideas and the approach used by the Aboriginal Scientist.

Invite the students to further consider how George, the Aboriginal Scientist, conducted his investigation and what he found. (These notes will help to guide the discussion).

George talks about the sounds. There used to be a lot of birds singing and now it's quiet. He talks about how the blind grandmother relied more on the sounds for her investigation but that she knew that something was wrong from what she heard and didn't hear anymore.

George sees the fish carcass, the piece of pipe and tires. He says that we used to just drink the water but it is no longer safe. He knows this from gathering his evidence through observation. He states that with the imbalance we know that there is something wrong. He says the solution is that we need to educate ourselves about nature, look after the earth or we will be in for tough times.

View "A Beautiful Word".

www.sacredrelationship.ca/videos

Activate:

Following the viewing of the video, invite students to share their thoughts about how the Aboriginal Scientists approach was similar to, or different from, their original ideas about gathering evidence and conduction scientific investigation.
Discuss how this Indigenous scientist gathers his evidence, examines patterns, and draws conclusions based on his own investigation.

Have students work in pairs or small groups and challenge them to create their own Indigenous Investigation based on what they observed in the video. Ask students to choose a site that is within close proximity to the school grounds in which they could actually conduct their investigation based on an Aboriginal investigation framework.

Remind students to:

» Pose questions based on George's model (what we see, hear, observe in plant and animal patterns etc.)

» Clearly state their method of examination of evidence gathered and how they will record their evidence.

» List any materials that they may require for their outdoor investigation.

Connect:

Once students have had time to prepare themselves for their Aboriginal based investigation, take them outdoors to examine and observe their chosen sites. Be sure to coordinate the locations prior to going outdoors so that students stay within line of site of the teacher at all times to ensure safety, as well as the freedom to investigate at the same time. Remind students that it is also important to respect the space of other groups during the investigations.

Upon return to the classroom have each group develop a presentation of results to share with the rest of the class based on their findings. The presentation will include:

» An overview of findings.

» Hypothesize who might have been involved in the activity that lead to this situation.

» Hypothesize as to what the activity was that lead to the situation.

» A proposed strategy to restore the environment to its natural state.

Students will present their findings to the class complete with their proposed strategy to rectify the environmental issues that they discovered. This may include talking to other classes about waste management and recycling, presenting a letter to administration about preservation of school grounds and the environment near the school, establishing weekly tasks to be undertaken by the class to preserve the local environment, etc.