ARCHAEOLOGY LESSON PLAN SERIES

FIRST PEOPLES OF THE ATLANTIC PROVINCES OF CANADA

MI'KMAQ, WOLASTOQIYIK, AND PESKOTOMUHKADI

HOW (AND WHY) WE DO ARCHAEOLOGY

An Introduction to the Indigenous Archaeological Record

A LESSON PLAN BY CORA WOOLSEY AND PATSY MCKINNEY

Lesson Plan 4: Seeing and Knowing in Archaeology

How (and Why) We Do Archaeology: An Introduction to the Indigenous Archaeological Record
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Statement of recognition: This lesson plan has been developed using educational facilities and resources within the traditional lands of the Wolastoqiyik and many other First Nations of Canada. The material in these lesson plans deals with the culture and history of the Wolastoqiyik, the Mi'kmaq, and the Peskotomuhkadi, as well as the First Nations in the Northeast of North America and across all of the Americas. Much of the knowledge base shared in this lesson plan is the direct result of the sharing of knowledge by the First Peoples of the Americas. The authors gratefully acknowledge that the unceded territories of the Mi'kmaq, Wolastoqiyik, and Peskotomuhkadi and all First Peoples made this lesson plan possible and that the rich cultural history of these peoples created the sites that we study.

Note Concerning Ethical Treatment of the Archaeological Record

This lesson plan is not intended to replace archaeological education or give students or teachers the skills to conduct archaeology. The authors and NCCIE in no way endorse seeking out Indigenous artifacts, withholding archaeological information from regulatory bodies, looking for archaeological sites, or digging with the intention to find artifacts or sites. Conducting archaeology, including excavation, testing, surveying, and monitoring, is only to be undertaken by an archaeologist or under the direction of an archaeologist who meets the criteria to be permitted by the provincial regulatory body of the province in question. The authors and NCCIE strongly condemn any activity that endangers the archaeological record, treats artifacts in a disrespectful way (such as selling or destroying artifacts), or impedes the ability of regulatory bodies to protect cultural resources.

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Lesson

4

Seeing and Knowing in Archaeology

In this lesson, we will learn about how to use evidence to understand the past, what we can learn by using science, and the different ways of knowing about the past.

Doing archaeology is not only about digging, lab work, and research. Archaeologists need to know how to put the pieces together to figure out what they are seeing. This is because the past is fragmentary – in other words, the archaeological record is not complete. Archaeology is often compared to a jigsaw puzzle from which most of the pieces are missing and the ones remaining have been chewed on by a dog! This will obviously make it hard to assemble the puzzle, and even more so, to know what picture the puzzle shows. Archaeology is similar because often we only find small pieces of artifacts and features and they are often discoloured, decomposed, or changed in some other way. This means we have to use a lot of different kinds of **data** (like stratigraphy and radiocarbon dating, plant and animal identification, and analysis of minerals) to reconstruct a picture of what happened in the past, and we can never know for certain that what we think happened is what really happened.

It takes a special kind of person to do archaeology. An archaeologist has to be able to gather data from a wide range of sources, which means knowing a little bit about almost everything. An archaeologist also has to know how to solve puzzles with only the faintest clues and the smallest fragments. Most importantly, archaeologists have to know how to think about the past using **evidence** (what we can see) and **logic** (what we can know from the evidence we have). An archaeologist is an outdoorsperson, a lab technician, a physical laborer, a mapper, and – most important of all – a thinker.

The Science of Archaeology

Archaeology is a **science** because it uses data to understand what is going on. Any time we **observe** something while doing archaeology, we are collecting data. Data could be anything from how many artifacts we find in one area to noticing a large mound in the woods to noting the water level of a river every day for a year. Data can also be what our community members tell us, what we find written in books, and what we know from our own experience. Sometimes, we

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only need to make one **observation** to help us form a **hypothesis**, such as when we note an artifact on the ground and hypothesize that beneath the surface is an archaeological site. Sometimes we need to make hundreds or thousands of observations before we can say anything definite, like studying the stone materials used in woodworking tools to hypothesize that people switched from one stone material to another at some point in time.

Archaeology uses the **scientific method**, which is one way of knowing and mapping the world. The techniques used in the scientific method are:

1. Hypothesis building
2. Testing
3. Explaining what is observed
4. Inductive and deductive reasoning
5. Checking for assumptions and bias
6. Presenting proof and drawing conclusions
7. Building a theory

It isn't necessary to understand all these steps in too much depth, but we will look at each one to see how archaeology needs to be done in order to be scientific.

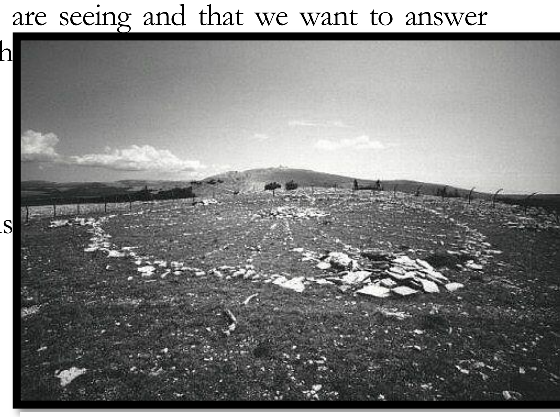
Hypothesis Building

Often in archaeology, we will see something that makes us curious and gets us thinking. It might be an artifact we've never seen before, or the way several artifacts are all broken in the same way, or a ring of stones whose function we don't understand. This might lead us to develop a **research question**, which is basically a question we have about what we are seeing and that we want to answer through study. Some examples of research questions might be:

"What is the function of this artifact?"

"What caused these artifacts to break this way?"

"What is the purpose of this stone ring?"



1. A medicine wheel from Wyoming.

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2. The purpose of these so-called "plummets" continues to be a mystery to archaeologists.

Once we have our research question, we can begin to **investigate** it. A new artifact could be examined carefully for clues about how it was used – called **use wear** – by looking at **abrasion**, which is the scratches, rubbing, and removed surface objects accumulate from being used over time. We could also show it to other people to see if they have ever seen a similar artifact. A **breakage pattern** – a particular way that artifacts break over and over – could be investigated by making reproductions of those artifacts and then trying out various activities to see if the reproductions break in the same way. A stone ring could be studied to see if it matches other types of stone rings (such as hearths or tipi rings) and its shape could be compared with the local environment for clues. This process of investigation involves gathering data and trying to put the pieces together.

Hopefully, we have found one or several possible answers to our research question after a little bit of study. If so, this might lead us to develop a **hypothesis** about something. A hypothesis is a tentative explanation for an observed **phenomenon** (a thing or force that can be touched, felt, seen, heard, smelt, tasted, or otherwise perceived with the senses). You can have more than one hypothesis at a time, and you can change your mind about a hypothesis and scrap it if you find it doesn't make sense with the data. You can even have no hypothesis! Then you have a real mystery on your hands and all you can do is keep investigating until you find a good clue. Many archaeologists have encountered **phenomena** (plural of *phenomenon*) that remain a complete mystery even after an entire career of investigation.

Testing

Once we have a hypothesis (or several **hypotheses**), we need to **test** to see if it is true under different circumstances and conditions. The more often we confirm our hypothesis in different situations, the more certain we can be that we are on to something.

One of the best ways to test a hypothesis is to set up an **experiment**. An experiment shows what would happen if certain things were put together that we think would make or do something like what we want to investigate. Usually, in an experiment, we want to show a certain principle. For example, we may notice that the tips of projectile points are often missing or we find only the tip. What could be making them break this way? Perhaps this comes from the way they are used. We could set up an experiment in which replicas of projectile points are hafted to spears and thrown at sandbags, a good stand-in for an animal that people in the past might have hunted. We may find that throwing spears in this way results in projectile points breaking in the same way about once every 10th throw. Now we know what is causing this breakage and we also know how often hunters would have had to replace their projectile points.

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In archaeology, we can't always conduct experiments, so often we test our hypothesis by seeing if the same set of conditions occurs at different sites. For example, we might believe that a certain shape of arrowhead occurs only before the invention of pottery, which was 3,000 years ago. We might have developed this hypothesis because we found it only in layers below pottery-bearing layers in a site we excavated. To test this hypothesis, we would need to see if this shape of arrowhead also occurs only below pottery-bearing layers in other sites. The more sites that conform to our expectations, the more certain we can be that the arrowhead shape was made only before 3,000 years ago.

Explanation

When we have gathered enough evidence to be fairly certain our hypothesis is correct, we need to start thinking about what caused the phenomenon we are studying. This is because science is both *predictive* and *explanatory*. In other words, if we know what we are going to find but don't know why it keeps happening that way, then we have not really solved any mysteries. To do science, we need to understand both what and why.

3. A hearth feature with reddened soil and charcoal.

One way to explain phenomena is to try to **reproduce**, or imitate, the physical evidence (arrowheads, hearth features, and so on) through experiments. For instance, if we want to know why a hearth feature always has a red layer of soil underneath, we might want to build our own hearth to see if the soil turns red or if something else is responsible for the reddish colour, like maybe people were throwing red pigment into the hearth for some reason. If we conduct this experiment, we will see that, in fact, soil turns red when exposed to fire for a long time. Therefore, we can say that not only does a reddish layer of soil accompanied by charcoal indicate a hearth feature, but also that this is because heat turns soil red. Now, we have knowledge that we can apply to other situations, so that if we see a much deeper layer of reddish soil, we can say that the fire there was much larger and hotter than the average camp fire because the heat penetrated deeper into the ground. In this way, we increase our knowledge of the archaeological record and how to interpret it.

When we try to explain what we are seeing, usually we are searching for the **mechanism** that caused the phenomenon. In the hearth feature case, we can see from

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reproducing hearth fires that fires turn soil red. But why does it do that? The mechanism that causes soil to turn red is the presence of iron in most soils. When iron is exposed to heat and oxygen, it **oxidizes**, turning whatever contains it red. This is why rust and fired clay are reddish-brown, why many red gemstones are the colour they are, and why blood is bright red. Each of these things contains iron that, at some point, made contact with oxygen. This is the mechanism that is responsible for red soil layers below hearths: oxidation.

Reasoning

Although evidence is the basis on which any science is conducted, evidence alone is not enough. The scientist must be able to gather evidence and figure out what it means by using the **reasoning process**. This is the process of using logic to determine how the pieces fit together. You may not realize this, but every time you try to solve a puzzle – from a riddle to a complicated maze in a video game to figuring out how to open that one sticky door in your life – you are using logic and reasoning. You are also using logic every time you give someone a reason why you did something.

Arguing is usually considered bad, especially when you do it with an authority figure, who might get annoyed that you are not simply doing as they tell you! But in science, your **argument** is how you convince people (and yourself) that you are right. A logical argument is the way you put the pieces together so that your explanation makes sense. Let's look at a logical argument:

> I have excavated an archaeological site that contains a lot of lithics, no pottery, and no faunal remains. There is a hearth feature, but it is small. Furthermore, all the lithics are flakes, numbering about 200 and of the same stone material. There are no formal artifacts, like knife blades or projectile points, and no ground-stone tools. However, there is one rounded cobble with little chips taken out of one end. The flakes are all sizes and they are spread out over a fairly small area.
> Because there is no pottery or faunal remains, this site was not occupied by a family and was temporary. Because the flake scatter occurs mainly in one area, someone was probably sitting in the middle of that area knapping a stone tool and using the cobble as a hammerstone. Because there is a hearth feature but it is small, the person who knapped the stone tool probably did not stay very long and this site was probably a camp site during a journey to somewhere else.

Do you believe this argument? We might quibble with some of the details, like how long the person stayed and whether it was one tool or several that were made, but for the most part, the argument is good. Pottery is used when someone is cooking for a

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family, so the absence of pottery (especially in a small site with no living floors) and also the absence of faunal remains like bones is pretty good evidence that only one or two people were at the site. The flakes found all in one place and all made of the same material is also pretty good evidence for a single event – in other words, only one tool, not a stone tool manufacturing site, where flakes would be scattered everywhere, not just in one area. 200 might seem like a lot of flakes, but remember that a single stone tool can have many more than that, depending on how refined the knapper wants the tool to be.

Assumptions and Bias

In any reasoning process, you will encounter **assumptions**. But contrary to what you might have heard, assumptions are not necessarily bad. In fact, we need assumptions to make any kind of reasoning because if we don't start with some kind of knowledge, we can't make any argument at all. Assumptions are the knowledge base we start with when we begin the process of solving a puzzle. An assumption that archaeologists make when they are excavating is that layers above are younger than layers below. Even though lots of events can mix layers (like someone digging a hole), or even put younger layers below older layers (such as someone digging a tunnel), we know that layers always start in order from older to younger. This assumption comes from the well-established law of superposition that we talked about in the last chapter, for which a mechanism has been identified and which has been shown to be true countless times. It is a safe assumption to make unless proven otherwise.

However, assumptions become a problem when they are **unwarranted**. In this case, they can fool us into thinking we are seeing something that isn't really there. For instance, if the argument presented above about the flake scatter has concluded that the person making the flakes was male because they were travelling alone or because there was no evidence of cooking, then the argument would become less convincing. There is no evidence in the above argument of which gender made the stone tool, and so proposing one or the other would have been based on assumptions. It is possible that there is reason to believe that women did not travel alone or that they always cooked, but these reasons would need to be justified in the argument with evidence; otherwise, it would be an unwarranted assumption.

Often, unwarranted assumptions arise because of **bias**. Bias is the set of assumptions you make about the world as a result of the particular perspective you have that comes from your experiences of the world and the influences of the people around you. Your perspective is not wrong or bad in any way, but you have to be careful about assuming that your experiences are the same as everyone else's. This includes people in the past. Maybe in your house, the males do all the cooking. However, it would obviously be an error to assume that, in every house, the males do all the cooking. Therefore, we need to think carefully about the kinds of bias we might introduce unknowingly to our argument as a result of our perspective.

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THOMAS JEFFERSON

From the Files: An Example of Poor Arguments

When Europeans arrived in North America and began to colonize, they were noticing the landscape around them and wondering who could have made the impressive cities and earthwork mounds that were common across Ohio, Illinois, and other parts of what is now the United States. The mystery for them was that the people already living here no longer resided in cities nor did they build mounds any longer. This led the European colonizers to speculate that some other "race" of monument-builders had been there before, and that the "Native" people living there now had killed off this race. This conclusion came because of several unwarranted assumptions. First of all, the colonizers believed that the Indigenous people of the Americas were technologically deficient and could not have built cities or monumental earthworks. Second, the colonizers had myths about a "lost tribe of Isrealites" that they believed were capable of creating these works. Third, the colonizers did not believe that Indigenous people would have wanted to build cities.

4. An artist's depiction of Jefferson's excavation.

To understand how the colonizers could have been so wrong, we need to examine their bias. They were hoping to treat the continent as an unexplored "*tabula rasa*" (blank slate) that they could do with as they pleased. To do this, they needed to discredit the people already living here as the rightful inhabitants and stewards of the land. They wrote a mythology in which Indigenous people were thought of as lazy, technologically inferior, primitive, warlike and unkind, and having arrived no more than several hundred years earlier. This made colonizers ignore the most obvious explanation, which was that Indigenous people were descended from the mound builders and city dwellers whose monumental works were apparent all over the landscape (in fact, St. Louis is built on top of a former city of approximately the same size!).

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Sometime late in the 18th century, Thomas Jefferson excavated a mound in Virginia, proving conclusively that the Indigenous population had come from the builders of the mound and that the mound was very old. He did this by noting similarities in material culture from the Indigenous population and the grave goods in the mound, and showing that the grave goods evolved over time. Finally, he showed that the lowest layers had evidence of being very old, meaning they were maintained over many millennia. Although some people kept believing in the Isrealites even after Jefferson's report, Jefferson's work continues to be an important and influential piece of evidence for the long time depth of Indigenous history in the Americas. Jefferson is considered the father of Americanist archaeology, partly because he was the first to question the assumptions of his colleagues.

Proof and Conclusion

A **conclusion** is your final opinion about what you are studying and it comes after you have developed a hypothesis, tested it, gathered your evidence in an argument, and checked to see if you are making unwarranted assumptions. It is what you want everyone else to know about your study in a nutshell.

In archaeology, we have a problem when we try to draw conclusions. It is very difficult to say anything with certainty because much of what we see in the archaeological record cannot be fully reproduced. This is different from other sciences like chemistry, in which scientists can conduct experiments that conclusively prove what will happen when certain things occur. In archaeology, we have some things we can never reproduce, the most important being the history. In other words, we can reproduce processes on a small scale, but we can never know exactly what led to artifacts being deposited in the ground, what was done to them before they were deposited, and what happened to them afterwards. We can only make an educated guess.

This means that we have to be careful about our conclusions. In order to conclude anything, we need to evaluate our evidence as **proof**, which consists of deciding what the evidence means and whether it supports our hypothesis. It is important to remember that evidence does not have to be strong for us to make a conclusion; sometimes, we can say that our evidence points towards a certain conclusion but that more evidence is need to support the conclusion better. In fact, this is the most common conclusion in archaeology!

When evidence is strong and our argument is well-founded, we can conclude that it constitutes proof that our hypothesis is correct. This is a rare situation in archaeology, but it does happen. There is good evidence that people in Atlantic Canada had contact with people in distant locations, and one of the main sources of evidence for this is the lithic materials that come from very distant sources. For instance, Ramah chert is a toolstone that comes from Newfoundland that was traded into Atlantic Canada and other regions. When it was first realized that this material came from very far away, archaeologists suspected they were seeing evidence for long-distance trade in the

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archaeological record, but did not feel confident to say for sure. However, Ramah chert has been found in so many sites, both as raw material (unworked chunks) and as formal tools that several archaeologists have stated that their sites have proof of trade between the Atlantic Provinces and Newfoundland. This is now well accepted as an archaeological **fact**, or in other words, we can safely assume that trade occurred between these regions when we are looking at evidence.

Scientific Theory

When proof is conclusive and overwhelming for one hypothesis, it becomes a **theory**. This is not the same meaning as when someone says they have a theory about something, meaning, they think they might know what is going on. A theory in science is a statement about how the world works that cannot be refuted. Examples of theories are Einstein's theory of relativity or Darwin's theory of evolution. We may find that there is more to the story in the future, but we can say with certainty that this one part of the puzzle is solved.

But scientists are careful about calling something a theory because they are much better at being skeptical than at accepting proof as conclusive. This means it takes a long time before scientists all agree to call something a theory. In archaeology, there are very few theories because we have so many unsolved mysteries, but one example of a scientific theory in archaeology is the law of superposition. We are pretty sure at this point that no further evidence is going to disprove that sediments are deposited through time and that this sedementation process occurs from older to younger moving from lower to higher.

Traditional Indigenous Knowledge

We have explored the scientific method in depth because this is how archaeology is still mostly done. Therefore, we need to understand it. However, it is not the only or even the best way of knowing and understanding the natural world, although for a long time many scientists would have told you it *was* the best way. The scientific method is also not the only way of conducting archaeology. **Traditional Knowledge**, or **TK**, is becoming increasingly important in discussions on how to improve archaeology. Unfortunately, we have only a handful of examples of archaeology being conducted using TK.

In this section, we will look at what TK is and how it can be used to conduct archaeology.

What is TK?

TK is knowledge gathered over generations of people through time. This makes TK very stable and reliable. TK is usually landscape- and skill-based, meaning that people with TK know a lot about the land and how to use it. They also know how people have used the land in the past, which is very important for archaeology.

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Comparison of Science and TK

There are several differences between the Western science knowledge system and TK.

Holism. TK is **holistic**, which means that it looks at all components of a phenomenon together. Unlike the scientific method, which dissects phenomena to look at their different parts separately, TK looks at things in their environment to learn what they are naturally like. The scientific method tends to like phenomena to be dead or deactivated before being studied, but TK prefers things to be alive, active, and interacting with the environment. In this way, TK learns about the behaviour of animals and stars, the various uses of plants, and the manipulation of natural materials to make artwork and build technology.

Experiential. To learn TK, people must experience the world firsthand over and over so that the best way to do things becomes like a second nature. In science, experience is usually only for how to do lab work, field work, or writing results. We need these skills through experience, but it does not extend to experiencing the things we are studying. In fact, some scientists believe you should stay as far away from what you are studying s possible in case you affect its behaviour! Psychologists often do experiments with animals and humans and they try to interact with their subjects as little as possible. TK, on the other hand, comes from many, many experiences of the natural world and many generations of people living in it.

Unwritten. TK does not use writing systems for the most part but instead relies on **oral tradition**. As opposed to the scientific method, which relies heavily on writing (data collection, presenting results, and so on), TK instead builds up the shared memory of the group through individuals learning from Elders and from experiencing the environment in which the phenomenon exists. This is a very different way of studying because memory is activated in a completely different way from when writing is used to record things. Memory becomes stronger when learning experientially, whereas it becomes weaker when learning is mostly done using writing. As a result, TK tends to be good for individual mental health.

Customary. TK is usually passed on through **customs** that help instill the knowledge in others more effectively than just being told by a teacher. Societies that use TK often design ceremonies and recurring events that allow for extra learning. For instance, the peoples of Atlantic Canada have always travelled from far away to gather together at places like Bear River in Nova Scotia. During these gatherings, feasting was important to make people feel welcome and to give people a chance to talk and conduct important business, like naming leaders or deciding whether to go to war. It was also a time for the people's greatest **Knowledge Keepers** to tell stories, share their experiences, and give gifts they made to others. In this way, the people learned from each other even though they might have come from very far away from each other. In science, customs are not well developed. Knowledge is passed on from a professor to a student in classes or through reading and if the student is not able to take in the

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concepts, s/he/they will probably not last long as a student. For this reason, TK is more inclusive and oriented towards group-building whereas science is more specializing and oriented towards developing a group with the skills to do science.

EXPLOITATION OF TK

In the past, some scientists have taken knowledge from Indigenous peoples and claimed it as their own. This shows that scientists can use TK to better understand the natural world and that sometimes TK is a more efficient way to learn about the world. However, it also shows that scientists have taken TK for granted and have not given enough credit to the people who developed the TK, and – perhaps worst of all – have profited off this information without giving anything to the Indigenous people who gave it. More and more, Indigenous people are seeking ways to protect their knowledge from this kind of **exploitation**.

A good example of this kind of exploitation is the problem of "bioprospecting," sometimes called "biopiracy." This is the case of pharmaceutical companies looking for medicinal plants used by the Indigenous people of other countries. In the past, companies have made huge profits by watching Indigenous people in places like Belize and Samoa use plants for traditional healing and then taking those plants back to laboratories to figure out what compound in the plants could be extracted to get the same results. This made many Indigenous people angry for many reasons. For instance, people working for pharmaceutical companies were often pushy and even forceful in trying to get Indigenous people to reveal knowledge. To make matters worse, Indigenous people often gave this knowledge at some cost to themselves, taking time to show outsiders how to find plants and use them properly. Sometimes, outsiders depleted the plants by taking many back with them. Rarely did these Indigenous people see any benefit from the exploitation of their knowledge before the last two decades. Another thing to consider is that sometimes the plants used had sacred properties and Indigenous people were angry that their knowledge was being used outside of their proper customs. And Indigenous people have often become angry to see that the knowledge they shared freely become property that others withhold in order to make money.

Agreements are now in place that allow Indigenous people to sue for rights to knowledge that they helped build, and Indigenous people have even placed copyright on their medicinal knowledge. However, this goes against how many Indigenous people think about knowledge and plants. Many Indigenous people don't feel that knowledge can be owned or that plants can be property. Believing knowledge should be shared makes it hard to restrict access to others, yet many groups now protect their knowledge through these kinds of legal agreements.

Two-Eyed Seeing

Two-Eyed Seeing is a way of bringing together science and TK to better understand the world and to acknowledge the importance of Indigenous **perspectives** in science. This idea was developed by Elder Albert Marshall in Nova Scotia to describe the way Indigenous perspectives and TK should be used as though

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they are one eye, while Western ideas about science and knowledge should be used as though they are the other eye. Using them together makes a more complete picture than one or the other alone or using both at different times.

Two-Eyed Seeing is considered a way of doing science that also uses TK to learn faster, more fully, and with greater respect for the Earth and the people involved than science can do alone. In Two-Eyed Seeing, different areas of life are often brought together to try to understand how they relate to each other. Sometimes, this can be hard for scientists, who are usually taught to divide up the areas of life and study only one part at a time. Two-Eyed Seeing also usually tries to keep in mind how knowledge can make things better for people. This can also be hard for scientists, who usually try not to think about who they might be benefitting with their study. This is not because scientists don't care about people; it is because sometimes, if you worry about whether you are doing useful work, you may end up looking at certain things and avoiding other things. In other words, scientists try to remain **objective** and discover new things without thinking about whether it helps anyone in case this might influence their interpretations. However, if used properly, Two-Eyed Seeing can be both objective and concerned for the well-being of people in its research.

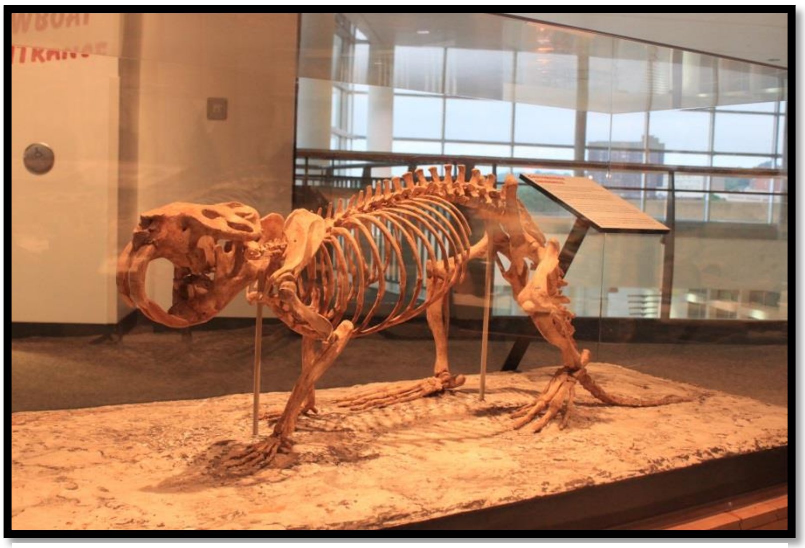
Two-Eyed Seeing has been used in archaeology. An excavation at Tobique First Nation in New Brunswick was conducted entirely by Indigenous workers under the direction of Ramona Nicholas, an archaeologist from Tobique First Nation. The excavation was designed to involve the community in decisions and sharing the knowledge from the site. Ms. Nicholas made sure to use Two-Eyed Seeing as a way to guide the work and learn as much as possible. The excavation was done using traditional archaeological methods but also added knowledge about the site from community members to get a more complete picture of what happened at the site. Using this method, Ms. Nicholas concluded that the camp site they found was one of many along the Tobique River. Some archaeologists have called this "Indigenous archaeology."

Lessons from the Past: The Case of Big Beaver

More and more, archaeologists have learned to pay attention to what Indigenous people say about what happened in the past. After all, Indigenous people have been here a lot longer, so this only makes sense. However, scientists of many kinds, including archaeologists, have not always been willing to admit that other kinds of knowledge could be important to understanding the natural world. Imagine the surprise of archaeologists and paleontologists (scientists who study species from the past) when they discovered that Big Beaver, a well-known Indigenous character known across northern North America, was real!

One story of Big Beaver tells about one of the earliest times in Indigenous history. Big Beaver was unwilling to show happiness when Glooscap created humans. This upset

Glooscap, who was very proud of his newest creation, so he tried to turn Big Beaver small by petting him on his back, but Big Beaver eluded him. He caused a giant tree to fall across the land, making the Wolastoq River. Glooscap pursued Big Beaver but could not quite catch him, and the Wolastoq River bears the scars (in the form of rocks and islands) of where Glooscap tried to smash Big Beaver with his snowshoes and throw rocks at him. Big Beaver managed to escape, but not before creating the Great Lakes with a giant dam; he then disappeared into the Underworld. Big Beaver played a big part in shaping the landscape that Indigenous people travelled on for millennia, so it is not surprising that he is an important character in the stories of Indigenous people across Canada.



5. A giant beaver skeleton on display at the Minnesota Science Museum.

Anthropologists and archaeologists had viewed this story as an imaginative myth that may have come from seeing fossilized beaver incisors larger than the ones from modern beavers. Maybe this really did influence how the story of Big Beaver came to be. However, these same scholars did not believe humans were in the Atlantic Provinces much earlier than 6,000 years ago, believing that the ice sheet would have made living here impossible. Yet we now know this is not true and people would have lived alongside giant beavers during the Ice Age. Furthermore, an archaeological site called the Sheridan Cave in Ohio shows that Paleo people were hunting giant beavers and bringing them back to their homes. It seems likely, then that people in the Maritimes were also hunting and using giant beavers.

But could the story have been passed down from 13,000 years ago, roughly when the giant beaver went extinct? It can be hard to imagine that people would remember something over such a long time. After all, people living in England up until the 1900s still thought that the flint arrowheads they found occasionally must have come from fairies, instead of from the early people who lived in England up until about 2,500 years ago. How could the English have forgotten their heritage over a much shorter time, if Indigenous people can remember 13,000 years ago?

One possible answer is that the English have largely lost their oral histories, relying for many millennia on written records. Without oral histories, people tend to forget what was not written down. However, the Indigenous peoples of North America have been handing down stories and histories from a long time ago. When oral history is the main history, the people who study and pass on the history usually get very good at remembering the stories handed down from older generations.

The authors gratefully acknowledge that the unceded territories of the Mi'kmaq, Wolastoqiyik, and Peskotomuhkadi and all First Peoples made this lesson plan possible and that the rich cultural history of these peoples created the sites that we study.

It is also interesting to note that the story of Big Beaver acted very much the way the glaciers acted, creating a new path for the Wolastoq River and making a dam that blocked water from escaping from central North America. Glaciers are very destructive, forming massive dams that create huge glacial lakes and forcing water through areas it would not otherwise travel through, such as mountain ranges. Another interesting detail in the story of Big Beaver is that there were other animals that were also very large, whom Glooscap petted on their backs to make them smaller. Although we have to be careful about saying that this is conclusive proof, we can say that Indigenous knowledge seems to confirm what scientists are slowly discovering.

The case of Big Beaver shows that science and TK together can give a more complete picture of the past. Scientists have amassed evidence for the existence of the giant beaver and when it went extinct, and even that humans had hunted the species in some parts of North America. Indigenous people know of a character from long ago who caused a lot of trouble and was driven from the land. Without the Indigenous oral histories, scientists would have a hard time knowing whether humans in the Maritimes had contact with the giant beaver. But thanks to these histories, we can feel more comfortable in saying that humans lived alongside this species and probably hunted it as humans hunted much of the megafauna during the Paleo period.

Seeing and Knowing in a Nutshell

We have looked at the scientific method and compared it with TK to better understand how these different systems could work together and also how they sometimes seem like they conflict with each other. Many archaeologists use science but remember to consider Indigenous perspectives in their work. As well, many Indigenous scholars and Knowledge Keepers use TK but bring in Western scientific approaches to better understand what they are studying. Many problems still exist with making sure TK is not exploited by scientists, but also, many Indigenous people are not yet ready to accept the value of science. As Indigenous and non-Indigenous groups become more familiar with each other, these barriers to understanding become lower and lower. We have a long way to go, but we have made some important steps over the last few decades.

In the next lesson, you will be introduced to the ways archaeology is conducted in the Maritime Provinces.

Photo Credits

1. *A medicine wheel from Wyoming, courtesy of the National Park Service, USA.*
2. *he purpose of these so-called "plummets" remains a mystery. Photo: Drew Gilbert.*

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3. *A hearth feature. Photo: Cora Woolsey.*
4. *An artist's depiction of Jefferson's excavation. Painting: John Egan.*
5. *A giant beaver skeleton. Photo: Ryan Somma.*

List of Terms

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