



Connecting Math to Our Lives and Communities

Determining Directions

Introduction

There are many stories of Mi'kmaq people using stars to navigate over long distances. Mi'kmaq navigation skills were consistently demonstrated during the First and Second World Wars due to a large portion of Europe sitting at the same latitude as Mi'kma'ki.

The Indigenous Polynesian and Micronesian people of the Pacific are well known for their excellent navigational knowledge. Aboriginal and Torres Strait Islander people also developed techniques to navigate using the stars and the sun in a variety of ways, having their own names for the cardinal points (North, South, East, and West) in different languages. You can learn more about their methods of navigation by checking out our Wayfinding module links on the CMTOLC website.

	DIRECTION	EAST	SOUTH	WEST	NORTH
	Colour	White	Yellow	Red	Black
	Spirit Animal	Eagle	Thunderbird	Black Bear	White Bear
	Medicine	Sweetgrass	Sage	Cedar	Fungus
	Element	Water	Fire	Earth	Air
	Season	Spring	Summer	Fall	Winter
	Life Stage	Infant	Adult	Elder	Ancients
	Notes		Women's direction		Men's Direction

Mi'kmaq use the medicine wheel to represent the four directions. These directions are Wjipnuk (East), Pkite'snuk (South), Tkisnuk (West), and Oqwatnuk (North). Because the circle represents the passage of the sun and the seasons, discussion of the Wheel usually starts in the Wjipnuk (East) direction, where the sun rises, and travels in a clockwise direction. Also, each direction has an associated spirit helper, an element, and a sacred medicine.

For this activity, we will find the four directions by using the sun, a stick, and some rocks.

Math Connections

- Directions
- Measuring

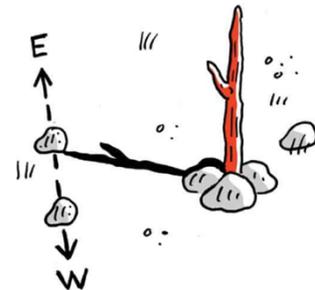
- Angles

Materials

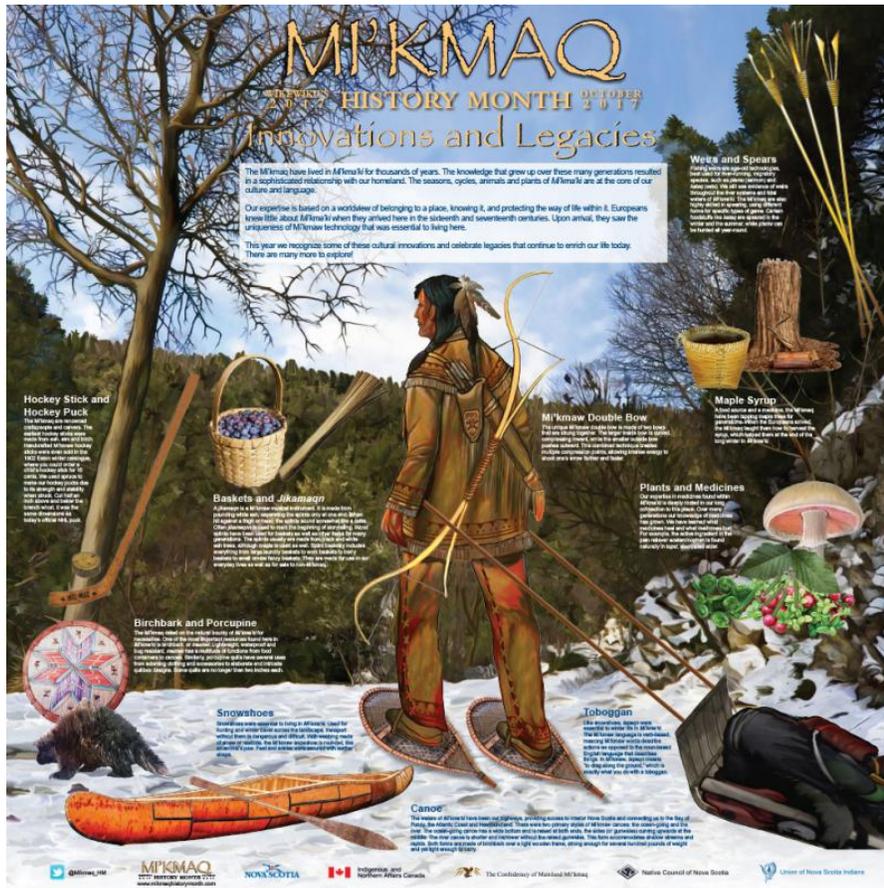
- Stick (30cm long)
- 4 small rocks

Activity

1. This activity is best performed on a sunny day. Start by gathering your materials. You will want to find 4 rocks and a straight stick that is at least 30 cm or longer. Be careful not to disturb your natural environment. Try to use what is available and not remove a branch from a living tree.
2. Place the stick vertically in flat ground. Find a spot where the ground is soft, so this is easier. Once your stick is in place, mark the tip of the stick's shadow by placing a rock at this point.
3. Come back after some time has passed. 30 minutes should be enough. You will notice that the shadow will have moved. Now, place another rock at the tip of the stick's shadow again.
4. Look at your two rocks. Trace a line in the dirt between them. The first rock that you placed is pointing Tkisnuk (West) on this line, and the second rock is pointing Wjipnuk (East).
5. Draw a line 90° perpendicular to the first line that you drew. This gives you the Oqwatnuk (North) / Pkite'snuk (South) line. Put your left foot on the first rock placed which is Tkisnuk (West) and your right foot on the second rock placed which is Wjipnuk (East) to find Oqwatnuk (North). When you're in this position, your front will be facing Oqwatnuk (North) and your back will be facing Pkite'snuk (South). Place two more rocks to indicate Oqwatnuk (North) and Pkite'snuk (South). This completes the compass. The Oqwatnuk (North) you're facing is true Oqwatnuk (North), because you've used the sun rather than the Earth's magnetic field.
6. Observe what landmarks are found in these directions and discuss how they are oriented relative to yourself. The medicine wheel is the basis of the four directions. However, in some cases you may use seven directions. The additional directions are:



UP	the direction of Creator, the sky, Grandfather Sun and Grandmother Moon.
DOWN	the direction of Mother Earth.
INWARD	to honor ourselves, and the spirit that exists within each of us.



- In the next activity you will be building a map. It would be a good idea to use the directions that you have found today in your map. You can make a note of the directions to use later by making a drawing or writing down a sentence like “Oqwatnuk (North) is facing the tree in my yard.”

Questions

- How is knowing and understanding these directions helpful?
- How can these directions be used compared to directions like left and right? If you knew the seven directions at all times, would you need to use the terms left and right?
- How did you measure the 90-degree angle? If you estimated, what knowledge did you use to help you?
- Where might you find these directions? Where have you seen or heard about them before?

Send us a photo of your direction points at Connecting Math To Our Lives and Communities email (cmtolcstfx@gmail.ca)! ☺