

Treasure Hunt

Grade: 1-2

Time: 1 hour

Activity Overview :

Today we are going to be cartographers! You will be making your own compass and learning about magnetism, and the four cardinal directions. Next, you will get the chance to make a map of a room in your house and use your compass to guide family members to your hidden treasure!

Before we begin think about the following questions:

- How does a compass work? What do compasses tell us?
- How do you find your way around a new place?

Materials:

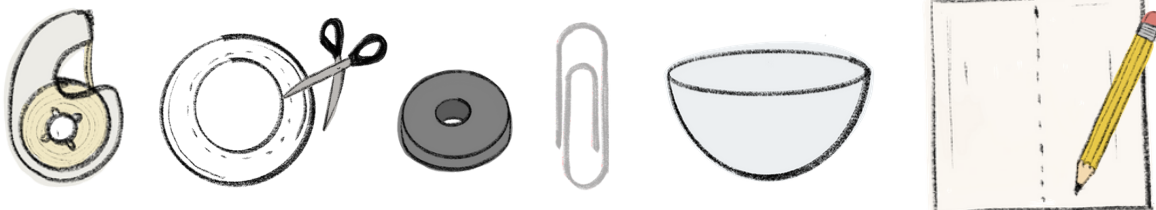
For Compass:

- Plastic wrap
- One magnet
- One paperclip (nail or sewing needle works too)
- Styrofoam plate or cardboard
- A small plastic bowl or cup (preferably clear)

- Tape
- Scissors
- A red marker

For Map:

- Blank paper (preferably grid paper)
- Pencils and
- Erasers
- Markers or pencil



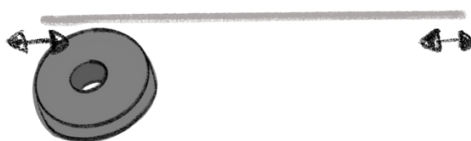
Activity (Compass):

- 1 Get a small plastic bowl or cup and trace the bottom of it on a Styrofoam plate or cardboard. Use scissors to cut this out.
- 2 If you used cardboard, wrap it in plastic wrap to prevent it from getting soggy.
- 3 With the help of a parent/guardian, grab a paperclip and unfold it so that it's straight. Then, take rub a piece of magnet for a minute, on both ends of a paperclip
- 4 Grab a plastic bowl or cup and then fill it up with a little bit of water.
- 5 Place your cut out of Styrofoam or cardboard in your bowl/cup and place the paperclip on top of it in the middle.
- 6 The Styrofoam or cardboard should start to spin and should follow the movement of your magnet.
- 7 Once the paperclip stops spinning, compare the ends of it to an actual compass, such as the compass app on a phone/tablet. One end of the paperclip should be pointing south while the other is pointing north. Colour the end of the safety pin that is pointing north, red.
- 8 With the help of a parent/guardian wrap your compass tightly with plastic wrap and tape the bottom to ensure the water won't spill out. Over time the paperclip will lose its magnetism and will have to be magnetized again with the magnet to get it working again.
- 8 To help remember the four different compass directions use the following abbreviation: Never Eat Soggy Waffles (NESW).

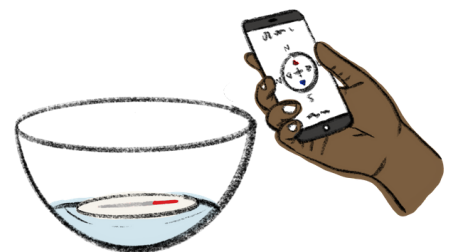
Step 1



Step 3

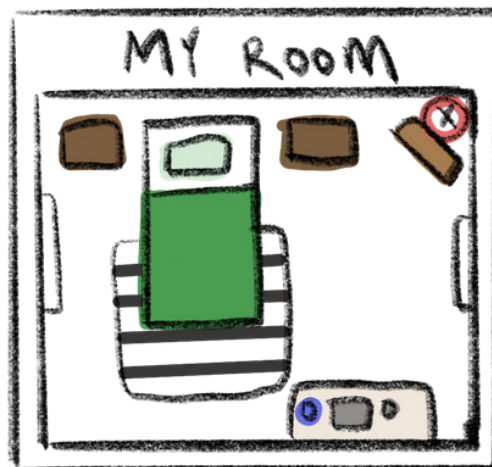


Step 4 - 7



Activity (Map):

- 1 Choose a room in your house such as your bedroom that you would like to make a map of, from a birds eye view.
- 2 Measure your room using your footsteps. Each footstep will equal one square on the grid paper. Make sure you count in both directions. If you do not have grid paper, take a blank sheet of paper and, using a ruler, make horizontal and vertical lines on the paper that are all one centimeter apart with the help of a parent/guardian.
- 3 Count the same number of squares on your paper as you did footsteps.
- 4 Draw the shape of the room.
- 5 Count your footsteps to different things in your room and to windows and doors. Add these on to your map.
- 6 Colour your map to make it look like your room.
- 7 Hide an object somewhere in your room. Make a route using your compass and cardinal directions to guide a family member to the object. Give them directions such as: take 4 steps east.
- 7 Have a family member hide an object somewhere in the room and have them give you cardinal directions that you have to follow using your compass to find the object.



Engineering and Science Connections

Earth's Magnetic Field extends from deep inside the earth to space where it interacts with the sun. As the earth rotates a magnetic field is formed from this interaction. This magnetic field acts as an invisible shield that protects the earth from things such as radiation from the sun. This shield helped make life possible on Earth. Try putting two magnets on top of each other, flip one magnet and try again. Move the magnets around each other to feel the magnetic force. The magnetic field is the area around a magnet where there is a magnetic force.

A **Compass** is made up of a magnetized needle on a free rotating axle that allows it to interact with nearby magnetic fields.

The **four cardinal directions** on a compass are North (direction of the North Pole), East (where the Sun rises), South (direction of the South Pole), and West (where the Sun sets). These are shown at 90° angles on a compass rose.

A **Compass Rose** is a figure on a compass or map used to display the orientation of the four cardinal directions.

Cartography is the study and practice of making maps. **Cartographers** use science, technology and specialized mapping software to draw maps.

A **map** is a drawing of a place such as a city, a country or the world. It includes physical features such as rivers, cities, roads etc. Most maps show places from a birds eye view.

Extensions

How do different magnets affect your compass?

If you have magnets of different strengths at home such as a flat fridge magnet and a neodymium magnet, try using the different magnets to make multiple compasses. Compare how well the different compasses work.

Draw a map of your neighbourhood

Take a hard surface to write on such as a book, a piece of paper and pencil and take a walk around your neighbourhood. As you walk, count your steps and sketch out a quick map of your neighbourhood from a birds eye view. Make sure to include a compass rose and all major land points on your map. Use this map for a bigger treasure hunt!

Extensions

Let trees show you the way

Go for a walk and try to see if you can tell which way is North by looking at different trees. Trees grow towards the sunlight as they need the energy to grow and since the sun spends most of its time in the south part of the sky, a tree can be seen to favour the South direction. The branches on a tree will grow more upward on the North side of the tree and on the South side the branches will be growing more horizontally.

Another way to tell which way is North is by looking at the stump of a tree. As you follow the rings on the stump to the center where they are the smallest, the rings should be growing towards one direction more than the other direction. This direction would be South.

You can try to find some moss and see which side of trees and rocks there is more moss on. Moss tends to grow more on the North side as they prefer a darker and shadier environment. Just remember, moss can grow in other directions depending on the surrounding environment - check for yourself!

Use your compass to check how well these helped your guesses!

Share your creations!

Don't forget to share your experiments and creations with us! We would love to see what you've made. You can Email us at: esqinfo@uwaterloo.ca or send us a message/tag us on our social media!

Facebook: @uwengoutreach **Twitter:** @UWEngOutreach **Instagram:** @uwengoutreach

Thanks for exploring, discovering, and learning with us!

3, 2, 1 Done!

3 - Write or draw 3 things you learned from this activity

2 - Write or draw 2 things you found super interesting or cool and want to learn more about

1 - Do you have any questions about the activity? Did something make you wonder...what if? how? or why?