



Activity

# Sundials

## MATERIALS (per group)

- Compass
- Protractor
- Piece of cardboard or any material that can be used as a dial
- Stick or straw whose length is proportional to the dial
- Modeling clay

**DURATION**  
60 MINUTES

## Activity Summary

This activity invites students to build their own sundials. The objective of this activity is to use a compass, measure angles in degrees and better understand the concept of latitude. This activity works best in groups on a sunny day.

## Preparation

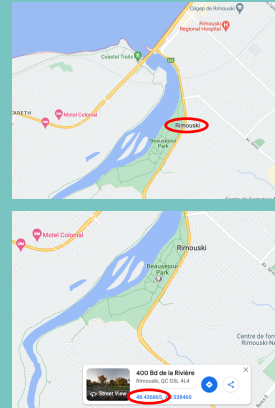
- Watch this introductory video explaining the movement of the sun and shadows:
  - *Crash Course Kids: Following the Sun*  
<https://www.youtube.com/watch?v=1SN1B0pLZAs>
  - *Bill Nye The Science Guy: Seasons(10:57-12:25)*  
[https://www.schooltube.com/watch/bill-nye-the-science-guy-seasons\\_1k8qpfxt9m79w.html](https://www.schooltube.com/watch/bill-nye-the-science-guy-seasons_1k8qpfxt9m79w.html)
- Read the article : *How to make a sundial* <https://www.wikihow.com/Make-a-Sundial>
- To find the degree of latitude of your location from your phone, follow these steps:
  - Open Google Maps
  - Search the location of your school, or the name of the city (e.g. Rimouski, Qc).
  - Click on the location of your school on the map and a pushpin will appear.
  - Information for latitude and longitude will appear. The first data point is latitude (e.g., 48, 45)





## Preparation continued...

- Use 48 degrees as the angle of the protractor for the activity.
- If I do the same search for Montreal, Qc, or even Laval, Qc, I can use 45 degrees.
- Gather the necessary equipment to make a sundial.
- Students work in groups of two or three.



\*see page 3

## Steps

### A.

**In class:**

**Say:** *What is a sundial?*

Listen to students' answers and show one or both introductory videos:

- *Crash Course Kids: Following the Sun*  
<https://www.youtube.com/watch?v=ISN1B0pLZAs>
- *Bill Nye The Science Guy: Seasons(10:57-12:25)*  
[https://www.schooltube.com/watch/bill-nye-the-science-guy-seasons\\_lk8qpfxt9m79w.html](https://www.schooltube.com/watch/bill-nye-the-science-guy-seasons_lk8qpfxt9m79w.html)

Check in with students to ensure they understand, answer their questions, and review some excerpts from the videos, if necessary.

**Say:** *We will be going to the park to make our own sundials.*

Distribute materials to each group.

### B.

**At the park**

Find a sunny spot.

Remind students never to look directly at the sun.

**Say:**

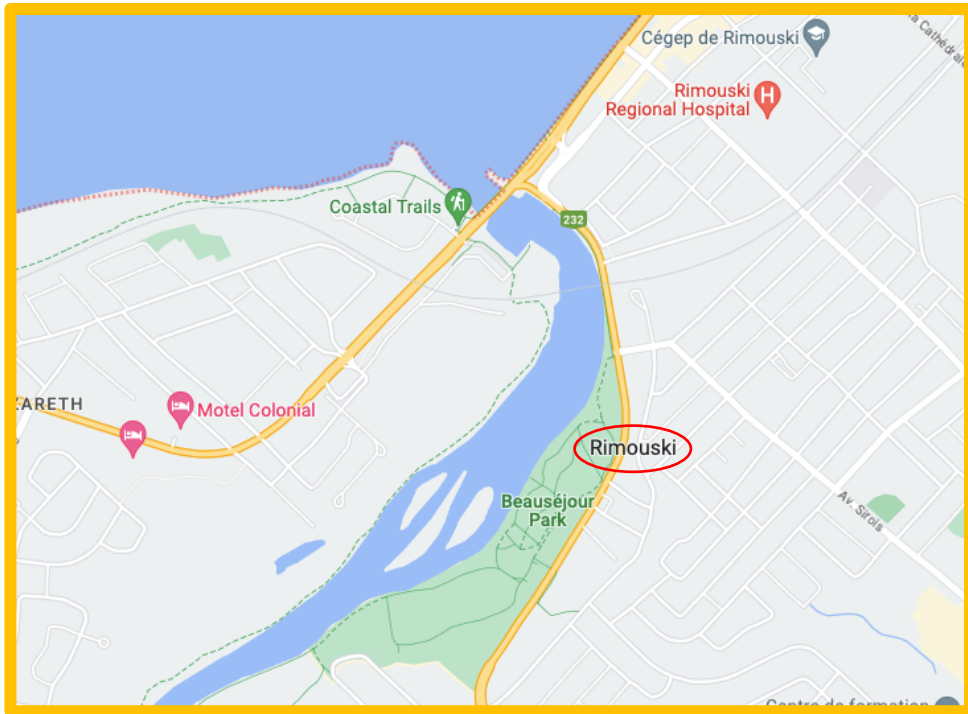
- *Identify the North/South axis using the compass and mark 'noon' on your dial.*
- *Place a ball of modeling clay in the center of the dial.*
- *Plant your stick (or straw depending on the material used) in the modeling clay and use your protractor to give your [stick or straw] the angle of latitude.*
- *Here at [name of your city or school] the degree of latitude is (give students the latitude provided to you by Google Maps).*
- *Draw the shadow line on your dial and write the time indicated on your watch at the end of the line to the outside of the dial.*
- *Add the rest of the hours knowing that one hour is represented by a rotation of 15 degrees.*

RETURN  
TO GROUP

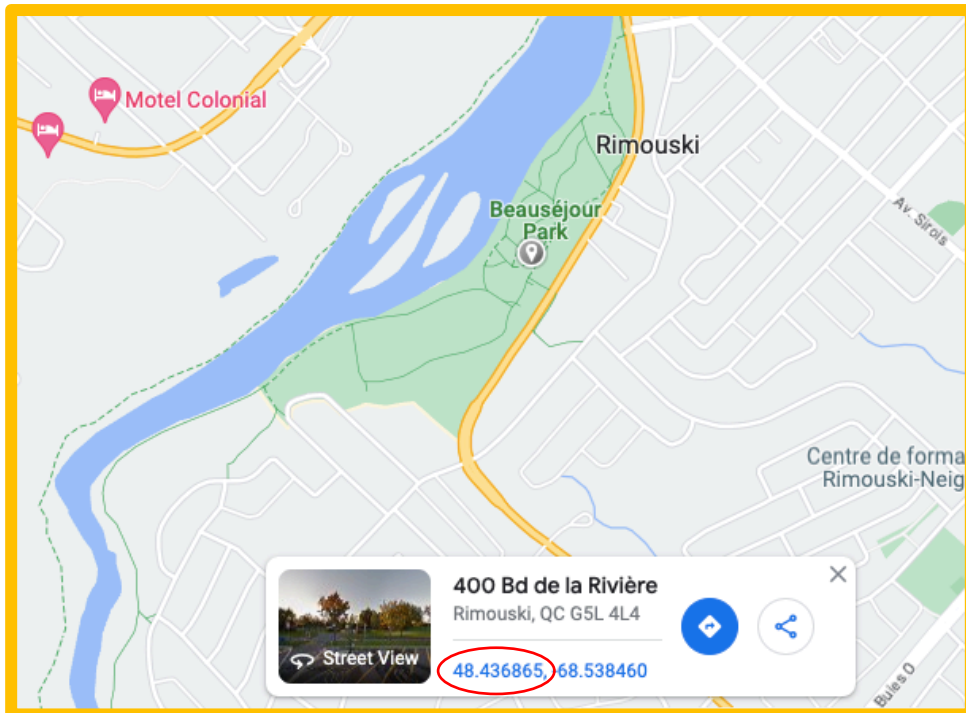
- Each team shows the class the sundial they have made.
- Should we test our sundials on the next sunny day? Do they always indicate the right time?

### REINVESTMENT:

It is possible to test whether the sundials have been made correctly by using them in a season other than the one in which they were created. If the dial always shows the correct time (considering time changes), then the angle of the stick or straw was correctly positioned. Otherwise, the angle of the stick or straw was not precise. You can make a few dials that are not angled properly and use them to demonstrate the effect of the Earth's axis of rotation on sunshine and seasons.



*Search for the city or school name on Google maps, e.g., Rimouski, Qc.*



*Click on the map and the latitude and longitude data will appear on-screen. The first data point is latitude. Use this number as the angle of the protractor.*