

Calgary



# Junior Weather Forecasters Challenge

# How to make your own Weather Station

The first step in emergency preparedness is understanding the risks. In Calgary, disaster risks are often connected to changes in our weather. Heavy rains, winter and summer storms, hail, lightning, strong winds, heat waves and drought are just some examples of extreme weather we can experience in Calgary.

The Junior Weather Forecaster challenge is an activity for children, families, and classrooms to learn more about the weather and how to prepare, all while making crafts and taking weather observations together. Get started today using the simple instructions below to make the following weather station instruments:

1. **Barometer** – tells us what the air pressure is
2. **Wind Vane** – tells us which way the wind is blowing
3. **Anemometer** – tells us how fast the wind is blowing
4. **Rain Gauge** – tells us how much rain fell
5. **Snow Gauge** – tells us how much snow fell



We encourage you to put your new-found weather forecasting skills to use by sharing your weather station and forecast with your friends, family and classmates! To learn more about emergency preparedness, make sure you take the Ready Squad e-course at [calgary.ca/readysquad](https://calgary.ca/readysquad)



## GRADE 5 SCIENCE CURRICULUM CONNECTIONS

### Core Competencies:

- Critical Thinking
- Communication
- Problem Solving
- Collaboration
- Creativity and Innovation
- Managing Information

### Grade 5 Science Topic D: Weather Watch

5–8 Observe, describe, and interpret weather phenomena; and relate weather to the heating and cooling of Earth’s surface.

5–9 Investigate relationships between weather phenomena and human activity.

3. Describe and demonstrate methods for measuring wind speed and for finding wind direction.
4. Describe evidence that air contains moisture and that dew and other forms of precipitation come from moisture in the air.
5. Describe and measure different forms of precipitation, in particular, rain, hail, sleet, snow.
6. Measure at least four different kinds of weather phenomena. Either student constructed or standard instruments may be used.
7. Record weather over a period of time.
8. Identify some common types of clouds and relate them to weather patterns.
13. Appreciate how important it is to be able to forecast weather and to have suitable clothing or shelter to endure various types of weather.
14. Test fabrics and clothing designs to choose those with characteristics that most effectively meet the challenges of particular weather conditions; e.g., water resistance, wind resistance, protection from cold.

### Grade 5 Health

W-5.8 - Promote safety practices in school and community; understand and appreciate others around them – the lesson promotes safety practices by identifying local hazards and provides skills and practices that children can use to be safe during disasters and emergencies.

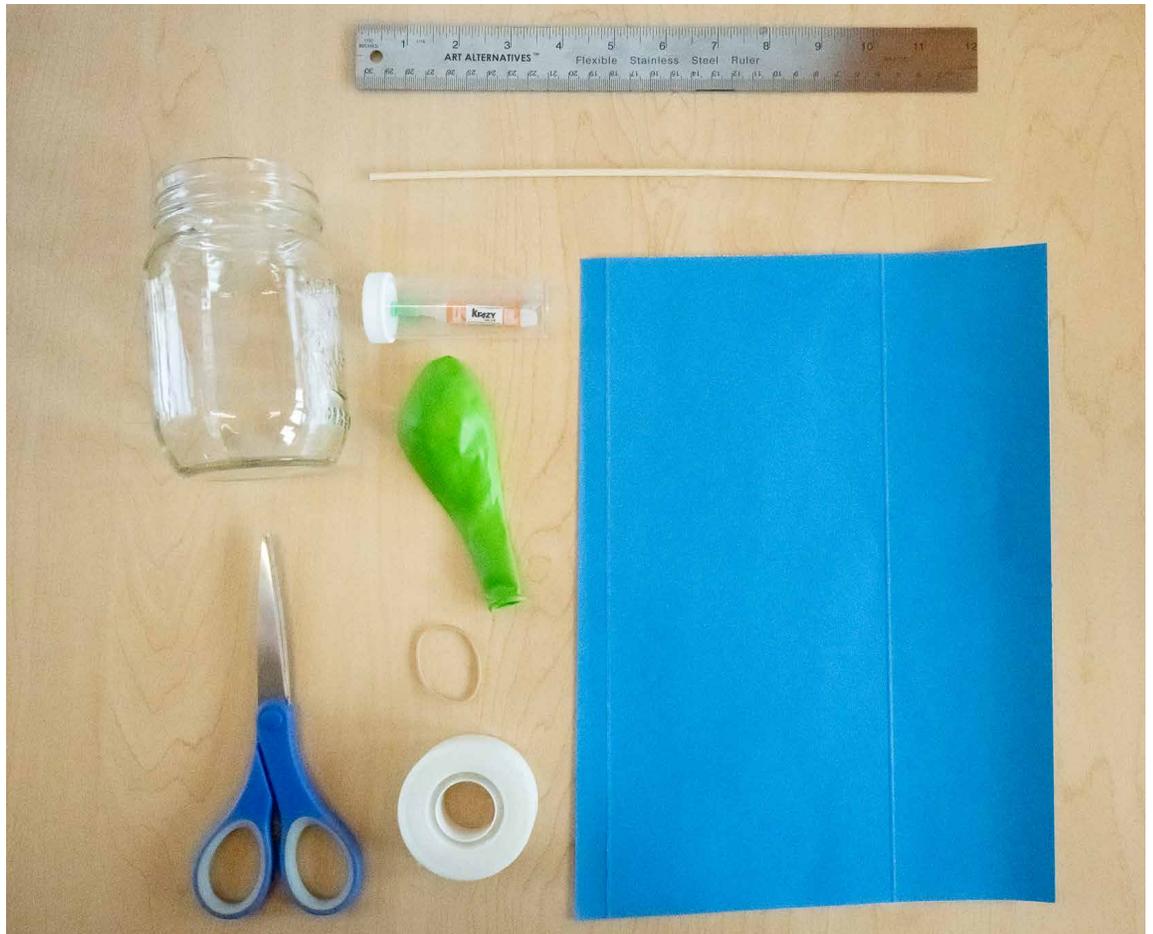


## STATION 1

# How to build a Barometer

**Time needed – 15-20 minutes**

Changes in weather often come with a change in air-pressure. When there is high pressure, skies are usually clear and sunny. When pressure is dropping that means a low-pressure weather system is coming, so get ready for cloudy weather and rain or snow. A barometer is a simple tool that can tell you when air pressure is rising or dropping. Make your own using these simple instructions to become your very own weather forecaster!



### Materials

- Balloon
- Glass Jar
- Elastic Bands
- Glue
- Tape
- Wooden skewer
- Construction Paper
- Tape
- Scissors
- Shoebox/  
small cardboard box



## Directions



1. Cut end-piece off balloon.



2. Stretch balloon to fit over top of the glass jar. Once on the jar, place 2-3 elastic bands over top. **Seal needs to be air-tight, so repeat process with new balloon if there are any tears or holes in balloon.**

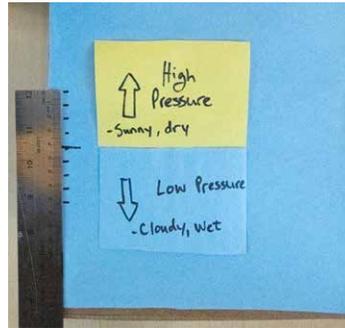


3. Place 2-3 drops of glue onto the centre of the balloon.  
4. Glue skewer to the balloon jar, with the pointed end facing outwards.  
5. Use masking tape to secure skewer to balloon while the glue dries.

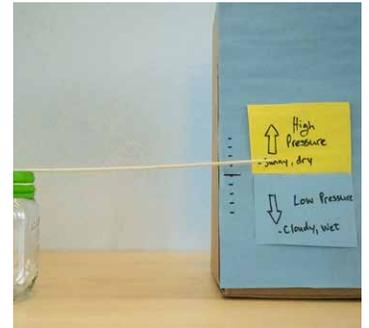


6. Tape construction paper to cardboard box.

7. Using the skewer as a guide, make a mark on the construction paper.



8. Using a ruler, make 4 markings 1cm apart above the line, and 4 below.



9. Above the neutral line is high pressure, below is low pressure. Students can write or draw what weather conditions happen during high pressure and low pressure.

## Making your observations

Your Barometer can be placed inside or outside and will work as long as the jar remains sealed with the balloon. Using your observation sheet record if your barometer is reading high or low pressure. Watch your barometer throughout the day and note if it changes or stays the same. If pressure is rising, then high pressure is on the way. This means you can expect sunny skies and warm temperatures. If it keeps dropping, there is a low-pressure system on the way so get your umbrella and rain gear out.

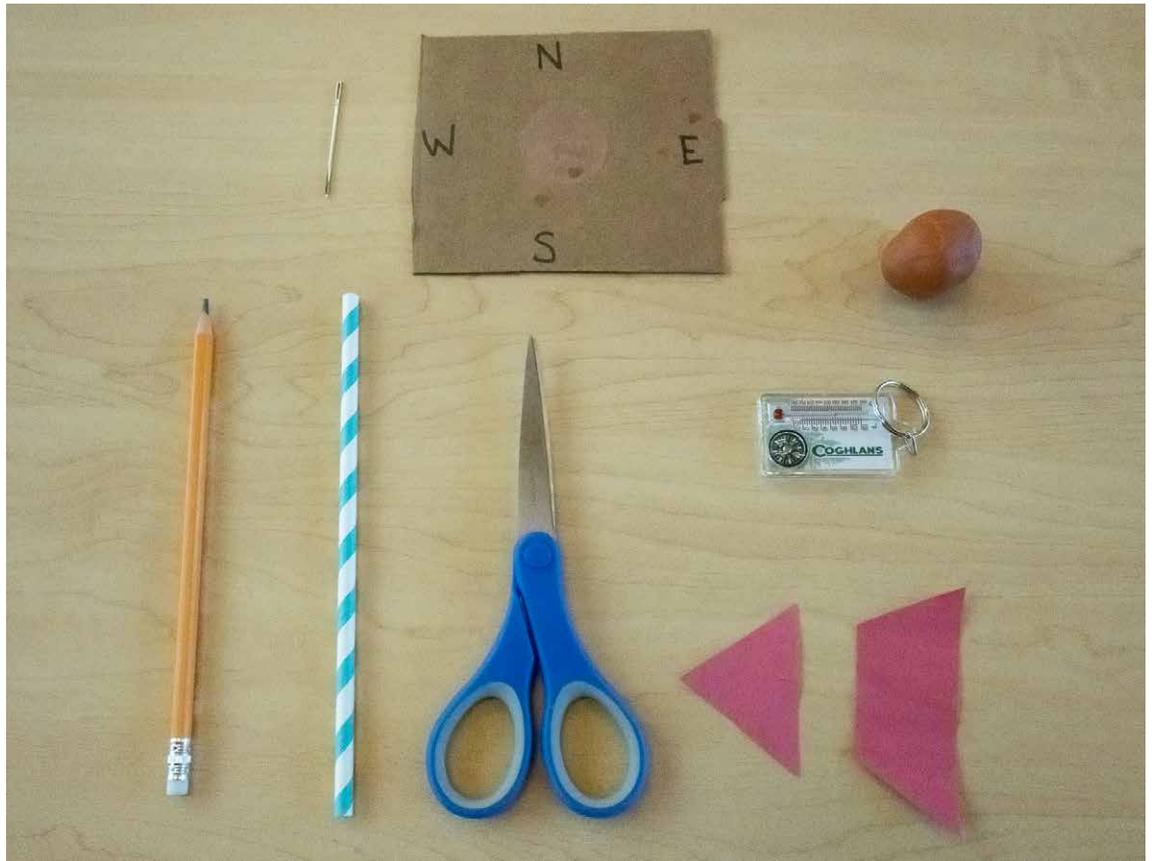


## STATION 2

# How to build a Wind Vane

**Time needed – 10-15 minutes**

In Calgary, wind can blow in all directions, sometimes changing in the same day! A wind vane tells us which way the wind is blowing, giving us a clue that helps us understand the weather. In general, wind coming from the north gives us a clue that the temperature will be cold, and wind coming from the west or southwest means we might get rain or snow, with mild or warm temperatures. In the summer and fall, the wind can also carry with it forest fire smoke, depending on where fires are located. Knowing this will help you plan out your day, choose the appropriate clothing, or know when to change plans to stay safe. Make your very own wind vane using the easy-to-find materials below.

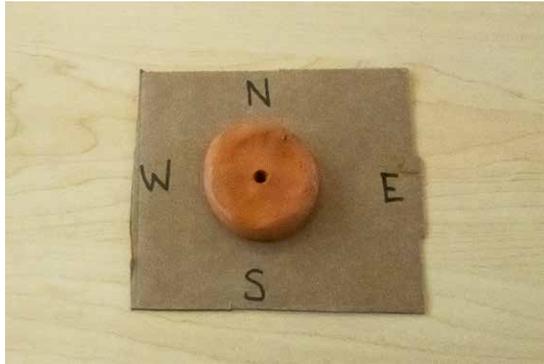


### Materials

- Cardboard
- Clay (eg. Magic Clay or regular clay)
- Pencil w/eraser end
- Paper straw
- Pin
- Construction paper
- Scissors
- Marker
- Compass
- Glue
- Rocks/small weights



## Directions



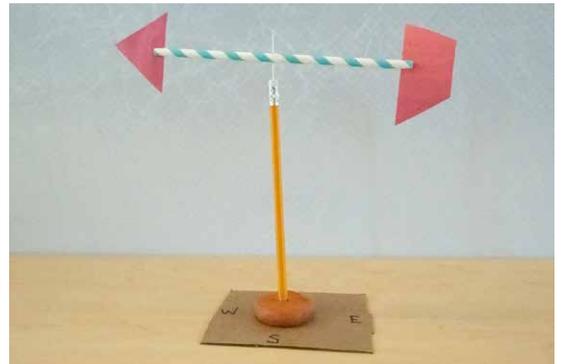
1. Cut a square piece of cardboard (approximately 10cm x 10cm).
2. Label north, south, east and west on the square piece of cardboard.
3. Place a ball of clay in the center of the cardboard, insert the sharp end of the pencil so that it stands straight.



5. Cut a triangle and tail-piece out of construction paper and insert into the slits in the paper straw.
6. Use pin to puncture through the middle of the paper straw and then put into the eraser end of the pencil.



4. Cut slits on either side of the paper straw.



7. Place somewhere on a flat surface outside. Use the compass to orientate the weathervane so that North is facing true north.
8. Place rocks or tape on weathervane base to avoid it being carried away by wind.

## Making your observations

To make your observations, observe which way the arrow is pointing using the north, east, south and west markings. If the arrow is pointing south, then the wind is coming from the north and you therefore have a north wind. If facing east, you have a west wind. If there is no wind, simply record no wind.

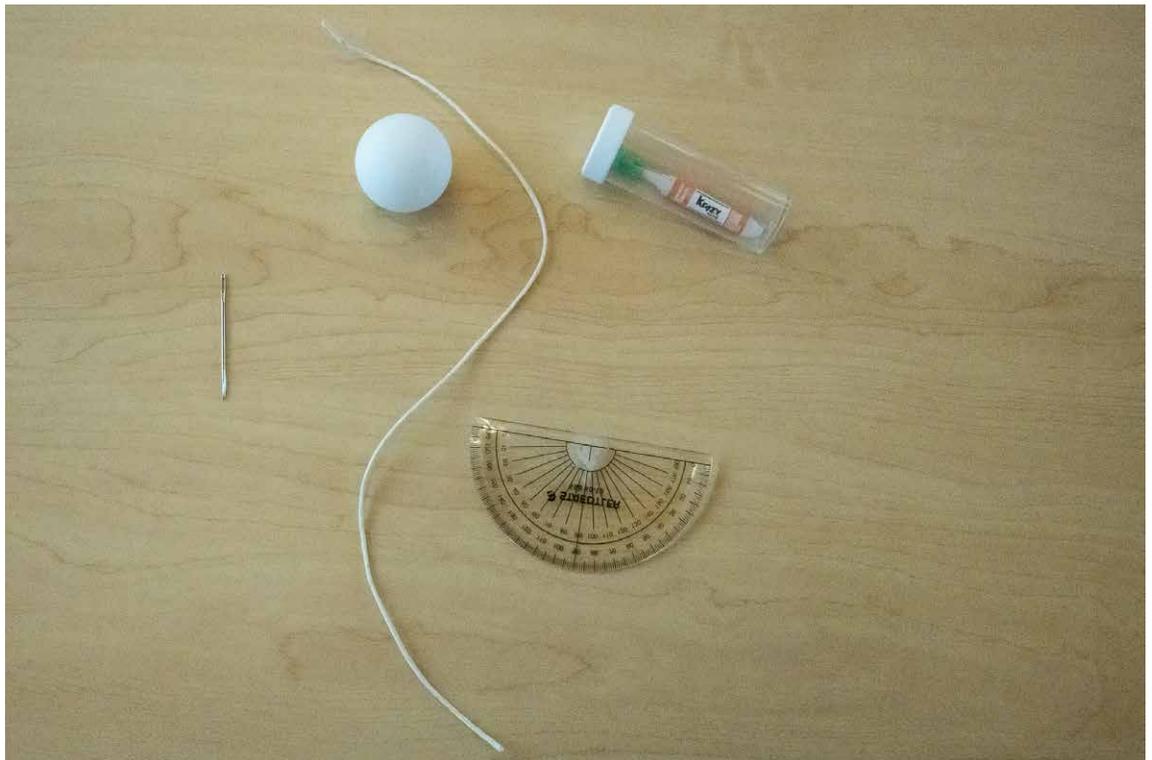


### STATION 3

# How to build an Anemometer

**Time needed – 10-15 minutes**

Calgary is known as a windy City as it is located in the prairies with few natural barriers to wind. It is not uncommon to experience wind speeds faster than cars driving on Deerfoot Trail! Wind speed is an important weather observation, as it gives us a clue about how intense an incoming storm is, and can also point to a chinook, where temperatures rise but wind begins to howl. If there are strong winds, it is important to take precautions, such as securing any loose objects around our front and back yards or balconies. Strong winds can also create conditions where fires can start easily and spread quickly. Make your very own wind-speed detector, or Anemometer, with these simple directions below.

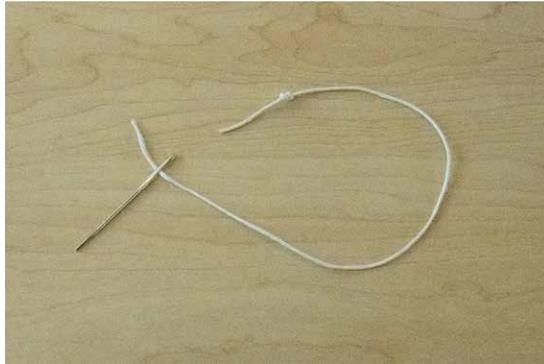


### Materials

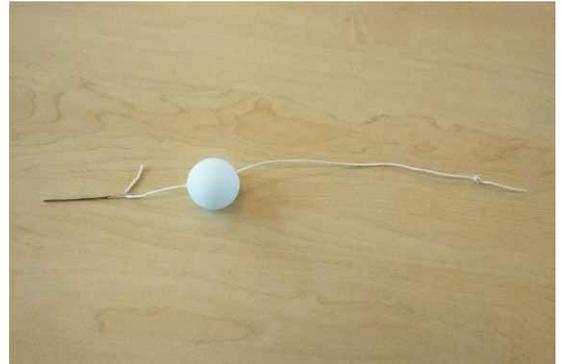
- Ping pong ball
- Strong needle
- Protractor
- String (no longer than 25cm)
- Super glue



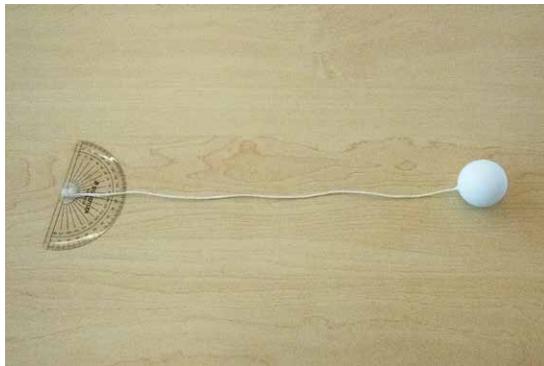
## Directions



1. Cut string to 20-25 cm length and tie a knot at one end.
2. Thread string through the needle.



3. Puncture the ping-pong ball with the needle, pulling through the string and leaving the knot inside the ball. Remove the needle from the string.



4. Place a drop of super glue in the middle of the flat edge of the protractor. Stick end of string to this glue. Let dry for at least 10 minutes.

## Making your observations

To record wind speed, simply hold your anemometer in the air and note the angle the angle of the string. Use the wind speed table in your observation sheet to determine the wind speed based on angle.



## STATION 4

# How to build a Rain Gauge

**Time needed – 10-15 minutes**

Calgary receives around 300 mm of rainfall every year, with almost half of that falling between May and August. Drought is caused when there is no rain, creating dry conditions that can negatively affect farming and increase wildfire risk. Observing rainfall amounts can tell us how strong a storm is, and let us know if flooding may be a concern.



### Materials

- Empty 2L plastic bottle (clear plastic)
- Ruler
- Clear tape
- Handful of pea-sized to golf-ball sized rocks
- Water



## Directions



1. Cut top off of 2L pop bottle.



2. Place rocks in bottom to level surface and provide weight.

3. Tape ruler to inside of pop bottle.

4. Fill with water until it reaches the bottom of the ruler at 0cm.

5. Place top upside-down into the rest of the pop bottle to make a funnel into the container.

6. Place outside, replenish water as needed so that it remains at 0cm mark on ruler.

## Making your observations

Check your rain gauge after a rainfall and see how much the water level has risen on the ruler. Make sure you record the amount using the observation sheet.



## STATION 5

# How to build a Snow Gauge

### Time needed – 10 minutes

It can snow in Calgary during the winter, fall, spring and occasionally the summer too! In fact, snowfall greater than 20 centimeters in one day has happened in every month in Calgary except for July and August! Knowing how much snow has fallen can help you plan your day in case you need more time to walk, drive, or catch the bus, and will also help you choose what to wear to keep you warm and dry in the fresh snow.

### Materials

- Ruler
- Wooden stir-stick
- Pencil crayon or marker
- Paint (optional)

### Directions



1. Place ruler against wooden stir-stick



2. Mark each centimeter on stir stick



3. Decorate stir stick with paint, crayon or marker

### Making your observations

To record the snowfall amount, place your snow gauge on a flat surface that has only the fresh snow that has fallen. For example, a picnic bench, railing or pavement that has not yet been cleared will all work. Record the amount of snow in centimeters on your observation sheet. Make sure to clear off the snow after you have taken your observation so that you can measure the next snowfall.

