a WOW Lab BLUEPRINT

Weather Station

Activity Instructions

Somewhere Over the Rainbow

The following items will be needed for this activity:

- CD
- sheet of white bristol board

Step 1

Place the CD label side down on a flat surface in direct sunlight so that light reflects off of it.

Step 2

Hold the bristol board up so that the image of a rainbow is captured on it (**Figure 1**).

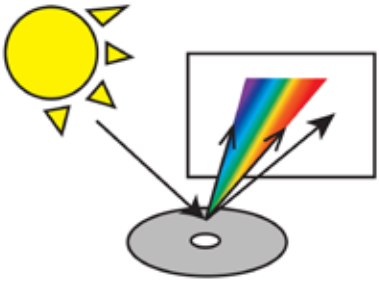

Figure 1

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Weather Station - Activity Instructions

Snowflakes

The following items will be needed for this activity:

- supersaturated alum solution (see *Prep Instructions*)
- petri dish from freezer (see *Prep Instructions*)

Step 1

Remove the petri dish from the freezer.

Step 2

The supersaturated solution may contain some crystals at the bottom of the beaker. These are the seed crystals. Scoop up one of the alum seed crystals using a spoon or scoopula and place it in the centre of the petri dish.

Step 3

Pour some of the room temperature alum solution onto the centre of the cold petri dish, which now contains the nucleation site (seed crystal), and watch the crystals form into a snowflake-like structure.

Step 4

Let the snowflake dry and harden to achieve a more impressive design.

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Weather Station - Activity Instructions

Blue Cloud

The following items will be needed for this activity:

- 2 L clear plastic pop bottle, with the label removed
- black construction paper
- tape
- small amount of warm water
- matches

Step 1

Tape the black construction paper halfway around the outside of the 2 L bottle. This will make it easier to see the cloud once it forms.

Step 2

Pour warm water into the bottle so that there is a thin layer at the bottom of the bottle (**Figure 2**).

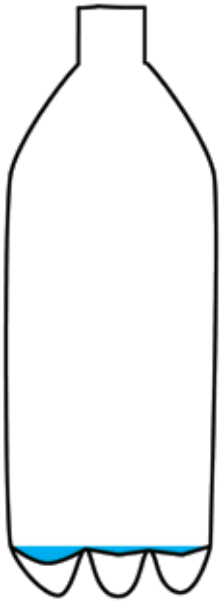

Figure 2

Step 3

Shake the bottle so that small water droplets accumulate on the walls of the bottle. Be sure that there is only enough water in the bottle to let droplets sit on the sides; an excess of water will ruin the activity.

Figure 3

Step 4

The teacher should now light the match. Once the match is lit (**Figure 3**), blow it out and drop it into the opening of the bottle. Screw the cap on quickly and tightly so that the smoke does not escape.

Step 5

Squeeze the bottle with both hands so that the pressure inside the pop bottle increases (**Figure 4**). The increase in pressure leads to an increase in temperature inside the bottle, which causes the water inside the bottle to evaporate.

Figure 4

Figure 5

Step 6

Quickly release the pressure on the bottle. A cloud will form due to the decrease in pressure (**Figure 5**).

Step 7

Uncap the bottle, squeeze the bottle gently and watch the cloud escape.

The Stormy Day

The following items will be needed for this activity:

- aluminum foil tray
- red food colouring
- 600 mL container
- 4 blue ice cubes (see *Prep Instructions*)
- scissors
- water
- kettle
- 4 bricks or tall pieces of wood
- plasticine or Play-Doh
- cocktail umbrella

Step 1

Place the four bricks upright and lay the aluminum tray on top so that each corner of the tray rests on a brick.

Step 2

Using plasticine or Play-Doh, build a small human figurine and stick the cocktail umbrella in its hand. Place the figurine under the aluminum tray.

Step 3

Remove the bags of ice from the freezer and cut the sides of the bags to remove the blue ice cubes. Place the ice cubes on the aluminum tray.

Step 4

Fill the kettle up with water and place it under the aluminum tray (**Figure 6**), but do not turn it on yet.

Figure 6

Step 5

Using tap water, fill the large beaker or container all the way to the top and add a few drops of red food colouring.

Step 6

Turn the kettle on and allow the water to come to a boil. Pour the red water over the ice cubes in the aluminum tray and listen carefully for the sound of thunder.

Step 7

The boiling water will cause the steam to rise up and condense on the bottom of the aluminum plate. As the steam cools, it will form water droplets. Eventually, the droplets will become large enough that they will fall onto the umbrella of the figurine (**Figure 7**).

Figure 7

A Windy City

The following items will be needed for this activity:

- 4 pinwheels (see *Prep Instructions*)
- city of buildings (see *Prep Instructions*)
- small fan

Step 1

Lay out the flattened cardboard box with the milk carton buildings.

Step 2

Place the fan and pinwheels at various locations (as suggested below) to test the different building effects. Notice how the pinwheels turn faster at different locations depending on the building effects.

Fan and Pinwheel Positions

To demonstrate the **wind tunnel**: the fan should be directed toward the wind tunnel. One pinwheel is held directly behind the buildings and another behind the gap between the buildings **(Figure 8)**.

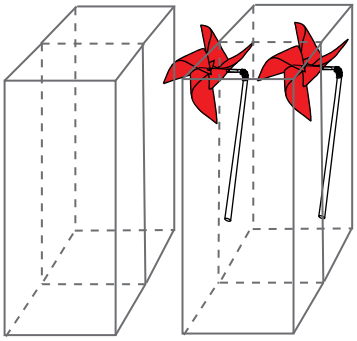

Figure 8

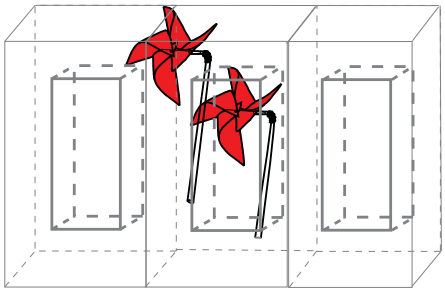

Figure 9

To demonstrate the **gap effect**: the fan should be directed toward the gap model. One pinwheel is held directly behind the buildings and another behind the gap or window of one of the buildings **(Figure 9)**.

To demonstrate the **side-stream effect**: the fan should be directed toward the side-stream model. One pinwheel is held directly behind the shorter buildings and another beside the tall building **(Figure 10)**.

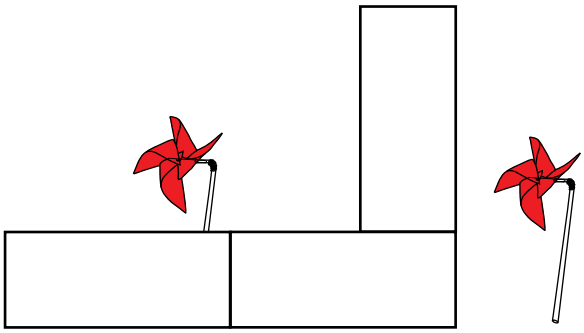

Figure 10

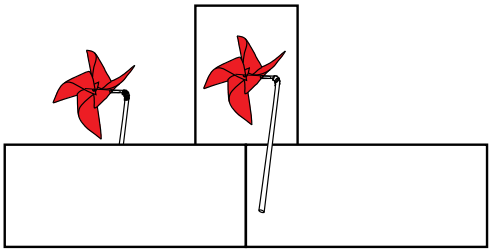

Figure 11

To demonstrate the **downwash effect**: the fan should be directed toward the downwash model. One pinwheel is held directly behind the shorter buildings and another in front of the tall building **(Figure 11)**.

Homemade Thermometer

The following items will be needed for this activity:

- homemade thermometer (see *Prep Instructions*)
- water
- kettle
- large plastic container

Step 1

Pour the water into the kettle and turn it on.

Step 2

When the water boils, pour the water into the plastic container.

Step 3

Hold the homemade thermometer directly over the boiling water and watch what happens to the red liquid **(Figure 12)**. If the liquid rises too quickly, hold the thermometer further from the boiling water. If the liquid rises too slowly, hold the thermometer closer to the water.

Figure 12

The Twist

The following items will be needed for this activity:

• attached pop bottles (see *Prep Instructions*)

Step 1

Flip the bottles so that the bottle containing water is upside down.

Step 2

Hold the bottom bottle to steady it. With the other hand, begin moving the top bottle in a circle (**Figure 13**). Watch what happens (**Figure 14**).

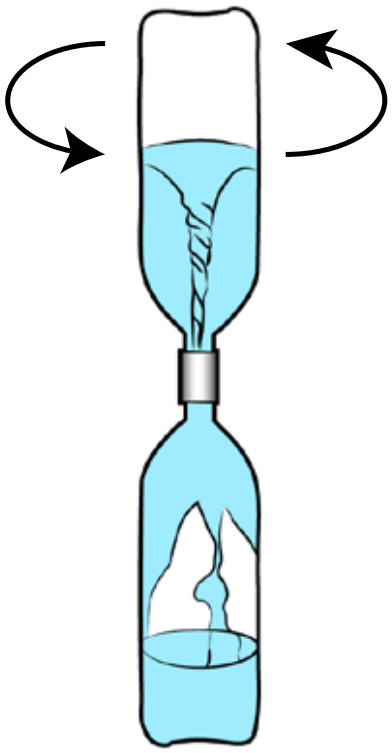

Figure 13

Figure 14

Creating Snow

The following items will be needed for this activity:

- resealable plastic bag containing polymer (see *Prep Instructions*)
- dropper

Step 1

Fill the dropper to its halfway point (**Figure 15**).

Figure 15

Step 2

Quickly squeeze the water into the resealable plastic bag containing the polymer.

Step 3

Seal the plastic bag tightly and shake the bag containing the powder and water. Watch what happens to the white powder.

Step 4

Place the plastic bag into the fridge for 30 minutes.


Figure 16

Step 5

Remove the bag from the fridge. While keeping the plastic bag sealed in hand, play with the snow-like gel (**Figure 16**).