Contents

e-Science Weather Observatory Kit	Model 3802
WARNING!	Only for use by children over 8 years old. Only for use under the supervision of adult. This toy contains functional edge.
CAUTION!	Read the instructions before use, follow them and keep them for reference. Keep small children and animals away from experiments. Store the telescope/microscope set out of reach of small children. Eye protection for supervising adults is not included.

Package Contents

2 Thermometers
1 Compass
1 Wind vane
2 Measuring cups
1 pH scale
20 Pieces of pH paper
1 Pressure scale card
1 Plastic tube
1 Magnifier
2 Collecting vials
1 Measuring cylinder
1 Towel
1 Plastic pipette
1 Pair of tweezers
3 Cotton balls
4 Pieces of rubber bands
6 Pieces of bag ties
1 Rubber ring
1 Stopper
2 Rubber balloons
1 Nameplate
1 Notepad
1 Activities guide

What is Weather?

We live and breathe in a blanket of air known as the atmosphere. The atmosphere is constantly moving and changing all around the earth. These changes are called the weather.

No matter if it is rainy, snowy, stormy, or warm and sunny, weather affects everyone all the time! That is why the science of weather, or meteorology, is so important! Scientist called meteorologist study patterns in the weather and try to forecast, or predict, what it is going to be like in the future. As we gain more understanding about weather and with advances in technology, these predictions have become more accurate.

When we talk about the weather, we are actually describing the conditions in the atmosphere and the air around us at a particular moment. If you look outside now you might see that the weather is cloudy or sunny, or that it is wet or windy.

Weather is made up of different things, such as:

- Wind direction
- Wind force
- Precipitation (rain, snow)
- Temperature
- Sunshine
- Cloud

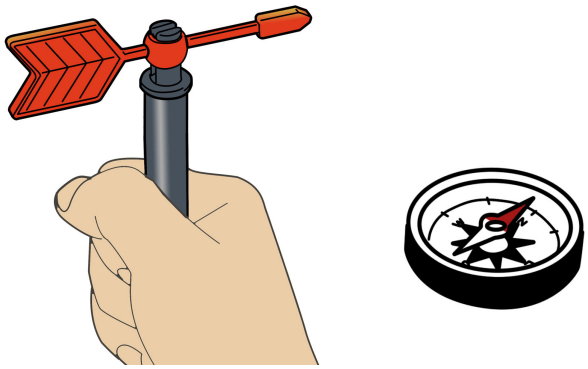
This weather observatory kit provides the necessary instruments for you to record these weather elements and make your own weather forecast.

Activity 1

Wind Direction measurement using a Wind Vane

From which direction the wind is blowing? The wind vane is one of the oldest weather tools and is for measuring wind direction.

Materials:
- Wind vane
- Compass



Steps:

1. Hold the wind vane up, at arm's length. Always make sure nothing blocks the wind, giving inaccurate results.
2. The wind vane's arrow spins and points in the direction from which the wind comes. So if it points south, the wind is a south wind. Use the compass to find the direction (align the compass direction scale's "N" with its red pointer).

Explanations:

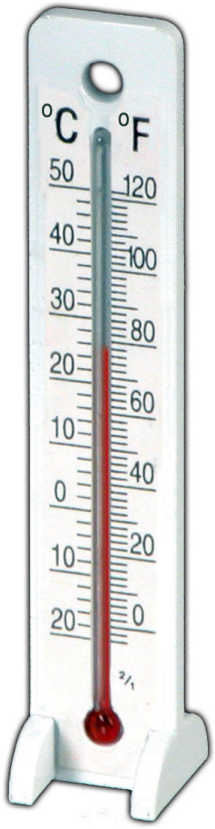
The part of the vane that turns into the wind is usually shaped like an arrow. The other end is wide so it will catch the smallest breeze. The breeze turns the arrow until it catches both sides of the wide end equally. The wind vane helps meteorologists to track, among other things, the movement of storm clouds.

Activity 2

Temperature and thermometer

Material:

- A thermometer
- A notepad



Observe your thermometer:
Look at your thermometer, which is a small tube with a small bulb at the bottom. In the middle you see a thin red line that rises higher when it is hotter. When it gets cold, the line drops. The liquid inside is colored alcohol, which expands when heated and shrinks when cooled. The scale on both sides of the thermometer indicates the temperature using different units. On one side is the Fahrenheit scale (°F), which is used mostly in the United States, on the other side is the Celsius scale (°C) which is mostly used in the rest of the world.

Temperature:
Temperature is a measure of how warm or cold something is. A thermometer is a device that measures the temperature of things You can use a thermometer to measure the temperature inside or outside your house, inside the refrigerator or even your body temperature if you are sick. Temperature is one of the most important elements of weather because it controls or influences other elements like humidity, clouds, rain and wind.

Time and temperature:
We know that the time factors influence how hot or cold it is. The time of the year and the time of the day have influence over temperature.

- Temperature variation between day and night: It refers to the periodic and regular change of temperature within a day. The temperature is usually at maximum around 2 o'clock in the afternoon when we receive the strongest sunlight and at minimum around sunrise in the early morning, when the heat stored in the ground from the day before is dissipated.
- Seasonal temperature change: It refers to the periodic and regular change of temperature at different times of the year. The temperature is highest during summer time when the earth is closer to the sun. During winter time the temperature is the lowest when the earth is further away from the sun and the sunlight is weaker.

Measure and record the temperature:
Use the supplied thermometer, measure the outdoor temperature. Take readings at

different time of the day and at different months. Try to complete the table below. It will give you a rather exact idea of the range of temperature of your area.

Month\Hour	3:00	6:00	9:00	12:00	15:00	18:00	21:00	24:00
January								
March								
May								
July								
September								
November								

Activity 3

Lightning and static electricity

Thunderstorms are terrifying and yet beautiful to watch. When warm, humid air rises and cools, the water vapor condenses into a cloud. When the conditions are right, it gradually develops into a thundercloud with more and more water vapor. Thunderstorms are created in the giant cumulonimbus clouds, flashes of lightning may fill the sky and sometimes with a booming sound wave called thunder.

Lightning

Lightning is a huge discharge of electricity and is one of the most unpredictable forces of nature. It can strike from minor or major storms and can hit a target 10 or even 25 miles away from the parent cloud. When ice and water particles collide in a cloud, they are charged with static electricity. Lighter particles tend to be positively charged and end up near the top of the cloud, while negatively charged particles are near the bottom of the cloud. In time, this charge becomes so great that electricity jumps to the ground or to the other clouds, creating great sparks of lightning. The lightning heats up the air to a high temperature and produces a powerful explosion we hear as thunder.

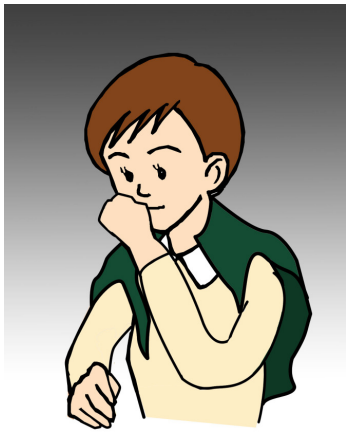
Material:

- Cotton cloth, towel or blanket. The material needs to be clean and dry.
- Dry air. This experiment works best when the humidity is low, like during wintertime. Turn the furnace up a few degrees will help dry the air further.

Steps:

1. Turn off all the lights and give your eyes some time to adjust to the darkness.

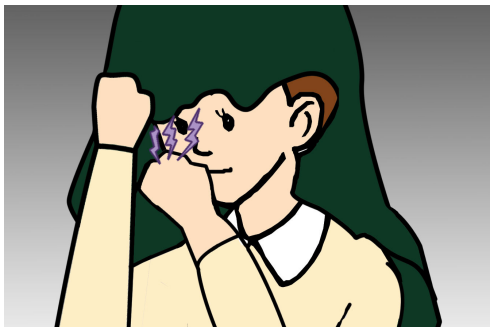
2. Sit on the floor or bed. Place the cloth on your back. Make a fist and hold your hand at a distance of approximately 15cm from your face, directly in front of your chin.



3. Quickly move the cover over your head with your other hand. Make sure it rubs well on your hair.

4. Draw the cloth close to your fist until it is approximately 10cm above your fist. Make sure the fist doesn't touch the arm.

5. If you're doing it correctly, spectacular little blue/purple sparks will jump off your knuckles into the cloth. The faster you pull the cloth, the longer and more frequent the sparks will be.



Activity 4

How far away is the storm?

Material:

- Watch/Stopwatch
- A notepad

Steps:

1. Get ready your stopwatch or a wristwatch.
2. When you see a flash of lightning, start the stopwatch or note the time of your wristwatch.
3. Count the number of seconds until you hear the thunder.
4. For every 3 seconds the storm is 1 kilometer away, divide the number of seconds you count by 3 to get the distance in kilometers. For example, if you hear the thunder after 9 seconds, the storm is 9/3=3 km away.

What's happening?

Light travels much faster than sound, the lightning and thunder are happening at the same time, but light reaches you instantly, while the sound takes longer. Sometimes you may see a lightning without hearing thunder. This is because the lightning happens too far away to be heard. But when you see the lightning and hear the thunder at the same time, it means it is very close, so LOOK OUT!

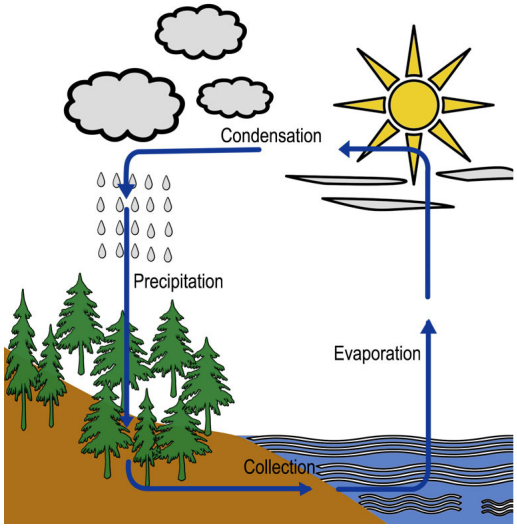
Activity 5

The water cycle and Evaporation

The earth has a limited amount of water. Water keeps going around and around in a continuous process called the "Water Cycle".

This cycle is made up of a few main parts:

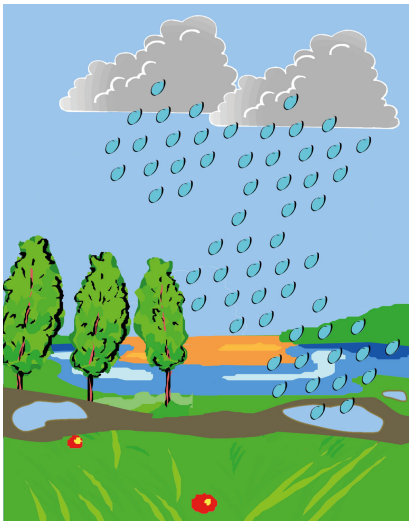
- Evaporation (and transpiration)
- Condensation
- Precipitation
- Collection



The sun's heat transforms the water in oceans, lakes and rivers into a gas, called water vapor, in a process called **evaporation**. In the atmosphere, the water vapor gets cold and changes back into droplets of liquid water, forming clouds. This is called **condensation**. When the water is too heavy to be held in the clouds, it falls back to the ground as **precipitation** - drew, rain, sleet or snow.

Material:

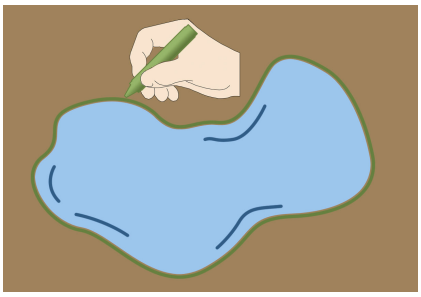
- Two chalk sticks
- A water puddle pool



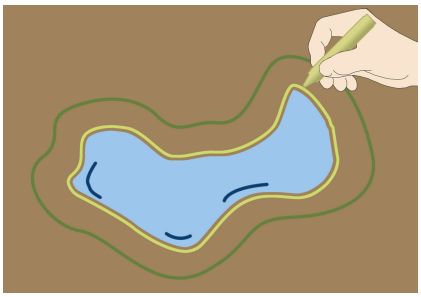
Steps:

1. Find a place where water puddle pools are always formed after the rain.

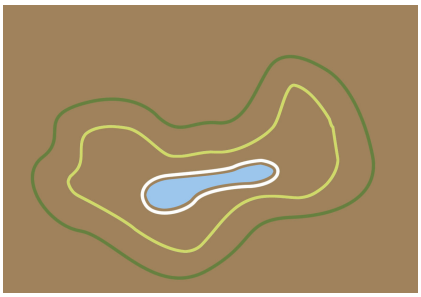
2. After a rainy day, look for a puddle pool. With your chalk, traces the feature all around the puddle pool and wait.



3. Four or five hours later, return to see your puddle pool. Trace a second feature around. If you have a chalk of another color, use it.



4. Compare the two marks. If you wish, you can wait to trace another feature a little later.



5. Try this activity under different weather conditions: with sun shinning, cloudy, windy weather... When will the puddle pool dry most quickly?

Explanations:

The puddle pool decreases as water evaporates. It is the intensity of the heat of the sun that determines the speed of evaporation. If it is hot after the rain, the puddle pools disappear very quickly, but if it remains wet and cold, the puddle pools remain longer.

Activity 6

Understand pH

What is pH?

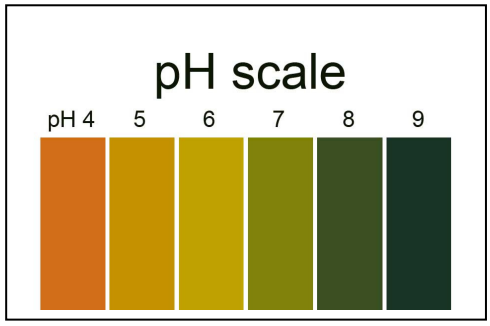
pH, which stands for Potential of Hydrogen, is the value which indicates if a substance is an acid or a base.

The pH can go from 1 to 14:

- substances which have a pH lower than 7 are acids (the pH 1 being the strongest acid)
- substances which have a pH equal to 7 are neutral
- substances which have a pH higher than 7 are bases/alkaline (the pH 14 being the strongest base/alkaline)

Material:

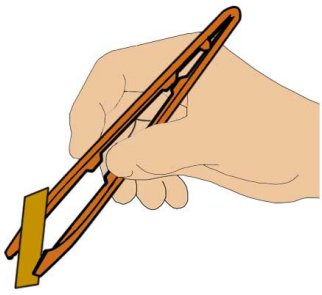
- pH paper
- pH scale
- tweezers
- tap water



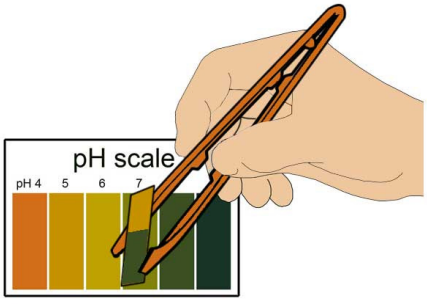
Steps:

1. Study the pH scale, the supplied pH scale goes from 4 to 9. Locate the color corresponding to each pH value.

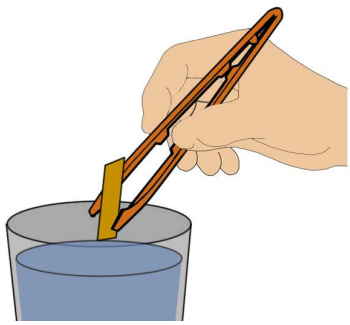
2. the pH paper changes color when we put it in contact with a base or acid substance. Always hold the pH paper with the tweezers, because even the moisture of your fingers can make it change color.



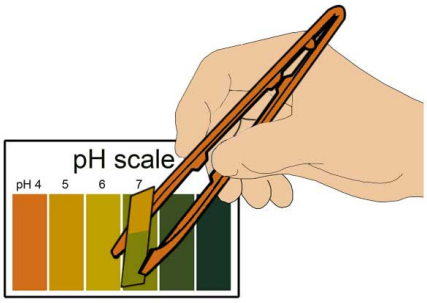
3. By comparing the color of paper pH on a pH scale, you can determine the pH of the substance you are testing.



4. Check the pH of the substances you want, but starts with the tap water of your house. Cut out small pieces of pH paper, do not forget to always use the tweezers! Soak the pH paper in water.



5. Note the color changes. Compare the color obtained with the colors of the pH scale.



Explanation: The pH of water should be neutral (7).

Activity 7

Air pollution and rain pH measurement

Pollution is caused by the emission of undesirable substances to the atmosphere, the earth, rivers and seas. Pollution harms or endangers our lives, and also badly affects the lives of animals and plants.

All rainwater contains some level of acidity. Normal rainwater has a pH of 5.6. When the pH level of rainwater goes below 5.6, it is considered as acid rain. Acid rain is caused by chemical changes which occur in the atmosphere, and are produced by the air pollution. Under the action of these chemical changes, certain gases become acidic. Acid rain is very harmful to the environment. Acid rain damages everything over a period of time because it makes the living things in the environment die. Acid rain affects the lives in the water as well as the lives on land. It is almost worse in water than on land because fishes need the water to breathe. When the water gets polluted, then the fish gets sick and ends up dying.

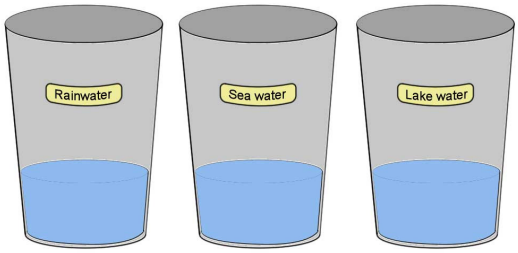
Material:

- pH Paper
- pH scale
- plastic cups
- tweezers
- a pipette
- different types of water

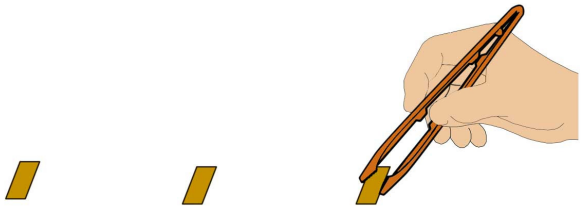
Steps:

1. Gather as many water samples as possible: water of the tap, rainwater, water of an aquarium, a lake, a river, the sea.

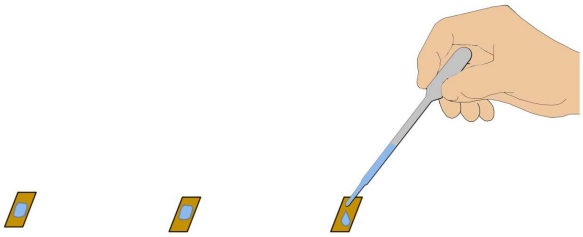
2. Pour each sample in a pot and label the pots.



3. Take pH paper with the tweezers. Cut it into small pieces and place one of these pieces next to each pot.

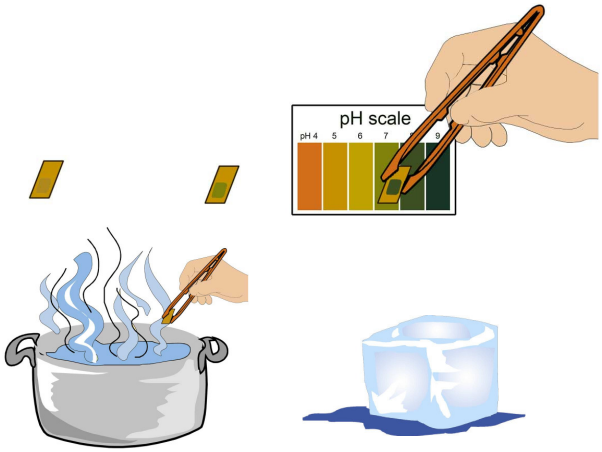


4. Add a few drops of each water sample on the pH paper using a pipette. Wash and dry the pipette before picking up different water samples.



5. Wait a few minutes and compare the colors with the scale. Find the pH of each sample.

6. You can also test the pH of the two other water forms, like an ice cube and vapour. Pay attention not to get burnt by the hot vapour.



Explanations:
If the pH of rainwater is 5, it is considered as acid rain. Acid rain is dangerous. If the pH of rainwater still goes down, this water is not viable.

Activity 8

Make a hygrometer

Humidity refers to the concentration of water vapour in the air. Measuring the humidity helps meteorologists forecast the weather. A relative humidity of 100 percent is when

the air has as much water vapour as it can hold at a particular temperature, and mists or fogs form. When the air is very humid, the chance of raining is higher. In hot and humid weather, we feel uncomfortable because perspiration on our skin does not evaporate as quickly, hampering our body's effort to cool down.

Meteorologists use a device called a hygrometer to measure humidity. One type of hygrometer is the wet-and-dry bulb thermometer, which contains two different thermometers.

Materials:

- Two thermometers
- A cotton ball or a small piece of cotton
- Tap water
- Relative humidity table

Dry Bulb	Dry Bulb Minus Wet Bulb										
	℃	1	2	3	4	5	6	7	8	9	10
	10	88	77	66	55	44	34	24	15	6	
	11	89	78	67	56	46	36	27	18	9	
	12	89	78	68	58	48	39	29	21	12	
	13	89	79	69	59	50	41	32	22	15	7
	14	90	79	70	60	51	42	34	25	18	10
	15	90	81	71	61	53	44	36	27	20	13
	16	90	81	71	63	54	46	38	30	23	15
	17	90	81	72	64	55	47	40	32	25	18
	18	91	82	73	65	57	49	41	34	27	20
	19	91	82	74	65	58	50	43	36	29	22
	20	91	83	74	67	59	53	46	39	32	26
	21	91	83	75	67	60	53	46	39	32	26
	22	91	83	76	68	61	54	47	40	34	28
	23	92	84	76	69	62	55	48	42	36	30
	24	92	84	77	69	62	56	49	43	37	31
	25	92	84	77	70	63	57	50	44	39	33

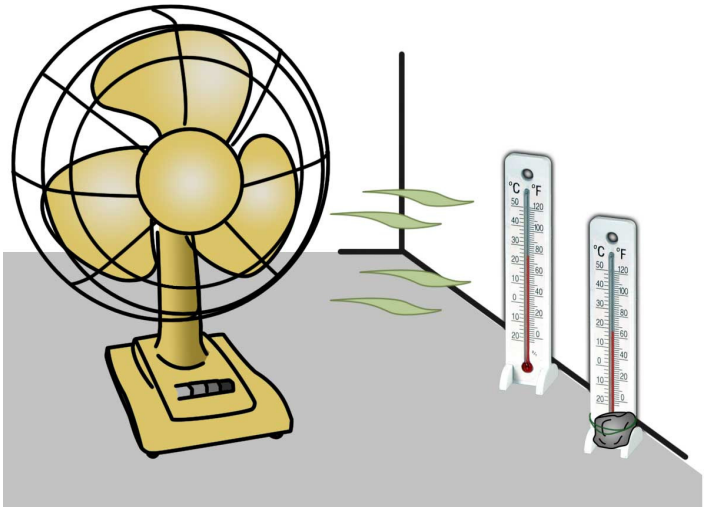
Relative Humidity Table

Steps:

1. Use a rubber band to tie a thoroughly wet cotton ball to the bulb of one thermometer. This is the wet thermometer.

2. Place the wet and dry thermometers side by side against the wall or one side of a box. You can use a piece of tape to secure them so they will not fall.

3. Turn on the fan and blow on the thermometers until the temperature readings stop falling, it may take several minutes.



4. Write down the temperature on both thermometers, for example 19°C and 15°C.

5. Subtract the temperature on the wet thermometer from that of the dry one, e.g. 19°C – 15°C = 4°C.

6. Use the table provided, find the dry thermometer temperature on the left and follow it to the right. Find the difference between the two temperatures on the top, and follow it down. The number where the row and column intersects is the relative humidity, e.g. 65%.

	Dry Bulb Minus Wet Bulb									
Dry Bulb °C	1	2	3	4	5	6	7	8	9	10
10	88	77	66	55	44	34	24	15	6	
11	89	78	67	56	46	36	27	18	9	
12	89	78	68	58	48	39	29	21	12	
13	89	79	69	59	50	41	32	22	15	7
14	90	79	70	60	51	42	34	25	18	10
15	90	81	71	61	53	44	36	27	20	13
16	90	81	71	63	54	46	38	30	23	15
17	90	81	72	64	55	47	40	32	25	18
18	91	82	73	65	57	49	41	34	27	20
19	91	82	74	65	58	50	43	36	29	22
20	91	83	74	67	59	53	46	39	32	26
21	91	83	75	67	60	53	46	39	32	26
22	91	83	76	68	61	54	47	40	34	28
23	92	84	76	69	62	55	48	42	36	30
24	92	84	77	69	62	56	49	43	37	31
25	92	84	77	70	63	57	50	44	39	33

Relative Humidity Table

Activity 9

Setting up the barometer

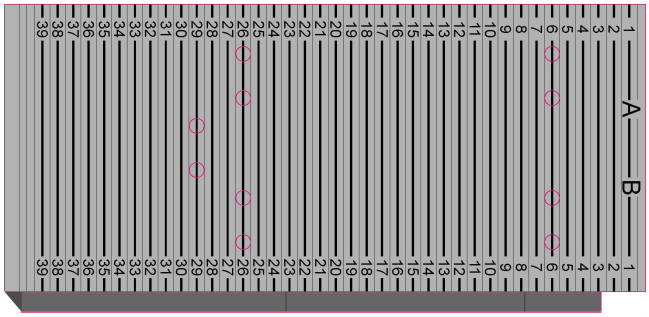
Atmospheric pressure or air pressure, corresponds to the weight of air. Measuring atmospheric pressure is very useful in predicting the weather. We use a barometer to measure the air pressure. Here is how to make your own.

Material:

- A Balloon
- A plastic tube
- Five pieces of bag ties
- A rubber ring
- A stopper
- A barometer index base cardboard
- A pipette
- A cup
- Food coloring
- Water

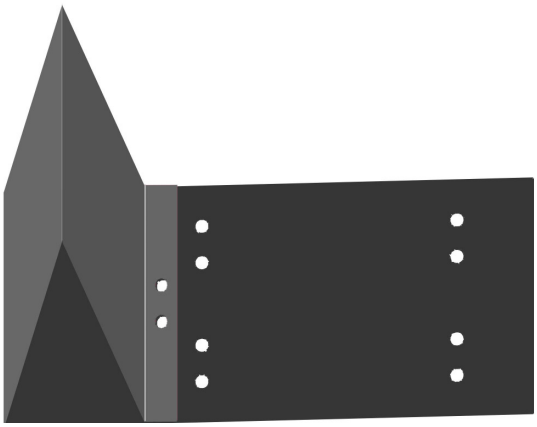
Steps:

1. Get the barometer index base cardboard

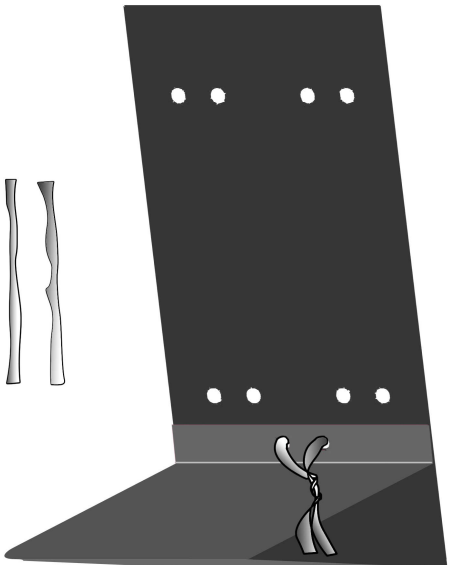


2. Lay it flat on a table, with the printed side faced down as indicated below.

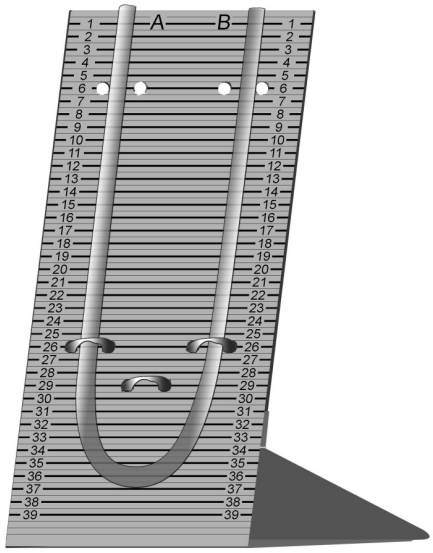
3. Fold the left side towards the middle, until the holes on the left panel intersects with those near the middle of the cardboard.



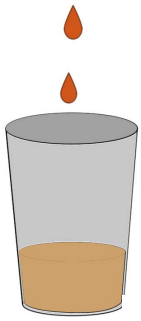
4. Insert a bag tie through the overlapping holes, make a loop and twist the ends so that the cardboard shape is secured.



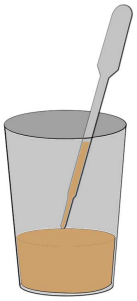
5. Fix the plastic tube in position using two bag ties.

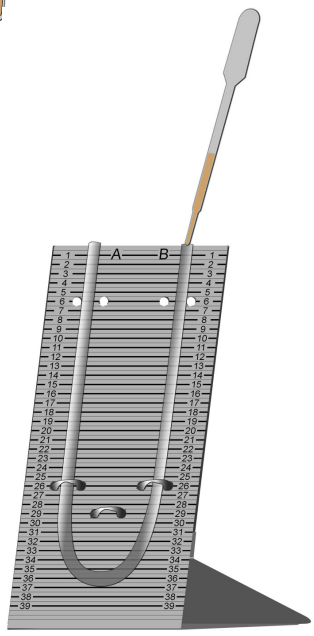


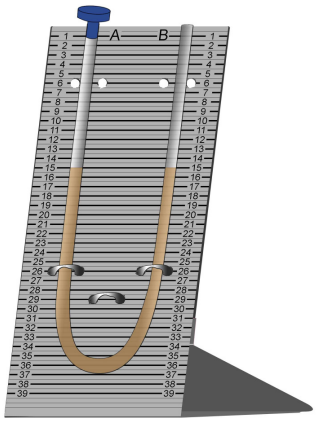
6. Fill the cup with some water, and add a few drops of food coloring and stir with a spoon until they are mixed.



7. Use the pipette to add the colored water into the plastic tube, until it is half full.

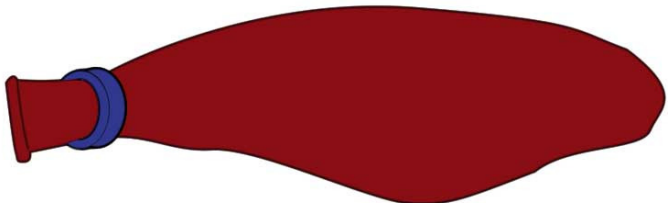




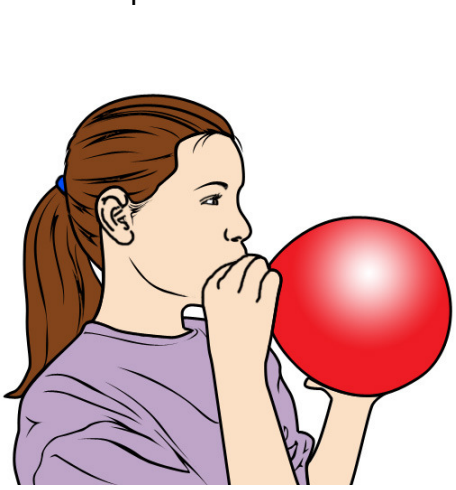


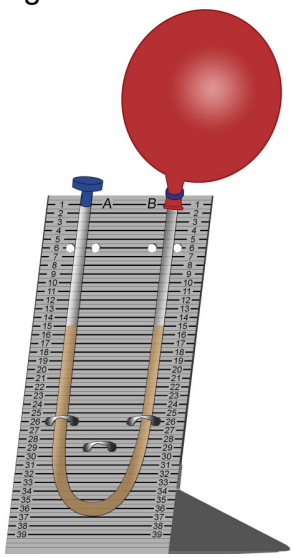
8. Put a stopper to one end of the plastic tube.

9. Insert the rubber ring into the balloon as shown in the diagram.



10. Blow the balloon up and quickly attach it to the open end of the plastic tube. Place the rubber ring around the tube to prevent the air from escaping.





11. Fix both ends of the plastic tube on the cardboard with two more bag ties. Now the barometer is ready. Record the level of the water on the left (A) and on the right (B).

Explanations:

The water level in the tube should change from one day to the next. Atmospheric pressure is the weight of air pressing on every part of your body, and everything around you. We can measure air pressure and predict a storm.

Activity 10

Using the barometer

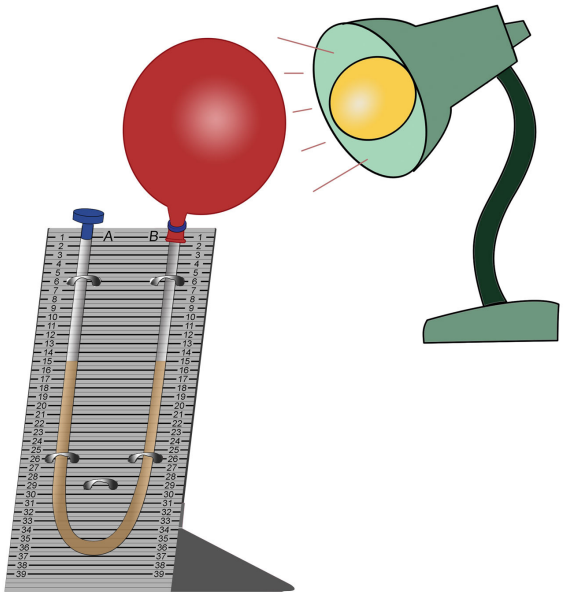
Check and record the water level of column B (under the balloon) for several days. Especially when the weather changes from good to bad or vice versa. Try to find a relation between the weather and the water level readings.

The water level of the barometer changes when the air pressure changes. When the weather is fine, the air pressure is higher, but when a storm is coming, the air pressure drops. When the pressure increases, the air leaves the balloon and goes into the tube and the water is pushed towards the stopper and the water level under the balloon falls.

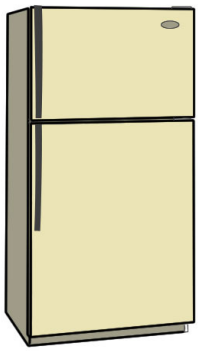
Conversely, when the pressure decreases, the air enters the balloon and water follows the same direction, making the water level under the balloon rise. You can simulate the change of air pressure by trying the activities below.

Steps:

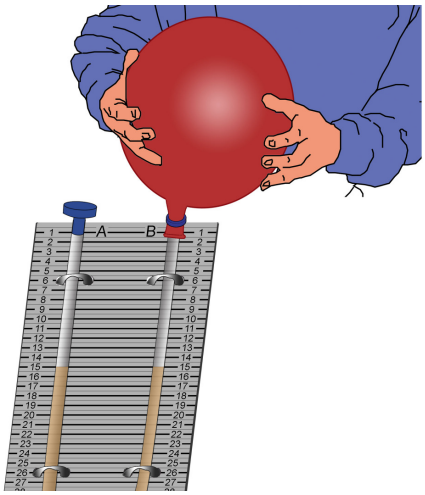
1. Place your barometer close to a light bulb for at least half an hour. Record the water level and compare it with your previous records.



2. Place your barometer inside a refrigerator for about 15 minutes. Record the water levels.



3. Simulate a large increase in air pressure b pressing the balloon with your hands. Note record the results again.



Explanations:

Air pressure varies according to many factors, such as air temperature and air density (how tightly its particles are packed together). The molecules of cold air move slower

and stay closer together than the molecules in warm air. Dense cold air contains lots of molecules and puts a greater force on the earth's surface. We usually do not feel the effect of air pressure on us because our body get used to it, unless there is a fast change of air pressure. For example, when we take a lift to go to the top floor of a tall building or when we are on a landing airplane, we can certainly feel the pressure inside our ears.

Activity 11

Snowflakes under a magnifier

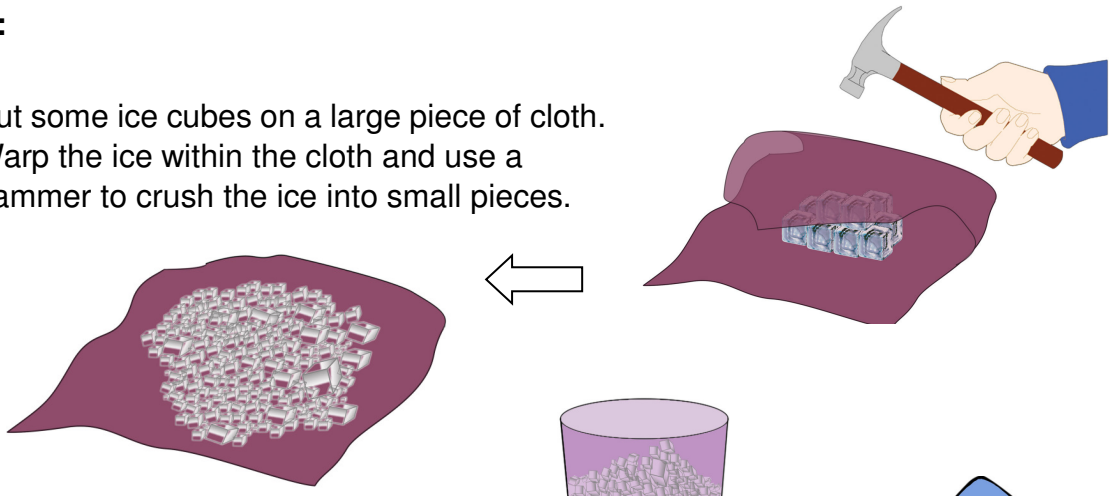
Materials:

- A magnifying glass
- A Cup
- A spoon
- A large piece of cloth
- A hammer
- Some ice cubes
- Some salt
- A desk lamp

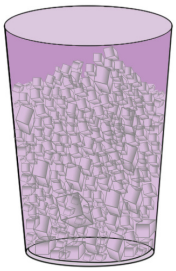
**** This activity must be performed under the supervision of an adult.**

Steps:

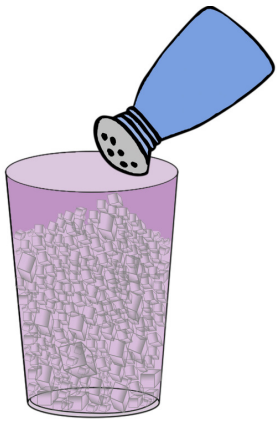
1. Put some ice cubes on a large piece of cloth. Warp the ice within the cloth and use a hammer to crush the ice into small pieces.



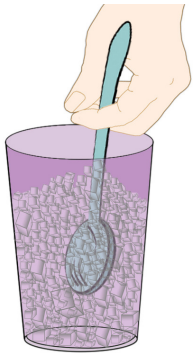
2. Fill a cup up to about 3/4 full with the crushed ice.



3. Add rock salt into the cup to almost full, the ice should start to melt.



4. Stir the ice and salt mixture very rapidly with a spoon for at least 15 minutes.



5. There should be some dew on the outside of the cup at first, observe what is produced if you wait some minutes longer. They become crystals of ice. Examine carefully with a magnifying glass. You can see the crystal structure more clearly if you place the cup near a desk lamp.

Explanations:

As the cup cools, the moisture in the air condenses on the cool surface. As the cup becomes colder, the water on the surface of the can freezes causing the formation of ice crystals.

Activity 12

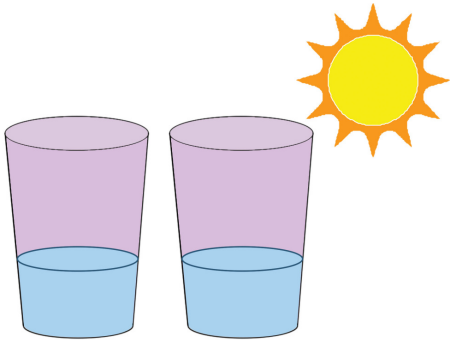
Air Pollution and Green House Effect

Materials:

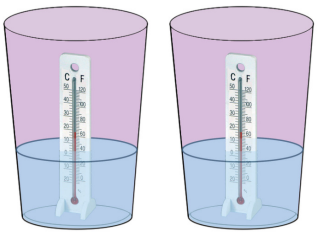
- 2 Cups
- 1 rubber band
- 2 thermometers
- 1 Plastic Bag

Steps:

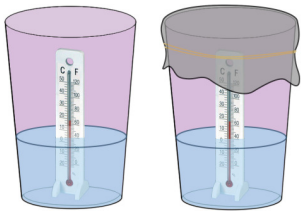
1. Fill both cups with same amount of cold water and place them under the sun.



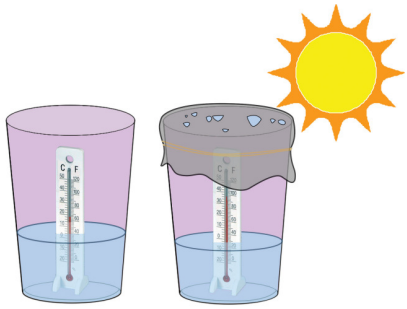
2. Put a thermometer inside each cup, the readings on both thermometers should be the same.



3. As shown in the diagram, wrap one cup with a plastic bag and fix the position with a rubber band.



4. Leave both cups under the sun for one hour and record the temperatures. What do you notice? Are they the same or different? How can this difference be explained? Also observe that there is some steam condensation form under the plastic sheet cover.



Explanation:

Greenhouse effect results from air pollution mainly due to carbon dioxide. The gas is produced when car engines are running. In fact carbon dioxide is formed when we burn the fuels, such as coal and oil. This gas builds up in the atmosphere and creates a layer which traps the sun's heat, like a greenhouse. As more and more carbon dioxide builds up in the atmosphere, this "Greenhouse Effect" warms the climate, dissolves the ice in the polar region. In this activity, the plastic sheets act as the layer of carbon dioxide in the atmosphere.

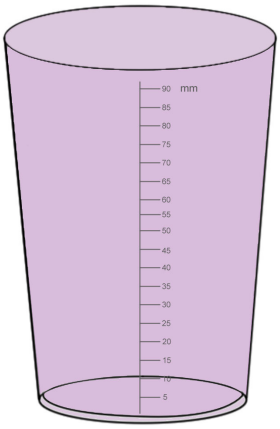
Activity 13

Rainfall measurement using a rain gauge

How much rainfall do you get where you live? Use the rain gauge to measure the amount.

Materials:

- Rain gauge (The cup with scale)



Steps:

1. When you see clouds in the sky and a storm is coming, set up the rain gauge in an open area away from trees or buildings, which may affect the amount of rain that falls into the gauge. Make sure the rain gauge is stable and will not be easily tripped over. You can put some small rocks around it but they should not block the mouth of the rain gauge.
2. When the rain stops, record how much rain (mm) is collected. Take the reading at eye level to avoid error. Compare your result with the weather report on radio or TV.

Explanations:

Meteorologists use a similar rain gauge at many weather stations around the world. If it is very rainy where you live, this project will keep you busy, if however you live in a dry area like the desert region, it may take a long time to collect any rain.

Activity 14

Artificial Rain

Make it rains! Learn how rain works.

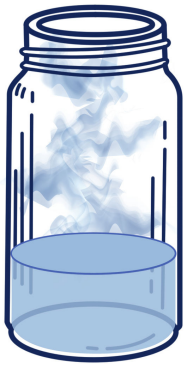
Materials:

- A large, wide-mouth container, such as a 1 litre glass jar or mayonnaise jar
- Hot water
- Some ice cubes
- Some salt
- A metal cover or a small plate to hold ice cubes

**** This activity must be performed under the supervision of an adult.**

Steps:

1. Pour about 5cm of very hot water into the glass jar. Pay attention and be very careful when pouring the water, ask an adult to help if needed.



2. Use a small plate or flip the lid to completely cover the jar opening.

3. Put some ice cubes on the lid and add some salt.

4. Wait and watch. In about 15 minutes you will see “rain” falling from the lid to the water inside the jar.

Explanations:

The ice with the salt makes the lid very cold while some of the hot water turns into vapour inside the jar. The cold lid causes the warm water vapour condense and form water droplets. This is the same thing that happens in the atmosphere as warm, moist air rises and meets colder temperatures high in the atmosphere. Water vapor condenses and forms precipitation that falls to the Earth as rain, sleet, hail, or snow.

Activity 15

Clouds and weather

There are many different type of clouds. Meteorologists classify clouds into three main types: cirrus, cumulus, and stratus. We can also group them according to the altitude of the cloud base. High clouds include cirrus clouds. Altostratus and altocumulus are middle clouds. Stratus are examples of low clouds.

Group			
High (Above 6km)	 **Cirrus**: Typically thin and white in appearance and made up of ice crystals.	 **Cirrocumulus**: With small ripples rather like the scale of a fish.	 **Cirrostratus**: Sheet-like, high level clouds composed of ice crystals.
Middle (2 – 6 km)	 **Altocumulus**: Shallow, puffy or wave-like. Composed of water and/or ice.	 **Altostratus**: Middle level grey sheet, thinner layer allows sun to appear as through ground glass.	
Low (Below 2 km)	 **Cumulus**: clouds looks like floating cotton. They have flat base and distinct outlines. When they are dark and deep, they bring rain.	 **Nimbostratus**: dark grey, "wet" looking clouds. They produce light/moderate rain over a large region.	 **Stratus**: Low level layer or mass, grey, uniform base.
	 **Cumulonimbus**: Cumulonimbus are thunder clouds. They are the largest clouds of all and more vertically developed, often with an anvil-shaped top, and produce heavy showers.		

Clouds can help you predict weather. A weather change is often indicated by a change in clouds. Cumulus clouds are the fair weather clouds seen on warm summer days. However, if conditions are right, a cumulus cloud can grow into a towering thunderhead called cumulonimbus. Violent updrafts of wind may lift the top of a storm cloud up to 19km above the earth.

Cirrus clouds often signal the approach of rain. Since cirrus clouds are so high, they do not appear to move very fast.

Stratus clouds are low grey clouds (below 2 km) and form when the air is filled with water droplets, and often accompany rain.

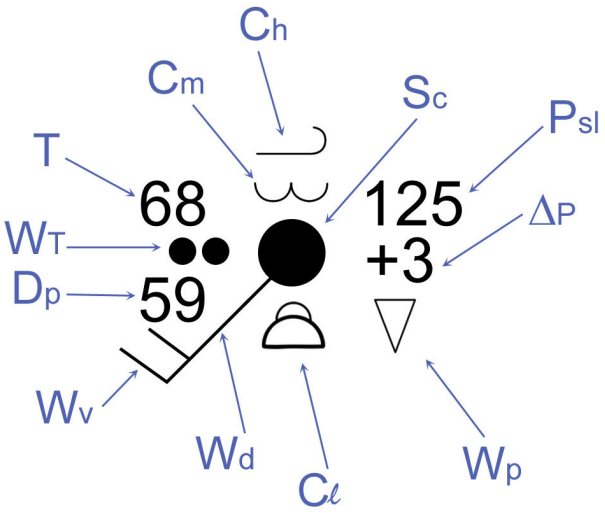
Activity 16

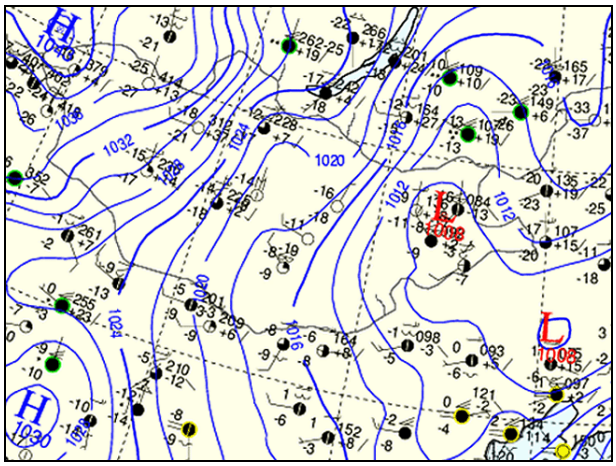
Weather symbols and weather map

Meteorological observations are represented on weather map with circles that show where weather stations are located. Around each circle are various numbers and symbols that represent the weather conditions being observed there. In order to correctly interpret the data, it is important to understand what types of data the different numbers and symbols represent. This activity introduce these reporting symbols:

Components of the observation symbol:

T: temperature in ºF
D_P: dew point in ºF
W_T: type of weather (see various symbols)
W_d: wind direction
W_v: wind strength in knots (1 knot = 1.83 km/h) indicated with short lines, which add up to a given value (20 knots in this example)
C_h: high clouds type (see various symbol)
C_m: type of middle height clouds
C_l: type of low clouds
S_c: sky cover (see various symbol)
P_{Sl}: air pressure at sea level (in millibars(mb) to the nearest tenth with the leading 9 or 10 omitted. In this case the pressure would be 1012.5 mb)
ΔP: change in air pressure in the past 3 hours (+ indicates rise, / indicates steady rise)
W_p: weather over past 6 hours





Weather Map

Weather Symbols

Weather Type


Drizzle


Rain


Snow


Freezing Rain


Showers


Hail


Ice Pellets


Fog

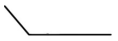

Thunderstorm

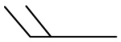

Tornado

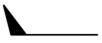

Hurricane

Wind Strength


5 knots


10 knots


20 knots


50 knots

Cloud Cover


Clear Sky


Slightly covered sky


Cloudy Sky


Very Cloudy Sky


Overcast

High Clouds Type


Cirrus


Cirrostratus


Cirrocumulus

Middle Height Clouds Type

Altocumulus


Altostratus

Low Clouds Type

Stratus


Stratocumulus


Cumulus


Cumulonimbus

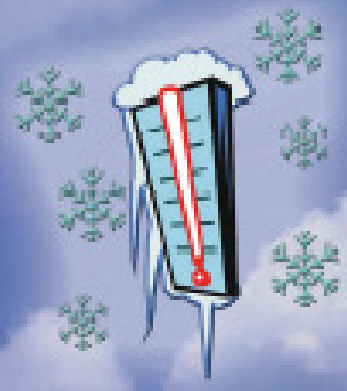

Nimbostratus

e-Science

Weather Observatory Kit

Activities Handbook

No. 3802



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