SUMMARY PROJECT: WEATHER STATION

TOPIC:

Observing and Predicting the Weather

INTRODUCTION:

Weather forecasting depends on careful observation of several elements. By interpreting the changes that occur in terms of humidity level of the air, wind speed, amount of rainfall, and existence and appearance of clouds, a trained person can make predictions of what the weather will be like for the next day or two. In this project you will act as a weather forecaster and use your skills of weather observation to follow patterns and predict changes.

TIME NEEDED:

1 hour construction time
15 minutes once (or twice in the case of cloud cover) per day for two weeks

MATERIALS:

IMPORTANT: YOU WILL NEED PHOTOCOPIES OF EXPERIMENTS 2.002, 2.003, 2.004, AND 2.005.
You will need the same materials as described in those experiments.

Safety Precautions

Please click on above link to view our safety guidelines.

PROCEDURE:

1. Use Experiment 2.002—"Wet Air"—to measure humidity every day for two weeks. Record your results in Part 1 of the Data Table.
2. Use Experiment 2.003—"Wind Station"—to measure wind direction and speed for two weeks. Record your results in Part 2 of the Data Table.
3. Use Experiment 2.004—"Rain Quality"—to measure rainfall for two weeks. Record your results in Part 3 of the Data Table.
4. Use Experiment 2.005—"Cloud Cover"—to measure cloud cover for two weeks. Record your results in Part 4 of the Data Table.
5. Use your observations to make predictions about the weather for the following day. Record these predictions in your notebook.

DATA TABLE

Part 1 Humidity					
Day	Prediction	Dry °C	Wet °C	Difference °C	Relative humidity
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Part 2 Wind speed		
Day	Wind speed	Weather conditions
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

Part 3 Rain pH			
Day	Rainfall (ml)	pH	Appearance of filter paper
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

Part 4 Cloud cover
Use the Data Table in your photocopy of Experiment 2.005.

ANALYSIS:

1. Write an account of your observations.
2. How correct were your predictions?

OUR FINDINGS:

Click on above link to see what we found.

Our Findings

II. WEATHER PROJECTS

2.006 Summary Project: Weather Station

1. Results will vary.
2. Results will vary.

SPECIAL SAFETY NOTE TO EXPERIMENTERS

Each experiment includes a short list of special safety precautions that are relevant to that particular project. However, these do not include all of the basic safety precautions that are necessary whenever you are working on a scientific experiment. For this reason, it is absolutely necessary that you read, copy, and remain mindful of the General Safety Precautions that follow this note.

Experimental science can be dangerous, and good laboratory procedure always includes carefully following basic safety rules. Things can happen very quickly while you are performing an experiment. Things can spill, break, even catch fire. There will be no time after the fact to protect yourself. Always prepare for unexpected dangers by following basic safety guidelines the *entire* time you are performing the experiment, whether or not something seems dangerous to you at a given moment.

We have been quite sparing in prescribing safety precautions for the individual experiments. We made this choice for one reason: We want you to take very seriously every safety precaution that is printed in this book. If you see it written here, you can be sure that it is here because it is absolutely critical to your safety.

One further note—The book assumes that you will read the safety precautions that follow, as well as those at the head of each experiment you are preparing to perform, and that you will *remember* them. Except in rare instances, these precautions will not be repeated in the procedure itself. It is up to you to use your good judgment and pay attention when performing potentially dangerous parts of the procedure. Just because the book does not say BE CAREFUL WITH HOT LIQUIDS or DON'T CUT YOURSELF WITH THE KNIFE does not mean that you should be careless when simmering water or stripping an electrical wire. It does mean that when you see a special note to be careful, it is extremely important that you pay attention to it.

If you ever have a question about whether a procedure or material is dangerous, wait until you find out for sure that it is safe.

GENERAL SAFETY PRECAUTIONS

Accidents caused by carelessness, haste, insufficient knowledge, or taking unnecessary risks can be avoided by practicing safety procedures and being alert while conducting experiments. Be sure to check the experiments in this book for additional safety regulations and adult supervision requirements. If you will be working in a lab, do not work alone.

PREPARE:
—Clear all surfaces before beginning experiments
—Read the instructions before you start
—Know the hazards of the experiments and anticipate dangers

PROTECT YOURSELF:
—Follow the directions step-by-step; do only one experiment at a time
—Locate exits, fire blanket and extinguisher, master gas and electricity shut-offs, eye wash, and first-aid kit
—Make sure there is adequate ventilation
—Do not horseplay
—Wear an apron and goggles
—Do not wear contact lenses, open shoes, loose clothing, or loose hair
—Keep floor and work space neat, clean, and dry
—Clean up spills immediately
—Never eat, drink, or smoke in laboratory or work space
—Do not eat or drink any substances tested unless expressly permitted to do so by a knowledgeable adult

USE EQUIPMENT WITH CARE:
—Set up apparatus far from the edge of the desk
—Use knives and other sharp or pointed instruments with caution
—Pull plugs, not cords, when removing electrical plugs
—Don't use your mouth to pipette; use a suction bulb
—Clean glassware before and after use
—Check glassware for scratches, cracks, and sharp edges
—Clean up broken glassware immediately
—Do not use reflected sunlight to illuminate your microscope
—Do not touch metal conductors
—Use only low voltage and current materials such as lantern batteries
—Be careful when using stepstools, chairs, and ladders

USING CHEMICALS:
—Never taste or inhale chemicals
—Label all bottles and apparatus containing chemicals
—Read labels carefully
—Avoid chemical contact with skin and eyes (wear goggles, apron, and gloves)
—Do not touch chemical solutions
—Wash hands before and after using solutions
—Wipe up spills thoroughly

HEATING SUBSTANCES:
—Use goggles, apron, and gloves when boiling water
—Keep your face away from test tubes and beakers
—Never leave apparatus unattended
—Use safety tongs and heat-resistant mittens
—Turn off hot plates, bunsen burners, and gas when you are done
—Keep flammable substances away from heat
—Have fire extinguisher on hand

GOING ON FIELD TRIPS:
—Do not go on a field trip by yourself
—Tell a responsible adult where you are going and maintain that route
—Know the area and its potential hazards, such as poison plants, deep water, and rapids
—Dress for terrain and weather conditions (prepare for exposure to sun as well as to cold)
—Bring along a first-aid kit
—Do not drink water or eat plants found in the wild
—Use the buddy system; do not do outdoor experiments alone

FINISHING UP:
—Thoroughly clean your work area and glassware
—Be careful not to return chemicals or contaminated reagents to the wrong containers
—Don't dispose of materials in the sink unless instructed to do so
—Wash your hands
—Clean up all residue and put in proper containers for disposal
—Dispose of all chemicals according to all local, state, and federal laws

BE SAFETY CONSCIOUS AT ALL TIMES