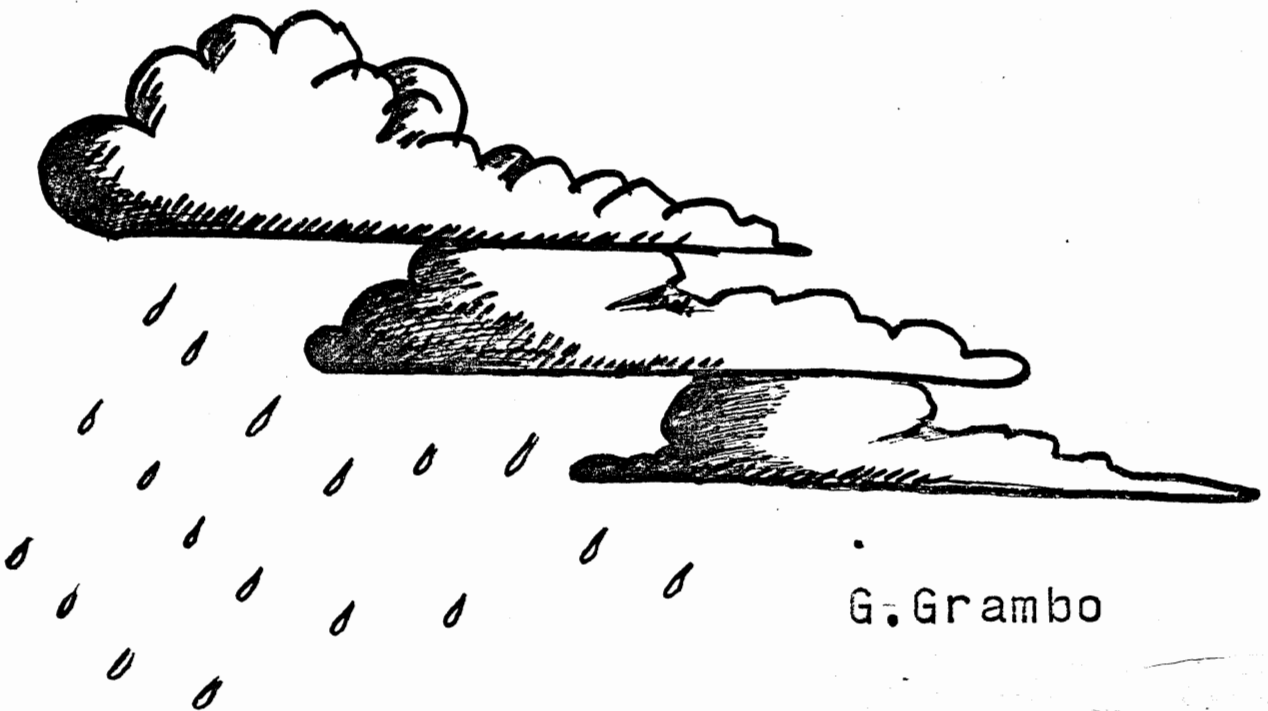




Climate and the Environment



G. Grambo

Climate and the Environment

Grade 6

This unit is designed using hands on activities. Students will work at their own pace experimenting, filling out the sheets, and taking the three quizzes . You may wish to use the bingo game that accompanies this unit. The game makes use of all knowledge learned in this unit. This unit was designed for grade 6, but may be used with the earth science unit for grade 8.

Gregory Grambo
The Louis Armstrong Middle
School

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Experiment Sheets

Chapter One

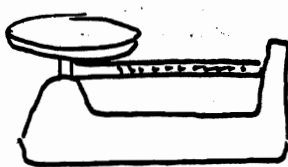
What is air?

Experiment 1


1 **Begin With**




Scale




Balloon




Low plastic glass




Beaker



Jar



Cover

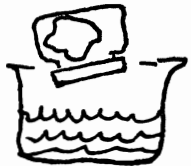


paper

2 What will happen if I put a piece of paper in a jar, cover the jar, & put it in water?

Prediction

Try it.




Q- How was the paper affected?

3 Predict what will happen to the paper if I do the same thing, but without the cover.

Prediction:

Try it

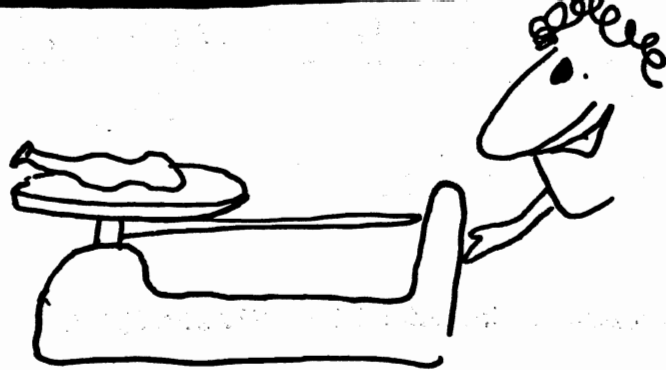
Explain Why this happened:



4

Next weigh a deflated balloon. How much do you think it weighs?

Prediction g



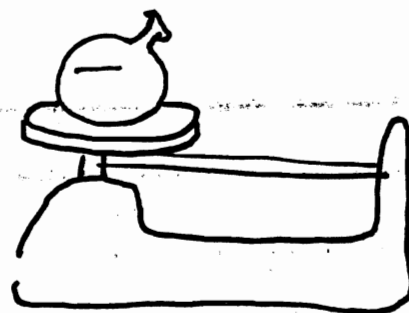
Actual Weight g

5 Fill the balloon and weigh it again.

Q- Will it weigh more or less?

Q- Why?

Try it



Actual Weight g

Q- How does Air look?

Q- How does Air smell and taste?

Q- Which weighs more a deflated or inflated balloon?

Q- Why?


Q- Why didn't the paper get wet in our experiment?

Q- From our experiment what are 5 things you can tell me about air?


Does Air Exert Pressure?

Experiment 2


1/ Begin With



plastic cup



Index card




Q- What are 5 things you can tell me about air?

Q- How do we know air has weight?

Q- Prove air takes up space.

2/ How would your hand feel if I began to pile books on it?

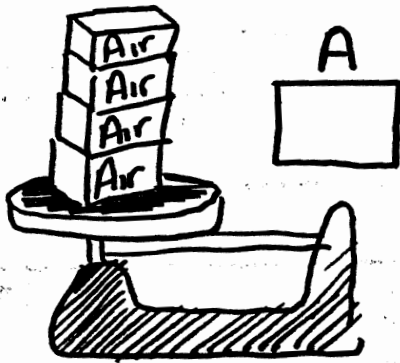


Why does your hand begin to feel this way?

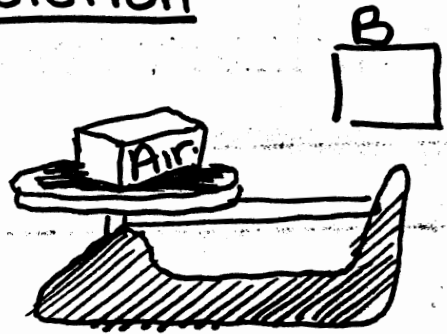
3/ How would a scale be affected if I begin to pile books on it?

How might the scale be affected if I replace the books with blocks of air?

4 Which would weigh more?



Prediction



Why?

Q- Why do these things have weight?

5

Put some water in a cup. Cover it with a index card. Turn over cup, holding card. Remove hand from cup.



6

Why doesn't water fall out?

What holds the card on the glass?

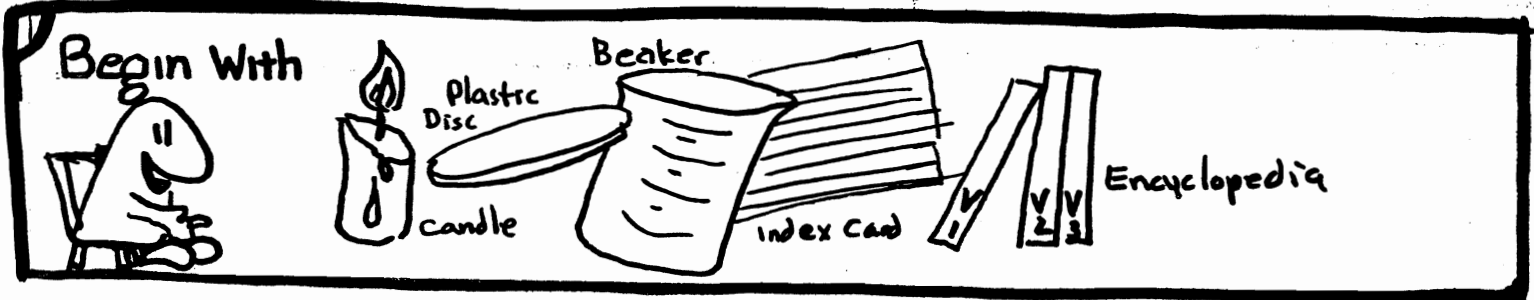
As I climb a mountain the air gets thinner.

Q- How does this affect the pressure of the air?

Q- How does air pressure affect things like the can I heated or our glass of water & card?

What is air made of?

Experiment 3



2) Place candle on plastic disc and light it.

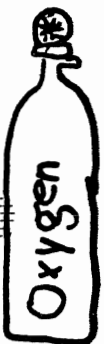


Q-What might happen if I cover the candle with a beaker?

3) Q-Why will this happen?

4) Q-In a hospital, why are there no smoking signs near the people in Oxygen tents?

5) Q-Why might they give people Oxygen?



6) Wet an index card and let it stand for 10 minutes

7) Describe what happened

8) Q-Where did the water go?

9) Q-How has the water affected our atmosphere?

10) Q-Why do parents have to dust?

11) Q-How might dust get into our atmosphere?

12) Q-How do buses and cars affect our Air?



13) There are many parts to our air. Some are good, some are bad, but all are there

Homework -

1) Name 3 things air is made of?

2) look in the encyclopedia. See if you can find out the other parts of air. See how much of each thing is in the air.

Where do we find air? Experiment 4

1) Begin
With

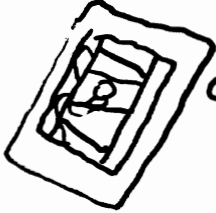


Chart of
atmosphere



2) Q-Why is air important to you?

3) Q-How do we know air is all around us?

4) Q-What about the ocean; how do we know there is air in the water?



5) If you were to climb a tall mountain, why would it become difficult to breathe?

6) Q-Why is there snow on top of tall mountains?



Q-What are 2 things you can tell me about air as you go higher up?

7) If air gets thin as you go up, what can you tell me about air pressure as you go up?

8) As you go up air gets so thin it can't even hold clouds any more. We call this area the Stratosphere.



9) After a while the air is so thin that the sun's rays affect the air. This is the Ionosphere.

10) The area closest to earth is the Troposphere.

11) Look at the atmosphere chart. The Stratosphere, Ionosphere and troposphere make up the atmosphere.

12) Q-Which part of the atmosphere is furthest away from the earth?

13) Q-Why would planes fly in the stratosphere?

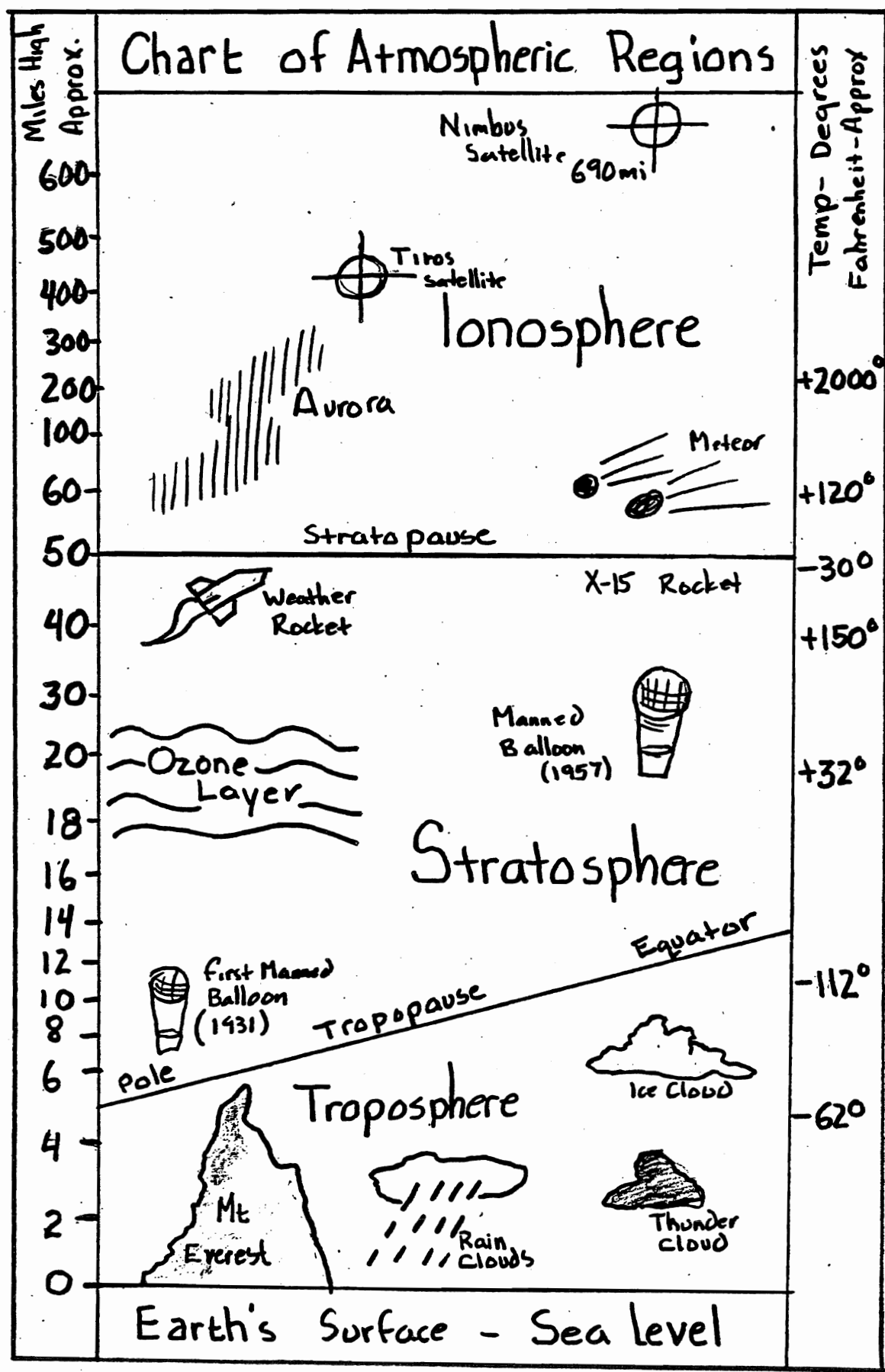
Homework -

1) - What is the atmosphere? What are its parts?

2) What part would we find weather in?

3) What happens to air as you go up?

Atmosphere Chart






This chart shows the parts of the atmosphere, how high they are, and what is in each part. Put this chart in your notebook.

Adapted from Board of Edu/City of N.Y./Grade 8

What is Weather?

Experiment 5

1) Begin With  Weather forecast  Thermometer. 

2) Q-look at the Weather forecast. What makes up a weather forecast?

3) Q-What are the things they tell you about the weather?

What is Airdex®?

4) WEATHER FORECASTS

Metropolitan area
Increasing cloudiness with a 30 percent chance of light rain or snow by evening. High in the upper 30s. Outlook for tomorrow, chance of rain, milder.

Watch Hill to Manasquan
Easterly winds 10 to 15 knots. Increasing cloudiness with a chance of light rain or snow by evening. Increasing wave heights.

Extended local forecast
Chance of rain Monday. Fair Tuesday and Wednesday. Above normal daytime temperatures with highs in the 40s and over and lows in the 30s.

Temperatures in New York
Saturday's Max. 45 at 1:00 p.m.
Saturday's Min. 38 at 5:00 a.m.
Highest January 8, 64 in 1930.
Lowest January 8, 2 in 1968.

6 a.m.	38	noon	44	6 p.m.	39
7 a.m.	39	1 p.m.	46	7 p.m.	38
8 a.m.	38	2 p.m.	45	8 p.m.	38
9 a.m.	39	3 p.m.	45	9 p.m.	37
10 a.m.	40	4 p.m.	43	10 p.m.	37
11 a.m.	43	5 p.m.	40	11 p.m.	36

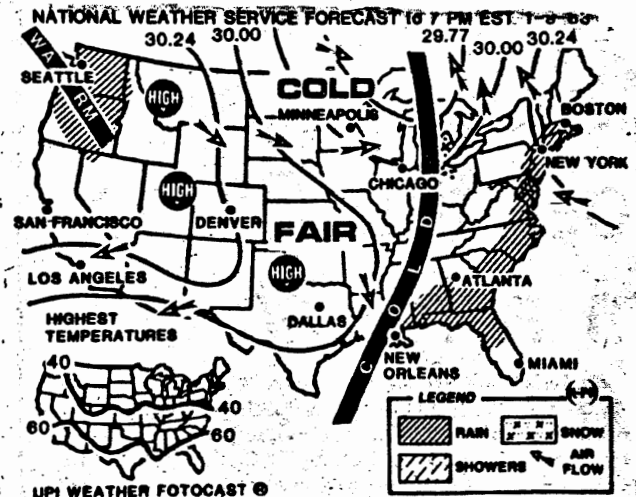
Mean temperature, 42; normal, 33; average above normal since January 1, 6.1 degrees. Degree days January 8, 26; since July 1, 1,570; normal since July 1, 1,911; last year to this date, 1,942.
(Degree days are number of degrees mean temperature falls below 65 in heating season.)

Precipitation
Yesterday, none inches; total since January 1, .76 inches; (.01 inches below normal); total last year to this date, 3.73 inches.

Airdex®
Yesterday: Air quality was moderate for 24 hours ending 3 p.m.
Today's air quality is expected to be moderate.

Humidity: 5 p.m. 41%; 11 p.m. 50%

NATIONAL WEATHER SERVICE FORECAST TO 7 PM EST. 1-8-68



NATIONAL SUMMARY
Rain will fall on most of the Atlantic Seaboard, as well as in the Pacific Northwest. Some snow activity may be found in the Great Lakes area, otherwise generally fair weather is predicted.

Sun, Moon and Planets
Sun rises in New York 7:20 a.m., sets 4:47 p.m.; rises tomorrow 7:20 a.m., sets 4:48 p.m. Moon rises 3:15 a.m., sets 1:34 p.m. Morning stars: Jupiter, Saturn; evening stars: Mercury, Venus, Mars.

	Jan. 5	Jan. 14	Jan. 22	Jan. 28
☾	☾	☾	☾	☾
☀	☀	☀	☀	☀
♁	♁	♁	♁	♁
♂	♂	♂	♂	♂
♃	♃	♃	♃	♃
♄	♄	♄	♄	♄
♅	♅	♅	♅	♅

Tides

	High		Low	
	a.m.	p.m.	a.m.	p.m.
Barnegat In.	3:51	4:13	10:09	10:20
Sandy Hook	4:11	4:33	10:30	10:41
Battery	4:53	5:15	11:15	11:20
Willels Pt.	8:24	8:55	2:16	2:55
Stamford	7:44	8:18	1:32	2:14
Fire Is. In.	3:33	3:55	10:01	10:12
Montauk Pt.	4:45	5:17	10:52	10:59

Foreign Cities

Local Time	Temp.	Skies
Athens	2 p.m. 55	Clear
Berlin	1 p.m. 41	Cloudy
Brussels	1 p.m. 43	P.Cldy.
Buenos Aires	9 a.m. 77	Cloudy
Cairo	2 p.m. 55	Rain
Dublin	NOON 43	Cloudy
Hong Kong	8 p.m. 56	Clear
London	NOON 42	Clear
Madrid	11 a.m. 49	Clear
Moscow	3 p.m. 35	Cloudy
Paris	1 p.m. 45	Cloudy
Rio J'n'ro	9 a.m. 85	P.Cldy.
Rome	1 p.m. 54	Cloudy
Stockholm	1 p.m. 39	Clear
Tokyo	9 p.m. 51	Cloudy
Warsaw	1 p.m. 40	Cloudy

U.S. Cities

City	Yesterday's High Low		Precip.	F'cast today
	High	Low		
Albany	40	32	—	Clear
Anchorage	-6	-9	—	Clear
Atlanta	59	34	—	Cloudy
Atlantic City	45	32	—	Cloudy
Boston	44	36	—	P.Cldy.
Chicago	36	26	—	Cloudy
Cincinnati	36	24	—	P.Cldy.
Cleveland	35	34	—	P.Cldy.
Denver	51	25	—	Windy
Detroit	33	31	—	Cloudy

Fort Worth 58 44 — P.Cldy
Honolulu 82 69 — Clear
Houston 64 60 .02 P.Cldy
Las Vegas 64 39 — Clear
Los Angeles 76 69 — Clear
Miami Beach 77 59 .58 Cloudy
Minneapolis 25 18 — Rain
New Orleans 70 55 — Cloudy
Orlando 75 55 — P.Cldy
Philadelphia 46 34 — Cloudy
Phoenix 73 46 — Clear
Pittsburgh 34 31 — Cloudy
Salt Lake C. 53 37 — Clear
San Fran'co 45 43 — Clear
San Juan PR 83 73 — P.Cldy
St. Louis 39 33 .05 Cloudy
Washington 47 34 — Rain

5) Precipitation is water falling to the earth. One form of precipitation is snow. What are some others?

6) Q-Why do leaves move around in the fall?



7) Look at the Thermometer.

Q-What does it tell you about the weather?



8) Q-Why is Precipitation, Wind and Temperature important to a weather scientist?

9) Q-Where does precipitation come from?

Homework -

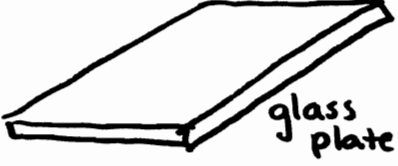
1) - What factors or things make up the weather?

2) What part of the atmosphere has weather?


3) Why does weather change?

Where do clouds Come From? Experiment 6


1) Begin With




glass plate



cloud chamber
(see teacher)




2) Q-What happens to a puddle of water after a few hours?




3) Where does the water go?



4) How does a blow dryer affect the water in your hair?



5) You spill water, how can you make it dry up faster?



6) How does heat affect water?



7) What are 3 ways to make water evaporate or dry up faster?

8) Define Evaporate

9) As water enters the air it travels upward.



10) Pick up glass plate and breath on it

11) Describe What happens.

12) Which is colder the inside of your body or the glass plate?

Q- How do you know this?

In the atmosphere warm air hits cold air. Warm air holds a lot of water vapor. The teacher will show you what happens when cold air meets warm moist air.

13) There is water vapor, or gas in your breath.

Q- What happens when water vapor hits the glass?



Homework

See Teacher

1) What is a cloud?

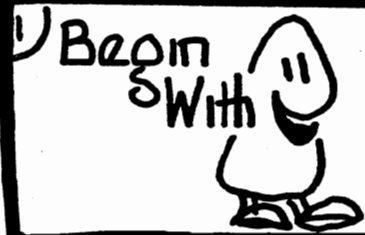
2) How is it formed?

3) How does water get to the clouds?


4) What happens when the cloud holds too much water?


What do Clouds do? What causes Weather?

Experiment 7




Sponge

2) How does water get up to the clouds? 

3) Take sponge and soak it with water. Try to pick up a small amount of water with the wet sponge. Describe What Happens 

4) What might happen if a cloud fills with water and more water is evaporating off of the earth?

5) When air hits its Dew point, the point where it can't hold anymore water it Rains. This is Precipitation

6) Water drops begin to cling or gather around bits of dust in the air. When the water drop gets heavy it falls as rain: 

7) As rain falls it may pass through cold air and freeze. We call this Sleet. The water vapor may freeze and fall, this is snow. As frozen rain falls it may melt, refreeze and grow larger. This is hail.

8) Q-Warm air makes water evaporate so it is usually wet. What might happen if wind blows the warm air and clouds over a city?

9) Q-How might moving hot and cold air affect the temperature?

10) Q-How does weather move?

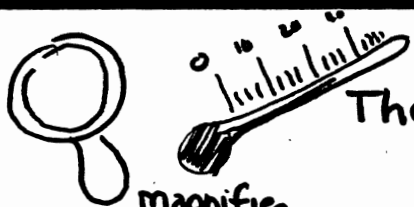



Homework -

- 1) How does rain affect weather?
- 2) Why does it fall?
- 3) What is snow? How is it formed?
- 4) How do clouds affect the weather?


5) How does evaporation affect the weather?

What does a Thermometer do? Experiment 8

1) Begin With  Thermometer 

The magnifying glass is labeled "magnifier". The thermometer has numbers 0, 10, and 20 marked on its scale.


2) Examine a thermometer. Describe what you see.




3) How do you think it works?

4) How does the liquid move up & down the tube?

5) Why does the liquid in the tube rise when it gets hot?



6) What are the numbers scratched in the tube for?



7) Q-Why doesn't the liquid come out of the tube?

8) How might cold air affect the thermometer?

9) How can we prove this?

10) How might the thermometer help us determine the weather?





Homework

1) How does a thermometer work?


2) What does it tell us?

3) How does it help the weatherman or weather women?


What is a rain gauge for? Experiment 9


1) Begin With   Cup or Beaker  Ruler  Rain gauge (from Teacher)

2) How does water get into the clouds?

3) How does water vapor turn into rain? 

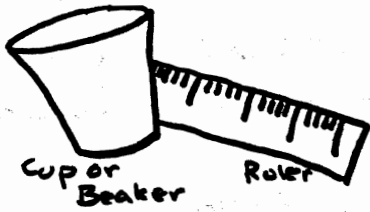
4) How does dust help in rain making?

5) Why does rain fall? 

6) What might happen to rain if it freezes as it falls?  cold

7) What is precipitation?

8) How might we use these materials to tell how much rain has fallen?



9) What would you use the cup for?

10) Why do you use the ruler?

11) Look at the rain gauge on the teacher's desk. How does it work?




12) Why does it have this shape?

13) What are the markings for?

Homework-

1) How can we collect and measure rainfall?

What does an Anemometer and a wind vane do? Experiment 10


1) Begin With    Wind vane
Anemometer (Get these from teacher)

2) Get the anemometer from the teacher. Examine it.
How can we make it turn?

3) Q- How might nature make it turn?

4) Q- Why are there cups on this instrument? 

5) Q- What will this instrument tell you if it turns very fast?

6) Blow hard on this instrument. Describe What Happens


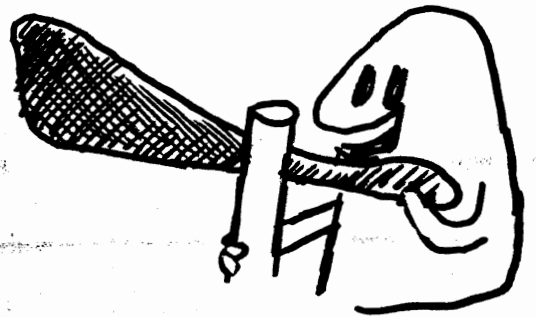
7) How can we tell how fast the cups are turning?

8) Describe how you can make one of these at home.

9) The other part (red part) of this instrument is a wind vane. What might it measure?

10) Blow hard on it. Does the arrow point to you or away from you? (Why?)

11) Why is it shaped like it is?



Homework -

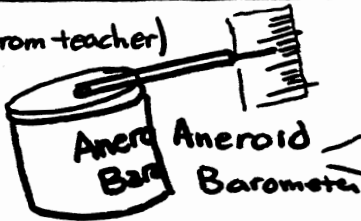
1)- What is an anemometer used for?

2)- How does a wind vane work?

A Barometer, what's a Barometer? Experiment 1)

Begin With

(from teacher)



Aneroid Barometer



Instructions for building Barometer

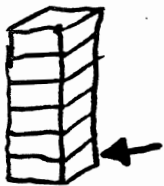


2) If I pile up books on your hand how would your hand feel?



3) Why would your hand feel this way?

4) Instead of books I will pile up blocks of air. What might happen to the bottom block if I keep piling up the blocks?



5) Why?

6) Examine the Barometer

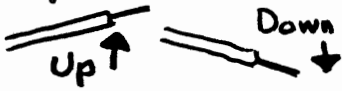
7) Press on the lid of the barometer and describe what happens to the arm.



8) What might happen to the barometer if the air gets cold and heavy and begins to press on the lid?

9) How might the arm of the barometer be affected if the air gets hot and light?

10) How can we figure out how far the arm moves up and down?



11) How can we use this instrument to measure air pressure?




If you would like instructions for building this barometer, see the teacher.

Home work -


1) - What is a barometer used for?

2) How does this aneroid Barometer work?

How can we tell how much water is in the air? Experiment 12

Begin With    Chart of Relative Humidity
Psychrometer (get from teacher)

2) What does a thermometer measure?



3) As air begins to hold water its temperature changes. The more water it holds, the more the temperature changes.

4) On any particular day the difference between the temperature of wet air and the real temp of the air tells us how much water is actually in the air.

5) You can find the temp of wet air by putting wet cotton around a thermometer.

6) Look at the Psychrometer

7) Dip cloth covered thermometer in water. Keep the other thermometer dry

8) Spin the Instrument.

9) Why are the temperatures different?

10) The difference between the temperatures tells us the % Humidity or amount of water in the air

11) If one temperature is 79°C and the other is 77°C , What is the difference between them?

12) Look at the chart on the back of the materials list. Take the difference and look it up on the chart. This will tell you the % humidity

13) What is the Humidity if....

<u>Temp</u>			
77°	78°	_____	humidity
50°	70°	_____	humidity

When the humidity is near 100% or when the wet and dry temperatures are very close it will Rain.

Homework

1) - Why is a psychrometer useful?

2) What is it used for?

3) How does it work?

What is climate?

Experiment 13

1) Begin With



Bucket




Map of World



Cup.



2) Q-Why will people wear heavy clothes in Alaska?




3) Q-Why will people wear thin clothes in a desert?




4) Why wouldn't you wear thick heavy clothes in a desert? What temperature do you think it is there in the winter? Summer?

5) Why wouldn't you expect it to be 80° in New York city in January?



6) What can you tell me about temperatures in the summer in New York City?



look at the map. - Do the questions on the map

7) look up
Climate-

8) How is climate different from weather?

lets see if the amount of rain will affect the climate.

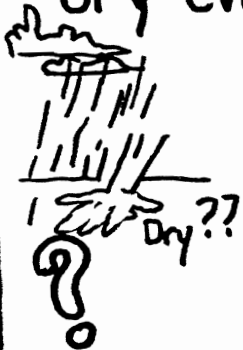
9) Put the cup into water and hold it over the bucket. Describe what happens.

10) What might happen if the water comes out faster than it goes in the cup?

11) What will happen to the ground if water evaporates faster than it rains?

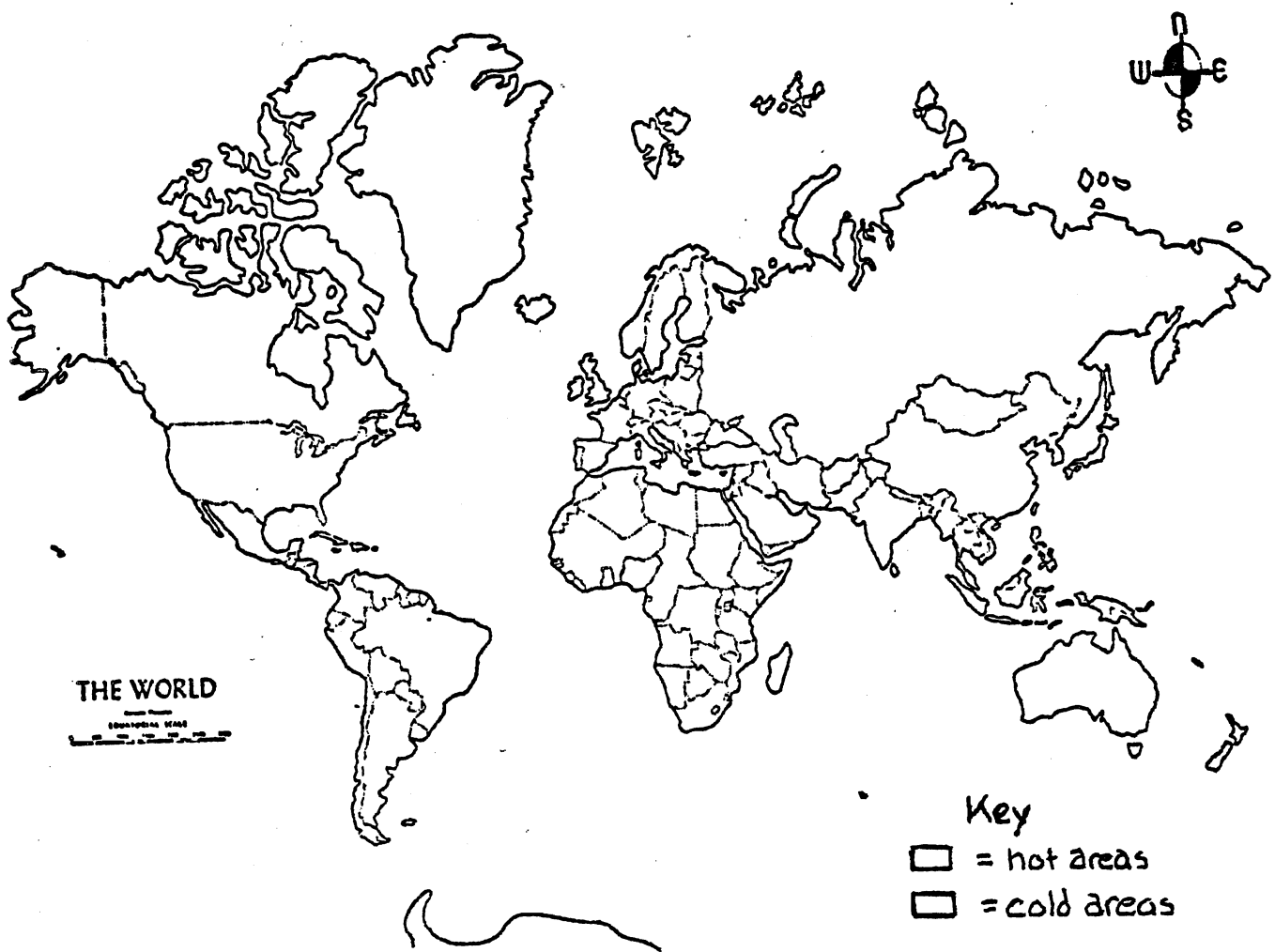


12) How can the ground stay dry even if it rains a lot?



13) What is climate?

How does weather affect climate?



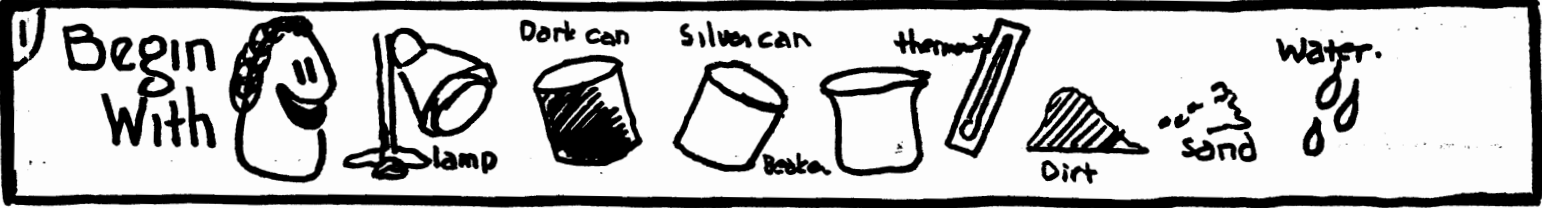
Look at the map. - Color in where it is hot all the time. Change colors, then color in where it is cold all the time.

Q-What do you notice about your map now?

Q-Why do the hot climate areas form a straight line on your map?

What are some things that affect the climate?

Experiment 14



2) Set up the following equipment at the side of the room.

3) There should be light sand in the silver can and dark dirt in the black can. Thermometers are placed in each can. Record the temperature before you start.

Dark Can _____ °C Light Can _____ °C

4) Turn on the light. Take the temperature of each can every minute for 10 minutes.

	Dark Can	Light Can
Start	_____ °C	_____ °C
after 1 min	_____ °C	_____ °C
2 min	_____ °C	_____ °C
3 min	_____ °C	_____ °C
4 min	_____ °C	_____ °C
5 min	_____ °C	_____ °C
6 min	_____ °C	_____ °C
7 min	_____ °C	_____ °C
8 min	_____ °C	_____ °C
9 min	_____ °C	_____ °C
10 min	_____ °C	_____ °C

Which gets hotter?

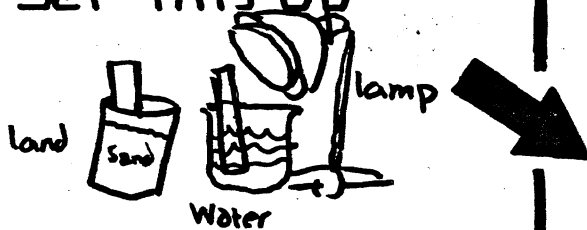
5) Why would you wear dark colors in the winter?

Why would you wear light colors in the summer?

6) Can you give a scientific reason why this can be heated up first?

7) How might heat affect the oceans?

8) Set this up



9) Turn on lamp and take temp. every minute for 10 minutes. Turn lamp off. Take temp every minute for 10 minutes.

10) Which heats up faster?

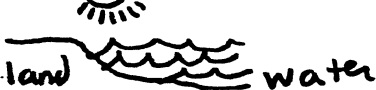
Which cools off faster?

When land or water is hot the air above the water gets hot. When air moves from cool places to warm places we get breezes.

When one is hotter than the other the breeze blows towards the hot one.

Light On			Light off	
Water	land		Water	land
—	—	Start	—	—
—	—	1 min	—	—
—	—	2 min	—	—
—	—	3 min	—	—
—	—	4 min	—	—
—	—	5 min	—	—
—	—	6 min	—	—
—	—	7 min	—	—
—	—	8 min	—	—
—	—	9 min	—	—
—	—	10 min	—	—

11) Look at the picture. Which way will the breeze blow in the Day?



Why?

How does climate affect the Environment?

Experiment 15

1) Begin With



Pictures of areas of the earth.

2) What happens to Maple and Oak trees in the winter?

3) Why does this happen?

4) What happens to most plants if you water them too much?
Why?

5) What if you forget to water the plants?
Why?

6) Why would a person die if left in a desert?

7) Why doesn't a camel die, it lives in a desert?

8) What do animals and plants have to be able to do to live in a desert?

9) How do Eskimo's survive the cold of Alaska?

10) Rain forests are wet, why don't the plants drown?

11) Why do different animals and plants live in different parts of the world?

12) How has climate affected the way living things are found around the Earth?

13) What role does climate play in the environment?

Homework-

1) Why is a cactus a good plant for a desert?

2) How are plants and animals affected by the climate of a region?

Stop! ² ² ² Tim
for

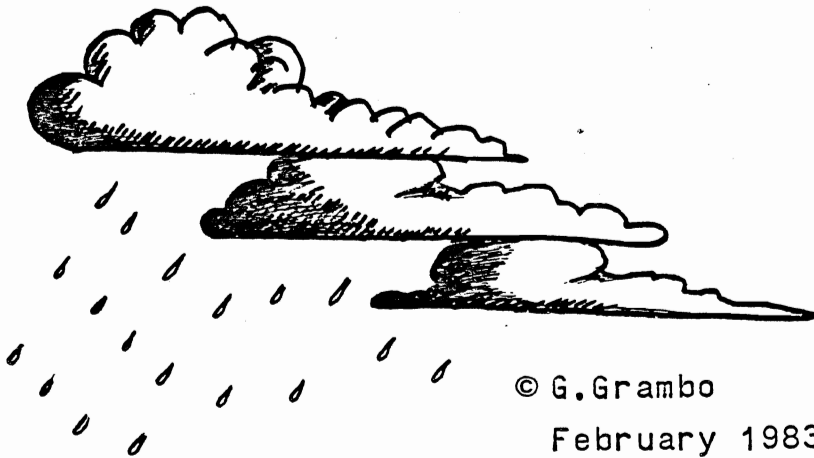
Climate and the
Environment Bingo Game

Chapter Two

Climate and the Environment BINGO



Climate and the Environment



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February 1983

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Climate and the Environment

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Bingo

Weather report	Weather	psychrometer	Rain Guage	anemometer
Ionosphere	Oxygen	precipitation	thermometer	stratosphere
Dust	Humidity	Water vapor	troposphere	atmosphere
Ozone layer	Clouds	Climate	Snow	evaporation
Barometer	Air	Rain	Hail	Sleet

Bingo

Weather report	Climate	psychrometer	Ozone layer	anemometer
Air	Rain Guage	Hail	thermometer	Stratosphere
Humidity	Ionosphere	precipitation	Dust	troposphere
Weather	Clouds	evaporation	Rain	atmosphere
Sleet	Oxygen	Water vapor	Snow	Barometer

Bingo

Water vapor	Ionosphere	evaporation	Snow	Hail
Dust	Barometer	Sleet	Climate	precipitation
Rain guage	Air	Weather	Ozone layer	troposphere
Weather report	Rain	psychrometer	Clouds	anemometer
Oxygen	Humidity	Stratosphere	atmosphere	thermometer

Bingo

atmosphere	Air	Humidity	Barometer	anemometer
Ionosphere	Snow	evaporation	Ozone layer	troposphere
Climate	Hail	Sleet	Clouds	thermometer
Dust	Oxygen	Weather	Water vapor	Stratosphere
Rain	Rain Guage	precipitation	Weather report	psychrometer

Bingo

Weather report	Barometer	Water vapor	Climate	Humidity
Ozone layer	Dust	precipitation	Ionosphere	Snow
troposphere	Clouds	thermometer	Sleet	Stratosphere
Oxygen	Hail	evaporation	Rain	atmosphere
Weather	Air	psychrometer	Rain Guage	anemometer

Bingo

Humidity	atmosphere	Weather	Rain Guage	Stratosphere
Ionosphere	Climate	water vapor	Dust	troposphere
Clouds	Rain	Sleet	Air	anemometer
Ozone layer	Hail	precipitation	Oxygen	psychrometer
thermometer	Weather Report	evaporation	Barometer	Snow

Bingo

Oxygen	evaporation	precipitation	Ozone layer	psychrometer
Weather report	Humidity	Snow	Water vapor	stratosphere
Rain	Ionosphere	Weather	Climate	troposphere
Sleet	Dust	anemometer	Barometer	atmosphere
Air	Rain Guage	Hail	Clouds	thermometer

Bingo

Weather report	Barometer	stratosphere	Air	anemometer
Ozone layer	Snow	psychrometer	Oxygen	thermometer
Water vapor	Hail	evaporation	Dust	troposphere
Rain	Humidity	Sleet	Rain Guage	atmosphere
Weather	Climate	precipitation	Clouds	Ionosphere

Bingo

Climate	Air	anemometer	Rain	thermometer
Barometer	Oxygen	troposphere	Sleet	atmosphere
Rain Guage	Weather report	Snow	Humidity	Stratosphere
Dust	Clouds	precipitation	Weather	Water vapor
Hail	Ionosphere	psychrometer	Ozone layer	evaporation

Bingo

Barometer	Rain Guage	precipitation	Oxygen	Rain
Climate	Sleet	Stratosphere	Ozone layer	atmosphere
Snow	Air	troposphere	Weather report	thermometer
Humidity	Water vapor	anemometer	Dust	Clouds
Weather	Hail	psychrometer	Ionosphere	evaporation

Bingo

Rain	Snow	Sleet	Water vapor	anemometer
Clouds	Rain Guage	Climate	evaporation	Stratosphere
Ozone layer	Weather	Humidity	Barometer	troposphere
Weather report	Oxygen	precipitation	Dust	thermometer
Hail	Ionosphere	psychrometer	Air	atmosphere

Bingo

Snow	Rain	Sleet	Hail	Water vapor
Weather	Humidity	evaporation	Clouds	atmosphere
Barometer	Oxygen	Stratosphere	Ozone layer	anemometer
Rain Guage	Climate	precipitation	Ionosphere	troposphere
Air	Weather report	psychrometer	Dust	thermometer

Falling water Drops Water drops forming around dust. Rain	1-Frozen water vapor. 2-Falling ice crystals	1-Frozen rain 2-Falling cold rain with ice Sleet	1-retrozen ice balls. 2-Falling ice balls Hail	1-molecule sized rising water in air. 2-Water as a gas Water Vapo
- Rain, snow, sleet, and hail. - Falling water Precipitation	1-Water vapor rising to the clouds 2-Water dries off the ground due to. Evaporation	1-Weather over a long period of time 2-Usual weather in a desert is its. Climate	1-Wind, temperature, pressure make this up. 2-Daily temp, pressure. Weather	1-Moistura in the air 2-Water Vapor in the air Humidity
First layer of the atmosphere. All weather is here Troposphere	1- Planes fly here 2- Second layer of the atmosphere. Stratosphere	1- last layer of the atmosphere 2- Satellites are found here. Ionosphere	1- People breath this. 2- Makes up about 20% of the air. Oxygen	1-Keep's radiation from killing us 2- Made of O ₃ gas Ozone layer
Made of Dust, Nitrogen and Oxygen - Has 78% Nitrogen Air	1-measures air speed 2-looks like spinning cups Anemometer	1-measures temp. 2-Mercury and alcohol _____. Thermometer	1-measures humidity 2- Has wet and dry bulb thermometa Psychromete	1-measures humidity 2- Has wet and dry bulb thermometa Psychromete
Catches rain measures rain-fall Rain gauge	1-Rain forms around this. 2-Factories put this in the air. Dust	1- Made of moisture, rain, dust 2- White and fluffy looking Clouds	1-Temp, Pressure Sky Cond, found in newspapers. 2-Weather on T.V Weather Report	1-made of Ionospher troposphere, and stratosphere. 2- Air Above us. Atmospher

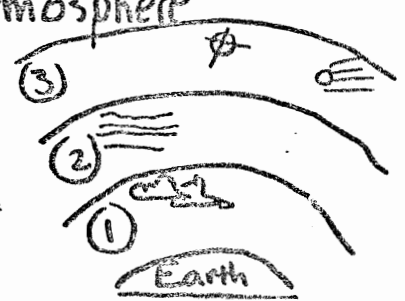
Appendix



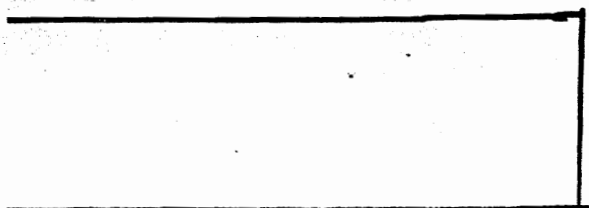
Quiz Experiments 1-5

- 1) What are 4 things you can tell me about air?
- 2) Why does air have pressure?
- 3) Prove air takes up space?
- 4) What are some of the things air is made of?

5) label the parts of the Atmosphere

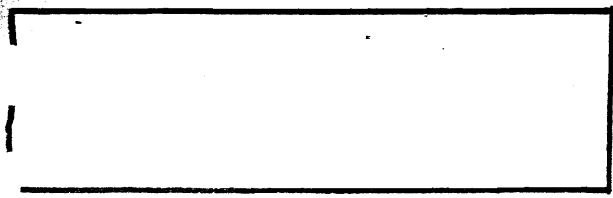


6) Name 4 things that make up the weather.



Quiz - Experiments 6-10

- 1) What happens to water when the sun hits it?
- 2) What are 3 ways to make water evaporate faster?
- 3) How does rain form?
- 4) How do clouds form?
- 5) What do the following instruments measure?
Pick one and describe how it works. (Use the back of this sheet)
Anemometer Rain Gauge Thermometer Wind Vane



Quiz-Experiments 11-15

1) What does a barometer do? How does it work?

2) Why are there 2 thermometers in a psychrometer? What do they tell us?

3) What is weather? How is it different from climate?

4) Why would you wear light colors in a desert and dark colors in cold areas?

5) How does humidity and precipitation affect the climate and the environment?

Climate and the Environment

Materials list

Your group is responsible for all materials in your box. Keep them neat and clean. Report missing materials to your teacher.

Small Jar with cover

Small cup 1 ounce

Beaker (or plastic cup)

Candle

Plastic candle base

Thermometer

Piece of Sponge

ruler

Cup with hole in it

glass plate

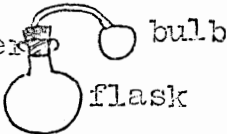
Balloon

Humidity Chart
(on Back)

Magnifying Glass

See the list of materials
to keep on hand - page 33

Materials to have at hand

- 6 Triple Beam Balances
- 6 Plastic Buckets
- 1 Box of matches
- 1 Cloud chamber
stopper 
- 12 Thermometers
- 1 Aneroid barometer
- 1 Anemometer
- 1 Rain Guage
- 1 Wind Vane
- 1 Psychrometer
- 6 Relative humidity charts
- 6 Silver cans
- 6 Black cans
- 6 Heat lamps
- 1 Dirt
- 1 Sand
- 6 Extra balloons
- 6 Pictures of areas of the Earth

RELATIVE HUMIDITY (in %)

RELATIVE HUMIDITY (in %)
Depression of wet-bulb thermometer, $t - t_1$ in °F

Temp. δ in °F	RELATIVE HUMIDITY (in %)																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
20	85	70	56	42	28	14																								
24	87	74	61	49	36	24	12	0																						
28	88	77	66	55	44	33	23	12	2																					
32	90	79	69	60	50	41	31	22	13	4																				
36	91	82	73	65	56	48	39	31	23	14	6																			
40	92	84	76	68	61	53	46	38	31	23	16	9	2																	
44	93	85	78	71	64	57	51	44	37	31	24	18	12	5																
48	93	87	80	73	67	60	54	46	42	36	31	25	19	14	8	3														
52	94	88	81	75	69	63	58	52	46	41	36	30	25	20	15	10	6	0												
56	94	88	82	77	71	66	61	55	50	45	40	35	31	26	21	17	12	8	4											
60	94	89	84	78	73	68	63	58	53	49	44	40	35	31	27	22	18	14	6	2										
64	95	90	85	79	75	70	66	61	56	52	48	43	39	35	31	27	23	20	16	12	9									
68	95	90	85	81	76	72	67	63	59	55	51	47	43	39	35	31	28	24	21	17	14									
72	95	91	86	82	78	73	69	65	61	57	53	49	46	42	39	35	32	28	25	22	19									
76	96	91	87	83	78	74	70	67	63	58	55	52	48	45	42	38	35	32	29	26	23									
80	96	91	87	83	79	76	72	68	64	61	57	54	51	47	44	41	38	35	32	29	27	24	21	18	16	13	11	8	6	4
84	96	92	88	84	80	77	73	70	66	63	59	56	53	50	47	44	41	38	35	32	30	27	25	22	20	17	15	12	10	8
88	96	92	88	85	81	78	74	71	67	64	61	58	55	52	49	46	43	41	38	35	33	30	28	25	23	21	18	16	14	12
92	96	92	89	85	82	78	75	72	69	65	62	59	57	54	51	48	45	43	40	38	35	33	30	28	26	24	22	19	17	15
96	96	93	89	86	82	79	76	73	70	67	64	61	58	55	53	50	47	45	42	40	37	35	33	31	29	26	24	22	20	18
100	96	93	90	86	83	80	77	74	71	68	65	62	59	57	54	52	49	47	44	42	40	37	35	33	31	29	27	25	23	21
104	97	93	90	87	84	80	77	74	72	69	66	63	61	58	56	53	51	48	46	44	41	39	37	35	33	31	29	27	25	24
108	97	93	90	87	84	81	78	75	72	70	67	64	62	59	57	54	52	50	47	45	43	41	39	37	35	33	31	29	28	26
112	97	94	90	87	84	82	79	76	73	70	68	65	63	60	58	56	53	51	49	47	45	43	41	39	37	35	33	31	30	28
116	97	94	91	88	85	82	79	77	74	71	69	66	64	61	59	57	55	52	50	48	46	44	42	40	38	37	35	33	31	30
120	97	94	91	88	85	82	80	77	74	72	69	67	65	62	60	58	56	54	51	49	47	46	44	42	40	38	36	35	33	31

You may wish to use this simplified humidity chart.

RELATIVE HUMIDITY IN PERCENT										
DRY-BULB TEMP.	DIFFERENCE IN DEGREES BETWEEN WET-BULB AND DRY-BULB THERMOMETERS									
	1	2	3	4	5	6	7	8	9	10
68°	95	90	85	81	76	72	67	63	59	55
70°	95	90	86	81	77	72	68	64	60	56
72°	95	91	86	82	78	73	69	65	61	57
74°	95	91	86	82	78	74	70	66	62	58
76°	96	91	87	83	78	74	70	67	63	59
78°	96	91	87	83	79	75	71	67	64	60
80°	96	91	87	83	79	76	72	68	64	61
82°	96	91	87	83	79	76	72	69	65	62

1. Write the number of students in each class.

6 Students

5 Students

6 Students

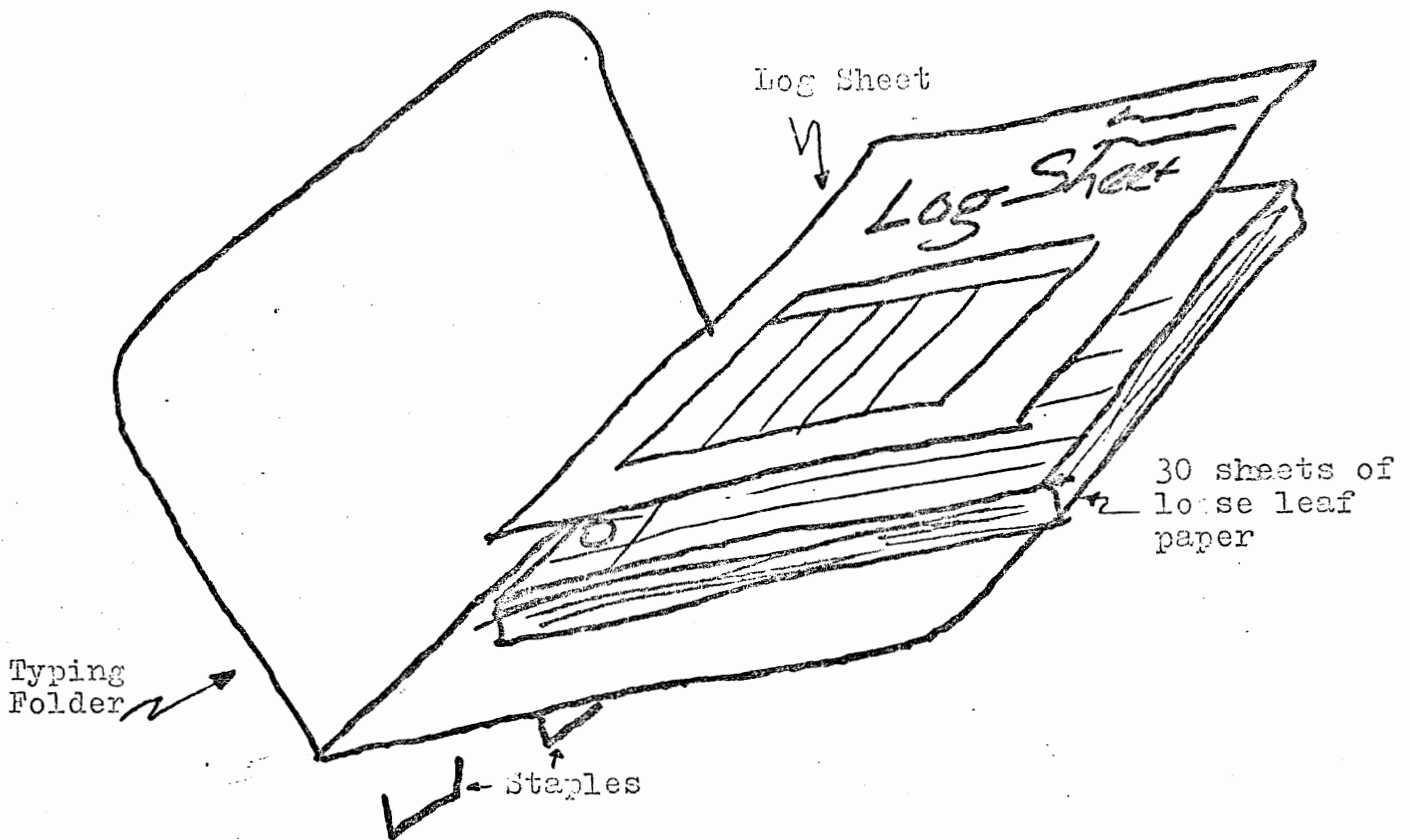
6 Students

6 Students

6 Students

Key
Blue - teacher
Red - student

How To Set Up A Log Book



Bind 30 sheets of paper along with the log sheet into a typing folder. Staple folder closed so papers will not fall out. Place students name and class at the top of the folder. Students may wish to decorate their folders. Pass out folders at the beginning of the period, and collect them at the end. Store folders in a milk crate or in a box. Students will write a summary of each days experiment into the log book. Periodically check log books.

Name _____

Class _____ Box No. _____

Science Log Book

Dates From To		Pages	Teacher's Comments	Checked By