

Sec.: _____ Name: _____

Experiment: Radiant Energy and Climate
(E. Science 9-17-1c)

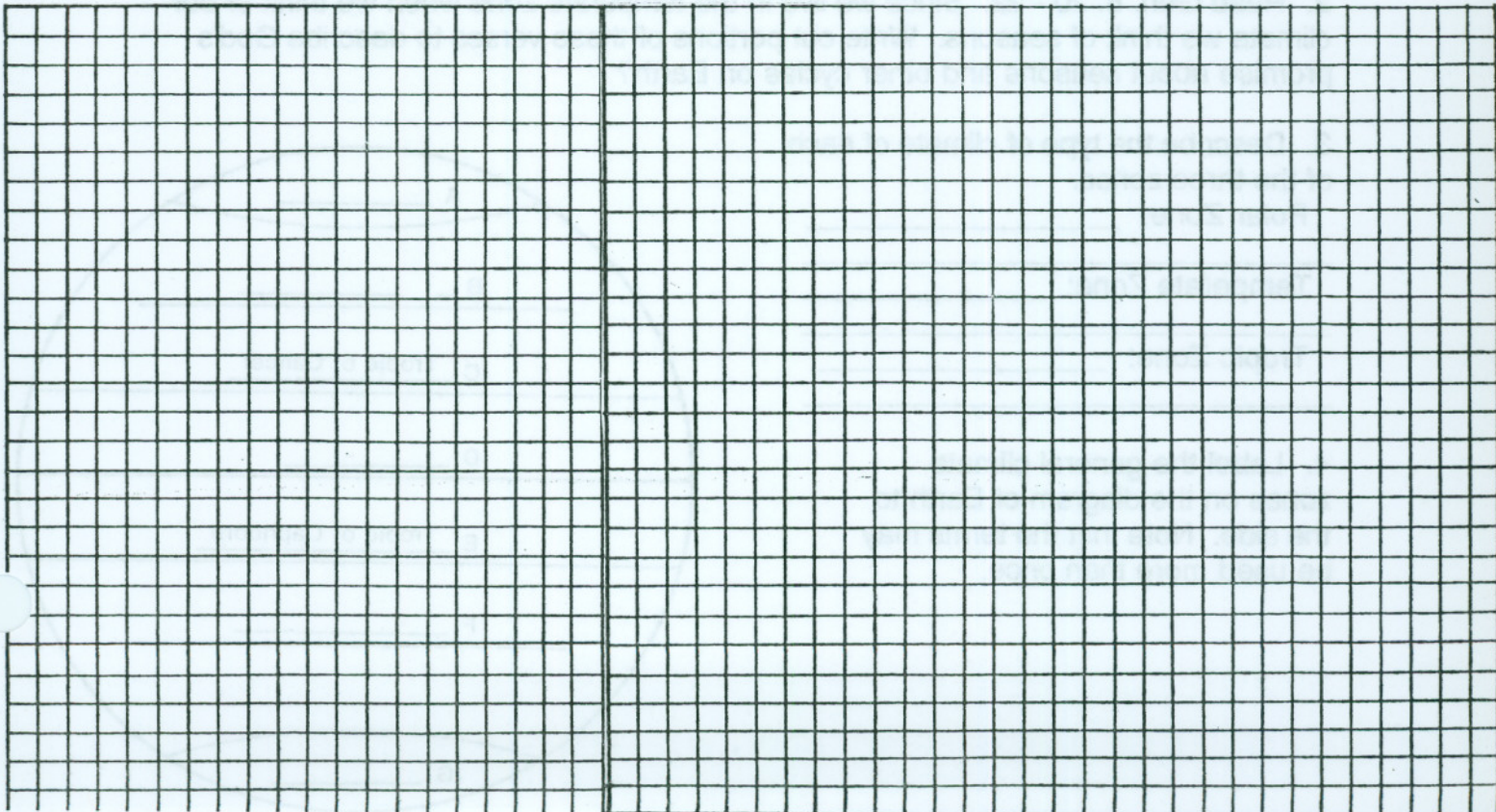
Purpose: To demonstrate that the angle at which radiant energy strikes Earth controls the amount of radiation received and to deduce the relationship between the amount of radiant energy an area receives and its climate.

Materials: overhead light protractor pencil pen

Methods:

1. Take three quarter sheets of paper and cut a hole of about a 2 mm diameter near the center.
2. Cover the overhead light with this paper and position the light so it shines at 90° to the chalkboard.
3. Outline the area of intense light using the yellow chalk (blue ink). Outline the area of less intense light using the white chalk (pencil). Sketch this on the left hand side of the graph paper on this lab. Try to make it proportional. The right chalkboard represents the entire graph paper on this lab.
4. Aim the overhead at 45° to the chalkboard and keep it the same distance from the chalkboard. Outline the area of intense light using the yellow chalk (blue ink). Outline the area of less intense light using the white chalk (pencil).
5. Repeat step four but at 3° .
6. Use the globes to record the latitude and longitude of three cities. Record NSEW

Results:



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6. Anchorage Alaska (polar area)	Latitude _____	Longitude _____
St. Louis Missouri (temperate area)	Latitude _____	Longitude _____
Havana Cuba (tropical area)	Latitude _____	Longitude _____

Conclusions:

1. Of the three light positions list the area of the most intense energy in order of size from largest to smallest. (Use the angle of light to identify each light position).

- 2. At which angle does the most intense radiant energy strike Earth?
- 3. At which angle does the least intense radiant energy strike Earth?
- 4. What climate zone does each radiant energy zone of our lab represent?

Step 3: _____

Step 4: _____

Step 5: _____

Discussion:

1. Below is a list of general climate zones for the Earth and a group of statements describing specific climate zones. Match the terms to the statements by writing the name of the appropriate climate zone in the space provided.

Tropic Zone Polar Zone Tropic of Capricorn Polar Zone Temperate Zone Tropic of Cancer

- _____ 1. Zone in which the sun's rays, at mid day, are nearly vertical much of the year.
- _____ 2. These areas are always cold.
- _____ 3. Located at 23.5 degrees south latitude.
- _____ 4. Winters are cold and summers are hot.
- _____ 5. Located at 23.5 degrees north latitude.

2. Read Gen. 8: 20 - 22. Since we live in the temperate zone when we think of our climate we think of seasons. Write out portions of these verses to describe God's promise about seasons and other cycles on Earth?

3. Describe the type of climate of each of the three zones.

Polar Zone: _____

Temperate Zone: _____

Tropic Zone: _____

4. Label the general climate zones on the diagram of Earth to the side. Note that the terms may be used more than once.

