Social Studies Coalition of Delaware
Grades K-3 Geography Lesson
Standard 2 – Environment

Lesson Title: Climb into the Climate Zones: Tropical - Temperate – Polar

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Lesson Description:
This lesson is an introductory lesson that will engage students in the understanding of three basic world climate zones and how they are affected by distance from the equator. There will be teacher directed activities to build knowledge as well as independent and group activities so students can apply the knowledge of climate in real life situations.

Grade Level: 3

End of Cluster Expectations (Benchmarks): K-3 Students will distinguish different types of climate and explain why they occur.

Assessments: (DSTP type) 1 constructed response and 1 multiple choice (See pages 8, 9, 10)

Essential Questions: What are the different types of climates? Why do they occur?

Objective(s): Students will:
- Develop an awareness of three types of global climate.
- Compare the three types of global climate.
- Understand how distance from the equator affects climate.
- Construct graphic organizers.
- Participate in an activity to simulate travel in the different climates.

Link to Additional Standards:
Mathematics Standards: One, Two, Three, Four, Seven, Eight, Nine, Ten
Science Standards: One, Four
Language Arts Standards: Two, Three

Prior Knowledge and Skills: Understanding of:
- different types of weather
- location of the equator and the polar regions
- identify the hemispheres
- finding locations on a map

Time to Complete: three-to-four 40-minute sessions

Materials/resources needed:
Handout 1- Climate Chart (one per student); (Climate Chart Answer Key - for teacher)
Visual 1- Climate Chart (transparency)
Visual 2a, 2b, 2c, 2d, 2e, 2f - Climographs of temperate, polar, tropical (transparencies)
Handout 2- World Map
Visual 3- World Map (transparency)
Large World Map
Globe
Desk maps or classroom atlases with a World Map for student use
Colored pencils or crayons- red, blue, green (per student)
Colored overhead markers – red, blue, green (teacher)
Pizza box/shoe box or plastic container to use as a suitcase- one per group (Other options: create a suitcase out of paper by folding a large sheet in half and stapling or taping the sides. Students can insert the items in the "folder" suitcase. Or students can draw and label the items on a sheet of paper. Remind them to add a title and their name.) Instead of drawing pictures, the students could cut pictures from seasonal store catalogues or sale circulars.
Assortment of paper (such as copying paper, newsprint, construction) to draw clothing, accessories, equipment, etc., needed for the trip. (Some per group.)
Literature (trade books) on Polar, Temperate, and Tropical climates; see attached list and consult with media specialist prior to the lesson.
Assessment 1- Multiple Choice
Assessment 2- Constructed Response
Assessment 2a- Constructed Response

Procedure for Guided Practice

<u>Lesson 1- Introduction; and Temperate and Polar Climates</u>

1. Build background knowledge with a discussion asking the following questions:
    - What is the weather (precipitation and temperature) like today? Yesterday?
    - What do you think the weather will be like tomorrow?
    - Is the weather different in July or August than now?
    - What is our weather like year round? Is it real cold or real hot?
    - Is it the same year after year?
2. Tell the students that climate is how hot or cold, wet or dry a place is over a long period of time. The type of climate in Delaware is called *temperate*. Write *temperate* on the chalkboard. Tell the students that they will be learning some new words during these lessons so we will add the new terms to the word wall/ word bank as we use them in the lesson. (See page 7 for a suggested Climate Vocabulary; teacher should use their discretion to add other terms.)
3. Display a transparency of Handout 1- Climate Chart and distribute a paper copy to each student. Tell the students that we will use this graphic organizer as we learn about the climate zones. On the climate chart transparency, label the first column *Temperate* and have the students write T*emperate* on their first (left) column. Tell the students that this is the kind of climate that we have in this area. [By starting with the temperate zone, the students will work from local climate to global climates.]

4. Brainstorm words to describe Delaware's climate. Record student ideas on the chart (see Climate Chart Answer Key for suggested responses) and have the students record the words on their copy. Teacher note: also include average highs and lows of the region. Ask students what is the hottest and lowest temperatures and how much *precipitation* we have Ask if they know how/where we could find this information for our area and other places. They might suggest newspaper, world-wide web, almanac, etc.
5. Display the Temperate climograph (Visual 2a). Briefly discuss the word *climograph*. (climate, graph) Climographs show average temperature and rainfall for a place. Also, mention that a climograph is a kind of *geo-graphic. [Geography Standard 1]*
6. Ask the students: Do you think the climate is the same all over the world? Briefly discuss what they know about other climates and the how people in other places in the world dress. Guide their thinking by asking why many people go to Florida in the winter. [Warm climate] Have them look at a world map and consider if there is any correlation between distance from the equator and climates?
7. Tell them: "Let's look at another part of the world." Introduce the Polar Regions by reading a book about the Polar Regions or is set in that region. (See suggested book list.) Ask the students to listen carefully to the story for any clues pertaining to the climate of that region/zone. Stop at selected points in the story to have the students record on their climate chart under the heading "Polar" (second column on the chart) what they have learned about the Polar region. Finish the story and ask them to think the Polar climate. Do they want to add any more words to the polar column? Take a few minutes to talk about the Polar climate zone.
8. Then have the students identify the similarities and differences between the polar and temperate regions on the chart.
9. Display the Polar climograph (Visual 2c) and record highs and lows for the temperature and precipitation for the Polar region. Have the students consider how the two climates compare. At this point, if you overlay the temperate (2a) on the polar (2c) the children can see a visual representation of the differences between the regions. (Also, 2b transparency can be placed over 2d.) Ask which one gets more precipitation? Which one has higher temperatures? Do both zones have great variation in monthly averages?
10. Hand out the world map (Handout 3) and have the students take out their blue and green crayons. Ask students to locate the polar zones on the world map and label the zones *Polar*. Then, using a <u>blue crayon,</u> shade in the Polar zones on the map. Teachers should color the polar region on the World Map transparency (Visual 3) [Have the students mentioned North Pole and South Pole or the movie Polar Express?]
11. Ask the students why the polar regions seem to be so small? Use a globe to show what the polar regions really look like – from bird's-eye view. This is what happens when a circular object is shown as a flat object (globe to flat map).
12. Ask students: Where would Delaware be on this map? Have them mark an X where Delaware is located. Ask students: What type of climate does Delaware have? (temperate) Color the northern temperate zone using a <u>green crayon</u> and label it *Temperate*. (Teacher does the same on the transparency.) There will be a section of the map (the southern temperate zone) not colored. Ask the students to suggest the name of this climate zone. Draw their attention to the pattern of two polar climate zones, and two sets of other zones. They may conclude that the southern zone next to the Antarctic is also temperate. Have them label this zone *Temperate* and color it green.

13. Closure- Return to the focus question: What are the different types of climates that we have studied so far? (temperate, polar) Do you think there are more? Why do the different types occur? Have we discovered that answer yet? Tell students to look at their world map. Ask: What do you notice about the map? (there are other zones) Tell them that tomorrow we will explore another climate zone. Ask, "Do they have any idea why there are different climate zones?" Let's find out tomorrow!

Lesson Two

1. Ask the students to recall the definition of climate from the previous lesson. Ask them to refer to the climate chart and review the differences in the temperate and polar climates. Point out the location of Delaware and the polar regions on a world map. Tell the students that now we will look at another part of the world- near the equator. Again using the world map, locate areas north and south of the equator.
2. Add new terms to the word bank: *Tropical, Equator.*
3. The teacher should read aloud a book about the tropical region. (Here is the Tropical Rain Forest or see the suggested book list.) Remind the students to use the words and the pictures to learn about the climate of this region. Stop at selected points in the story to record on the climate chart under the new heading *Tropical* what they have learned. When finished, look at the chart and ask the students to make some generalizations about the tropical climate. Display the tropical climograph (Handout 3-Tropical). Then ask the students to compare all three types of climate and to identify differences and similarities between them.
4. Ask students to take out their world maps and locate the equator. Label the sections north and south of the equator *tropical*. Use a red crayon to shade in these zones.
5. To bring closure to the lesson, ask students to name and describe the different climate zones in the world. Say to them, "Now that we know different parts of the world have different climates, think about how people who live in those climates might live." Tell them that tomorrow they will travel with their classmates among the different climate zones.

Teacher Preparation for Lesson Three

Teacher should prepare to model the activity in Lesson 3. The sample should be based on the climate of Delaware during a specific season. For example, if the lesson is taught during late October, the items might include the following: long-sleeved shirts, jeans, light jacket, hat, sneakers, football, etc.

Lesson Three

1. Review the definition of "climate" that was established on the first day. Review the climate chart. Ask the children to summarize what they have learned about the climate in different parts of the world.
2. Put up the overhead transparency of the world with the three major climate zones highlighted (the world map the children have been coloring). Have children draw conclusions about the distance from the equator and the relative temperatures. Guide them to the conclusion that, as they travel further from the equator, the temperatures usually drop.

3. Using the same overhead map, have the group practice locating destinations in the different climate zones. Mark each of the following places, one at a time, and have the children practice making generalizations about the climate in each place, based on the zone in which it is located: Paris, (France), Sri Lanka (off the southern tip of India), and Barrow, Alaska.
4. We're going on a trip! What clothing do we need, what outside activities will we experience?
    - Explain that the children will be planning a vacation and packing a suitcase to go on that vacation. They will need to pack clothing and equipment for some outdoor activities that are appropriate for their destination.
    - Use teacher sample to model activity for Delaware (appropriate clothing for the climate, equipment for an activity in this climate).
    - Have the children form small groups or assign students to groups. Students will work and share ideas and materials in the groups but each one will probably want to make their own suitcase. Assign each group a destination as suggested below but do not tell them what climate zone their destination is in. They may use the classroom atlases to locate their destination.
        - Polar: Antarctica, Victoria Island (Canada), New Siberian Islands (north of Russia)
        - Temperate: Rome, Tokyo, California, Falkland Islands (South America)
        - Tropical: Lake Victoria (Africa), Puerto Rico, Morocco

      [Teacher may need to select other locations, depending on the number of students.]
    - Tell the children to find their place on a world map with teacher's help and/or using an index in the atlas and discuss the climate of that place.
    - Pass out the assortment of papers and scissors, etc., that will be needed to draw and cut out the clothing and equipment.
    - Tell the groups to draw/make clothing and equipment appropriate for their location and to pack it in their suitcases. Then, ask them to record the reasons for their choice of items and to list activities in which they plan to participate.
    - Pass out pizza boxes, folders or other containers the children will be using as suitcases and encourage the students to decorate them like a suitcase – if time permits.
    - Re-assemble the class and have each group share their work. Have them mark the location of their destination on the overhead map that has been in use for the previous lessons. Then, have the students show their suitcases and explain why they have that type of clothing and equipment. As the groups present, draw their attention to the similarities of the contents of the suitcases. Ask why there are similarities in clothing and activities. They should conclude that locations in the same climate zones will have similar items.

Closure:

1. Revisit the focus questions for the lesson. What are the different types of climates? Why do they occur? Call on the students to make generalizations about the types of climate, such as:
    a. Temperate – like the climate in Delaware, has seasons, summers are warm to hot, winters are cool to cold; there is a temperate zone in the northern hemisphere and one in the southern hemisphere.
    b. Polar – very cold, not much precipitation, found around the North and South poles.

c. Tropical – warm to hot year round, usually humid, lots of precipitation; nearest to the equator.
d. The closer to the equator, the warmer the climate is.

[There are other factors that determine/affect climate but for this level this will suffice. Tell the students that in higher grades they will study these other factors.]

Assessments - see pages 9, 10, 11

Tips for the Teacher

- Point out to students that distance from the equator is not the only factor that affects climate.
- Make sure they understand that rain forests can also be found in temperate climates.
- The climographs are **average** temperature and rainfall for certain places.

Suggested related trade books

1. Baker, Lucy. Life in the Rain Forests. New Jersey: Two-Can Publishing LLC. 2000.
2. Berger, Melvin. Life in the Polar Regions. New York: Newbridge, 1994.
3. Branley, Franklyn M. Sunshine Makes the Seasons. Harper Trophy, 1986.
4. Byles, Monica. Life in the Polar Lands. New Jersey: Two-Can Publishing LLC. 2000.
5. Cherry, Lynne. The Great Kapok Tree. California: Gulliver Books, Harcourt Brace Jovanovich Publishers, 2003.
6. Dewey, Jennifer Owings. Antarctic Journal. New York: Scholastic, Inc. 2001.
7. DeWitt, Lynda. What Will the Weather Be? Harper Trophy, 1993.
8. Dunphy, Madelein. Here is the Tropical Rain Forest. New York: Hyperion Books for Children. 1994.
9. Geraghty, Paul. Stop That Noise! New York: Crown Publishers, Inc. 1992.
10. Gibbons, Gail. The Reasons for the Seasons. Holiday House, 1996.
11. Gibbons, Gail. Weather Words and What They Mean. New York: Scholastic, Inc. 1990.
12. Levinson, Nancy. North Pole, South Pole. Holiday House, 2002.
13. Lye, Keith. Temperate Climates. Raintree Publishing, 1997.
14. Neitzel, Shirley. The Jacket I Wear in the Snow. Harper Trophy, 1994.
15. Provensen, Alice. The Year at Maple Hill Farm. Aladdin, 2001.
16. Rogers, Paul. What Will the Weather Be Like Today? New York: Scholastic, Inc. 1989.
17. Taylor, Barbara. Weather and Climate. New York: Kingfisher Books, 1993.
18. Willow, Diane. At Home in the Rain Forest. Massachusetts: C. Bridge Publishing. 1991.
19. Yolen, Jane. Welcome to the Ice House. New York: Putnam Publishing Group, 1998.
20. Yolen, Jane. Welcome to the Green House. New York: Putnam Publishing Group, 1997.

Citations for Graphics, Information, Adapted Lesson, etc.

www.weathereye.kgan.com (Climate lesson with quiz)
The Climographs are adapted from information found on the following website:
www.cotf.edu/ete/modules/msese/earthsysflr/biomes.html (Biomes and climographs)
The following website contains background information for teachers:
http://en.wikipedia.org/wiki/seasons
www.epa.gov/globalwarming/kids/index.html (Climate/weather/global warming)

Answer keys for the assessments:

Desired responses:
Multiple Choice:

Place 2

Constructed Response 2

- The climate in Place1 is colder than Place 2 because Place 1 is in a polar climate and Place 2 is in a tropical climate.

- Another possible correct answer would be the reverse of the above.

- The climate in Place 1 is colder than Place 2 because it is farther from the equator than Place 2.

Constructed response 2a

A star should be placed in the polar zones because they have snow year-round.
A star should be placed in the zone near the North Pole because it is always cold there.*

Rubric

2 – This response gives a valid answer with an accurate and relevant explanation.
1 – This response gives a valid answer with an inaccurate, irrelevant or no explanation.
0 – Inaccurate response.

Climate Vocabulary

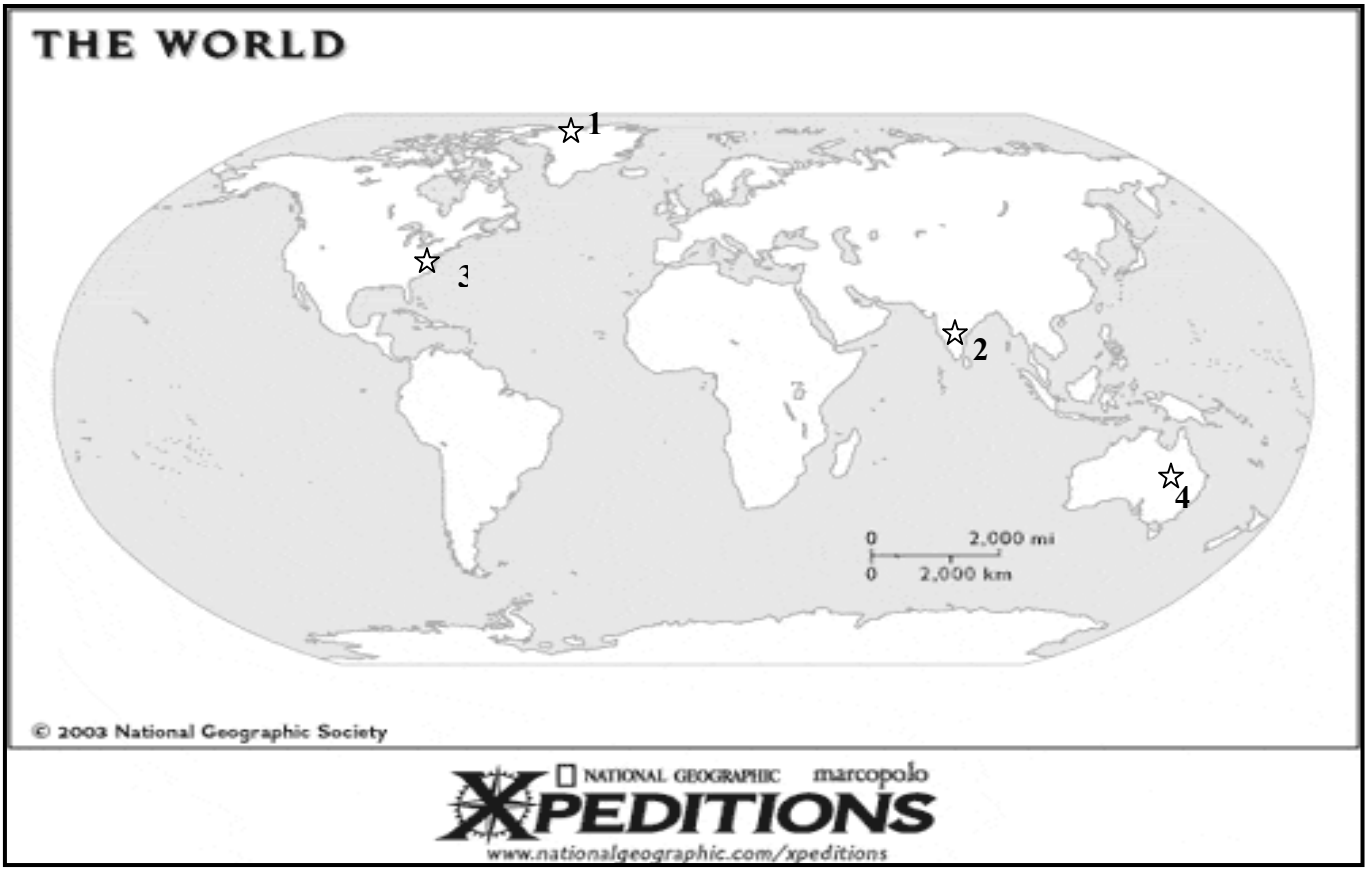
- Antarctic Circle: 66.5° degrees South latitude, approximate northern extent of the Antarctic polar climate.
- Arctic Circle: 66.5° degrees North latitude, approximate southern extent of the arctic polar climate zone.
- Climate: How hot or cold, wet or dry a place is over a long period of time.
- Climograph: a graphic that shows the temperature and rainfall of an area.
- Equator: 0° latitude, an imaginary line at the center of the Earth. (Introduce the degree symbol [°] that is used to indicate degrees of latitude and longitude and unit of measurement for temperatures.)
- Globe: a scale model of Earth that correctly represents area, relative size, shape of physical features, distance between points, and true compass direction.
- Map: a drawing of the earth's surface; a graphic representation of a portion of Earth that is usually drawn to scale on a flat surface.
- Polar region: the areas of the globe surrounding the poles.
- Precipitation: any of the forms in which water falls on the Earth's surface (rain, snow, hail, sleet).
- Region: an area with one or more common characteristics or features, which give it a measure of homogeneity (sameness) and make it different from surrounding areas.
- Temperate region: the area with warm summers and cool winters between the polar regions and the hot tropics of both hemispheres.
- Tropic of Cancer: 23.5° degrees North latitude, approximate northern extent of the tropics (tropical climate zone).
- Tropic of Capricorn: 23.5° degrees South latitude, approximate southern extent of the tropics (tropical climate zone).

Name_____Date_____

Delaware Social Studies Geography Standard 2

Multiple Choice

This world map shows the location of 4 different places.



Which location shows a place found in a tropical climate?

Place 1 Place 2 Place 3 Place 4

Name_____Date_____

Delaware Social Studies Geography Standard 2

Constructed Response

Data

This world map shows the location of 2 different places.

How is the climate in Place 1 different from the climate in Place 2? **Explain** your thinking.

_____

_____

_____

_____

_____

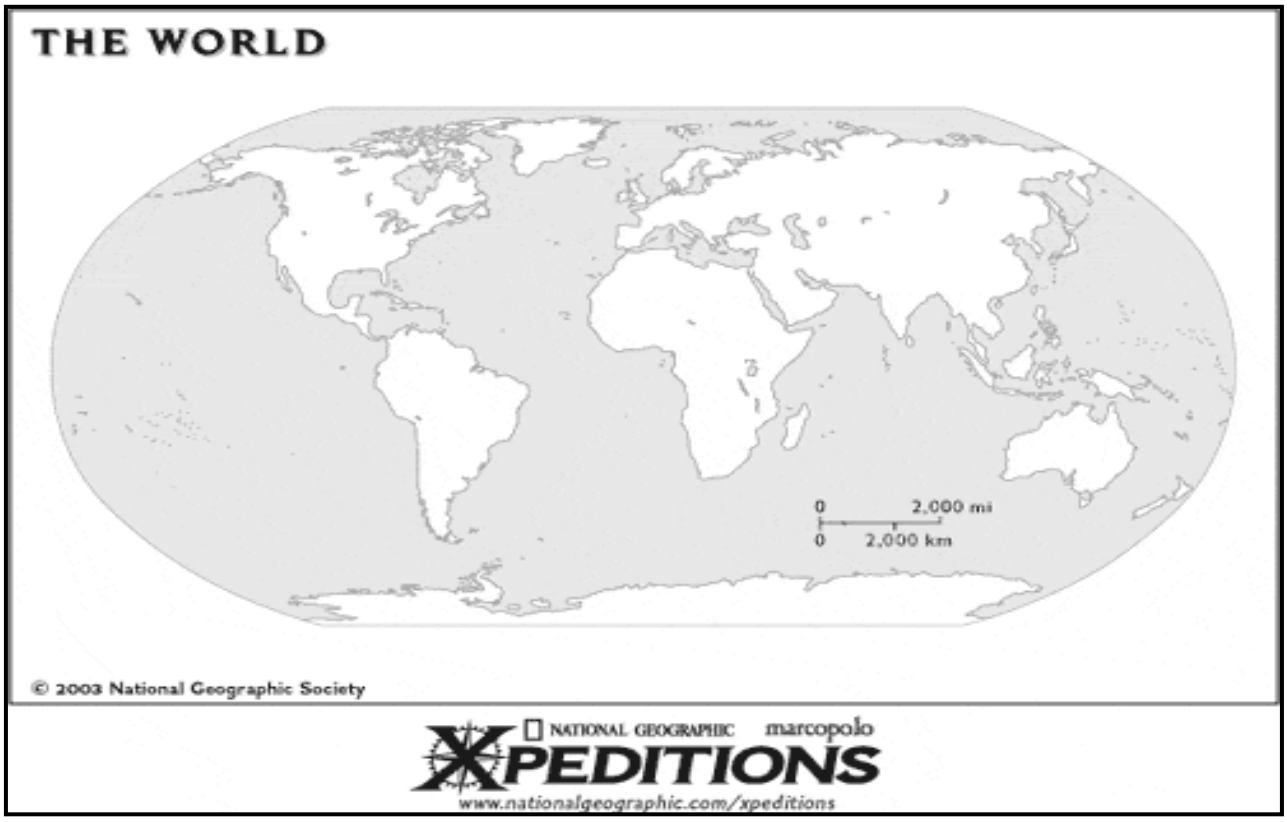
Name_____Date_____

Delaware Social Studies Geography Standard 2

Constructed Response

Data

John wants to open a store that sells snow sports equipment. Place a star on a location that you think he should consider. Explain why you think this would be a good location.

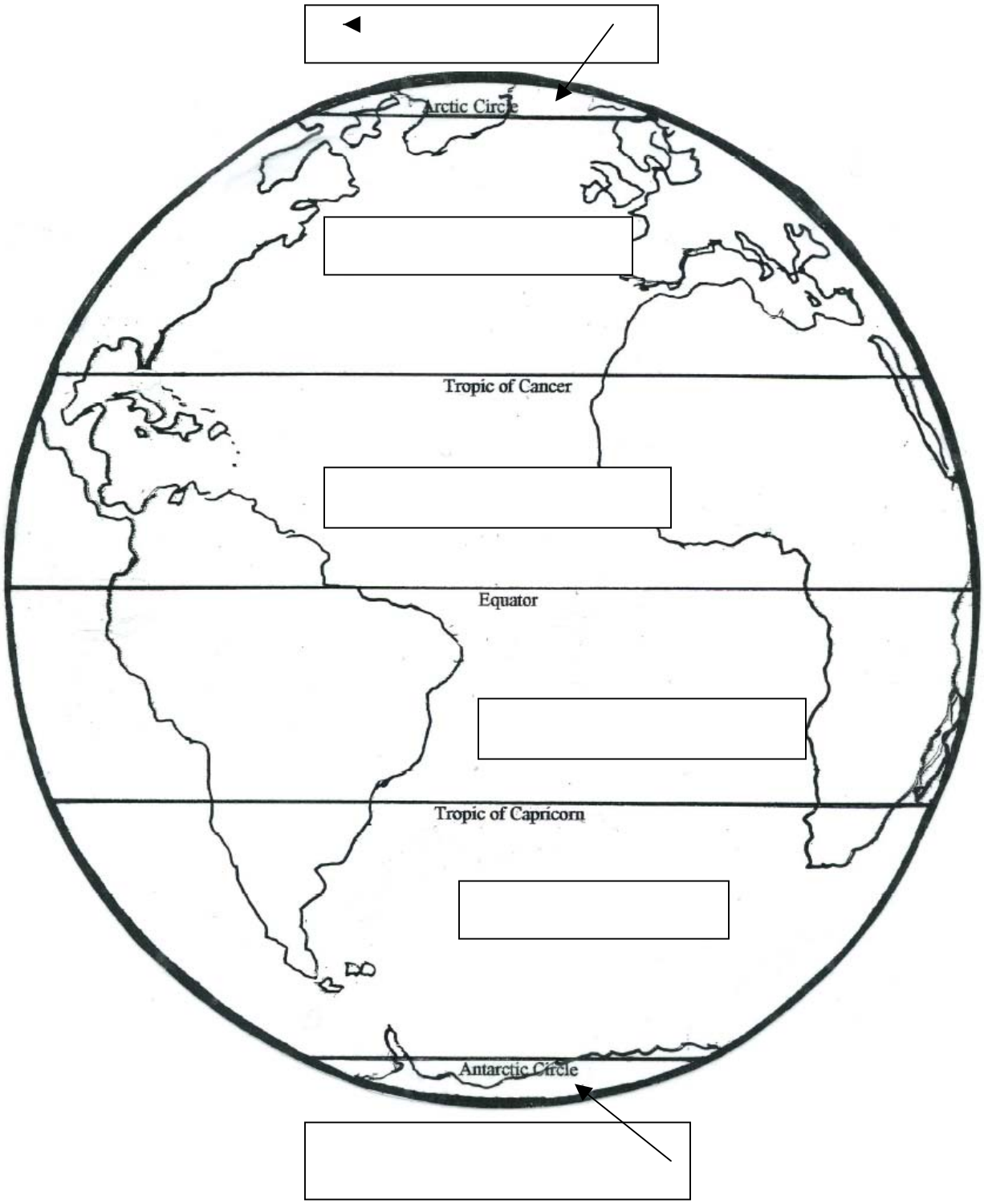


Climate Chart

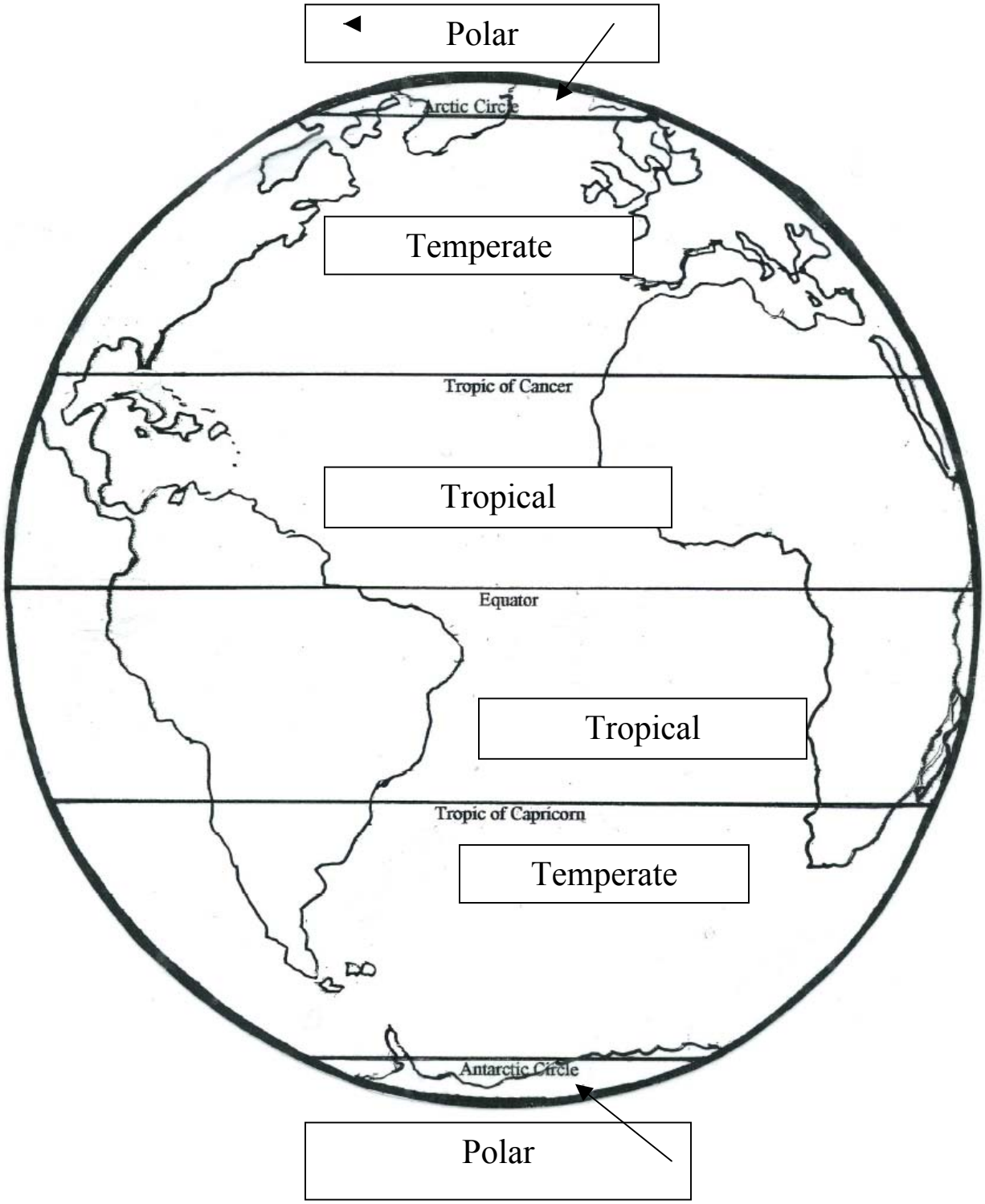
Climate Chart

Polar	Temperate	Tropical
Cold Freezing Ice Snow Icebergs Chilly White Hot	Hot Cold Rainy Snowy Sunny Warm Cool Different seasons Windy	Hot Steamy Rainy Green Wet Muggy Lush

Name_____Date_____Gr._____

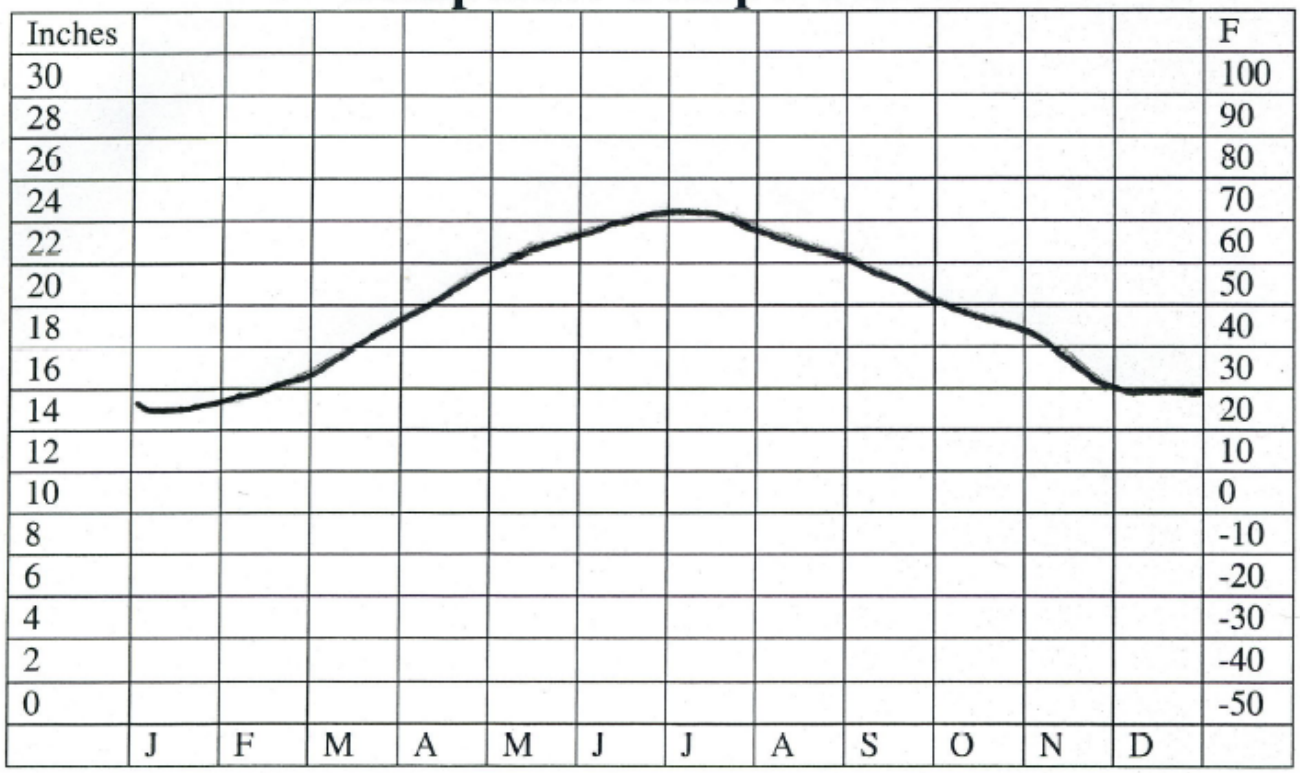

Arctic Circle
Tropic of Cancer
Equator
Tropic of Capricorn
Antarctic Circle

Name_____Date_____Gr._____

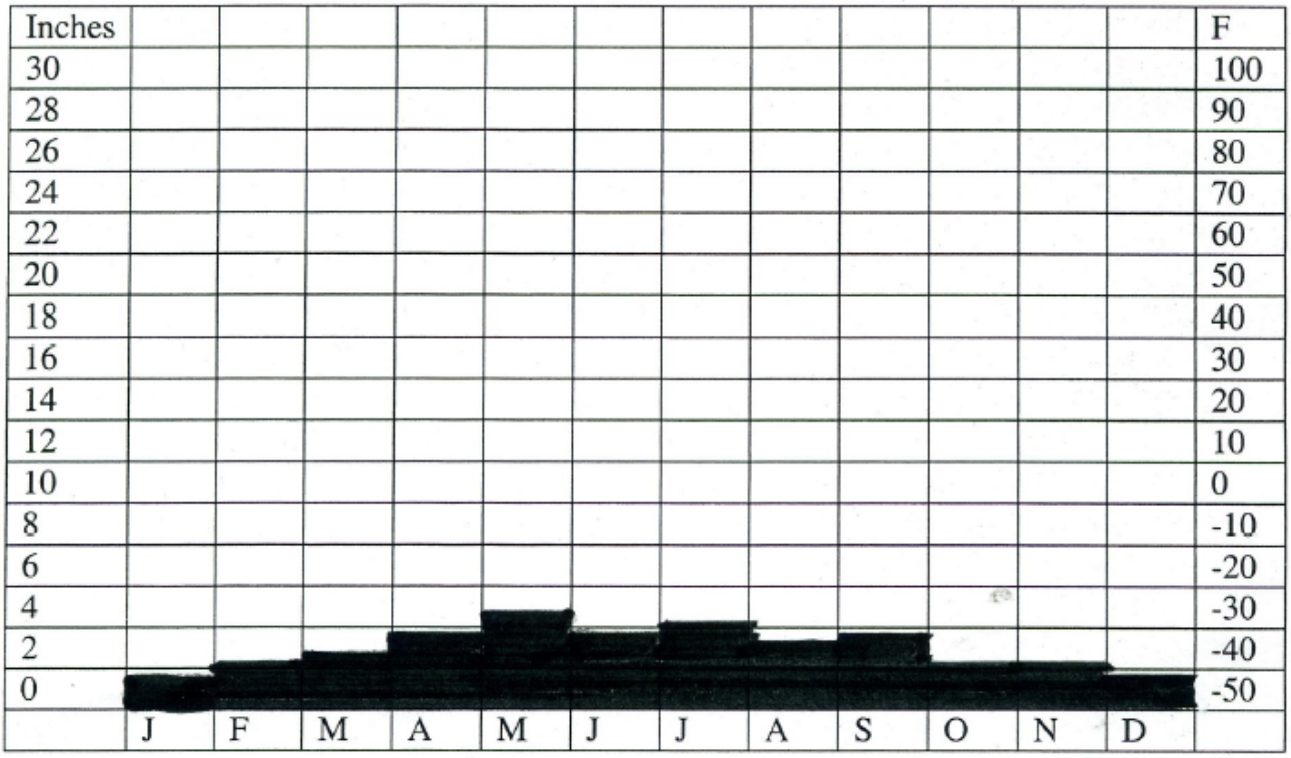

Polar
Arctic Circle
Temperate
Tropic of Cancer
Tropical
Equator
Tropical
Tropic of Capricorn
Temperate
Antarctic Circle
Polar

Visual 3a

Temperate Temperatures

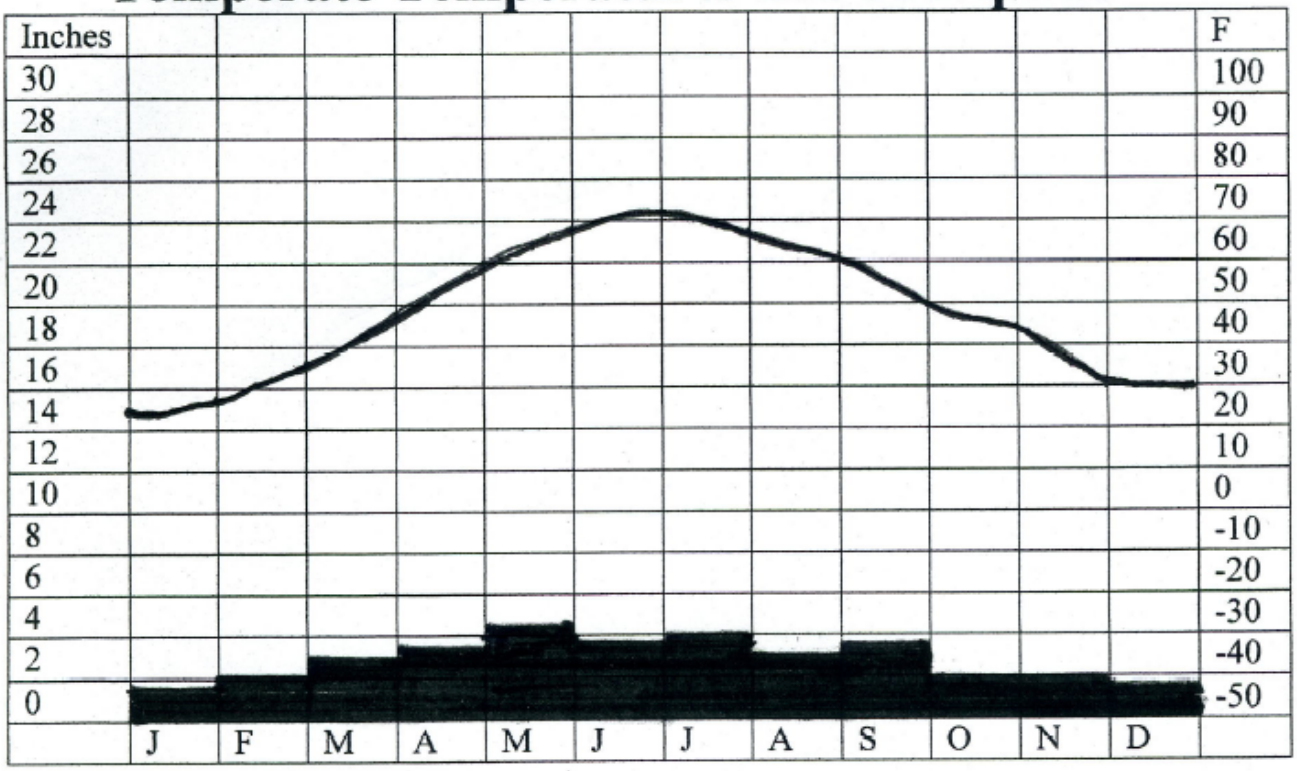


Temperate Precipitation



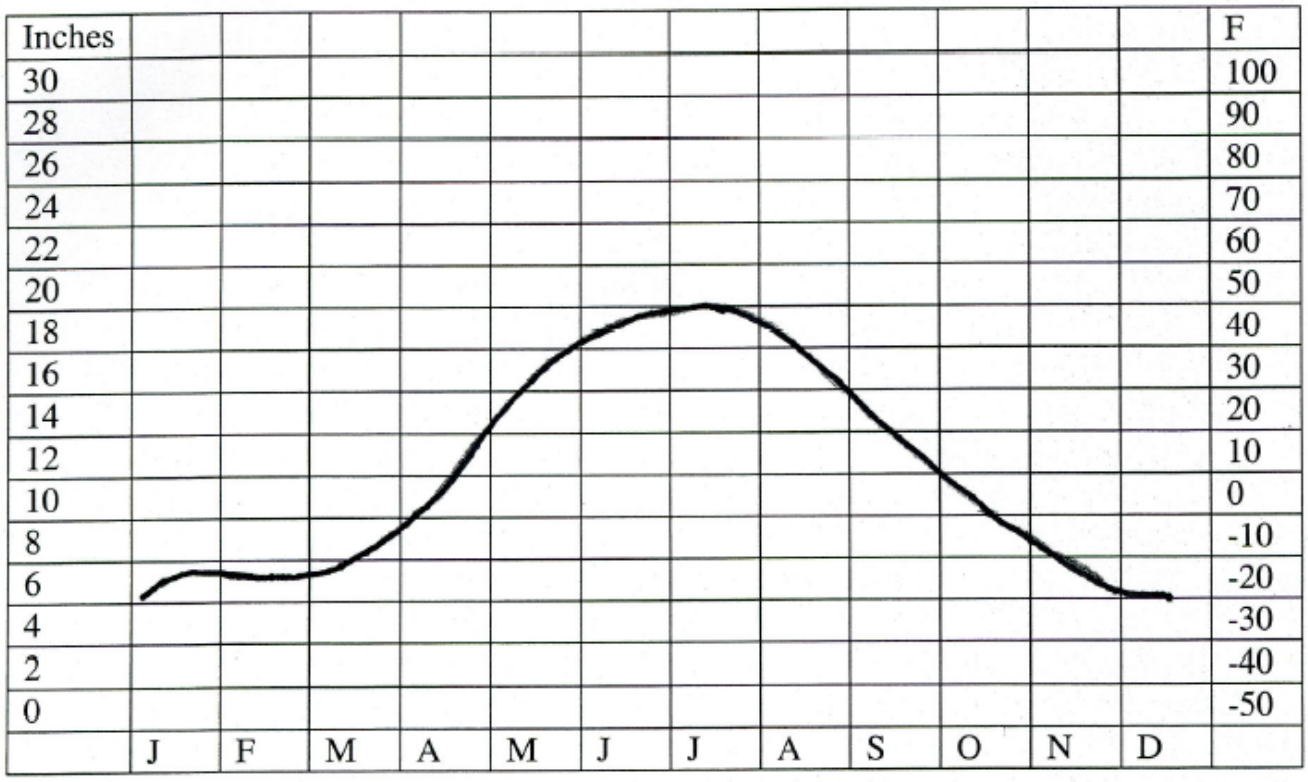
Visual 3 b

Temperate Temperatures and Precipitation

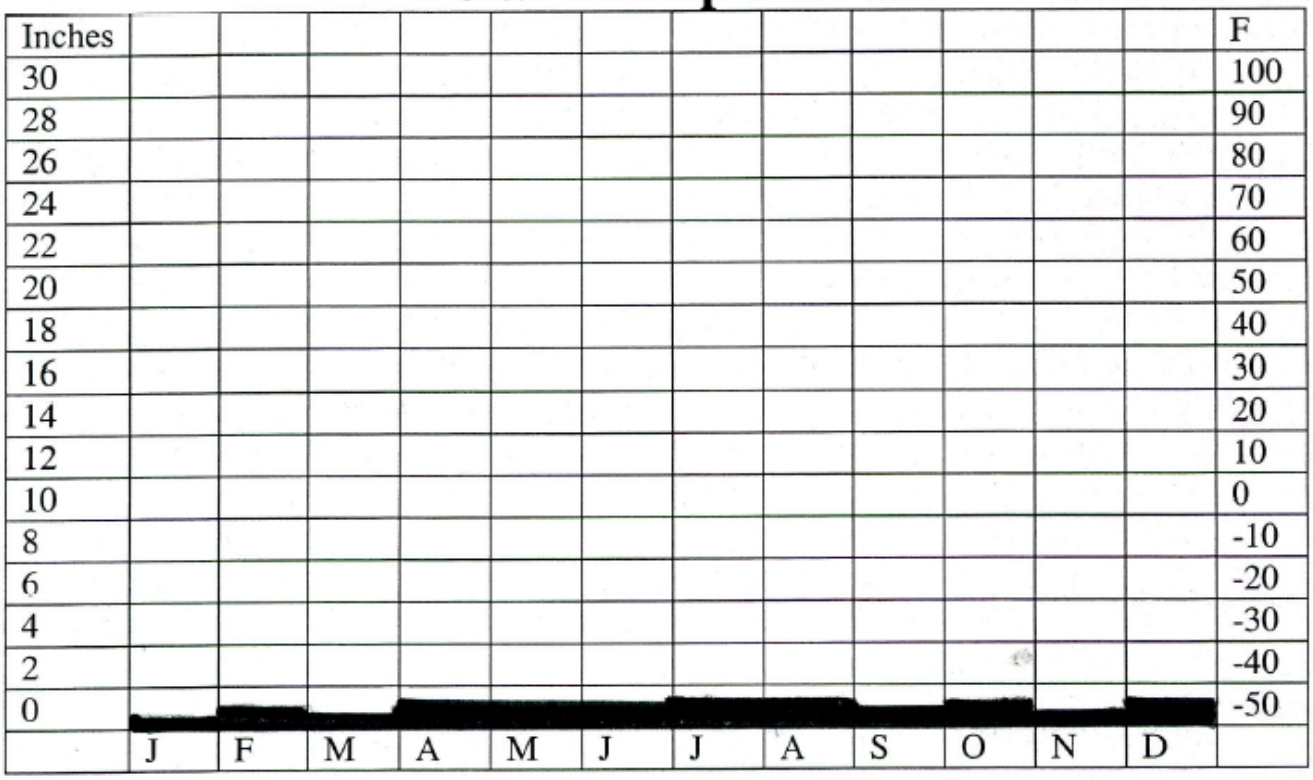


Visual 3 c

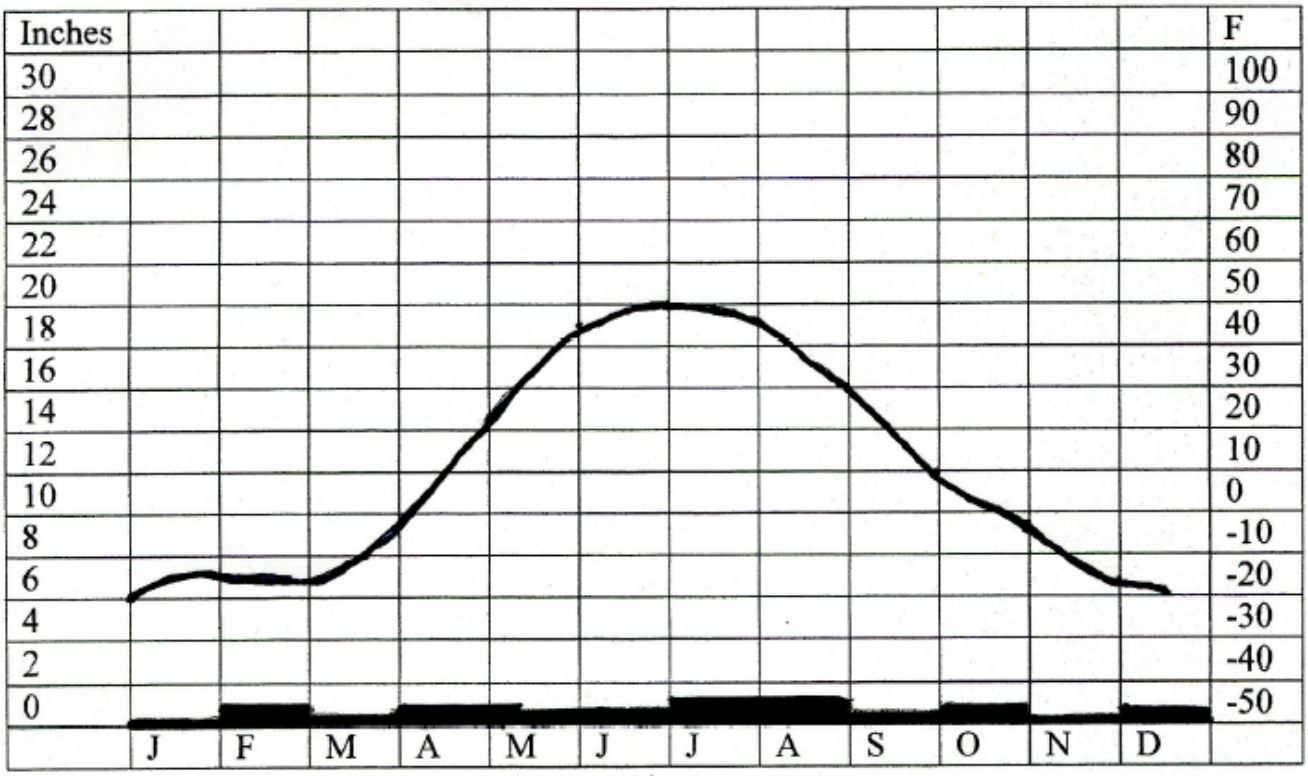
Polar Temperatures



Polar Precipitation

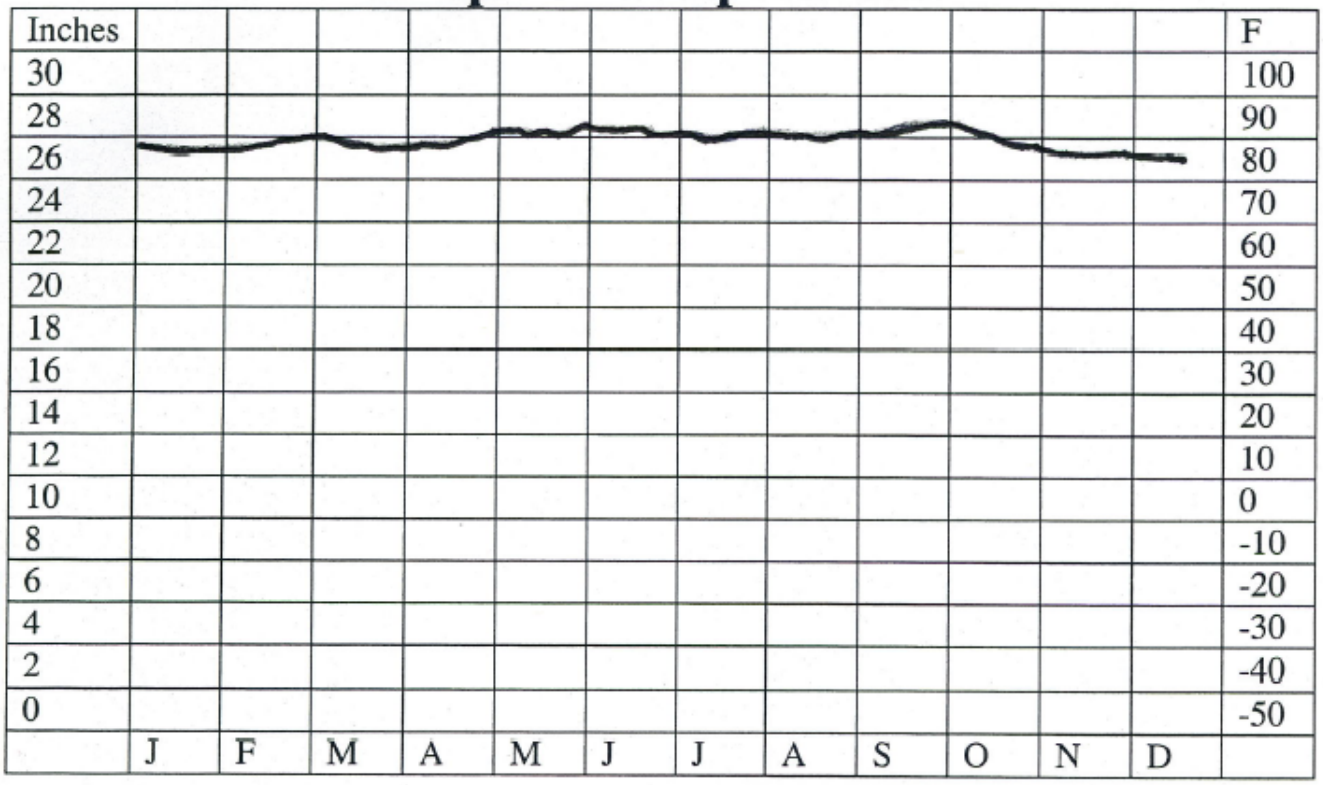


Polar Temperatures and Precipitation

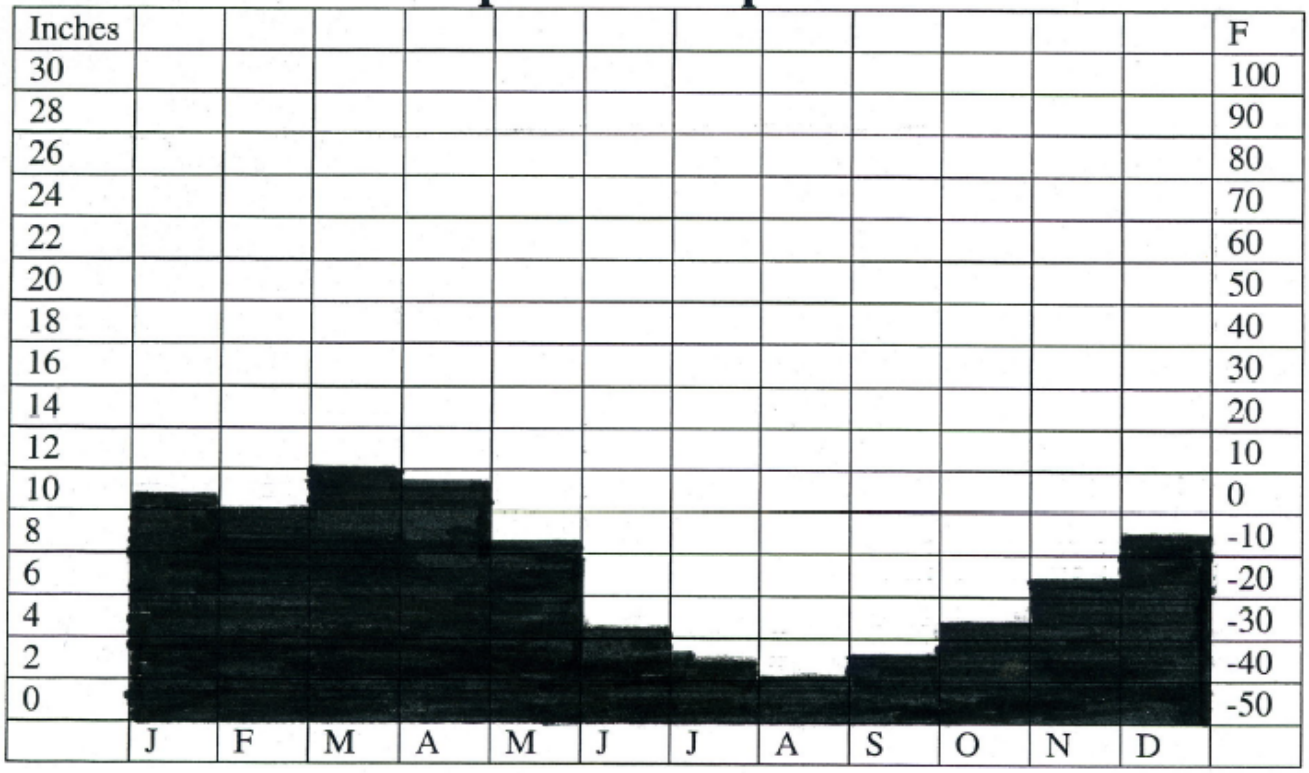


Visual 3 e

Tropical Temperatures



Tropical Precipitation



Visual 3 f

Tropical Temperatures and Precipitation