

Name: \_\_\_\_\_

Period: \_\_\_\_\_

**Introduction:**

Climatograms show monthly variations in only two climatic factors, precipitation and temperature. Other factors also affect climate, but a climatogram gives a rough idea of the climate in a particular area. By daily observation you can associate the climate with the biome of your own locality. This investigation allows you to study the worldwide relationships between climates and biomes. Refer to the pictures and descriptions of biomes to help you visualize the relationships between biotic and abiotic factors in some of the earth's major biomes.

**Materials (per team of 1)**

1-3 sheets of graph paper or climatogram forms

**Procedure**

1. Construct climatograms from the data in Table 22.1. These four, plus the six in Appendix 3, represent the major biomes on the earth. These are the 10 Reference Biomes you will use for your Climatograms. They will NOT match the Biomes listed in the Prentice Hall Biology textbook.
2. Using the data in Table 22.2, construct the unknown climatograms a - l.
3. Obtain monthly averages of precipitation and temperature from the weather station closest to your school.
  - a. These data may be expressed as inches of precipitation and degrees Fahrenheit. If so, convert the data to centimeters and degrees Celsius.
  - b. From these data, construct a climatogram for your area.

**TABLE 22.1** Group 1

| <i>T</i> = temperature (in degrees Celsius)  |  | <i>P</i> = precipitation (in centimeters) |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------------|--|-------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
|                                              |  | J                                         | F    | M    | A    | M    | J    | J    | A    | S    | O    | N    | D    |
| a. Tropical Deciduous Forest: Cuiabá, Brazil |  |                                           |      |      |      |      |      |      |      |      |      |      |      |
| <i>T</i>                                     |  | 27.2                                      | 27.2 | 27.2 | 26.7 | 25.6 | 23.9 | 24.4 | 25.6 | 27.8 | 27.8 | 27.8 | 27.2 |
| <i>P</i>                                     |  | 24.9                                      | 21.1 | 21.1 | 10.2 | 5.3  | 0.8  | 0.5  | 2.8  | 5.1  | 11.4 | 15.0 | 20.6 |
| b. Chaparral: Santa Monica, California       |  |                                           |      |      |      |      |      |      |      |      |      |      |      |
| <i>T</i>                                     |  | 11.7                                      | 11.7 | 12.8 | 14.4 | 15.6 | 17.2 | 18.9 | 18.3 | 18.3 | 16.7 | 14.4 | 12.8 |
| <i>P</i>                                     |  | 8.9                                       | 7.6  | 7.4  | 1.3  | 1.3  | 0.0  | 0.0  | 0.0  | 0.3  | 1.5  | 3.6  | 5.8  |
| c. Savanna: Moshi, Tanzania                  |  |                                           |      |      |      |      |      |      |      |      |      |      |      |
| <i>T</i>                                     |  | 23.2                                      | 23.2 | 22.2 | 21.2 | 19.8 | 18.4 | 17.9 | 18.4 | 19.8 | 21.4 | 22.0 | 22.4 |
| <i>P</i>                                     |  | 3.6                                       | 6.1  | 9.2  | 40.1 | 30.2 | 5.1  | 5.1  | 2.5  | 2.0  | 3.0  | 8.1  | 6.4  |
| d. Tropical Desert: Aden, Aden               |  |                                           |      |      |      |      |      |      |      |      |      |      |      |
| <i>T</i>                                     |  | 24.6                                      | 25.1 | 26.4 | 28.5 | 30.6 | 31.9 | 31.1 | 30.3 | 31.1 | 28.8 | 26.5 | 25.1 |
| <i>P</i>                                     |  | 0.8                                       | 0.5  | 1.3  | 0.5  | 0.3  | 0.3  | 0.0  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  |

Appendix Three

Climatograms

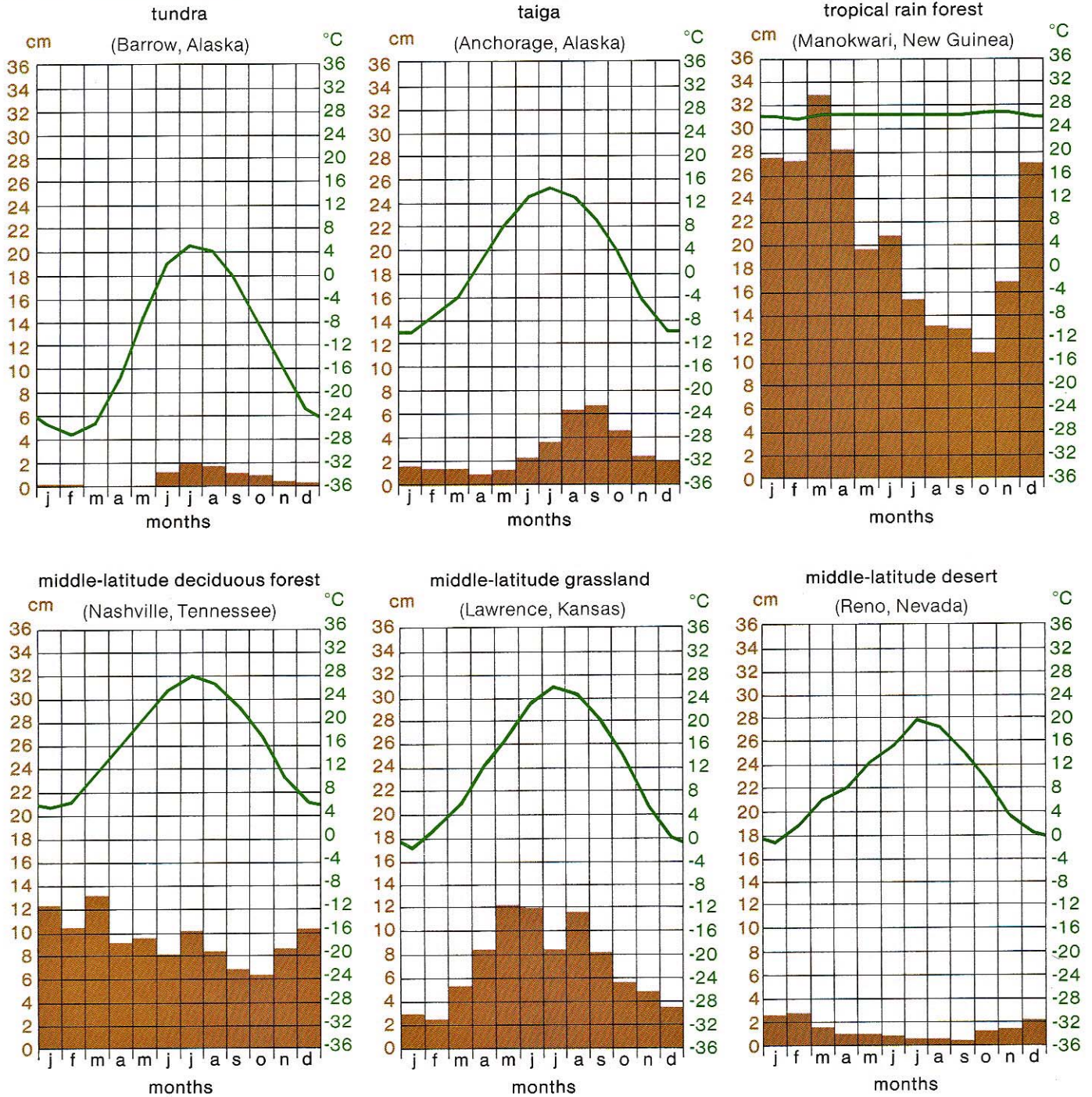
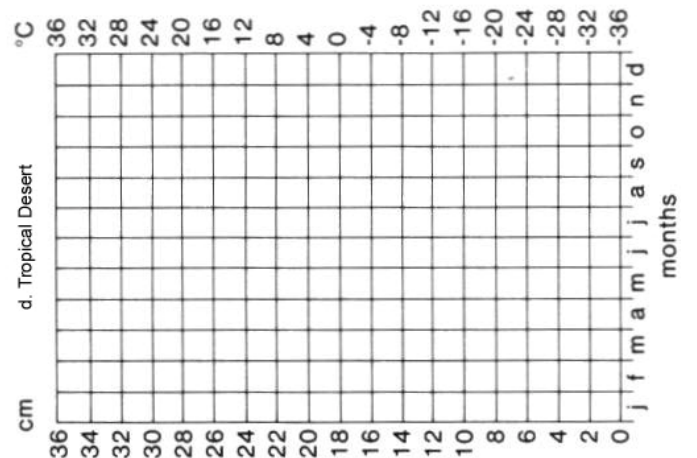
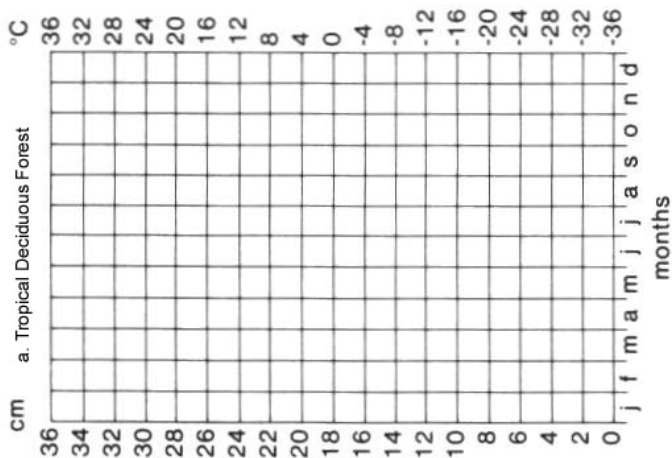
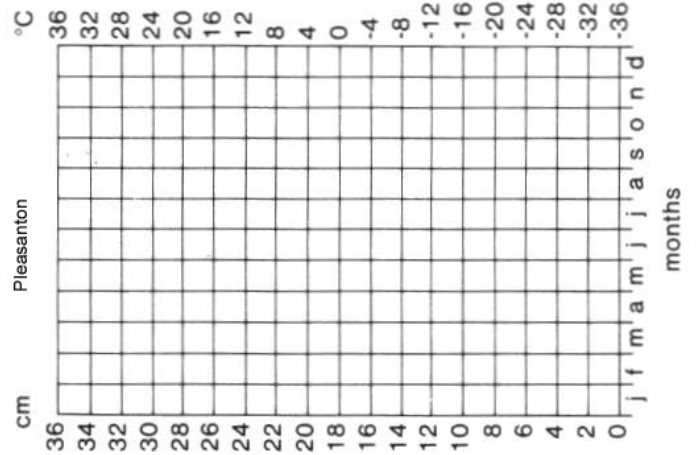
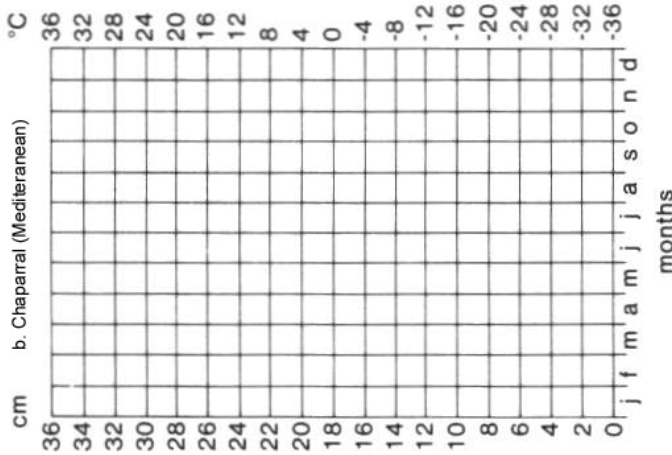
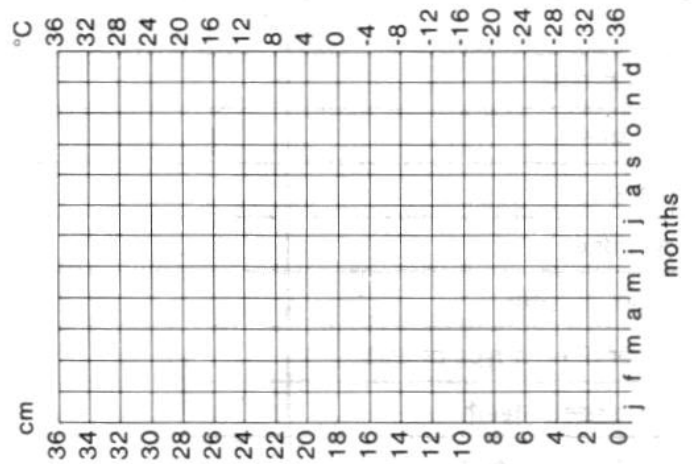
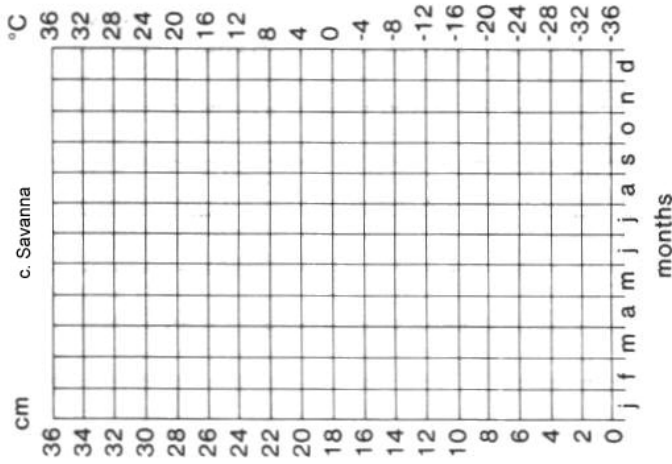


Figure A for Investigation 22.1  
Climatogram Blank

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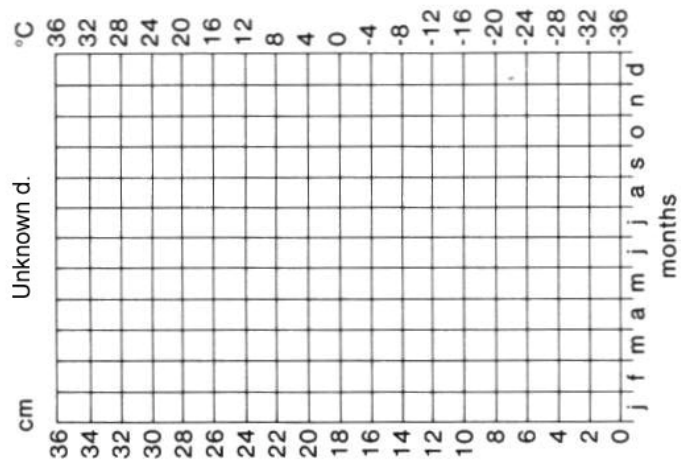
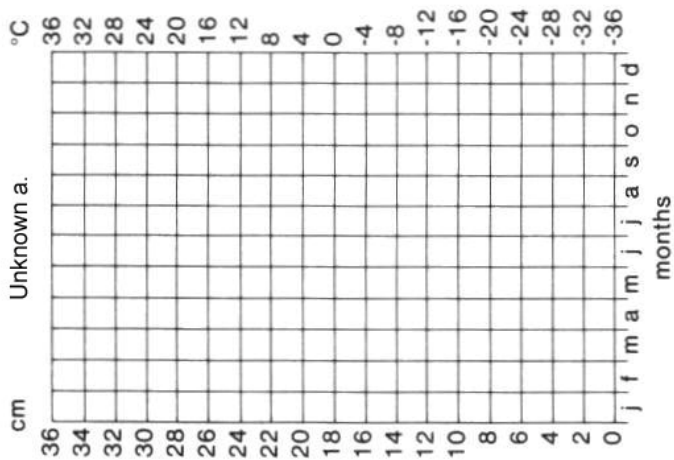
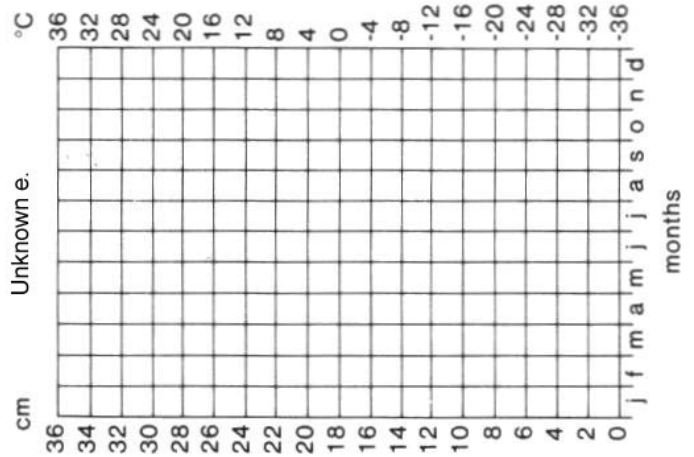
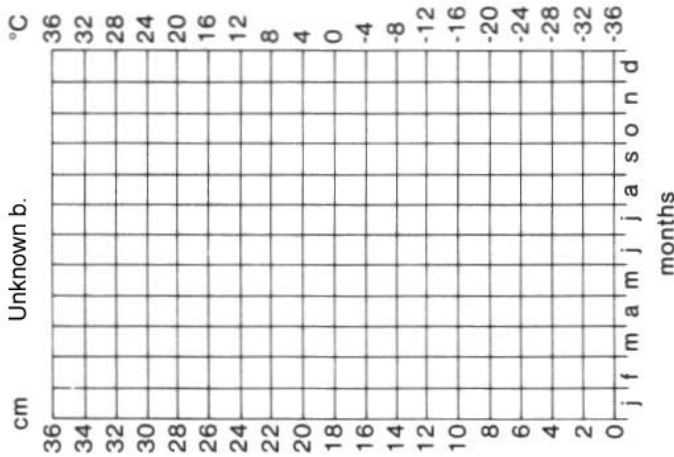
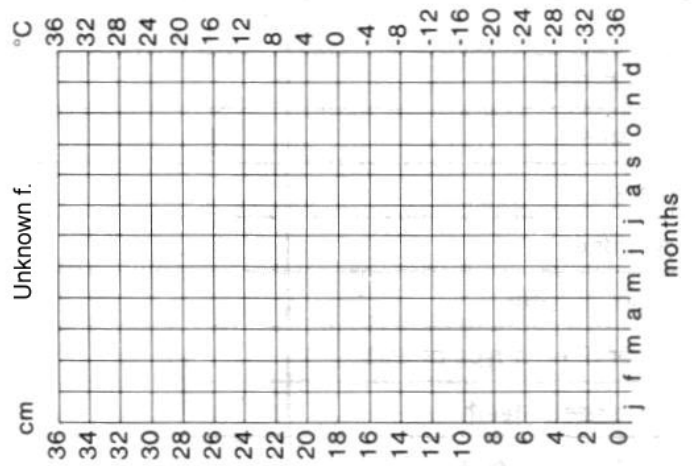
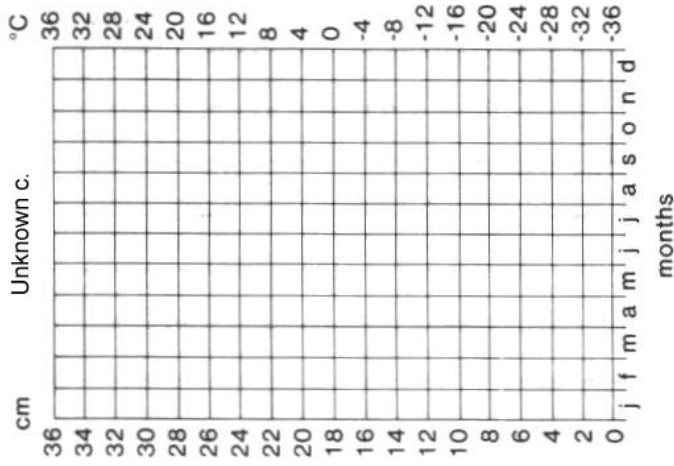


## Unknown Biomes

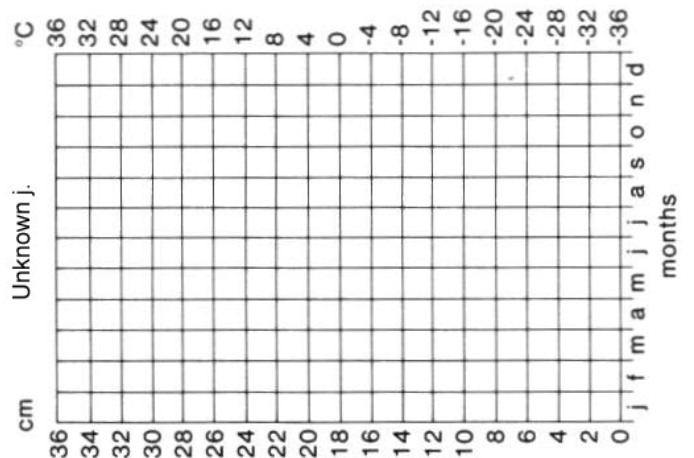
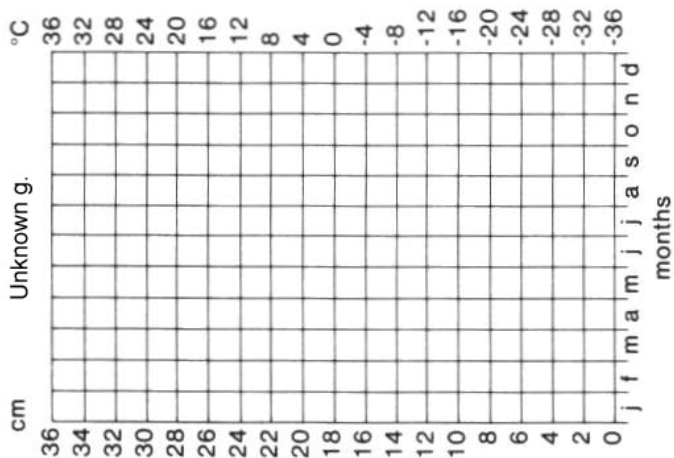
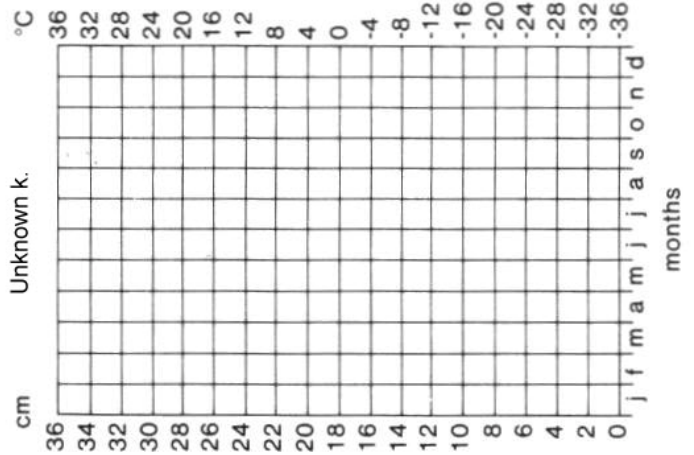
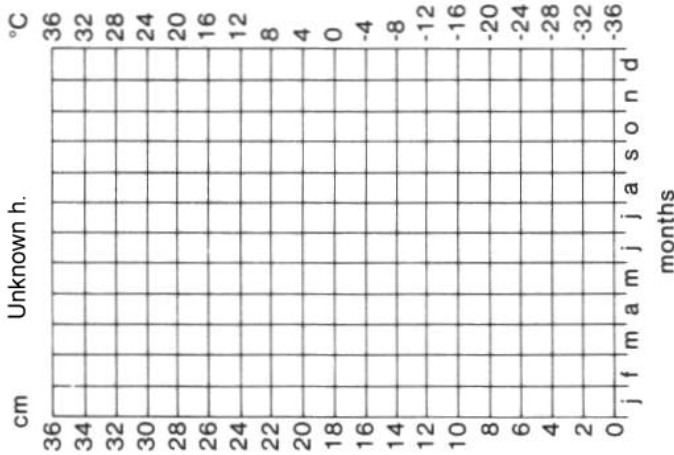
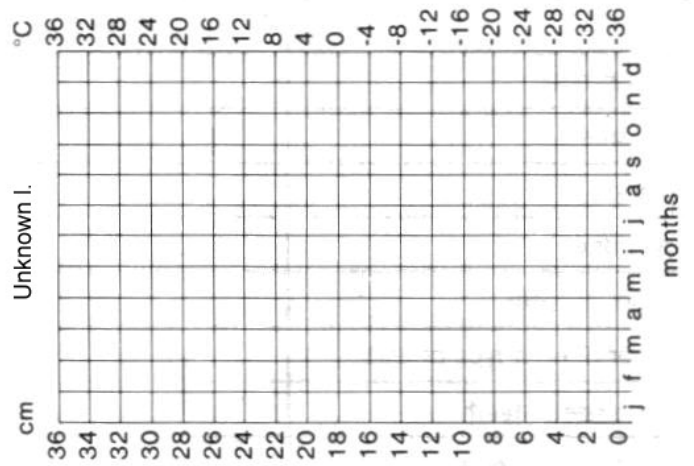
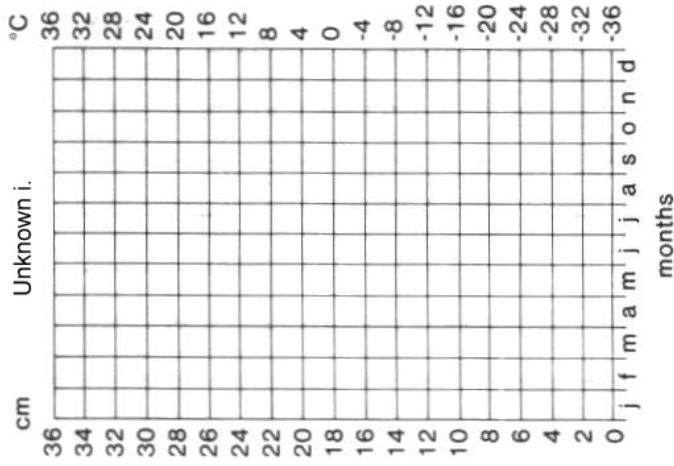
TABLE 22.2 Group 2

|    |          | J     | F     | M     | A     | M    | J    | J    | A    | S    | O    | N     | D     |
|----|----------|-------|-------|-------|-------|------|------|------|------|------|------|-------|-------|
| a. | <i>T</i> | 1.1   | 1.7   | 6.1   | 12.2  | 17.8 | 22.2 | 25.0 | 23.3 | 20.0 | 13.9 | 7.8   | 2.2   |
|    | <i>P</i> | 8.1   | 7.6   | 8.9   | 8.4   | 9.2  | 9.9  | 11.2 | 10.2 | 7.9  | 7.9  | 6.4   | 7.9   |
| b. | <i>T</i> | 10.6  | 11.1  | 12.2  | 14.4  | 15.6 | 19.4 | 21.1 | 21.7 | 20.0 | 16.7 | 13.9  | 11.1  |
|    | <i>P</i> | 9.1   | 8.9   | 8.6   | 6.6   | 5.1  | 2.0  | 0.5  | 0.5  | 3.6  | 8.4  | 10.9  | 10.4  |
| c. | <i>T</i> | 25.6  | 25.6  | 24.4  | 25.0  | 24.4 | 23.3 | 23.3 | 24.4 | 24.4 | 25.0 | 25.6  | 25.6  |
|    | <i>P</i> | 25.8  | 24.9  | 31.0  | 16.5  | 25.4 | 18.8 | 16.8 | 11.7 | 22.1 | 18.3 | 21.3  | 29.2  |
| d. | <i>T</i> | 12.8  | 15.0  | 18.3  | 21.1  | 25.0 | 29.4 | 32.8 | 32.2 | 28.9 | 22.2 | 16.1  | 13.3  |
|    | <i>P</i> | 1.0   | 1.3   | 1.0   | 0.3   | 0.0  | 0.0  | 0.3  | 1.3  | 0.5  | 0.5  | 0.8   | 1.0   |
| e. | <i>T</i> | -3.9  | -2.2  | 1.7   | 8.9   | 15.0 | 20.0 | 22.8 | 21.7 | 16.7 | 11.1 | 5.0   | -0.6  |
|    | <i>P</i> | 2.3   | 1.8   | 2.8   | 2.8   | 3.2  | 5.8  | 5.3  | 3.0  | 3.6  | 2.8  | 4.1   | 3.3   |
| f. | <i>T</i> | 19.4  | 18.9  | 18.3  | 16.1  | 15.0 | 13.3 | 12.8 | 13.3 | 14.4 | 15.0 | 16.7  | 17.8  |
|    | <i>P</i> | 0.0   | 0.0   | 1.5   | 0.5   | 8.9  | 14.7 | 12.2 | 8.1  | 2.0  | 1.0  | 0.3   | 0.8   |
| g. | <i>T</i> | -22.2 | -22.8 | -21.1 | -14.4 | -3.9 | 1.7  | 5.0  | 5.0  | 1.1  | -3.9 | -10.0 | -17.2 |
|    | <i>P</i> | 1.0   | 1.3   | 1.8   | 1.5   | 1.5  | 1.3  | 2.3  | 2.8  | 2.8  | 2.8  | 2.8   | 1.3   |
| h. | <i>T</i> | 11.7  | 12.8  | 17.2  | 20.6  | 23.9 | 27.2 | 28.3 | 28.3 | 26.1 | 21.1 | 16.1  | 12.2  |
|    | <i>P</i> | 3.6   | 4.1   | 4.6   | 6.9   | 8.1  | 6.9  | 6.4  | 6.6  | 8.9  | 5.1  | 5.6   | 4.6   |
| i. | <i>T</i> | 23.3  | 22.2  | 19.4  | 15.6  | 11.7 | 8.3  | 8.3  | 9.4  | 12.2 | 15.1 | 18.9  | 21.7  |
|    | <i>P</i> | 5.1   | 5.6   | 6.6   | 5.6   | 2.8  | 0.9  | 2.5  | 4.1  | 5.8  | 5.8  | 5.1   | 5.3   |
| j. | <i>T</i> | 17.2  | 18.9  | 21.1  | 22.8  | 23.3 | 22.2 | 21.1 | 21.1 | 20.6 | 19.4 | 18.9  | 17.2  |
|    | <i>P</i> | 0.3   | 0.5   | 1.5   | 3.6   | 8.6  | 9.2  | 9.4  | 11.4 | 10.9 | 5.3  | 0.8   | 0.3   |
| k. | <i>T</i> | -20.0 | -18.9 | -12.2 | -2.2  | 5.6  | 12.2 | 16.1 | 15.0 | 10.6 | 3.9  | -5.6  | -15.0 |
|    | <i>P</i> | 3.3   | 2.3   | 2.8   | 2.5   | 4.6  | 5.6  | 6.1  | 8.4  | 7.4  | 4.6  | 2.8   | 2.8   |
| l. | <i>T</i> | -0.6  | 2.2   | 5.0   | 10.0  | 13.3 | 18.3 | 23.3 | 22.2 | 16.1 | 10.6 | 4.4   | 0.0   |
|    | <i>P</i> | 1.5   | 1.3   | 1.3   | 1.0   | 1.5  | 0.8  | 0.3  | 0.5  | 0.8  | 1.0  | 0.8   | 1.5   |

# Climatogram Unknowns a - f



# Climatogram Unknowns g - l



**Discussion**

1. Compare your local climatogram with the four from Step 1 and the six in Appendix 3. Which one does it most closely resemble?
  - a. What similarities are there between the two?
  - b. What differences are there?
2. Consider the biotic characteristics of your local area. What characteristics of the local climate would be important factors in determining these biotic characteristics?
3. Does your local climatogram exactly match any of the original 10 climatograms?
4. Explain how any differences between your local climatogram and the one most nearly matching it might affect the biotic characteristics of your biome.
5. Compare each unidentified climatogram from Table 22.2 with the 10 identified climatograms. Label each graph with the name of the biome that you think the climatogram represents.
6. Using the climatic information shown by each climatogram constructed from Table 22.2, describe the biotic characteristics of each corresponding biome. In other words, what kind of plant and animal life would you expect to see.