LAB: Frost Wedging name: _____

Pre-Lab Questions . . .

1. During the last ice age, a glacier dammed the Clark Fork River in western Montana, causing Glacial Lake Missoula to form. Why doesn't ice make a very good dam?

2. Why is the density of ice less than the density of liquid water?

3. If the enrollment at Helena High School increases from 1650 to 1700, what is the percentage of increase?

Procedures . . . The materials are listed on the board.

1. Fill the test tube a little about half way with water. Using a ruler (metric), measure the height of the water in the test tube **to the nearest .1 cm**.

Height: _____ cm

2. Obtain a beaker full of slush from your instructor.

3. Place the test tube of water in the middle of the beaker. It is important that the level of water in the test tube be the same as (or below) the level of the slush. Leave the tube in the slush for at least 10 minutes. Look at the clock to check the time. Record the starting time here: _____

4. While you are waiting for the water in the test tube to freeze, do the questions on the last page of this handout. Make sure everyone in your group understands. Write the answers in the spaces below.

1. _____

2. _____

3. _____

_____

4. _____

_____

5. _____

_____

5. After you have finished the questions from the last page of this handout, check to see if your water has frozen. If it hasn't and at least 10 minutes have passed, ask your instructor to trigger the freezing.

6. After the water freezes, remove the test tube and measure the height of the ice in the tube **to the nearest .1 cm**. Record this height below. Place the tube into the brown tray of water near the microwave before it cracks.

Height of ice in test tube: _____ cm

7. Calculate the difference in height between the ice and water. You recorded the height of the water on the other side of this sheet before.

Height of ice – height of water = _____ cm

Follow-Up Questions . . .

1. By what percentage did the height of your water change as it froze?

(change in height ÷ the height of water before it froze) x 100 = _____ %

2. Will water expand more if it freezes slowly, . . . or freezes quickly?
Hint: Think about the formation of crystals.

3. Water takes up the least amount of space when it is 4 degrees Celsius. Which of the following explains why water expands as it freezes? Circle one.

a. crystals form b. the molecules slow down c. the molecules speed up

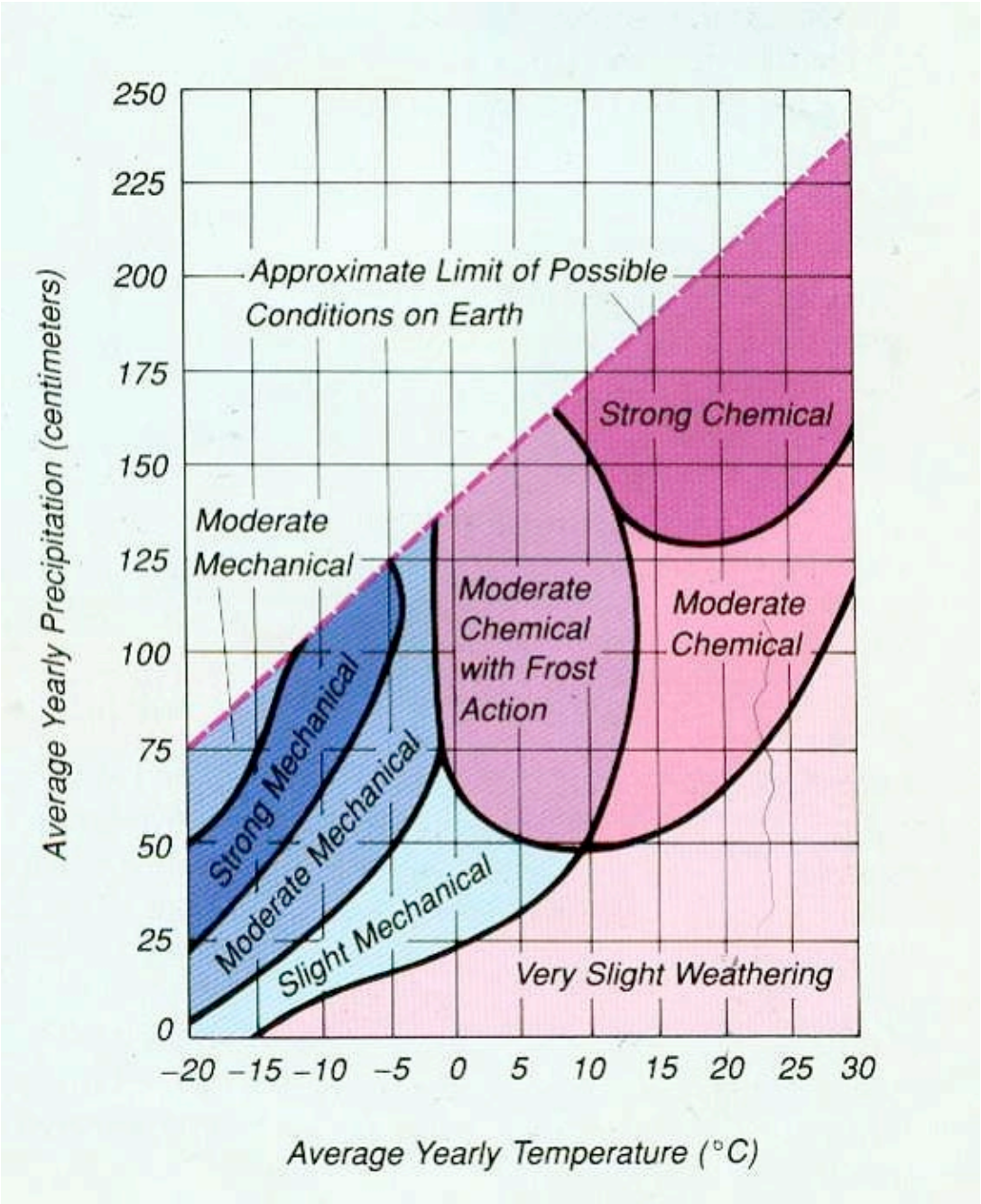
4. Which of the above choices is the reason water expands as it gets hot? _____

5. Explain what this lab has to do with the breaking up of rock (weathering). Text pages 127 may help (honors text page 86).

6. I frost wedging considered to be a type of chemical weathering, or a type of mechanical weathering?

7. Explain the reason for your answer to question #6.

8. How does mechanical weathering help to speed up chemical weathering? (figure 2 page 127, honors text page 86)



Write your answers in the spaces provided on the front page of this handout.

1. Use the graph above to determine the major type of weathering that occurs in Washington D.C. where the average temperature is 23 C, and the average precipitation is 104 cm.
2. If the average temperature in Washington D.C. dropped 26 degrees C, but precipitation stayed the same, what kind of weathering would dominate?
3. Phoenix has an average temperature of 20 C, and an average of 20 cm of precipitation per year. How would the climate in Phoenix have to change in order for moderate chemical weathering to become dominant?
4. According to the graph, no frost-wedging occurs if the average temperature is above 13 C (55 F). What is a possible reason?
5. In general, how does a climate with strong chemical weathering differ from a climate with strong mechanical weathering?