Name_____ Class _____ Date _____

Skills Worksheet

Graphing Skills

Ternary Diagrams and Mineral Composition

Ternary diagrams are a plot of three variables. Earth scientists use ternary diagrams to communicate data about the composition of rocks and minerals. Astronomers might use the diagrams to demonstrate the relationship between elements of a gaseous planet or the composition of a rock sample from the moon. The most common use of a ternary diagram is to show the relative percentages of three components, such as three minerals or three elements, labeled A, B, and C. The sum of these three components must always equal 100%.

Percentage values for A are read from zero along the axis starting at the bottom right of the diagram to 100% at the highest point of the triangle. Values for B are read from zero along the diagonal axis starting at the lower-left corner to 100% at the lower-right corner of the triangle. Values for C are read from zero starting at the highest point of the triangle along the diagonal axis to 100% at the lower-left corner of the triangle.

Scientists might use a ternary diagram like the one below to indicate the relative percentages of iron, magnesium, and silicon in a meteoroid. Points of the triangle are usually given names so that components can be easily identified. In this diagram, Point A is iron (Fe), point B is magnesium (Mg), and point C is silicon (Si).

The percentage lines have been labeled to help you. However, on most ternary diagrams, the percentage lines are absent. Remember that the total percentage of all three plots must equal 100%. (Note: The data represented by the percentages in the diagram below have been rounded.)
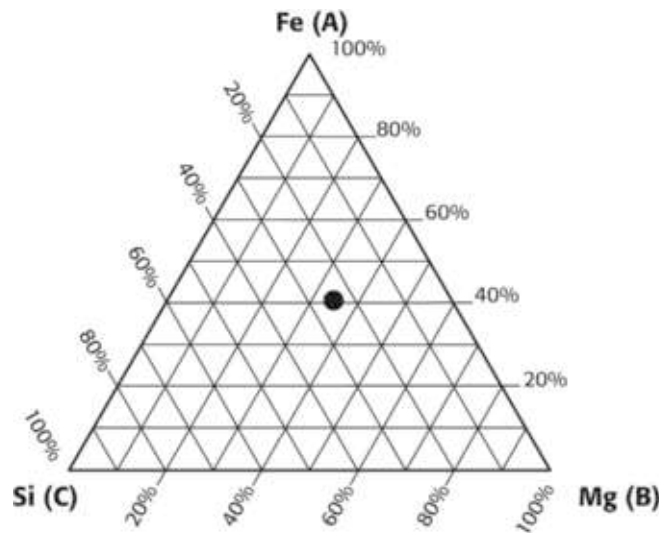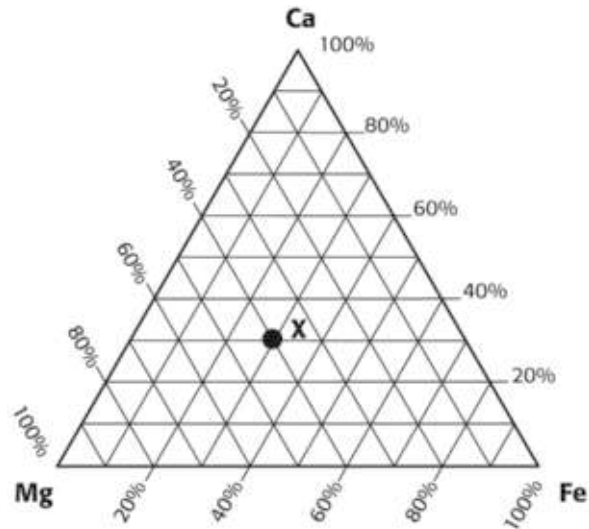

This ternary diagram of a sample composite meteoroid shows the composition of the meteoroid to be 40% iron, 35% magnesium, and 25% silicon. The sum of the percentages is 100%.

Graphing Skills *continued*

PRACTICE

Using the sample diagram to help you, answer the following questions. Note that the elements in this diagram are calcium (Ca), iron (Fe), and magnesium (Mg).

1. What is the composition of sample meteoroid X? Double check your answer by adding the three percentages.

   _____

   _____

   _____

   Total percentage = _____

2. Sample meteoroid Y is composed of 45% Ca, 10% Fe, and 45% Mg. Show its composition on the ternary graph above. Label it.

3. Sample meteoroid Z is composed of 20% Ca, 50% Fe, and 30% Mg. Show its composition on the above graph. Label it.