Measuring in Math and Science

The root *metr/meter* as in ***metric*** means "measurement." The root *therm* as in ***thermos*** means "heat." In each of the following key words, underline the root.

Key Words

diameter	metronome	symmetrical	thermometer
geometry	perimeter	thermal	thermostat

Using ROOT CLUES

The roots *metr/meter* (measurement) and *therm* (heat) give you clues about meaning. When you spot one of these roots in a word, you have a key to the word's meaning. Use the underlined root clues to help you match the following columns:

1. _____ thermal	A. measurement of outside boundary
2. _____ perimeter	B. having to do with heat
3. _____ thermostat	C. the study of the measurement of shapes
4. _____ geometry	D. device for controlling heat

The root clues did not give you complete definitions as the following dictionary listings will. But they got you started by giving you *part* of the meaning. Sometimes that *part* helps you to figure out the word.

METR/METER (from the Greek word *metron* meaning "measure")

Familiar Words with Root METR/METER

meter
metric

1. **diameter** (dī ɑ′ mə tər) [also derived from Greek *dia* meaning "through"]
   n. A line passing through the center of a circle from one side to the other.

   Kylie created two semicircles by drawing the diameter through the circle.

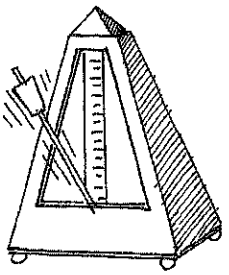
Challenge Words with Root METR/METER

chronometer
trigonometry
biometric

2. **geometry** (jē ä′ mə trē) [also derived from Greek *ge* meaning "earth"]
n. The area of mathematics that deals with lines, angles, and figures and their measurements.

When studying geometry, we will learn how to measure the size of different kinds of figures.

geometric, adj.



3. **metronome** (me′ trə nōm)
n. A device that marks the beat for musicians.

Mr. Rogers, our band leader, set the metronome to tick the quick tempo of a march.

4. **perimeter** (pə ri′ mə tər) [also derived from Greek *peri* meaning "around"]
n. The distance around a figure.

Before ordering the materials for a fence to enclose her yard, Aunt Anna measured its perimeter.

5. **symmetrical** (sə me′ tri kəl) [also derived from Greek *syn* meaning "together"]
adj. Similar in shape and size on opposite sides of a dividing line.

Carlos folded the paper in half so that as he cut out the bird shape the sides would be symmetrical.

NOTA BENE

Meter is a complete word in itself as well as a meaningful part of other words. It means the basic unit of length in the metric system, a measurement of 39.37 inches, which is a little longer than a yard.

THERM (from the Greek word *therme* meaning "heat")

Familiar Words with Root THERM

thermos

6. **thermal** (thər′ məl)
adj. Warm, hot, having to do with heat.

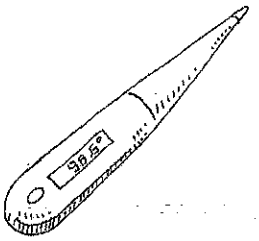
The temperature of the water in the thermal spring was higher than the temperature of the air around it.

Challenge Words with Root THERM

thermodynamics
thermoelectric
thermoplastic

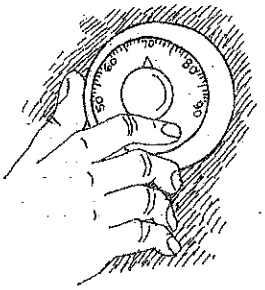
7. thermometer (thər′ mä mə tər)
n. An instrument for measuring the temperature of a person or place.

The nurse put a thermometer in my mouth to see if I had a fever.



8. thermostat (thər′ mə stat)
n. A device for regulating heat.

Before going to bed, Dad set the thermostat to turn on the heat if the temperature dropped during the night.



EXERCISE A: SYNONYMS

Write the letter of the best SYNONYM (the word or phrase most nearly the same in meaning as the word in bold-faced type).

1. _____ measure the **diameter**
   a. curve b. circle c. line d. arc
2. _____ a **thermal** system
   a. difficult b. heating c. grading d. drawing
3. _____ adjusted the **thermostat**
   a. sound b. light c. temperature d. speed
4. _____ **symmetrical** parts
   a. intersecting b. warm c. cold d. similar
5. _____ using a **metronome**
   a. timekeeper b. metal bar c. musical instrument d. subway

EXERCISE B: MEANING IN CONTEXT

Use these words to fill in the blanks in the following paragraph.

perimeter **thermometer** **geometry** **thermal**

When working outdoors in Alaska, the surveyors from Louisiana wore (1)_____ underwear to preserve their body heat, but they were still cold. The morning that the (2)_____ showed a temperature below zero, they put on extra layers of clothing, but they were still cold. These surveyors

were smart. They had studied (3)_____ and knew how to correctly mark the boundaries of large pieces of land. They had no difficulty measuring the (4)_____ of what they had marked. What they didn't know was how to get used to the cold.

EXERCISE C: EXTEND YOUR VOCABULARY

The "thousand" prefixes: *kilo-* and *milli-*

Kilo and *milli* (which appear with *meter*) are meaningful word parts. In the metric measuring system *kilo-* (from Greek for thousand) means "one thousand" and *milli-* (from Latin for thousand) means "one part of one thousand." A kilometer is 1000 meters. A millimeter is 1/1000 of a meter.

Using what you know from these meaningful parts, answer the following questions:

1. Is a *kilogram* lighter or heavier than a gram?

   _____

2. Is a *milligram* lighter or heavier than a gram?

   _____

3. Do you think a *milliliter* has more or less liquid than a liter?

   _____

4. Do you think a *kiloliter* has more or less liquid than a liter?

   _____

Among the key words in this lesson are *perimeter, diameter,* and *thermometer. Meter* is a meaningful part of many other words too. Match each "meter" word in Column 1 with what it could measure in Column 2.

5. _____	speedometer	A. distance between cities
6. _____	kilometer	B. a line less than a centimeter long
7. _____	millimeter	C. atmospheric pressure for predicting the weather
8. _____	barometer	D. miles per hour in a car