Module 3: Understanding the Metric System

3.1 The Metric System

1. Understand the Basic Units of Length used in Health Care Careers

The metric system is the most commonly used system of measurement in the Health Care career field. A **meter** is the basic unit of length in the metric system and 1 meter (abbreviated 1 m) is approximately 3 inches longer than 1 yard. Both larger and smaller units of measure are expressed using a prefix on the word *meter*. Below are diagrams of meter sticks whose lengths are scaled with markings of unit measures that are less than 1 meter. The abbreviations for the prefix on the word meter are shown in the parenthesis.

1 meter = 10 **decimeters** (dm)

1 meter = 100 **centimeters** (cm)

1 meter = 1,000 **millimeters** (mm)

Use the above meter sticks and previous content to answer the following questions.

1) Write down the abbreviations for **meters**, **decimeters**, **centimeters**, and **millimeters**.

2) How does the abbreviation for miles differ from the abbreviation for meters?

3) Order the following lengths of measure from smallest to largest.
   - 1 dm, 1 mm, 1 m, 1 cm

4) Order the following lengths of measure from largest to smallest.
   - 450 mm, 40 cm, $\frac{1}{2}$ m, 6 dm, 1 yd

5) A length of 3 dm is equal to a length of how many millimeters?

6) A length of 70 cm is equal to a length of how many decimeters?

7) A length of $\frac{1}{4}$ m is equal to a length of how many millimeters?

8) A length of $\frac{1}{5}$ m is equal to a length of how many decimeters?
Many of the things we use on a daily basis can help us estimate lengths of other objects. For example, the length of a dollar bill is 6.14 inches and its width is 2.61 inches. In metric units its length is approximately 16 cm and its width approximately 7 cm. A mechanical pencil is slightly smaller than the length of a dollar bill, and therefore its length can be approximated as 15 cm.

Here are some other items that we may use on a daily basis that can help us estimate metric lengths.

- The diameter of a quarter is about 25 mm.
- A dime is about 1 mm thick.
- A USB plug is about 1 cm wide.
- The diameter of a DVD is about 14 cm.

Using an incorrect metric prefix to represent measurements of quantities such as length, mass (weight), or drug dosages, can result in dangerous errors. In order to determine if a given or calculated quantity makes sense, we need to develop good estimation skills. Let’s now begin developing our estimation skills by doing problems that require us to write in an appropriate metric unit.

Fill in the blank with the appropriate metric unit. Choose m, dm, cm, or mm.

9) The width of the palm of your hand is 10 ____.

10) The height of a soda can is 12 ____.