

**KEY IDEAS**

As you read this section, keep these questions in mind:

- Why do scientist use the SI system of measurement?
- What are some tools and techniques that scientists use in the laboratory?
- What can you do to stay safe during an investigation?

**READING TOOLBOX**

**Compare** After you read about the SI system of measurement, make a table comparing the English and SI units for everyday measurements such as your height, weight, and distance from your home to school.

**What Is SI?**

Scientists from all around the world share data. However, different units of measurement are commonly used in different countries. Therefore, scientists use a common measurement system called the International System of Units (SI). By using SI units, scientists can easily understand and test the results of other scientists. Scientists also use SI because each SI unit can be organized into smaller or larger units based on powers of 10. This makes it easy for scientists to convert between large and small measurements.

Most SI units have a prefix that indicates the relationship between the unit and a base unit. For example, the base unit for length is the meter. The prefix *kilo-* means 1,000. Therefore, a kilometer is equal to 1,000 meters. The table below shows common SI base units and prefixes. ✓

Common SI units			
Prefix	none	<i>kilo-</i>	<i>centi-</i>
Factor	1 (base unit)	1,000	0.01
Units used to describe volume	1 liter (l)	1 kiloliter (kL) = 1,000 L	1 centiliter (cL) = 0.01 L
Units used to describe length	1 meter (m)	1 kilometer (km) = 1,000 m	1 centimeter (cm) = 0.01 m
Units used to describe mass	1 gram (g)	1 kilogram (kg) = 1,000 g	1 centigram (cg) = 0.01 g
			1 milligram (mg) = 0.001 g

**Math Skills**

2. Convert How many liters equal 2,450 mL?

**READING CHECK**

1. Describe What does a prefix in an SI unit indicate?

**What Tools and Techniques Do Scientists Use?**

When conducting investigations, scientists always make precise measurements and keep detailed notes. Many scientists also use special tools to boost their senses. For example, scientists use microscopes to observe objects that are too small to see with the unaided eye. Scientists also use special procedures in the lab. For example, they may use a technique called *sterile technique* to prevent samples from being contaminated.

**How Can You Stay Safe in the Lab?**

Studying science can be exciting, but it can also be dangerous. Here are some guidelines for working safely in the lab:

- Follow the instructions your teacher gives you.
- Read your lab procedure carefully before beginning.
- Do not skip any steps in your lab procedure.
- Always wear safety equipment in the lab.
- Measure chemicals carefully and precisely.
- Ask your teacher how to get rid of any extra chemicals or materials at the end of a procedure.
- Never taste or smell any materials or chemicals in lab unless your teacher instructs you to do so.
- Do not use any damaged or broken equipment.
- Keep your lab area clean and organized.
- Be careful when you place something on the lab bench. Make sure that the object will not fall or tip over.
- Walk carefully in the lab.
- If you are working outside, be aware of your surroundings. Avoid poisonous plants and dangerous animals that live in the area. Wear sunscreen and a hat that shades your neck and ears. ✓

Before a lab begins, be sure you know where the safety equipment is located and how to use it. If an accident occurs in the lab, stay calm. Make sure that you are safe and that no one else is in danger. Then, inform your teacher right away. Follow all the instructions your teacher gives you.

**Critical Thinking**

1. Identify Give three examples of tools that scientists may use when conducting an investigation.

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**READING CHECK**

4. Describe Name one thing you should do before you begin a lab activity.

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5. Compare Name one thing you should do when conducting an investigation outside that you do not need to do inside.

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