Tool Reading Quick Check

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Lesson:

Read the passages and examples below to learn about reading measurements correctly with science tools. Focus on the value shown by each tool, the unit name, and the part of the tool you read.

> Scientists choose a tool based on what they need to measure. A graduated cylinder shows liquid volume in milliliters. A balance shows mass in grams. A metric ruler or meter stick shows length in centimeters. A Celsius thermometer shows temperature in degrees Celsius.

Match the tool to the measurement

Liquid volume graduated cylinder	**Mass** balance
Length metric ruler meter stick	**Temperature** Celsius thermometer

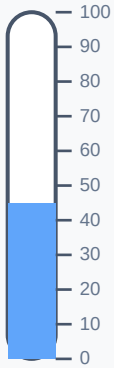
Each tool is used to measure a different kind of information.

> Some tools must be read in a special way. On a graduated cylinder, read the liquid at eye level and use the bottom of the curve in the liquid, called the meniscus. On a thermometer, notice whether the temperature is above or below zero.

> Careful tool reading helps scientists collect accurate data. Accurate data helps them compare observations, test ideas, and make better conclusions about what they see.

Graduated cylinder: the liquid curves down in the middle. Read at eye level — the bottom of the meniscus sits at 25 mL, so you record 25 mL.

How to read a graduated cylinder

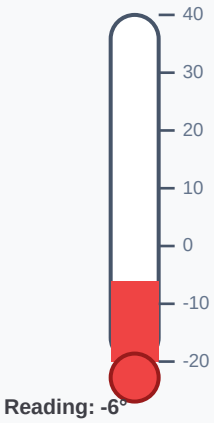


Reading: 45 mL

Read at the BOTTOM of the curved surface (the meniscus), with your eye level with it. This one reads 45 mL.

Thermometer: the red line stops 6 marks below the 0, so the temperature is -6 °C. Below-zero readings always get a negative sign.

Reading below zero

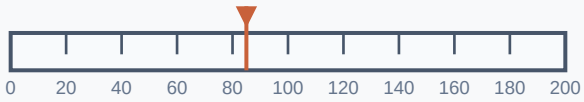


Reading: -6°

The liquid stops between -10 and 0. Below zero is written with a minus sign, so this reads -6 degrees C.

Balance: the pan balances when the masses total 140 g, so you record 140 g.

How to read a balance



Reading: 85 g

Mass is measured in grams. Read where the pointer settles: this balance reads 85 g.

Metric ruler: the leaf ends 4 small marks past the 12, so its length is 12.4 cm — read to the nearest tenth of a centimeter.

Reading to the nearest tenth

Reading: 12.6 cm

The end falls past 12 cm, six small marks along. Each small mark is one tenth, so this reads 12.6 cm.

Instructions:

Read each item carefully. Enter the number that matches the measurement. Use the unit only if the question says to include it.

1. A graduated cylinder has the bottom of the meniscus at 37 mL. What volume should you enter?

Answer: _____

2. A thermometer reads 4 degrees below zero. What temperature should you enter?

Answer: _____

3. A balance shows a mass of 62 g. What mass should you enter?

Answer: _____

4. A metric ruler shows a length of 18.4 cm. What length should you enter?

Answer: _____

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(Answer Key)

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1. A graduated cylinder has the bottom of the meniscus at 37 mL. What volume should you enter?
Hint: Use the bottom of the curve, not the top.

Correct Answer: 37

Explanation: The bottom of the meniscus is at 37 mL, so the recorded volume is 37.

2. A thermometer reads 4 degrees below zero. What temperature should you enter?
Hint: Below zero means a negative number.

Correct Answer: -4

Explanation: Four degrees below zero is -4 degrees Celsius.

3. A balance shows a mass of 62 g. What mass should you enter?
Hint: Read the number shown on the balance.

Correct Answer: 62

Explanation: The balance reading is 62 grams, so the mass is 62.

4. A metric ruler shows a length of 18.4 cm. What length should you enter?
Hint: Use the number shown on the ruler reading.

Correct Answer: 18.4

Explanation: The length reading is 18.4 centimeters, so the answer is 18.4.