

Essential Question

**How do we describe how far off
or how changed a value is?**

What Is Percent Error?

- Measured vs. accepted value
- Accepted value: the true value
- Accepted goes on the bottom

Percent error tells you how close a measured value is to the **accepted value**, the true value scientists agree on.

Why the Absolute Value?

- Too high or too low: still error
- Absolute value bars drop the sign
- Percent error is never negative

The straight bars in the percent error formula mean **absolute value**, which is the distance between two numbers with no sign.

What Is Percent Change?

- How much a value grew or shrank
- New minus original, on top
- Original value goes on the bottom

Percent change
describes how much a
quantity grew or shrank
compared to where it
started.

The Sign Shows the Direction

- Positive: the value increased
- Negative: the value decreased
- Keep the sign, no absolute value

Percent change keeps its sign, because the sign shows the direction.

Which Value Goes on the Bottom?

- Percent error: accepted value
- Percent change: original value
- Bottom: what you compare to

For percent error, the bottom is always the **accepted** value, never your measurement.

Example: Pendulum Lab

Try it first!

A student uses a pendulum to measure gravity and gets 9.62 m/s^2 . The accepted value is 9.81 m/s^2 . What is the percent error?

Example: Balloon in the Fridge

Try it first!

A balloon has a volume of 2.40 L at room temperature. After an hour in a refrigerator, its volume is 2.18 L. What is the percent change in volume?

Example: Cart Speeding Up

Try it first!

A cart rolling down a ramp speeds up from 1.60 m/s to 4.30 m/s .
What is the percent change in its speed?

Big Ideas

- Error: accepted on the bottom
- Percent error is never negative
- Change: original on the bottom
- Change sign shows direction