

Measure Like Scientists

Read tool data, compare measurements, and analyze results.

GRADE 4 • TEKS 4.1.D

4.1.D "use tools, including hand lenses; metric rulers; Celsius thermometers; calculators; laser pointers; mirrors; digital scales; balances; graduated cylinders; beakers; hot plates; meter sticks; magnets; notebooks; timing devices; sieves..."

NAME _____

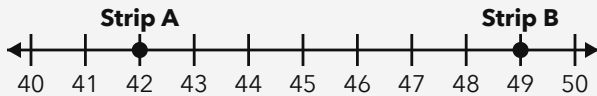
DATE _____

MEASURE AND COMPARE

Choose a tool that matches what you need to measure. Metric rulers measure length, scales measure mass, graduated cylinders measure liquid volume, thermometers measure temperature, and timers measure time. To find how much a measurement changed, subtract the smaller measurement from the larger one and write the correct unit.

WORKED EXAMPLE

The metric ruler below shows the lengths of two strings. How much longer is Strip B than Strip A?



1. Read Strip A as 42 cm.
2. Read Strip B as 49 cm.
3. Subtract: $49 \text{ cm} - 42 \text{ cm} = 7 \text{ cm}$.

Answer: 7 cm

PRACTICE 6 problems

- 1** A Celsius thermometer reads 15°C in the morning and 24°C in the afternoon. How much did the temperature rise?

ANSWER _____

- 2** A graduated cylinder holds 34 mL of water. After a stone is placed in it, the water level is 61 mL. How much did the water level rise?

ANSWER _____

- 3** A beetle travels from the 60 cm mark to mark B on the metric ruler below. How far does it travel?



ANSWER _____

- 4** A timer shows that one test takes 1 minute 38 seconds. A second test takes 2 minutes 27 seconds. What is the total time for both tests?

ANSWER _____

- 5** A digital scale shows that a rock has a mass of 276 g. A second rock has a mass of 223 g. How much heavier is the first rock?

ANSWER _____

- 6** A camera records 4 ladybugs on one plant, 6 on a second plant, 5 on a third plant, and 8 on a fourth plant. How many ladybugs are shown in all?

ANSWER _____

APPLY IT Show your work

- 1** The aquarium club checks the water temperature after school. Which day had the warmest water, and how many degrees warmer was it than Monday?

AQUARIUM WATER TEMPERATURE

Day	Temperature
Monday	21°C
Wednesday	25°C
Friday	22°C

ANSWER _____

- 2** Students use a camera to count insect photos in the school garden. How many butterfly and bee photos are there together?

GARDEN INSECT PHOTOS



ANSWER _____

- 3** Actually measure two classroom objects with a teacher-supplied metric ruler. Choose two straight edges shorter than the ruler, such as a book edge and an eraser edge. Align the ruler's 0 cm mark with each starting end, keep it straight along the edge, and read the other end to the nearest centimeter. Measure each edge twice. On extra paper record object names, both readings with cm, and which edge is longer. If repeat readings differ, check alignment and measure again. Subtract the final shorter reading from the longer reading to compare them. Show your ruler use to your teacher.

WORK SPACE

ANSWER _____

CHALLENGE

One step up

An empty beaker has a mass of 86 g. The beaker and water together have a mass of 154 g. A student says the water has a mass of 154 g. Explain the correct mass of the water.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A Celsius thermometer reads 15°C in the morning and 24°C in the afternoon. How much did the temperature rise?	9°C
2	A graduated cylinder holds 34 mL of water. After a stone is placed in it, the water level is 61 mL. How much did the water level rise?	27 mL
3	A beetle travels from the 60 cm mark to mark B on the metric ruler below. How far does it travel?	16 cm
4	A timer shows that one test takes 1 minute 38 seconds. A second test takes 2 minutes 27 seconds. What is the total time for both tests?	4 minutes 5 seconds
5	A digital scale shows that a rock has a mass of 276 g. A second rock has a mass of 223 g. How much heavier is the first rock?	53 g
6	A camera records 4 ladybugs on one plant, 6 on a second plant, 5 on a third plant, and 8 on a fourth plant. How many ladybugs are shown in all?	23 ladybugs

PART 2 • APPLY IT

1. **Wednesday, 4°C warmer than Monday** The highest temperature is 25°C on Wednesday. Subtract 21°C from 25°C to find a difference of 4°C.
2. **23 photos** Add the butterfly photos and bee photos: $14 + 9 = 23$.
3. **Answers vary with actual objects and readings; a correct difference uses the two measured lengths in cm.** Observe actual zero-mark alignment and straight ruler placement; require two readings per object and a checked final comparison. Example only: book edge 18 cm twice, eraser edge 5 cm twice; book edge is 13 cm longer. Do not accept copied example values as a measurement record.

CHALLENGE

The water has a mass of 68 g because $154\text{ g} - 86\text{ g} = 68\text{ g}$. The empty beaker's mass must be subtracted.

Accept correct units written as g, mL, cm, and °C. For the challenge, accept any explanation that subtracts the empty beaker mass from the combined mass. Apply 3 requires actual metric ruler use and records. Support reading nearest-centimeter marks, accept justified remeasurement, and verify subtraction against the child's final readings. One real tool operation complements the preserved supplied-data analysis; use of every listed tool is not required.