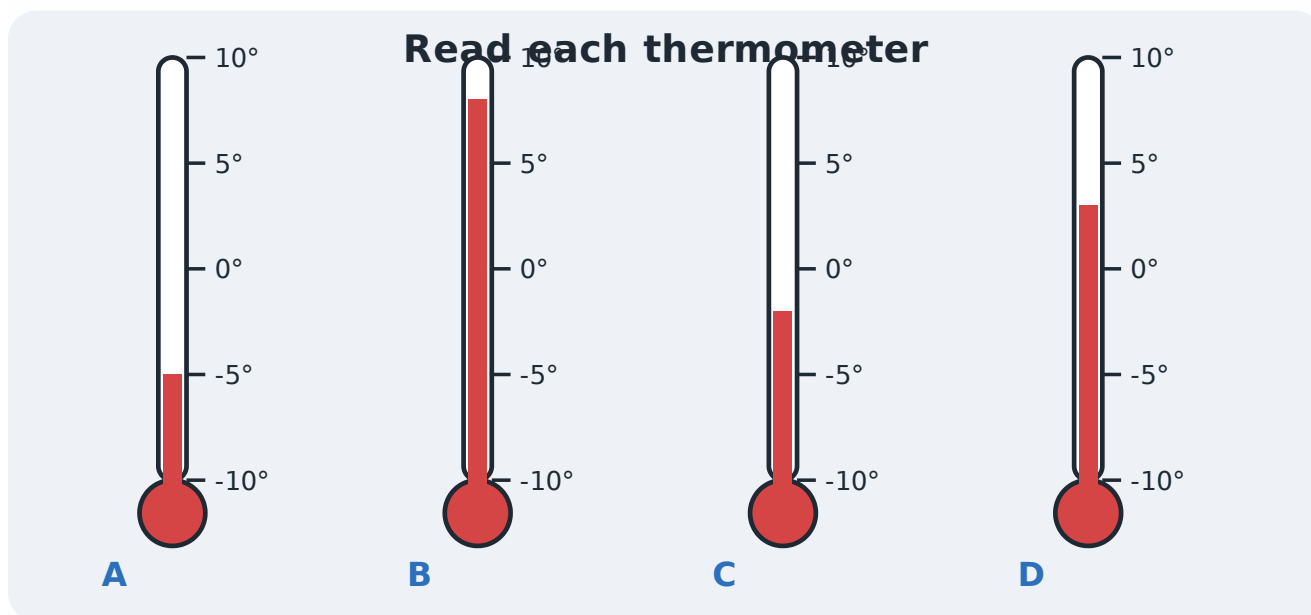


Extension & Challenge — Understanding Number

Challenge A — Integers in the real world

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These problems go beyond ordering integers — you will need to find **differences** that cross zero and reason about **change**. Sketch a number line whenever you get stuck.



Worked example — difference across zero. How many degrees warmer is 8°C than -5°C ?
Count up the line: from -5 to 0 is 5 steps, then 0 to 8 is 8 steps. Total $5 + 8 = 13^{\circ}\text{C}$.

Q1. Read each thermometer: A = _____ B = _____ C = _____
D = _____

Q2. How many degrees apart are the **coldest** and **warmest** thermometers? Show your counting.

Q3. Overnight, thermometer B falls by 11° . What does it read now? _____

Q4. A lift starts on floor -3 (3 levels of car park). It goes up 9 floors, down 4, then up 2. Which floor is it on? Show each step.

Q5. The temperature in Perth was 19°C . In Thredbo it was 23° colder. What was Thredbo's temperature? _____

Q6. Prove it. Marcus says " -10 is bigger than -2 because 10 is bigger than 2." Is he correct? Use a number line to explain.

Q7. Open task. Write three different real-world situations that could each be represented by the integer -6 .

Challenge B — Place-value puzzles

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Each place in our number system is **ten times** the place to its right. Reading a number in a place value chart helps you reason about how its digits change when you multiply or divide by 10, 100 or 1000.

Place value chart: 4.56

Tens	Ones	.	Tenths	Hundredths
	4		5	6

The number 4.56 set out in a place value chart.

When you make a number 10 times larger, every digit shifts one column to the **left**. When it becomes 10 times smaller, every digit shifts one column to the **right**.

Q1. In 4.56, write the value of each digit: 4 = _____, 5 = _____, 6 = _____

Q2. Make the number **10 times larger** and then **100 times smaller** than 4.56. Write both.

Q3. Digit puzzle. I am a number between 4 and 5. My tenths digit is double my hundredths digit, and my digits add to 7 with the 4. What number could I be? Is there more than one answer?

Q4. Use the digits 7, 3, 0, 9 once each to make the number **closest to 5** in the form _ . _ _ _ .

Q5. Prove it. Is 0.4 the same as 0.40? Explain using place value, not just "they look the same".

Q6. Reasoning. Jess writes $3.7 > 3.65$ because "7 is bigger than 65 has more digits". Her answer is right but her reason is wrong. Write a correct explanation.

Q7. Challenge. Counting by 0.01 , how many steps from 4.56 to 4.6 ? _____