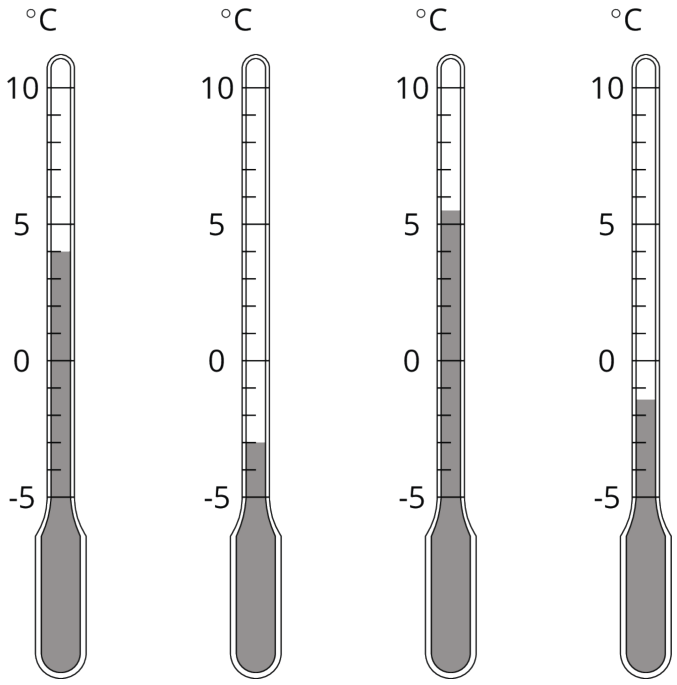
Interpreting Negative Numbers

Let's review what we know about signed numbers.

1.1 Using the Thermometer



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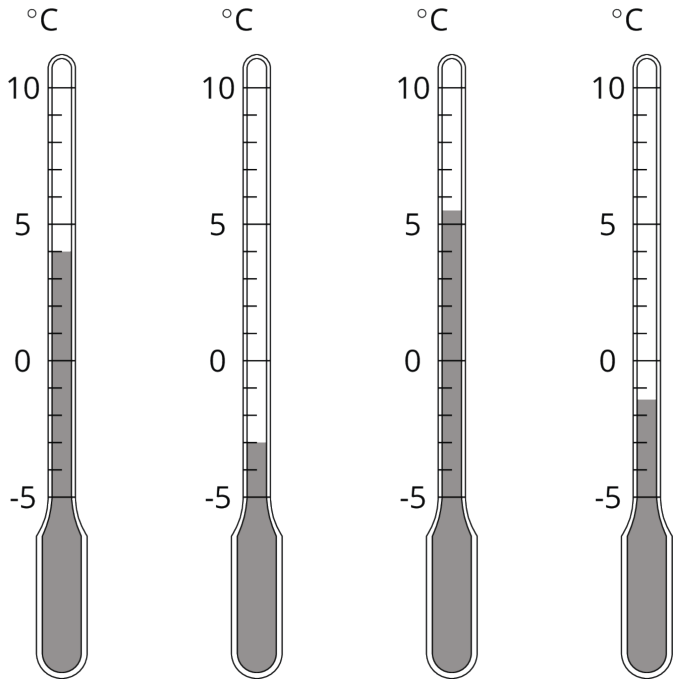
1.2 Fractions of a Degree

1. What temperature is shown on each thermometer?



2. Which thermometer shows the highest temperature?

3. Which thermometer shows the lowest temperature?

4. Suppose the temperature outside is -4°C. Is that colder or warmer than the coldest temperature shown? Explain your reasoning.

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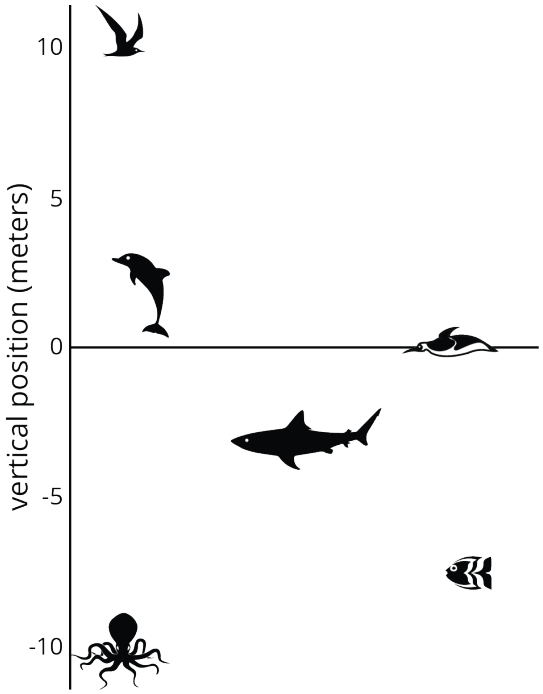
1.3 Seagulls Soar, Sharks Swim

Here is a picture of some sea animals. The number line on the left shows the vertical position, in meters, of each animal above or below sea level.



1. How far above or below sea level is each animal? Measure to their eye level.

2. A mobula ray is 3 meters above the surface of the ocean. How does its vertical position compare to the height or depth of:
   a. The jumping dolphin?
   b. The flying seagull?
   c. The octopus?
3. An albatross is 5 meters above the surface of the ocean. How does its vertical position compare to the height or depth of:
   a. The jumping dolphin?
   b. The flying seagull?
   c. The octopus?
4. A clownfish is 2 meters below the surface of the ocean. How does its vertical position compare to the height or depth of:
   a. The jumping dolphin?
   b. The flying seagull?
   c. The octopus?

5. The vertical distance between a new dolphin and the dolphin in the picture is 3 meters. What is the new dolphin's distance from the surface of the ocean?

Are you ready for more?

The North Pole is in the ocean. So its elevation is 0, or sea level. The South Pole is on land, about 1.7 miles above sea level. Sea level at either pole is about 3,949 miles from the center of Earth.

A submarine is directly below the North Pole at an elevation of about -2.7 miles. A person is standing on the South Pole. How far apart are the submarine and the person?

1.4 Rational Numbers Cards

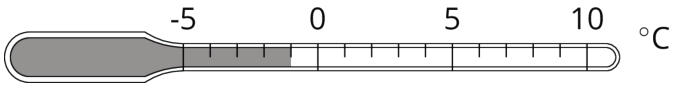
Your teacher will give you a set of number cards. Take turns with your partner placing a card from the set in order from least to greatest.

1. For each placement that you make, explain your reasoning to your partner.
2. For each placement that your partner makes, listen carefully to their explanation. If you disagree, discuss your thinking, and work to reach an agreement.
3. Pause after the first set so your teacher can review your ordering.
4. Your teacher will give you a second set of cards to add in order with the first set.

Lesson 1 Summary

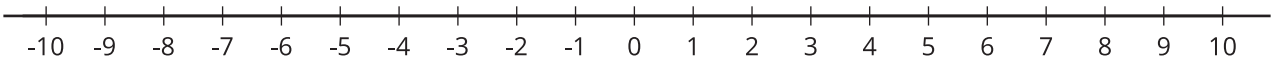
We can use **positive numbers** and **negative numbers** to represent temperature and elevation.

When numbers represent temperatures, positive numbers indicate temperatures that are warmer than zero and negative numbers indicate temperatures that are colder than zero. This thermometer shows a temperature of -1 degree Celsius, which we write -1°C.



When numbers represent elevations, positive numbers indicate positions above sea level and negative numbers indicate positions below sea level.

We can see the order of signed numbers on a number line.



A number is always less than a number to its right. So $-7 < -3$.

We use *absolute value* to describe how far a number is from 0. The numbers 15 and -15 are both 15 units from 0, so $|15| = 15$ and $|-15| = 15$. We call 15 and -15 *opposites.* They are on opposite sides of 0 on the number line but the same distance from 0.