

Comparing and Ordering Integers

- You will need**
- number lines

GOAL

Use a number line to compare and order integers.

Léa did a report on climate change in Canada. She included a chart showing typical temperatures in the capital cities of the Western provinces and Northern territories.

| City | Low (°C) | High (°C) |
|-------------|----------|-----------|
| Edmonton | -19 | -8 |
| Iqaluit | -31 | -22 |
| Regina | -21 | -11 |
| Victoria | +1 | +7 |
| Whitehorse | -22 | -13 |
| Winnipeg | -23 | -13 |
| Yellowknife | -31 | -23 |



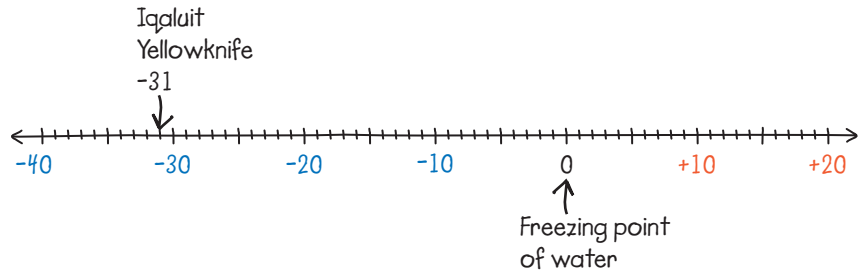
What is the order of the temperatures from coldest to warmest?





Léa's Comparison

My number line looks like a thermometer placed on its side. I marked $0\text{ }^{\circ}\text{C}$ and the low temperature for Iqaluit and Yellowknife.



I'll mark the other low temperatures on the number line to figure out the order of the temperatures.

- How does an integer tell you whether a temperature is above or below the freezing point of water?
- Mark each low temperature on a number line like Léa's. Which temperature is colder, $-21\text{ }^{\circ}\text{C}$ or $-22\text{ }^{\circ}\text{C}$?
- How can you tell that $-31\text{ }^{\circ}\text{C}$ is the coldest temperature in the chart?
- Write the low temperatures in order from coldest to warmest. Explain what you did.
- Write the high temperatures in order from coldest to warmest.

Reflecting

- How can you decide which is warmer when comparing a positive temperature with a negative temperature?
- How can you decide which of two negative temperatures is warmer? How is this the same as comparing two positive temperatures? Use examples to explain.

Checking

- Copy and complete. Use $<$ or $>$ to make each statement true.
 - $-20\text{ }^{\circ}\text{C}$ $+30\text{ }^{\circ}\text{C}$
 - $-5\text{ }^{\circ}\text{C}$ $-20\text{ }^{\circ}\text{C}$
- The chart below shows the extreme low and extreme high January temperatures in the capital cities of the Western provinces and Northern territories.



Extreme January Temperatures

| City | Extreme low ($^{\circ}\text{C}$) | Extreme high ($^{\circ}\text{C}$) |
|-------------|------------------------------------|-------------------------------------|
| Edmonton | -48 | +10 |
| Iqaluit | -45 | +4 |
| Regina | -50 | +10 |
| Victoria | -16 | +15 |
| Whitehorse | -52 | +9 |
| Winnipeg | -42 | +8 |
| Yellowknife | -51 | +3 |

- Write the extreme low temperatures in order from warmest to coldest.
- Write the extreme high temperatures in order from coldest to warmest.

Practising

- Copy and complete. Use $<$ or $>$ to make each statement true.
 - $+9\text{ }^{\circ}\text{C}$ $-30\text{ }^{\circ}\text{C}$
 - $+25\text{ }^{\circ}\text{C}$ $+17\text{ }^{\circ}\text{C}$
 - $-3\text{ }^{\circ}\text{C}$ $+2\text{ }^{\circ}\text{C}$
 - $-7\text{ }^{\circ}\text{C}$ $-16\text{ }^{\circ}\text{C}$
 - $-22\text{ }^{\circ}\text{C}$ $+22\text{ }^{\circ}\text{C}$
 - $+8\text{ }^{\circ}\text{C}$ $-12\text{ }^{\circ}\text{C}$
- What temperature is halfway between $-10\text{ }^{\circ}\text{C}$ and $+4\text{ }^{\circ}\text{C}$? Use a number line.

5. The temperature on Liam's birthday went from -7°C to -4°C . Which of the following temperatures are between -7°C and -4°C ?
 -8°C -3°C -6°C -5°C

6. How can you tell whether a temperature is colder or warmer than -5°C ? Use a number line to explain.

7. Write an integer to make each statement true.

a) $-20^{\circ}\text{C} < \blacksquare^{\circ}\text{C}$

b) $\blacksquare^{\circ}\text{C} < -7^{\circ}\text{C}$

8. Carmen and Jack roll a number cube with these integers on the faces: $+1$, -3 , $+3$, -2 , -1 , $+2$. Carmen scores 1 point if the integer rolled is greater than $+1$. Jack scores 1 point if the integer rolled is less than -1 . Who has more chances to score a point?

9. Erynn made a chart showing the typical surface temperatures of four planets and the approximate distance of each planet from the Sun.



| Distance from the Sun | | |
|-----------------------|---|--|
| Planet | Approximate distance from Sun (in millions of kilometres) | Typical surface temperature ($^{\circ}\text{C}$) |
| Earth | 150 | $+14$ |
| Mars | 228 | -63 |
| Jupiter | 778 | -130 |
| Neptune | 4500 | -200 |

- a) Which temperature is colder than -150°C ?
 b) Which temperature is warmer than -50°C ?
 c) What is the relationship between a planet's distance from the Sun and its surface temperature?
10. How does thinking about temperatures help you decide which of two integers is greater? Use examples to explain.