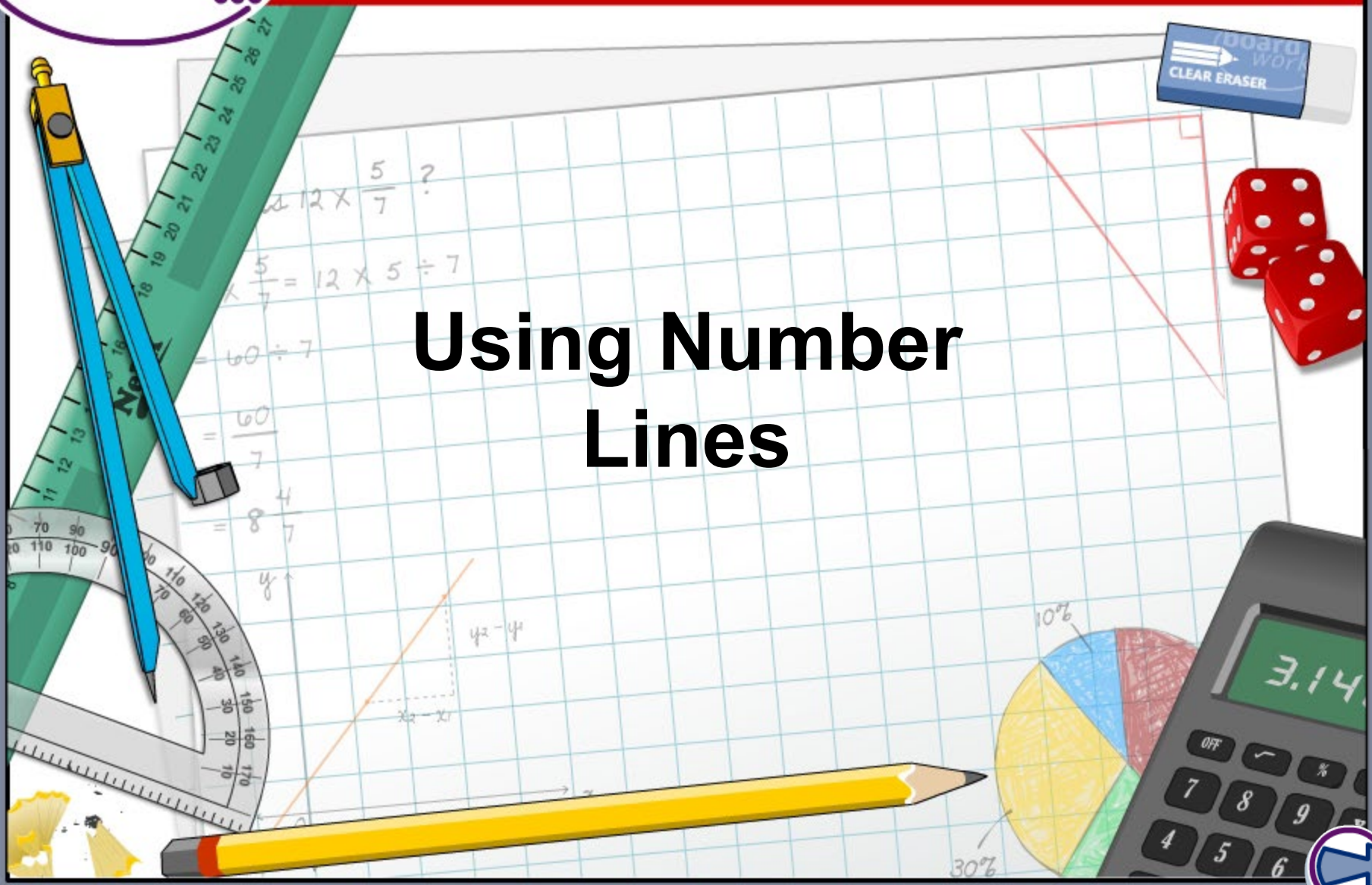
Using Number Lines



Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

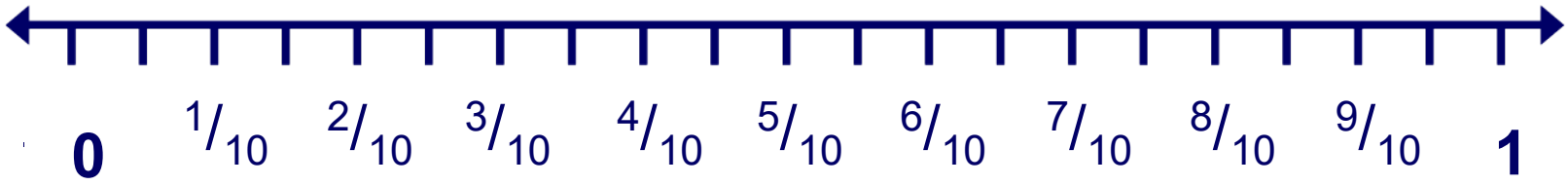
8) Look for and express regularity in repeated reasoning.

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Introducing number lines

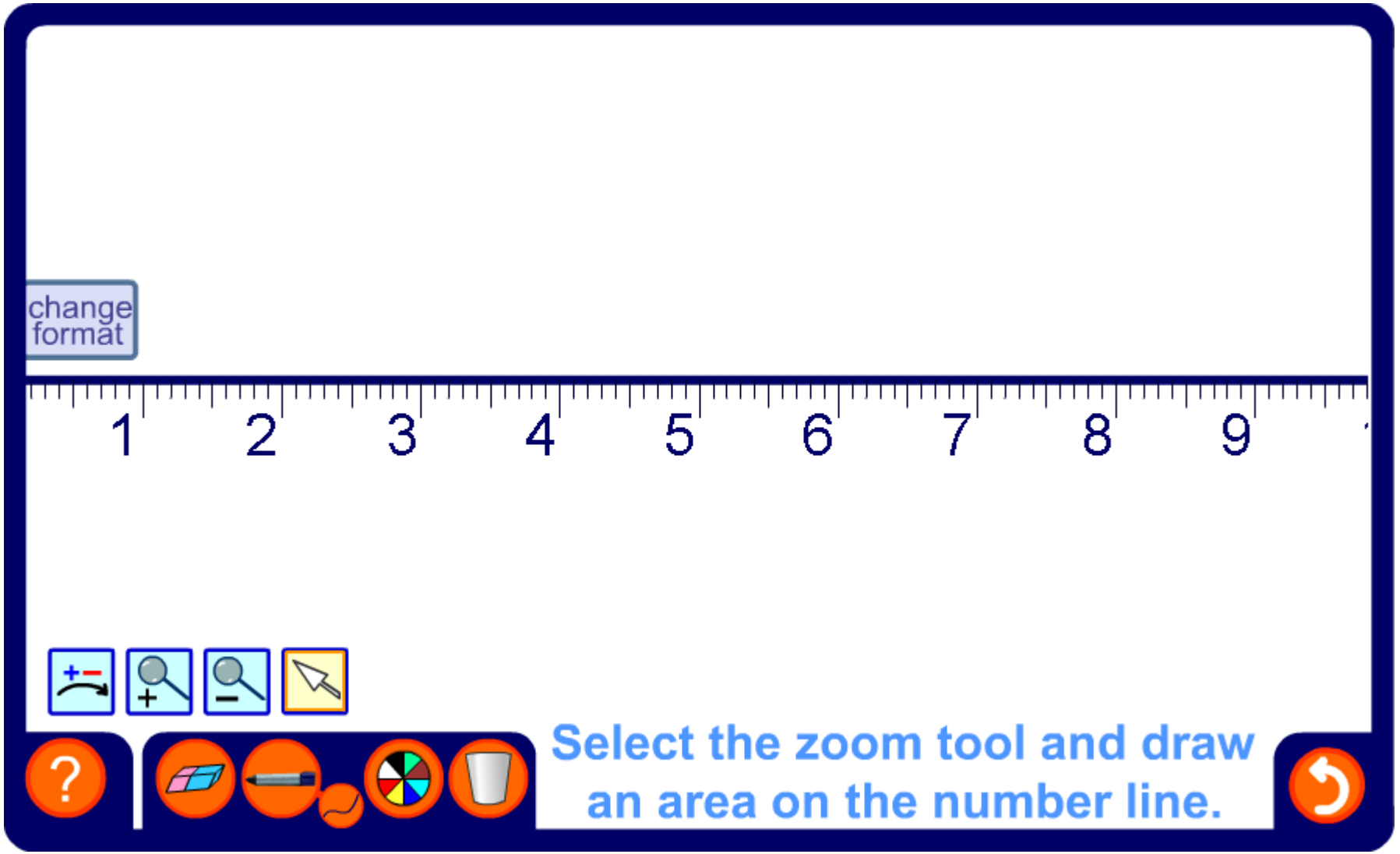
A number line is a line on which numbers are marked at regular intervals.



Number lines can be used to show:

- positive and negative integers
- decimals
- fractions.

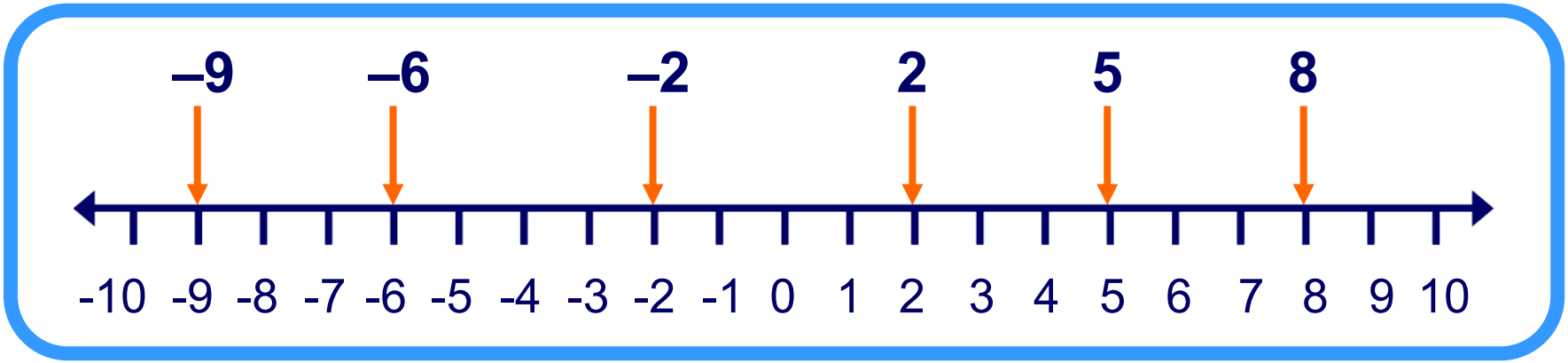
Zooming in on a number line



Ordering numbers

We can use a number line to help us write numbers in order.

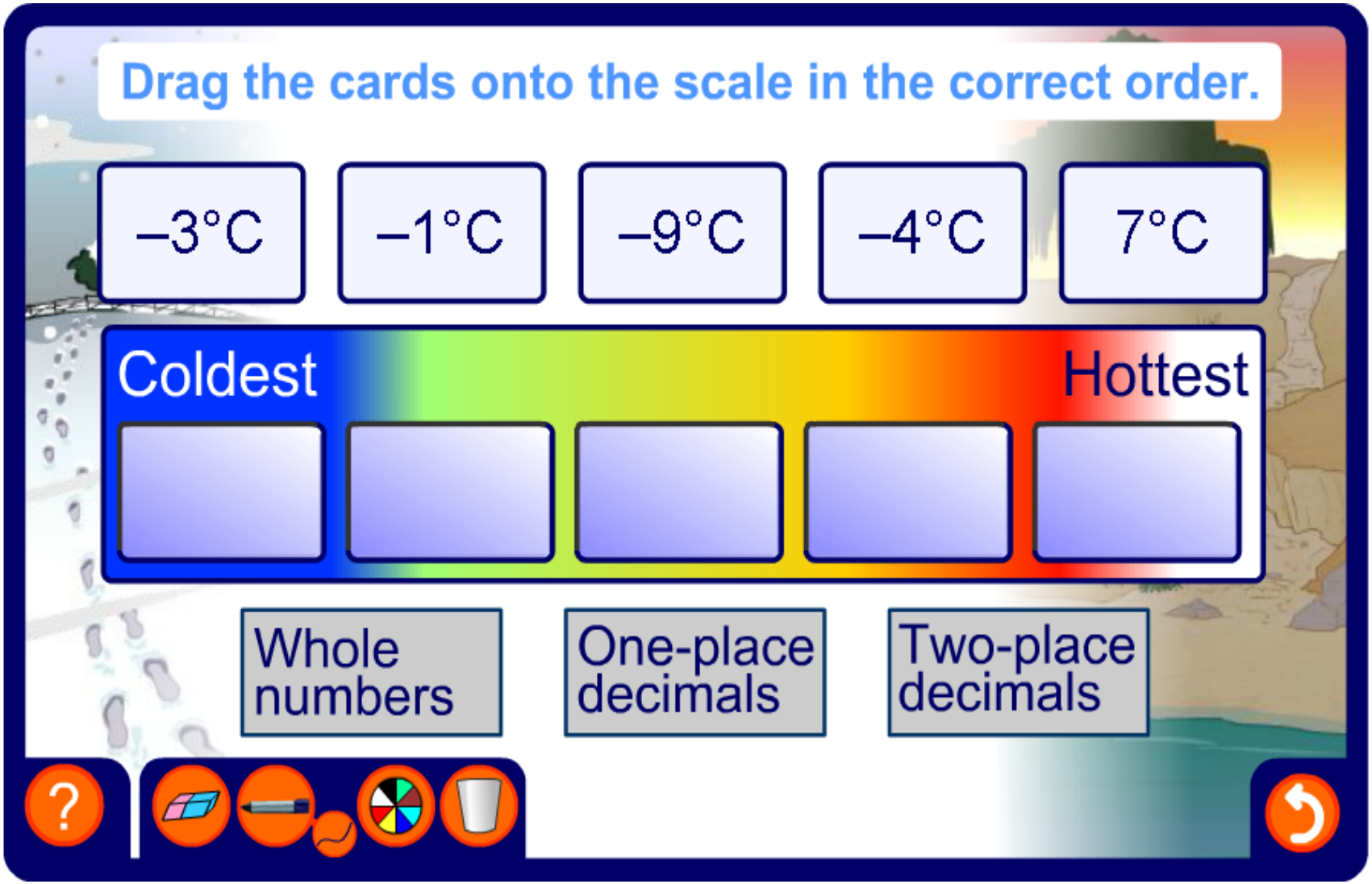
Write the integers –2, 8, 2, –6, –9 and 5 in order from smallest to largest.



So, the integers in order are:

–9, –6, –2, 2, 5, and 8.

Ordering temperatures



Interpreting number lines

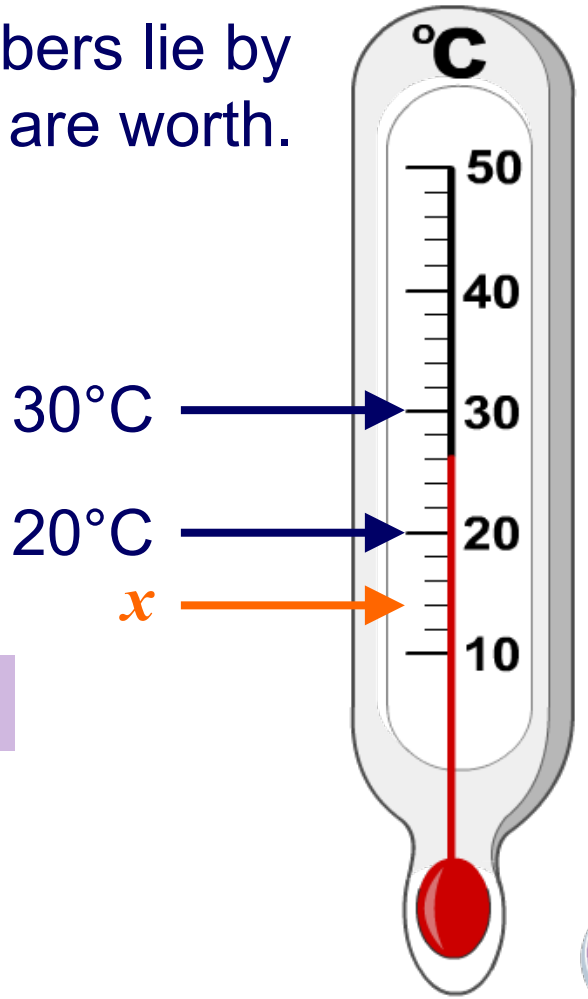
A thermometer is an example of a number line. As you can see, only some of the numbers are marked on the line.

We can figure out where the other numbers lie by finding how much each of the divisions are worth.

There are **5 spaces** on the line between these two points.

Each division is worth:

$10 \div 5 = \mathbf{2°C}$

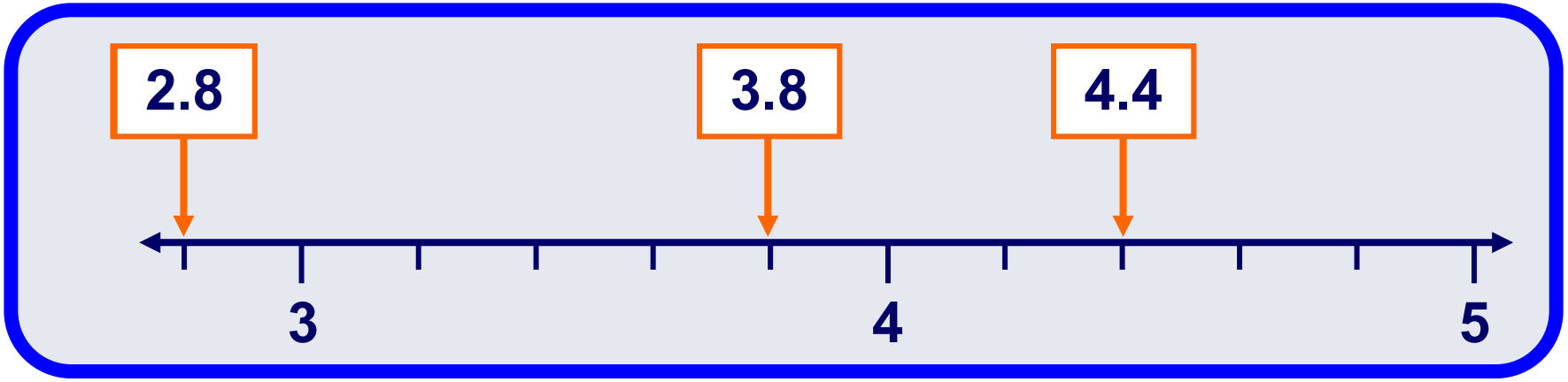


What temperature is marked at x?

14°C

Interpreting number lines

What numbers are the arrows pointing to on the following scale?



Each small division is worth: 1 ÷ 5 = 0.2

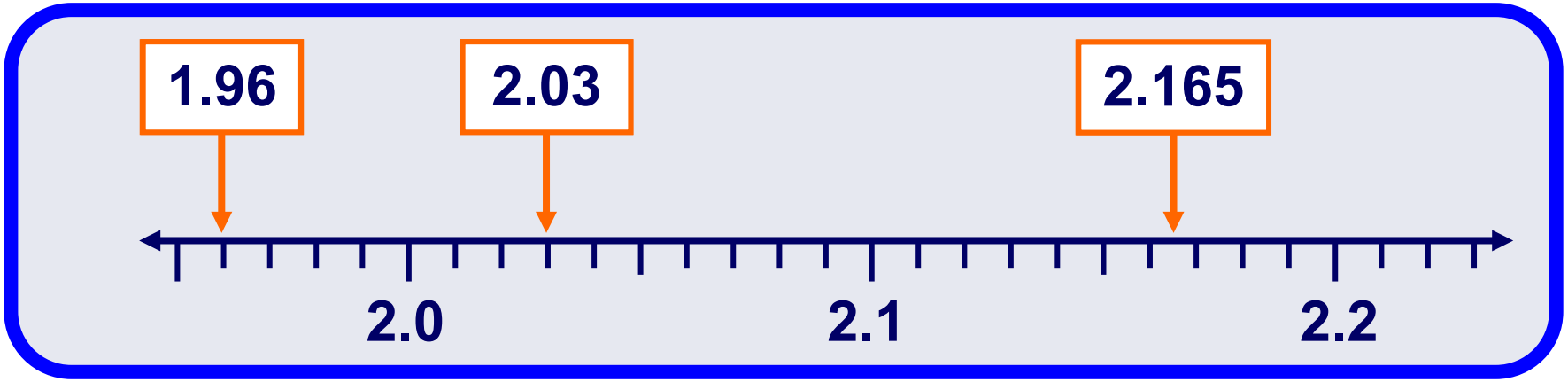
A is pointing at **3.8**

B is pointing at **4.4**

C is pointing at **2.8**

Interpreting number lines

What numbers are the arrows pointing to on the following scale?



Each small division is worth 0.1 ÷ 10 = 0.01

A is pointing at **2.03**

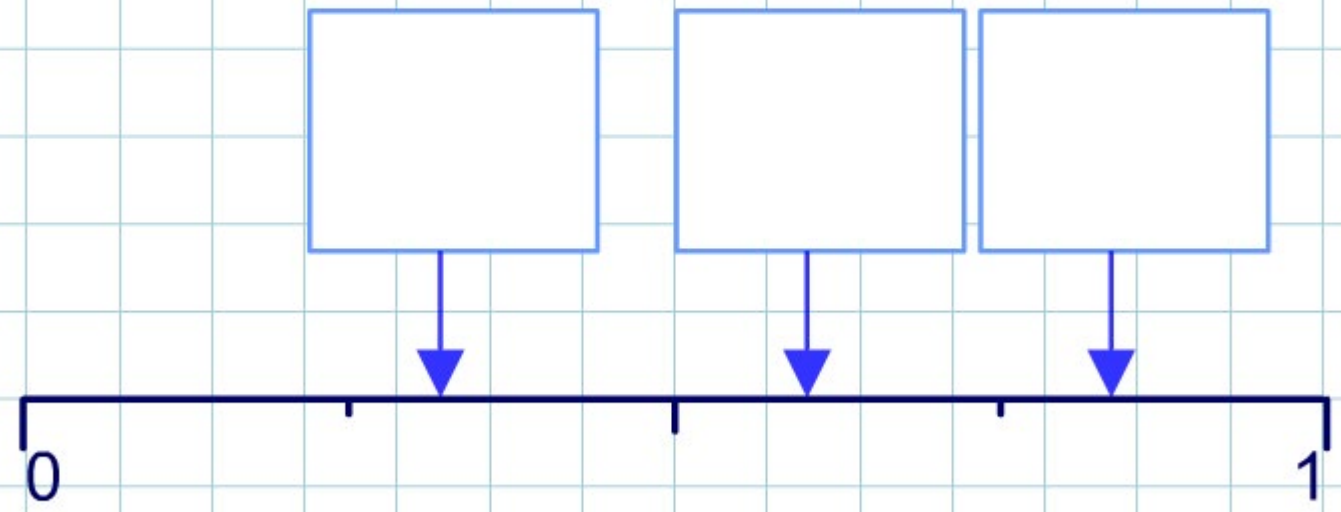
B is pointing at **2.165**

C is pointing at **1.96**

Fractions on a number line

Drag the fraction in the red box to the correct point on the number line.

$\frac{3}{5}$



Connect three fractions

Split into two teams and take turns choosing a fraction and placing it on the number line. The first team with three in a row wins.

Blue

Red

0

1

Inequalities

An **inequality** is an algebraic statement involving the symbols **>**, **<**, **≥** or **≤**.

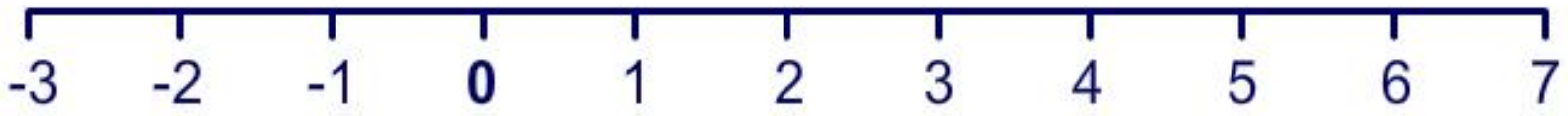
$x > 3$	means	'x is **greater than** 3'.
$x < -6$	means	'x is **less than** –6'.
$x \geq -2$	means	'x is **greater than or equal to** –2'.
$x \leq 10$	means	'x is **less than or equal to** 10'.

"The temperature outside is above 80 °F today."
Write an inequality for this statement.

Temperature > 80 °F

Representing inequalities on a number line

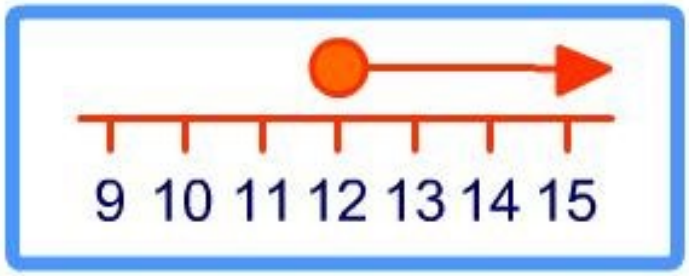
We can represent inequalities on a number line using open and closed circles.

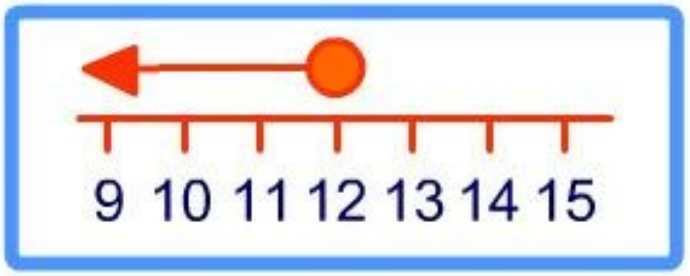


Inequalities in words

Choose the number line that represents the inequality described below.

I can fit at least 12 marshmallows in my mouth.

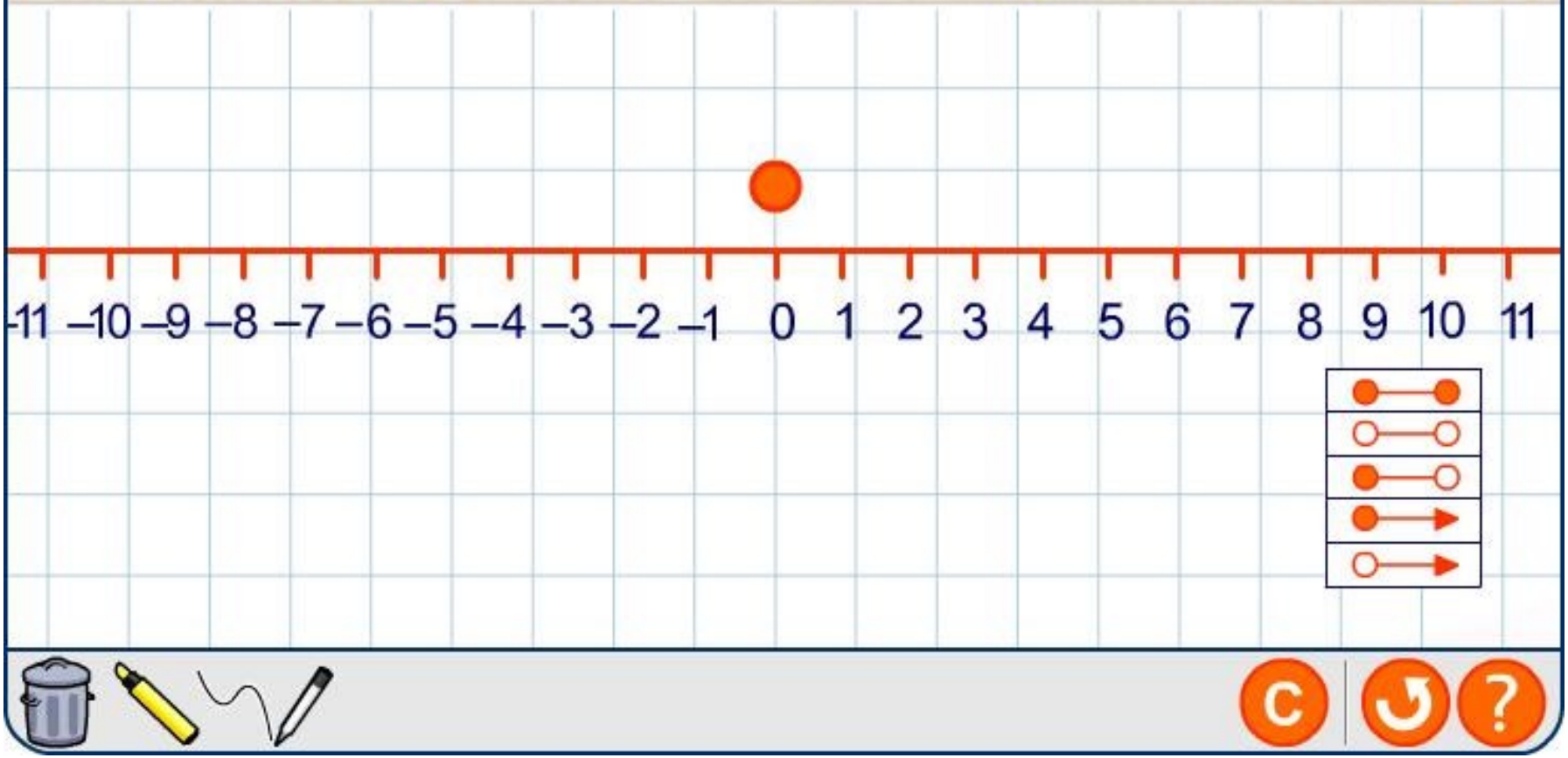




Inequalities on number lines

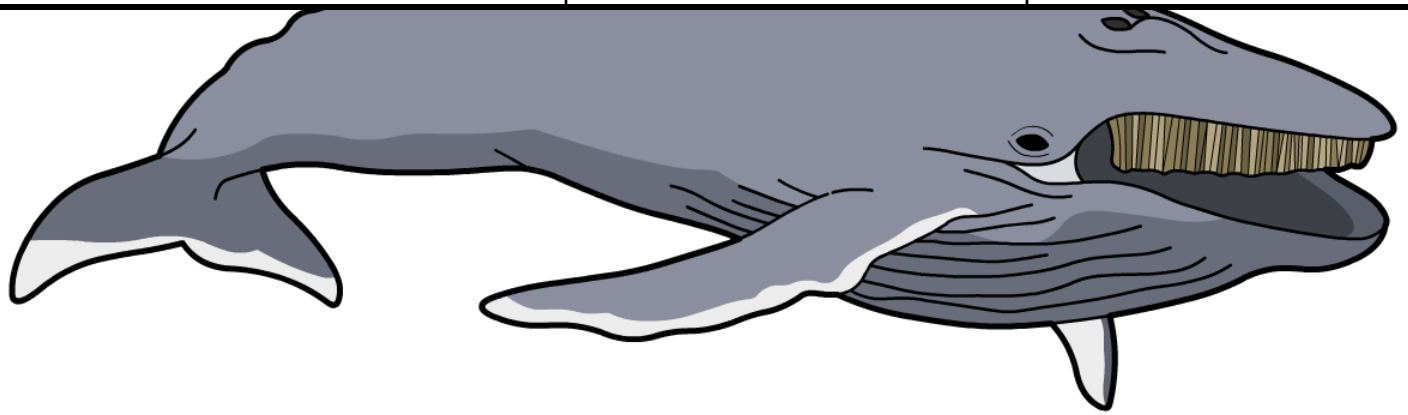
Use the tools below to represent this inequality on the number line:

$x < -1$



Comparing whales

whale	length (m)	mass (tons)
humpback whale	$12 \leq x \geq 14$	$25 \leq x \geq 30$
fin whale	$19 \leq x \geq 22$	$45 \leq x \geq 60$
bowhead whale	$14 \leq x \geq 15$	$60 \leq x \geq 75$
minke whale	$8 \leq x \geq 10$	$9 \leq x \geq 15$



Using the information in this table, Eric decided that the fin whale is the largest. Is he correct?