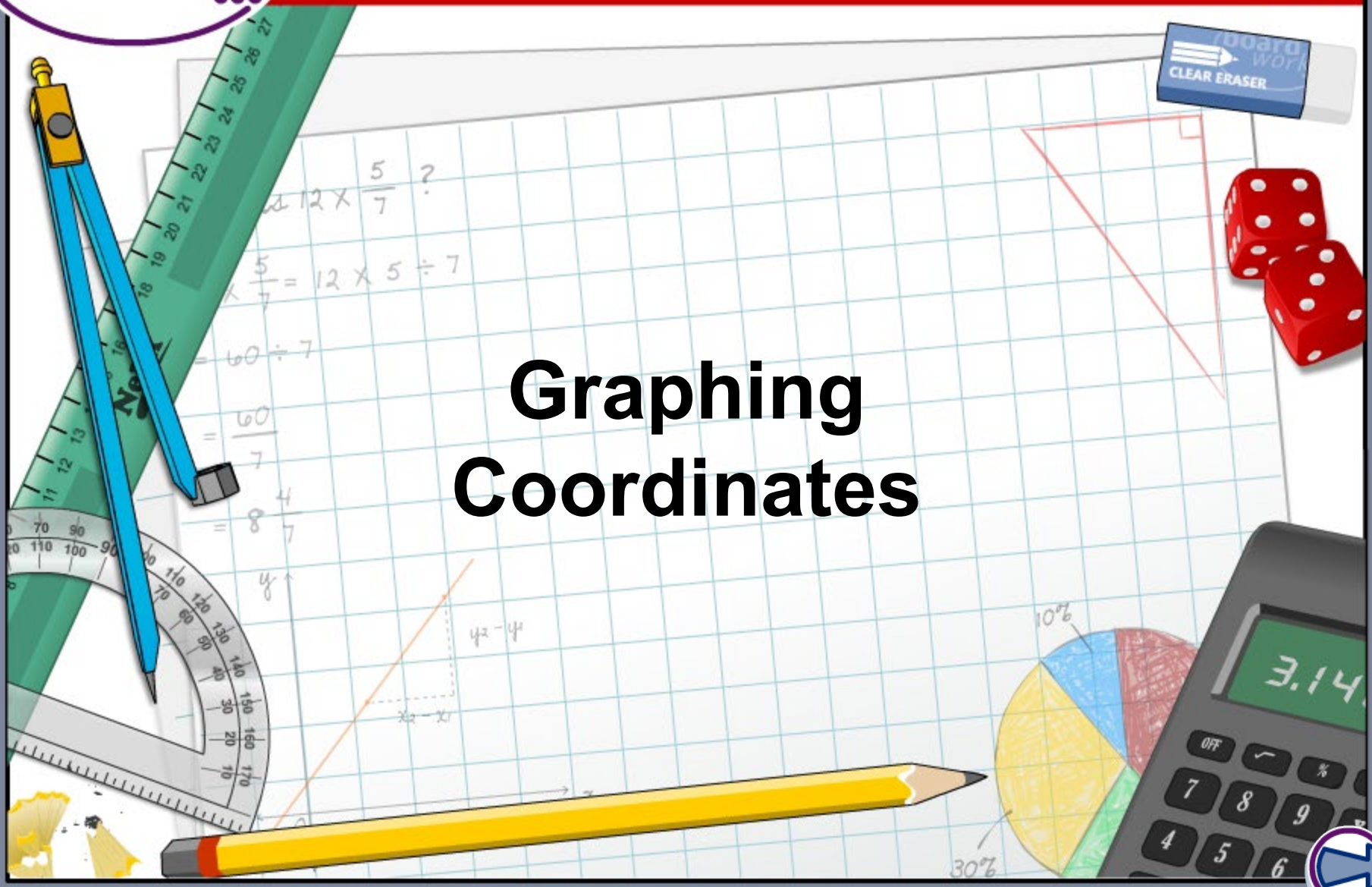


Graphing Coordinates

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.

Plotting coordinates

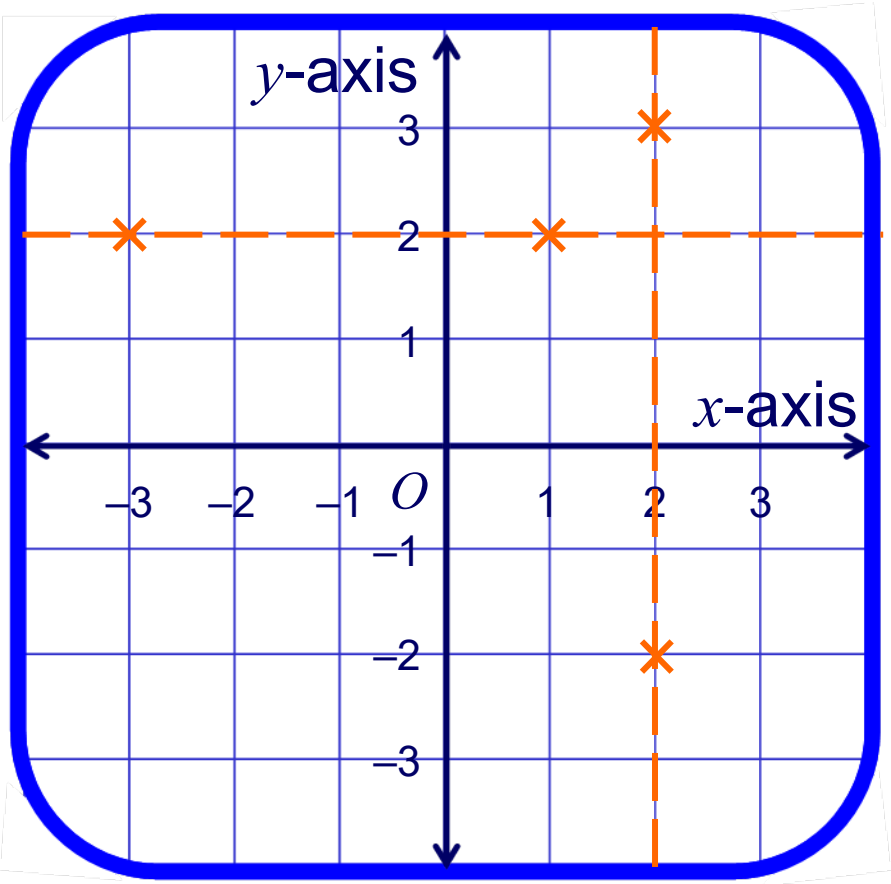
You can tell a lot about some coordinates before you even plot them on a grid.

What can you say about these two sets of coordinates?

(1, 2) and (–3, 2)

(2, 3) and (2, –2)

Let's plot them to see if you are right:



Counting the distance

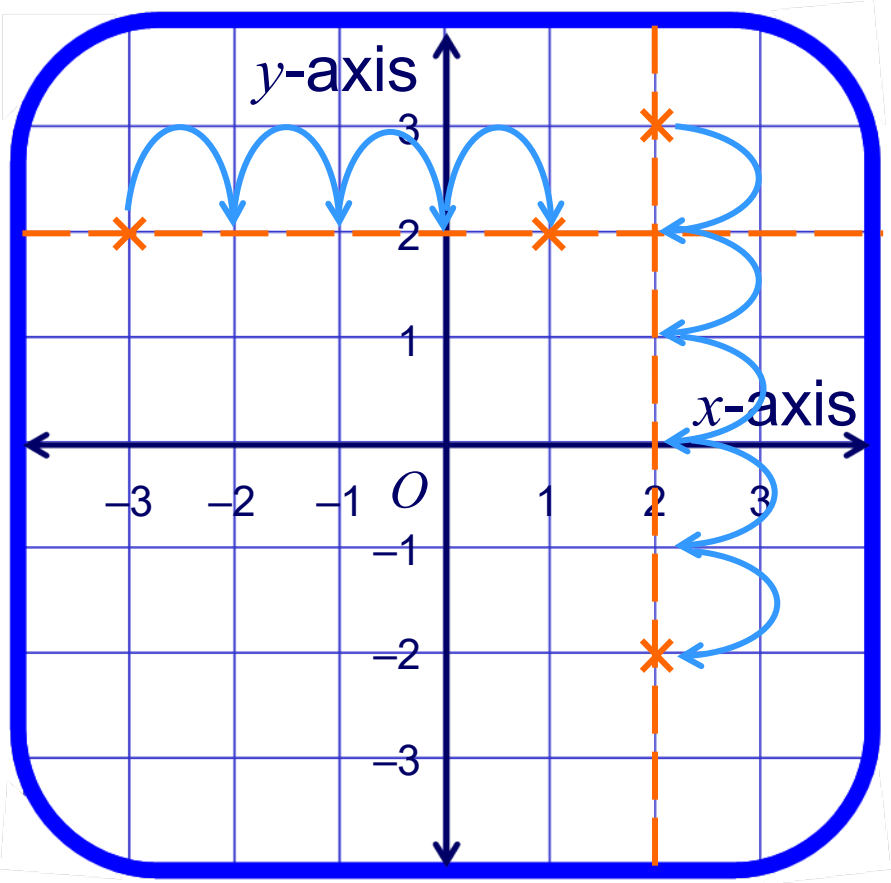
When two points are on the same vertical or horizontal line, you can find the distance between them by counting the units from one point to the other.

This is true even if the points are in in different quadrants.

What is the distance between these two points?

(–3, 2) and (1, 2)

The distance is **4 units**.



What is the distance between (2, 3) and (2, –2)?

Calculating the distance

How else could we find the distance between two points when they are on the same vertical or horizontal line?

If two points lie on the same horizontal line, they will have the same y-coordinate. We need to calculate the difference between the x coordinates to find the distance between the points.

(1, **2**) and (–3, **2**)

$1 - -3 =$ **4**

If two points lie on the same vertical line, they will have the same x-coordinate.

(**2**, 3) and (**2**, –2)

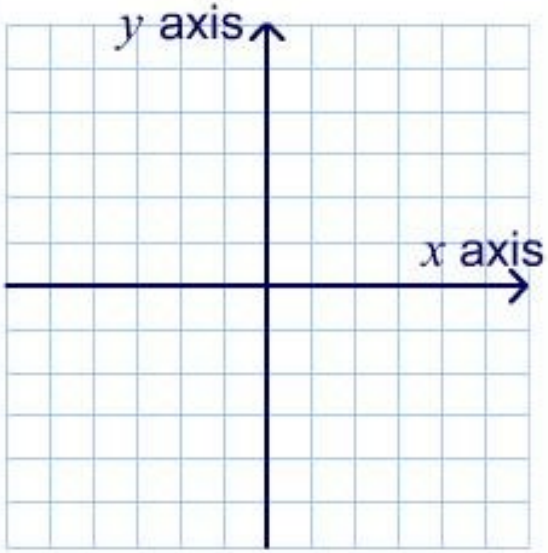
$3 - -2 =$ **5**

What if the order of the points was reversed?

Practice finding distances

Finding the distance between two points

Q1/3 Find the distance between the points (–3, –6) and (–3, 4).

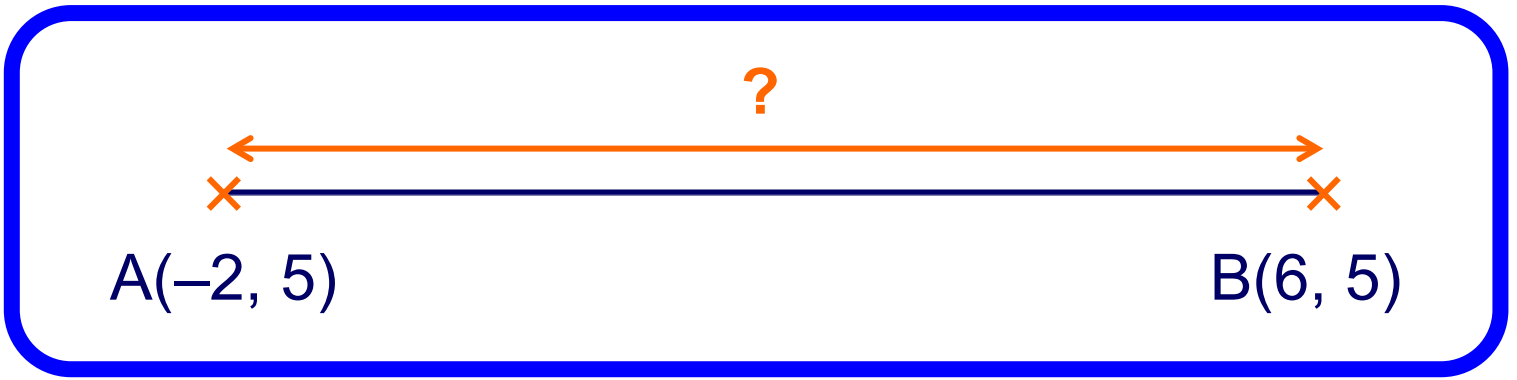


Press the "=" button to show the calculations step by step.

Finding the distance

A is the point (–2, 5) and B is the point (6, 5).
The two points, A and B, have the same y-coordinate.

What is the length of line segment AB?



We use the x-coordinates because the y-coordinates are the same.

$$-2 - 6 = -8$$

This is negative, so we must use the absolute value.

The distance of line segment AB is **8 units**.

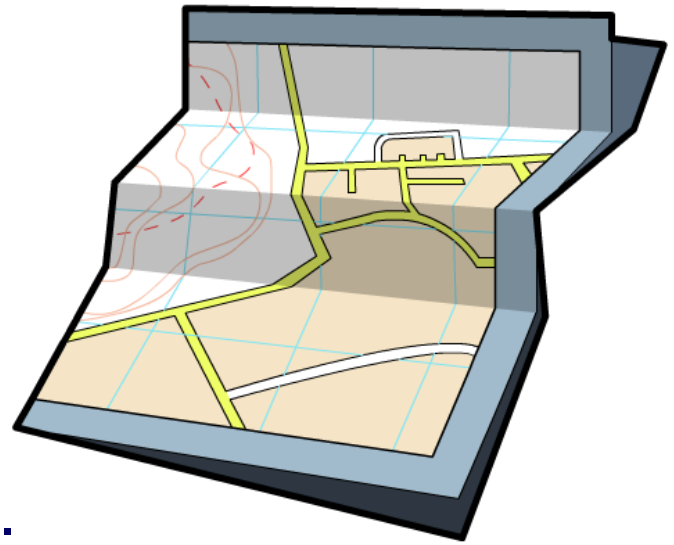
Problem solving

Max has a map of his town. The map is overlaid by a grid, with lines drawn every mile north and east of the town center.

His house is located at (1, –7), while his school is at (1, 10).

What is the distance from Max's house to school?

Both x-coordinates are the same and so both locations must lie on the same north-south line.



Calculate the distance between the two locations:

$$-7 - 10 = -17$$

17 is the absolute value of –17.

Max's house is **17 miles** from his school.

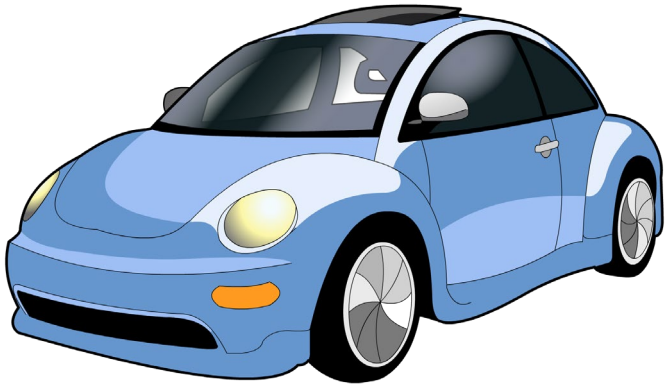
Using graphs

A rental car company charges a one-time fee to rent a car and then a fee for each day that the car is rented.

Three people rent cars from the same company.
Here is the duration and total cost of each rental:

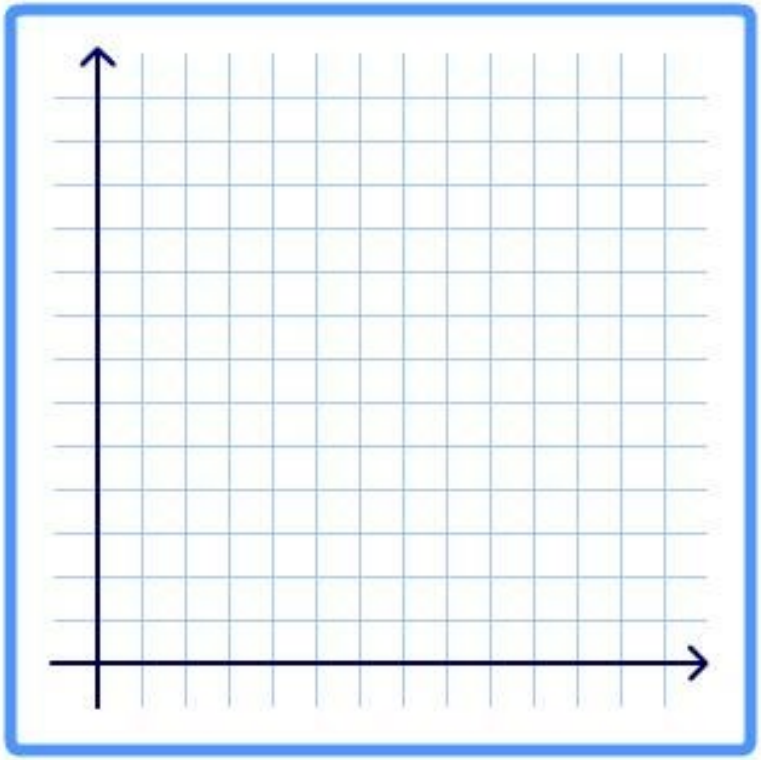
Number of days, d	1	3	5
Cost in \$, c	55	105	155

Amiel can't find the brochure but wants to know how much it would cost to rent a car for 4 days.



How could you use your knowledge of graphs and coordinates to help Amiel?

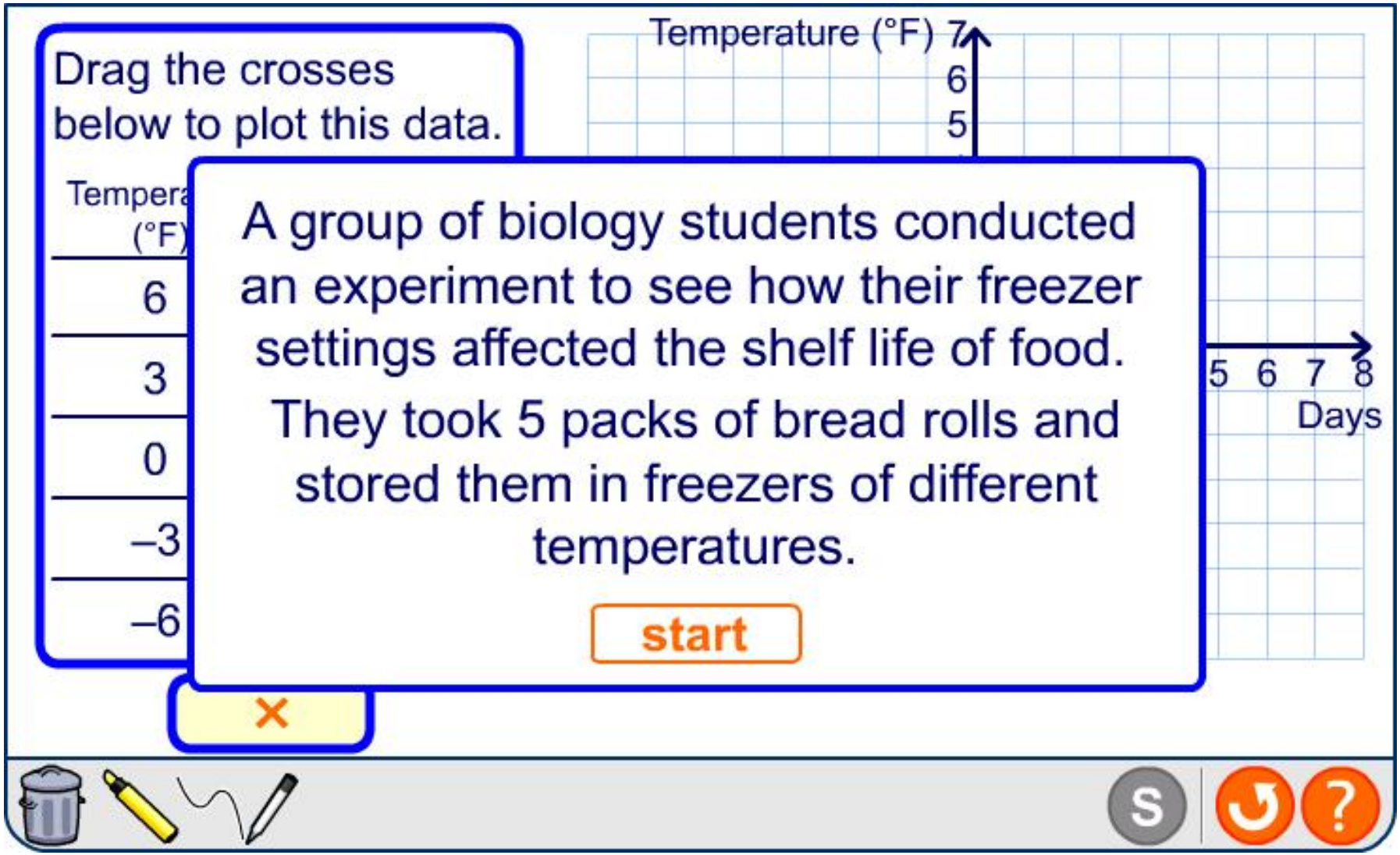
Drawing graphs



How should we draw the axes?

What is the cost for 4 days?

Science experiment



How long would food stored at 2°F last?