Coordinates
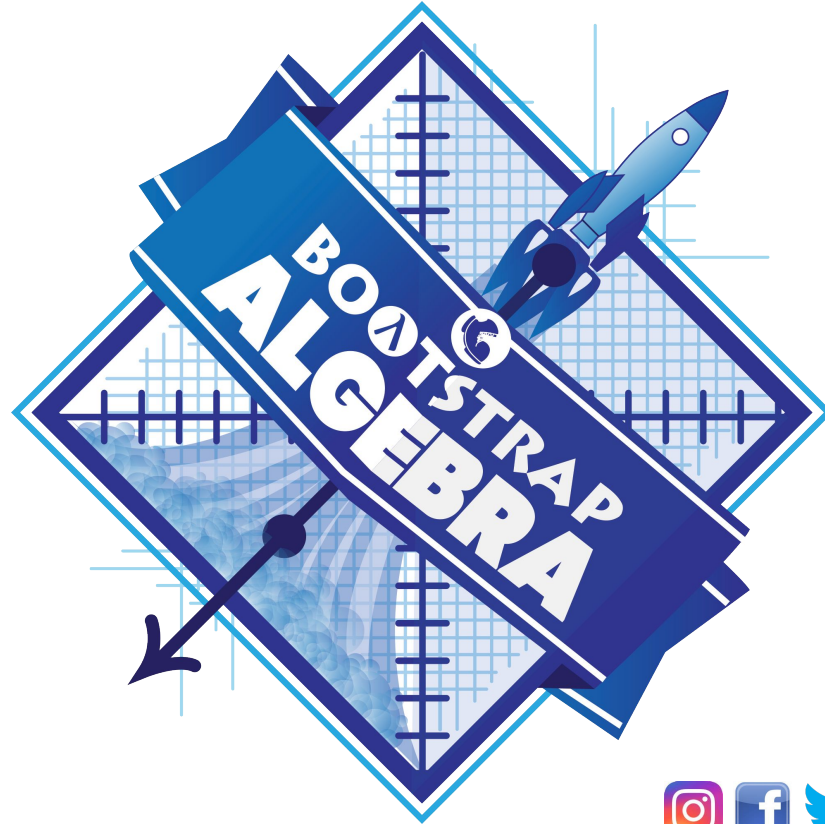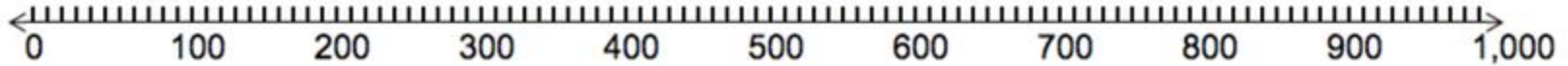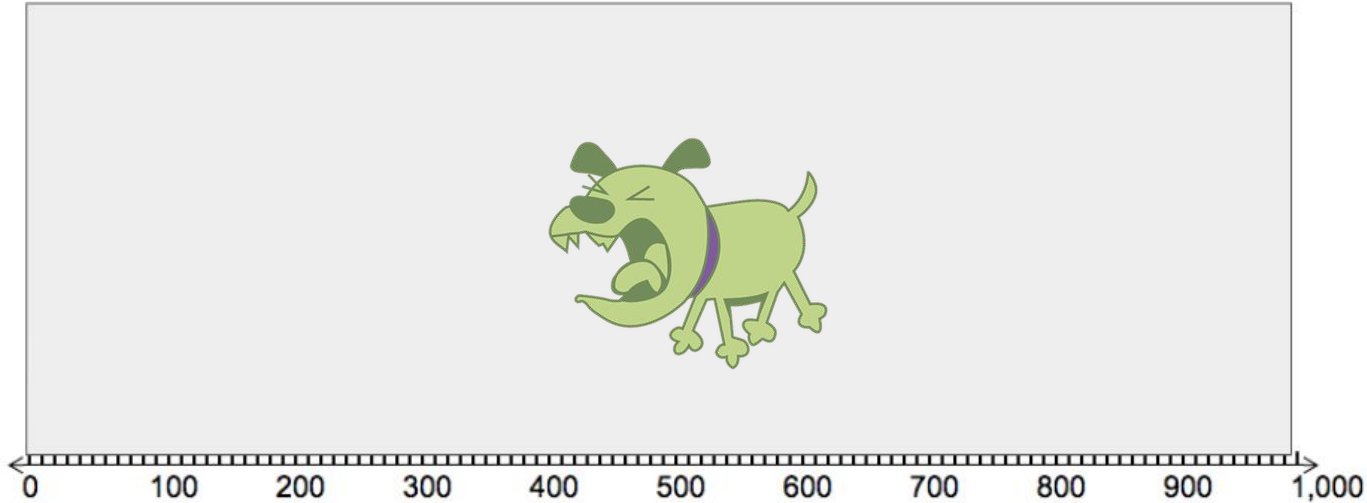
Computers use numbers to represent a character's position on screen, using number lines as rulers to measure the distance

But one number line isn't enouah!

By adding a second number line, we can locate a character *anywhere* on the screen in either direction. The first line we drews is called the ***x-axis***, which runs from left to right. The second line, which runs up and down, is called the ***y-axis***. A 2-dimensional ***coordinate*** consists of both the x- and y-locations on the axes.

A coordinate pair is always written in the form of (x, y). When we write down these coordinates, we always put the x before the y (just like in the alphabet!). Most of the time, you'll see coordinates written like this: (200, 50) meaning that the x-coordinate is 200 and the y-coordinate is 50.
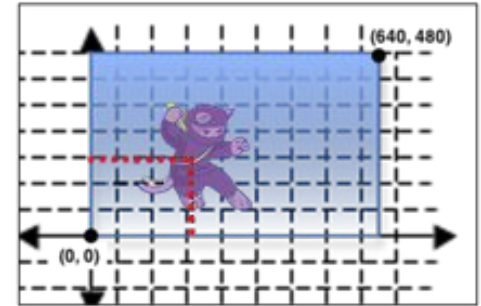
1. Turn to Estimating Coordinates.
2. For each character, *estimate* what you think the x- and y-coordinates are.

- Should any of the characters have x-coordinates that are very similar? How come?
- Should any of the characters have y-coordinates that are very similar? How come?
- How do you think this concept relates to a video game?

With your partner, adjust the sliders to move the cat on [Ninja Cat Desmos graph](#).

Turn to [Notice and Wonder](#).

What do you Notice?

What do you Wonder?

Turn to [Brainstorm Your Own Game](#).

As a group, come up with at least one idea for a game!

- Every game has a BACKGROUND (where the game is set)
- Every game has a PLAYER (moves up and down)
- Every game has a DANGER (moves left/right - lose points if you hit it!)
- Every game has a TARGET (moves left/right - gain points if you hit it!)

In a minute, you're going to find images for your game! Tip: DuckDuckGo is a great place to find transparent images.

Bridging to video games

Use this Google Draw template to create a Screenshot.

Screenshot must include:

- BACKGROUND, PLAYER, DANGER, TARGET
- Estimates of coordinates for each character.
- 2 characters that have similar x-coordinates.
- 2 characters that have similar y-coordinates.

What games did you come up with?

What are the coordinates of the DANGER before it is on the screen?

Why do we make estimates?

What makes a good estimate?

How can we improve our estimation skills?