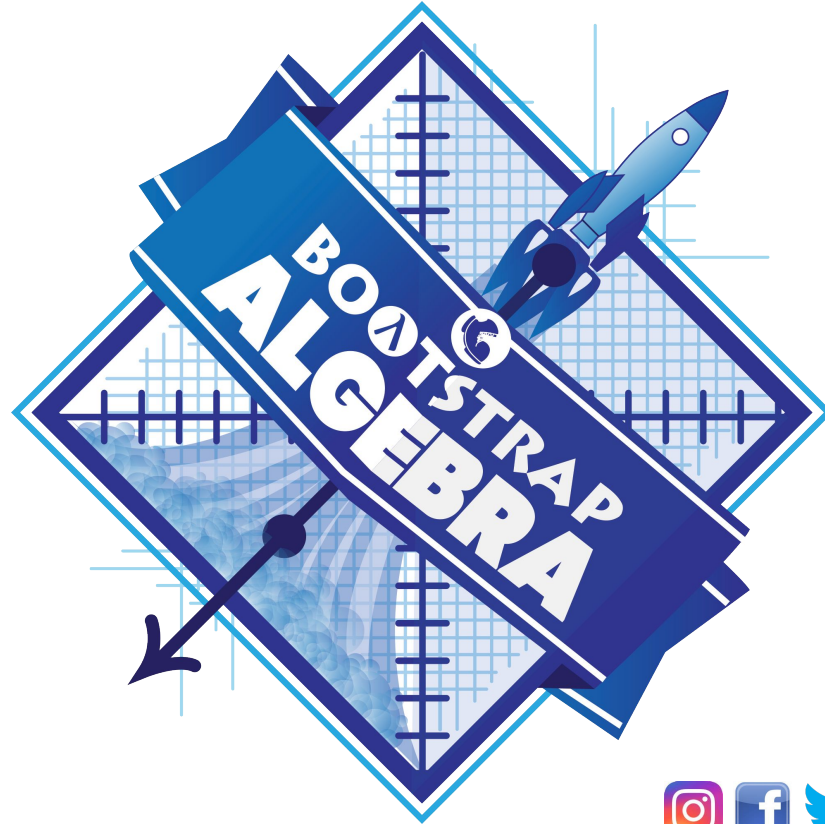


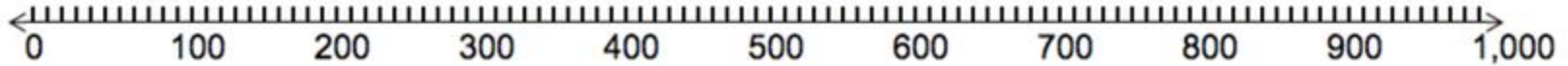
Coordinates



Navigating a Grid



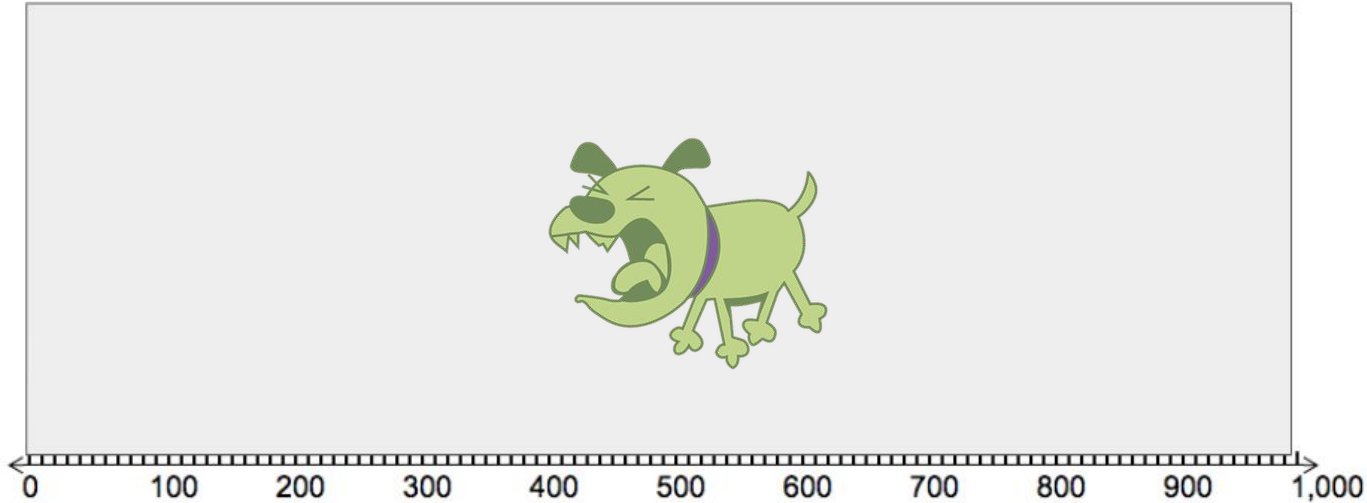
Computers use numbers to represent a character's position on screen, using number lines as rulers to measure the distance



Navigating a Grid



But one number line isn't enough!

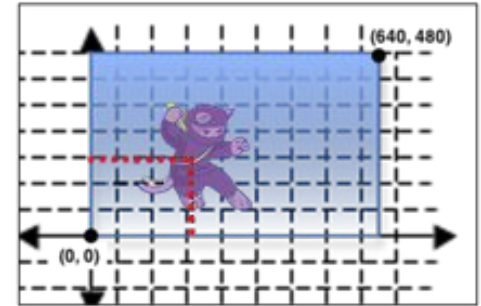


Navigating a Grid



By adding a second number line, we can locate a character *anywhere* on the screen in either direction. The first line we draws 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.



Navigating a Grid



1. Turn to [Estimating Coordinates](#).
2. For each character, *estimate* what you think the x- and y-coordinates are.

Navigating a Grid



- 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?

Bridging to video games



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?

Bridging to video games



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!)

Bridging to video games



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

The screenshot shows a search engine interface with the search term 'puppy' in the input field. Below the search bar are navigation tabs for 'All', 'Images', 'Videos', 'News', 'Maps', and 'Meanings'. A filter bar shows 'fe Search: Moderate', 'All Sizes', 'Transparent', and 'All Layouts'. A dropdown menu is open over the 'Transparent' filter, listing 'All Types', 'Photograph', 'Clipart', 'Animated GIF', and 'Transparent' (which is selected with a checkmark). Below the search results, a grid of images is visible. The first image shows two golden retrievers, one adult and one puppy, with a resolution of 670 x 491. The second image is titled 'Cute puppy climbing trans...' and is from freepngimages.com. The third image is titled 'Puppie' and is from play.go.

puppy

All Images Videos News Maps Meanings

fe Search: Moderate All Sizes Transparent All Layouts

All Types
Photograph
Clipart
Animated GIF
Transparent ✓

Is It Better To Get A Puppy Or An O...
offleashk9training.com

Cute puppy climbing trans...
freepngimages.com

Puppie
play.go

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.

Bridging to video games



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?