Ex-Alta 1
Coding with AlbertaSat
Why is coding important for satellites?

- Communication
  - Between mission control and the satellite
  - Between subsystems in the satellite

- Power regulation

- Control of the payload
Scratch is a coding language that uses blocks to perform programming

- These blocks come in different shapes and colors
- The blocks can be arranged to execute different functions
- They are connected together like puzzle pieces
The game you’ll make: Asteroid Dodger!
Motion Blocks

- These blocks control the motion of the objects
- They are indicated in blue
Control Blocks

- These blocks use logic to perform certain tasks.

- These blocks use ‘If’ statements:
  - If ___ happens, then do ___

- These blocks do loops:
  - Repeat until ___

- These blocks are indicated in orange.
Sensing Blocks

- The sensing blocks ‘listen for’ certain events

- These are indicated in light blue.
Looks Blocks

- These blocks change the appearance of the sprite
- The appearance of the sprites are called costumes
- They are indicated in purple
Operator Blocks

- These blocks do things regarding:
  - Math
  - Logic
- They are indicated in green

- We’ll be using an Operator block to randomly generate where the asteroids will come from!
The Main Programming Window:
Sprite/Character Window:
Game Preview Window:
The game is a cartesian plane

Can you identify the location of the satellite sprite?

(0,0)

If we move the satellite sprite to (-50,50), which quadrant will it be in?

Quadrant 2
Over to scratch!

Go to the tutorial on the scratch website:

https://scratch.mit.edu/projects/605478607

and click on the “see inside” button:
Your screen should now look like this!
Programming the **AuroraSat_sprite**

- You’ll notice that when you press nothing happens just yet!
- Click on the AuroraSat_sprite from the Sprite window:
  - You should now have all the blocks you need to program the AuroraSAT in the main window!
- First, let’s try to get it to move with your arrow keys!
- Try and recreate the picture on the right with your blocks!
- When you think you’ve finished, click and try and see if you can use your arrow keys to move the AuroraSat!
What happens when the AuroraSAT runs into an asteroid?!

We have to program the game to stop when the AuroraSAT runs into an asteroid!

Try and recreate these conditions from your remaining blocks!
Programming **asteroid1**

You may have noticed your asteroids don’t move yet!

- Select the **asteroid1** sprite from the Sprite window
  - The blocks necessary to program **asteroid1** should now be in the main window!

- Try and recreate the image on the right with your blocks!
Programming *asteroid2*

Let's add another asteroid!

- Select the *asteroid2* sprite from the Sprite window
- The coding for this sprite has mostly been done, they just need to be connected together!
  - There's a hint if you're stuck!
- The finished blocks should look like this:
Completed Game

https://scratch.mit.edu/projects/605516110