StarLogo Nova Activity: Orientation

You will learn the parts of the StarLogo Nova interface and program your first StarLogo Nova project, which uses multiple agents to draw a flower.

Learning Objectives:

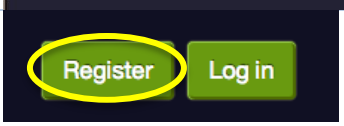
- Register for an account
- Identify each part of StarLogo Nova
- Navigate to profile
- Create a new blank project
- Change the name of a project
- Save and Run code
- Use tabs to switch between different pages
- Drag blocks from the drawer
- Connect blocks to create a program
- Create more than 1 agent
- Use movement blocks
- Draw on the terrain
- Identify interface terms for StarLogo Nova
- Distinguish between push and toggle buttons
- Explain how movement blocks affect turtle agents in different interface blocks

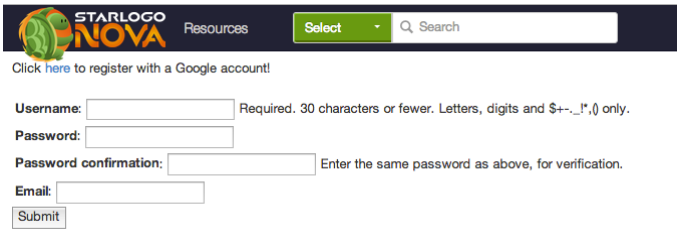
New Terms:

- Workspace
- SpaceLand
- Drawers
- Blocks
- Widgets
- Terrain
- Agent
- Breed of agents
- 3D Model
- Tab
- Page
- Interface
- Toggled
- Loop
- (x, y) coordinates

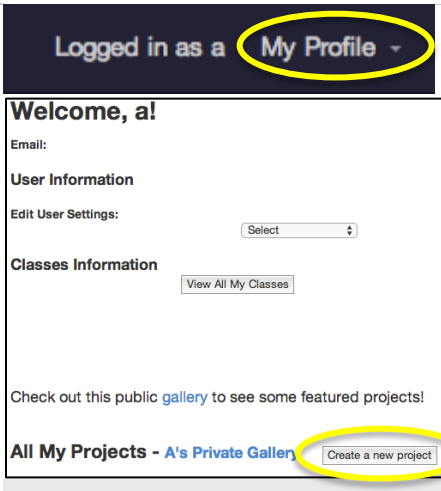
Part 1: Create a StarLogo Nova account and log in

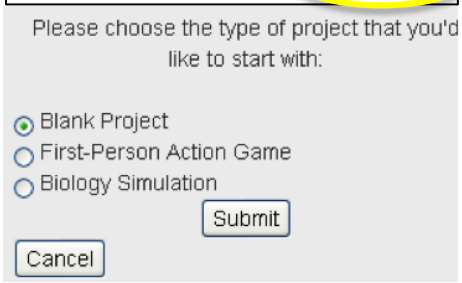
1. In a web browser with an internet connection, navigate to www.SLnova.org.
    - If you already have a StarLogo Nova account, skip the next step.





2. If you do not yet have a SLNova account, click the Register link and follow the directions.
    - You can create a new username + password OR register with a google account. We ask for your email ONLY for password recovery.

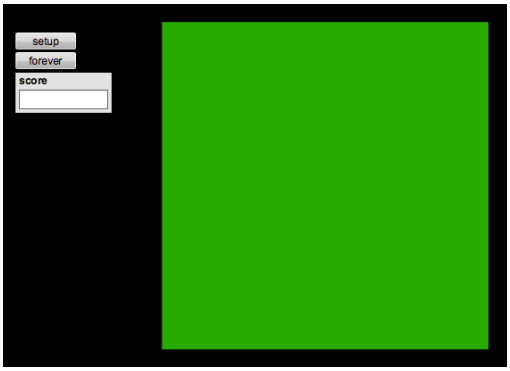




3. Create a new project
    - After login is successful, click on My Profile.
    - Click the “Create a new project” button.
    - Choose “Blank Project” and click “Submit”.

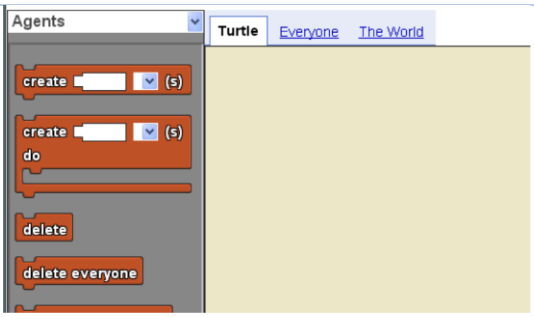
More info: If you have a google account, you can log into StarLogo Nova with it by clicking the appropriate link on the log in section. You can also change your username to something more personal.

Part 2: StarLogo Nova Interface



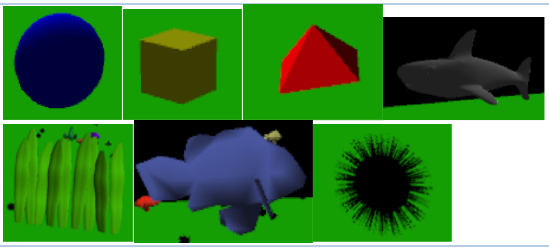
StarLogo Nova has two main parts:
1. The top part, called SpaceLand, is a 3D world where agents follow the programs. It consists of a green flat plane (called the terrain).

Note that it has several buttons. The “setup” button, “forever” button and “score” box are called “widgets”.

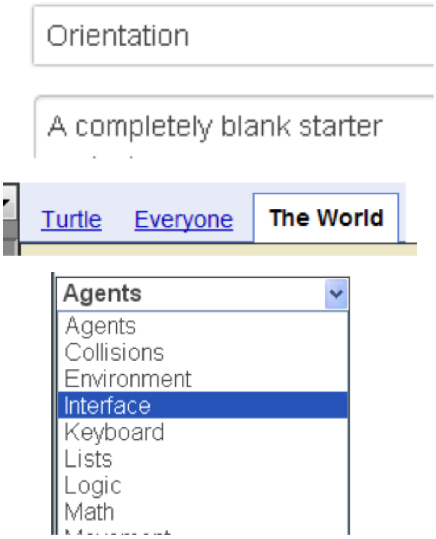


2. Programming is basically putting together a logical sequence of directions.

The bottom part, called the Workspace, contains drawers of blocks that represent the programming commands, and pages where you snap the blocks together to write programs.



3. An agent is represented by a 3D model. You can select from simple built-in shapes or a library of 3D models.

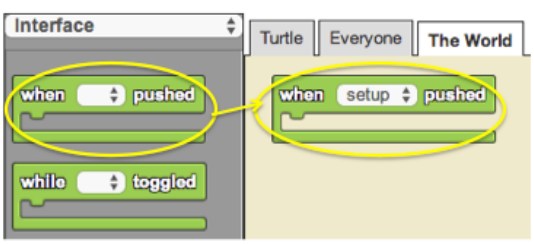


4. Basic Orientation
- Change the project title “Untitled – Blank Project” to “Orientation”. Then click Save in the bar at the top of the page.
- Scroll down to the Workspace and you will see tabs with the names: “Turtle”, “Everyone” and “The World”. Click on the different tabs to switch between pages.
- Click on the “The World” tab and prepare to create some agents
- On the left you will see the drawers. Click on a drawer name to open that drawer to see the blocks within
- Open the **Interface** drawer. In the next part, you will drag blocks from the drawers to build a program

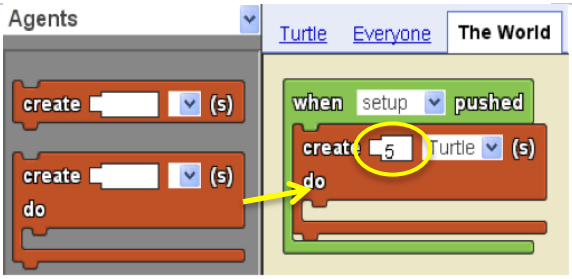
More Info: The drawers each represent a set of related blocks a programmer may use in StarLogo Nova

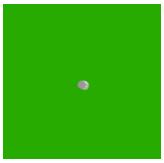
Part 3: Create agents

A blank project comes with one breed called Turtle and a "setup" button. In this part, you will program The World to create Turtle agents when the user clicks the "setup" button.



1. Dragging a Block
   - Drag the "when___pushed" block from the **Interface** drawer onto the World page and select "setup" from the drop down menu

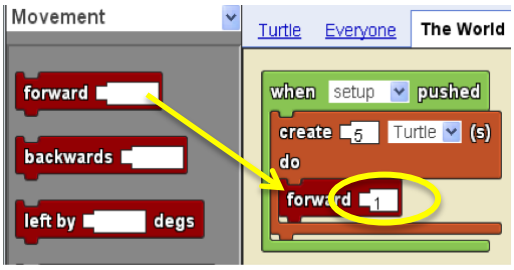


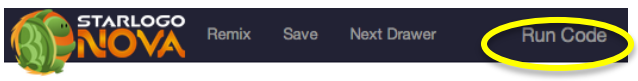


2. Creating your Turtle Agents
   - Open the Agents drawer
   - Create 5 Turtle Agents by dragging the "create___do" block and placing it inside the "when___pushed" block.
   - Type "5" in the socket of the "create___do" block and select "Turtle" from the drop down menu
   - Scroll to SpaceLand and check your progress by clicking "Run Code" then click the "setup" button. You should be able to see a tiny white circle in the middle of SpaceLand.

More info:

- You can drop blocks onto the pages to make that breed of agents follow the programs on that page. In this case, "The World" will be creating the turtles
- The "when___pushed" block executes commands when the push button widget is pushed.
- The "create___do" block creates agents of the selected breed and tells each of the newly created agents to do specific commands right away.



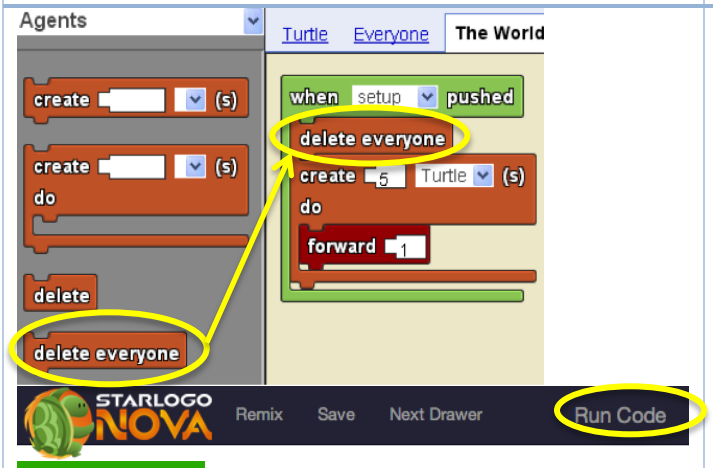


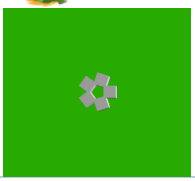
3. Turtle Movement

Where are the 4 other agents? When created, all the agents begin at the same starting position in the middle of SpaceLand.

- Try to program the turtle to each take 1 step forward as soon as they are created.
- Open the **Movement** drawer
- Drag the "forward___" block and place it inside the "create___do" block
- Type "1" into the "forward ___" block

- Check your progress by clicking “Run Code” then the “setup” button.





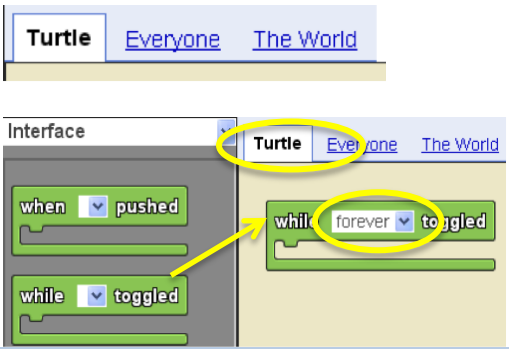
4. *Why does it look like there are more than 5 agents?* Every time you click the “Setup” button, five more agents will be created. To fix this delete the previously created agents before creating new ones.

- Open the Agents drawer
- Drag the “delete everyone” block and place it above the “create___do” block still inside the “when___pushed” block

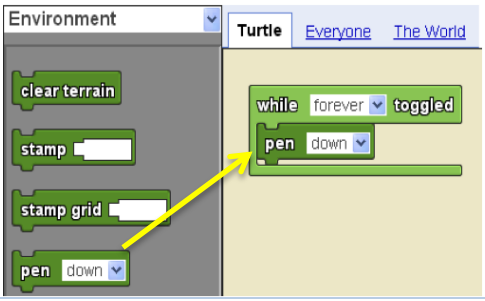
Check your progress by clicking “Run Code” then the “setup” button. You should see 5 turtle agents in the SpaceLand

Part 4: Draw a flower

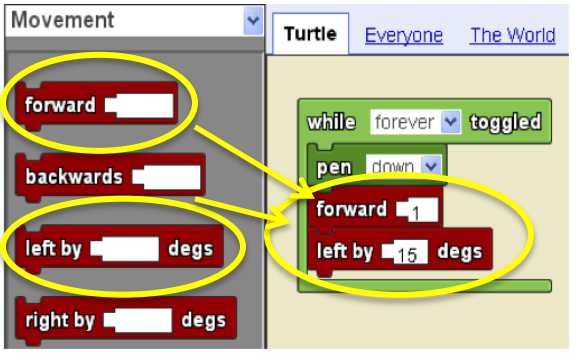
In this part, you will make the Turtles draw a flower



1. Program the Turtle Agents
   - Go back to the Workspace and open the Turtles page.
     - *The Turtle agents will run the programs you create here*
   - Open the **Interface** drawer
   - Drag the "while___toggled" block onto the Turtles page
   - Select "forever" from the drop down menu on the "while___toggled" block



2. Make the Turtle agents leave a trail as they move.
   - Open the **Environment** drawer
   - Drag the "pen down" block and place it inside the "while___toggled" block.

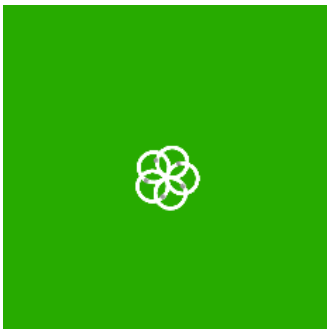
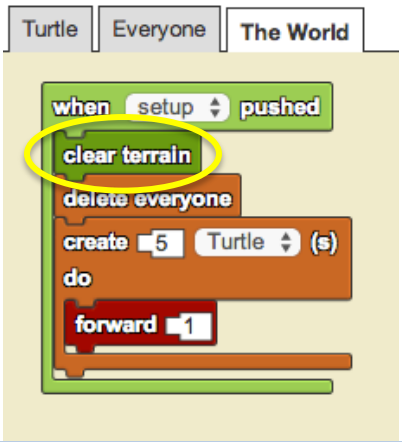
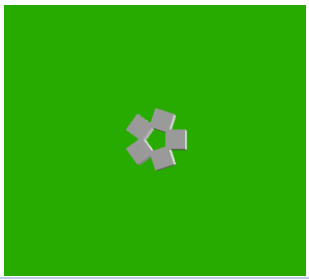


3. Make the Turtle agents move in a circle.
   - Open the **Movement** drawer
   - Drag the "forward___" block on the Turtles page and place it under the "pen down" block.
   - Type "1" in the "forward___" block socket
   - Drag the "left by___degs" block and place it under the "forward___" block. (The "forward___" and "left by___degs" blocks should be inside the "while___toggled" block)
   - Type "15" in the "left by___degs" block socket

The turtle agents will follow these instructions over and over, resulting in a circular path

More info:

- "Forever" is a toggle button widget, like an on/off button. When it's toggled "on", the "while___toggled" block runs all commands contained in it, in order from top to bottom, over and over again. This is also called a "loop".
- The "pen down" block tells agents to leave behind a trail of color. The color of the trail corresponds to the color of the agent.

	4. Check Your Progress • Click the “setup” button. • Click the “forever” button. • You should see the Turtles draw 5 white circles which make a flower • Click on the “forever” button again to stop the simulation.
	5. Clear terrain If you click setup again, you’ll notice that the flower drawing is still on the terrain. To reset the simulation back to an all green terrain do the following things: • Open the **Environment** drawer • Drag a “clear terrain” block onto “the World” page • Place the “clear terrain” block above the “delete everyone” block inside the “when___pushed block”
	6. Check Your Progress • Scroll to SpaceLand and check your progress by clicking “Run Code” then click the “setup” button. • You should see the terrain reset to its default green color

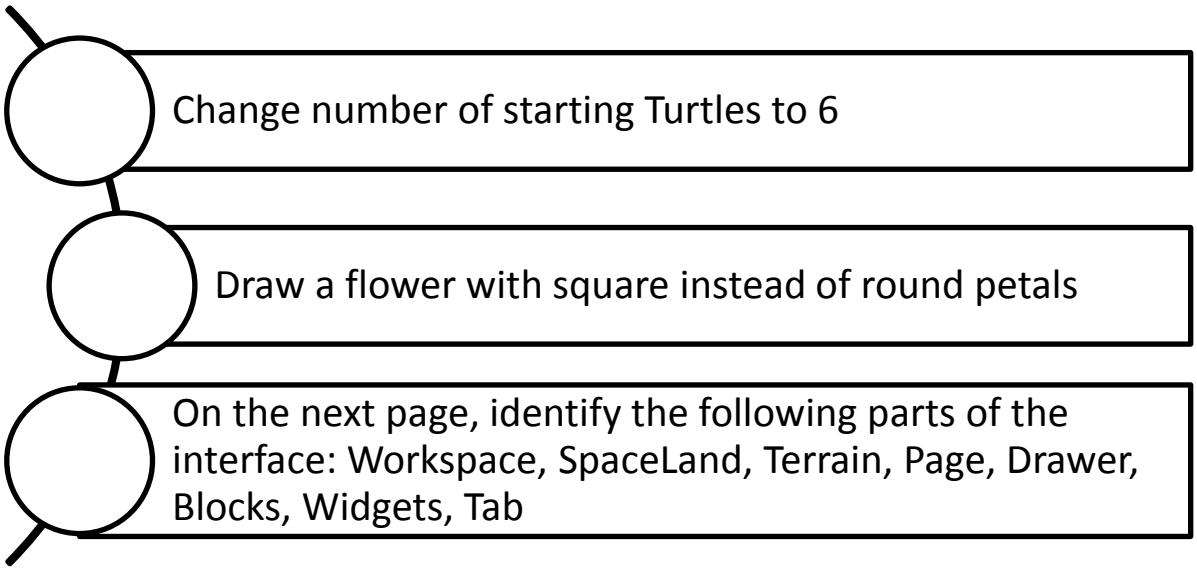
Part 5: Exit Ticket

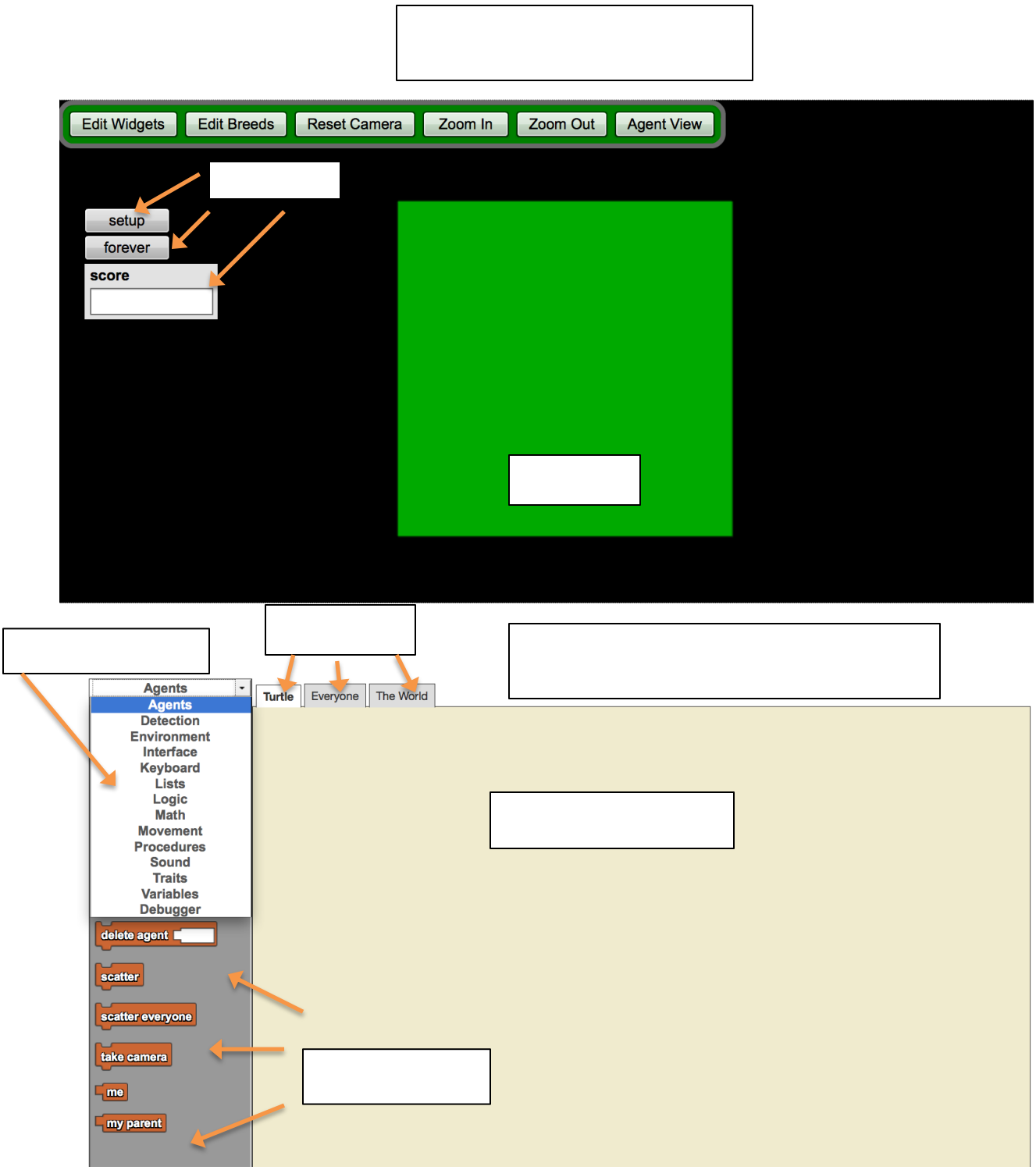
The purpose of the exit ticket is to check your understanding and review what you've learned during this activity. There are two parts and you can do either one or both. One part consists of several programming tasks. The other part consists of a few concept questions, which you discuss with a partner.

Programming tasks

- You may want to REMIX (make a copy of) your project before you attempt these tasks so that you are working from another copy of the project.
- Complete each task. Try each task on your own first. You may ask clarifying questions or for hints. Although it should be self-evident if you're able to complete these tasks, feel free to ask a facilitator to check your solutions.

When finished with the tasks, click Save.





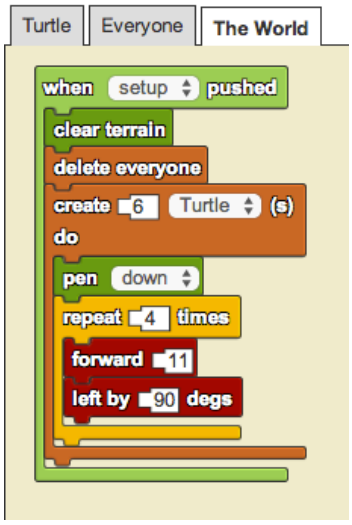
Orientation Concept Questions

Concept Question #1

With your partner look at the following two pieces of code and answer the questions below.

a) Which, if any or both, will create a flower with 6 square petals?
b) How are the two pieces of code different?
c) How are they similar?

Code #1

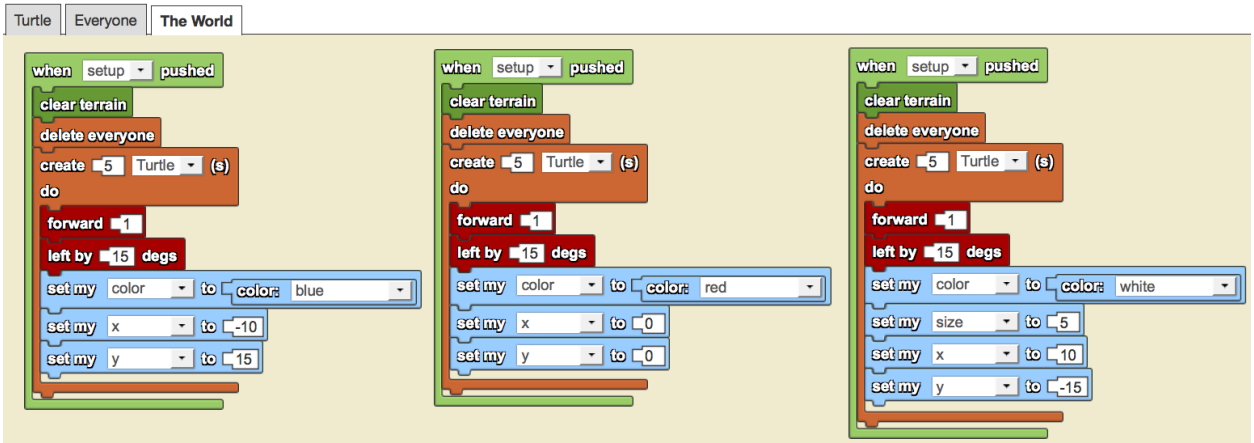


Code #2

Concept Question #2

You want to program turtles to draw three different flowers in three different locations. With your partner look at the following piece of code and answer the questions below.

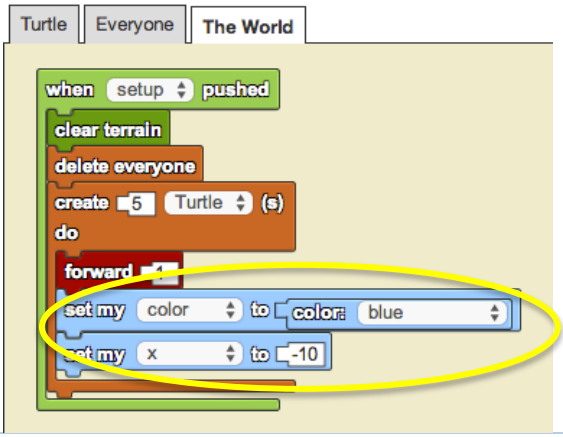
a) Predict what you think will happen when setup is pushed.
b) Test the code to check your prediction. [**http://tinyurl.com/OrientationConceptQuestion]**
c) How can you fix the code to do what you intended?



Part 6: Extensions

With whatever remaining time you have in this section, try the following explorations:

Examples:

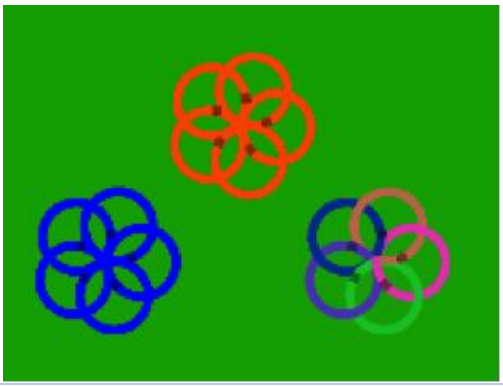


Use the existing blocks or new blocks from the Movement drawer to explore variations on the flower drawing program by changing the:

- number of agents
- number of degrees of the turn
- direction of the turn
- number of steps forward
- direction of steps (try back instead of forward)

Look in Traits drawer to use "set my___ to" blocks to change (see example):

- color of agents
- size of agents
- starting location (x, y) of agents



Challenge:
Draw 3 flowers in different locations that are different colors.

Hint: You can have more than 1 "create___" block inside ONE "when *setup* pushed" block.

Hint: The SpaceLand is a coordinate plane with (0,0) at the center, X goes from -50 to +50 and Y goes from -50 to +50.