08_Groups_Lab Lesson Plan

Description

In this lesson, students will learn how to use groups to make their code more efficient. Students will learn how to make a group of sprites through a code along and will work with a partner using the driver/navigator protocol to enforce their understanding.

Objectives

- I can create a group of sprites.
- I can create individual sprites.
- I can make individual sprites interact with groups of sprites.

Brain-Starter + Hook (10 min)

Prompt:
You have **4 minutes** to recreate the above image. Each circle should be its own sprite.

Turn && Talk: Answer the following questions with your partner.

- Did you finish the task?
- How did it feel?

Mini-Discussion: have students share their experiences. Explain that we can do this process even faster using groups.

Code Along (20 min)

Say: “While it is possible to make as many individual sprites as you would like, there are easier ways. Today we will see a p5 play group, which allows us to make multiple sprites at once.”

Every student should duplicate an editor that has p5 play linked and title it 08_Groups. Students should code along with the class.

```
var dotList //variable to hold the group of dot sprites
var player1 //variable for sprite that is NOT part of a group

function setup() {
  new Canvas(800, 400);

  dotList = new Group() //creation of group

  // OPTION 1:
  //this for loop iterates and adds a new sprite to the dotList (30 in total because of
```

```
the condition) and makes it appear on the canvas
  for (var i=0; i<30; i+=1) {
    new dotList.Sprite(i*20,25,10)
  }

  //OPTION 2
  //this for loop iterates and adds a new sprite to the dotList every 20 pixels along
the x axis until there is no more room.
  for (var j=0; j<width; j+=20) {
    new dotList.Sprite(j,50,10)
  }

  //you can change a property of the sprites by using dot notation.
  dotList.color = "pink"

  //you can change a single sprite by using indexing and dot notation
  dotList[8].color = "blue"

  player1 = new Sprite()
}



function draw() {
  background(255);

  //you can move dots just as you can move sprites -- this must happen in the draw
function!
  // dotList.moveTowards(mouse.x, mouse.y)

  player1.moveTowards(mouse.x,mouse.y) //lets see how the sprite interacts with the
group elements.

}
```

Questions to ask during code along:

1. Where do we make variables?
2. Where do we initialize variables?
3. What is the difference between the draw function and the setup function?
4. Why is it helpful to use iteration (or a for loop) to make a group?
5. What happens when you try to move an entire group towards the mouse?
6. Why does the .moveTowards() need to be in the draw function? Why can't it be in function setup?

Pause frequently during code along to take questions and comments.

Lab Exploration (30 - 45 min)

Regroup students into pairs. Students will be working in the Driver/Navigator Protocol which should have been introduced prior to this lesson.

> Driver: Student who types on the computer
> Navigator: Student who decides what should be coded, gives instructions to driver.

Sample Lab Instructions for Students

```
function setup() {
  createCanvas(400, 400);

}

function draw() {
  background(220);
}

//Challenges:

//1. Create a group of ellipse sprites horizontally

//2. Create a group of rectangle sprites vertically

//3. Use indexing to change a property of ONE of your sprites in each group.

//4. Create a non-Grouped sprite.

//5. Have the non-Grouped sprite interact with the Groups you created in some way
(think: movement of group and collision)
```

Debrief (7 min)

Say: “We have now learned about individual sprites and groups. Let’s think about how they compare.”

Ask the students to pick a question and answer it on an exit slip.

- What are the advantages of groups and sprites?
- What are the disadvantages of groups and sprites?

Have students share out at their tables and then ask for popcorn responses.