**1.2.2 Bubbles - More While Loop Practice**

**Introduction**

In this assignment we will build a scenario that creates disco light objects and moves them across the stage.

Concepts covered are:

* More logical operators
* More abstraction
* More arrays
* More while loops
* Keywords: **import, while**

**Materials**

* Computer with Greenfoot
* Source files - piano.zip

**Activity**

**Part I: Logical Operations & Abstraction**

1. Download bubbles.zip. Unzip the folder into your Greenfoot projects folder. Open the project.
2. Instantiate a few bubbles into the world and run it...what happens? What is the initial color, size, direction of movement, etc?
3. Take a look at the Space class source code.

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| * Write a method called setup() to have the world create 21 bubbles in random locations. |

1. No we will alter our functions so that they use loops. For reference, here is the while loop syntax.

declare a variable to control the loop

**while** ( conditional )

{

statement;

statement;

…

increment control variable

}

It is very common for programmers to use a variable to control the number of **iterations** of a loop.

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| * Change setup() so that it uses a loop to place 21 bubbles in the center of the world instead of in random locations. * Write a second method called setupLine(). This one will use a while loop to create 21 bubbles in the world on a diagonal. The bubbles will be created 30 units apart: first one at (0,0), next at (30,30) next at (60,60) etc.      * Change setupLine() so that it will place them on a slightly different diagonal line: from the top left corner to the bottom right corner. The last bubble should be created at 900,600. * Add a second loop to the setup() method that places 10 more bubbles in a horizontal line starting at x = 300, y = 100. Increase x by 40 to place the next bubble (ex. next bubble is at 340,100). As you place new bubbles, increase their size by 10 as well. |

1. Now that you’ve gotten down the loop

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| * Remove all your previous loops from setup() so we can create the ultra-double-dog-loop-of-fantastico! * Write a new loop that does the following:   + Creates 18 bubbles placed in the center of the world but with sizes starting at 190 and decreasing by 10 each time.   + As the bubbles are created, they should also get an initial direction starting at 0 and increasing by 20 with each new bubble. Look at the bubble constructors to help you out! |