Schedule for 3D Oculus Rift Workshop October 1, 2016

**Items needed**
- Clear box with coordinates marked
- Oculus Rift
- Whiteboard, erasers, and markers
- Cheat-sheet
- Schedule
- The Absolute Beginner's Guide To Coding Using Processing (available on Amazon)
- 2D coordinate grid worksheets
- Code for walk-through(s)
- Pencils

**Brief Introduction and overview of Schedule**

**Time:** 5 min
Discuss schedule for remainder of day. Ask what types of things they want in their scenes by the end of the day.

**Peanut Butter and Jelly**

**Time:** 15 min

**The Coordinate System – 2D**

**Time:** 5 min
- Learn the coordinate grid for Processing
- Practice locating points and drawing shapes using the coordinate grid worksheet

**Questions to ask:**
- Which coordinate comes first, x or y?
  - *X is always first.*
- How does the Processing grid differ from the usual coordinate grid?
  - *Y increases going down.*

**2D Shapes – Rects and Ellipses**

**Time:** 15 min
- Learn Processing template
- Learn to draw basic shapes

**Resources:** Beginners’ Guide to Processing pp. 11-13; code for walkthrough

**Questions to ask:**
- What point of the rectangle is the x, y coordinate?
  - *The top left corner.*
- What point of the ellipse is the x, y coordinate?
  - *The center.*
2D Shapes – Triangles and Build a House

Time: 30 min

Goals:
Learn to draw triangles and quadrilaterals
Draw a house using a combination of shapes

Resources: Beginners’ Guide to Processing pp. 11-13; code for walkthrough; code for house

Questions to ask:
Why do we list all three points of a triangle?
We can draw many shapes of triangle, so we have to specify which triangle we want to draw.

Why do we have to draw the points in a quadrilateral in a specific order?
If we don’t, we end up with a mixed-up shape.

Colors

Time: 25 min

Use RGB values to color house
Experiment with using colors

Reference: Beginners’ Guide to Processing pp. 16-21;

Questions to ask:
How do you remove a color once you have added it?
Comment out the code to remove it. Use noFill().

What happens if you use noFill() for a shape that has another shape beneath part of it?
The color of the other shape will show through.

How does this differ from commenting out the color?
Commenting out the color sets the color of the shape to be the same as the previous fill() command.

How is this different from using Fill(255, 255, 255)?
Fill(255, 255, 255) is the command to fill with white.

How is strokeWeight() different from the other commands?
It changes the thickness of the lines instead of changing their color.

3D Coordinate System

Time: 5-7 min

Learn how the 3D coordinate system looks in Processing
Look at box to learn about 3D points
Identify 3D points using (x, y, z) coordinates

Reference: Clear box with coordinates marked. Questions to ask for identifying points.

Pass around: Clear box for them to look at
3D Shapes
Time: 15 min
Learn to specify 3D renderer in code
Sphere, sphereDetail(), Ellipsoid, Box, and Cylinder

Translate – 3D
Time: 15 min
Learn translate and that it goes between pushMatrix() and popMatrix()

Extended Translate Activity to create Lawn
Time: 20 min
Learn to translate and resize to create new shapes in a method

Camera Navigation 3D without Oculus
Time: 5 min
Learn to use the keyboard to navigate through 3D space for the camera
Looking at house previously drawn using camera
Reference: Sheet listing which keys achieve what result

Brainstorming Session – how to plan a scene
Time: 15 min

How to Draw a Flower function (challenge)
Time: 25 min
Teach the girls to draw a flower and make it into a function
Let them experiment

Additional topics if they are interested:
  Animation, collision detection, and game state
  how this technology could be used for a social issue