Lesson Overview
Infographics are a great way to visualize data. Rather than charts with numbers, designers are getting better and better at creating graphics that illustrate important aspects of data sets. In this activity, students will use Size Wise to create a small poster that shows how far away from the camera various objects need to be so that they all appear the same size on the screen. This type of effect is often called forced perspective photography. Along with creating your poster, there will be a few other challenges along the way.

After students either sketch their objects, they will take a picture in Size Wize, and line up calipers for each. The calipers are specific to each object with their real world heights. The data window shows how far away each object is from the camera.
Intro Info

Forced Perspective Photography

As objects get further from our view, and from cameras, they appear smaller on screen. People can appear to crush tall buildings, pour waterfalls from bottles, or stand in the hand of a friend.

What would it take to make 5 things of vastly different heights appear to be the same size in a photo?

Infographics and Data Visualization

Infographics help us understand data at an intuitive level.

The visual representation of data makes it easier to understand because the numbers are brought to the scale of daily life.

Learning Objectives:
From this activity, students will be able to:

- Use ratio language to describe a ratio relationship between two quantities
- Follow a multi-step procedure when performing technical tasks
- Use ratios to solve real world problems that pertain to designing digital media

What you need to get started
A set of iPads with the Size Wise app

Time Needed
Depending on how much time you want to spend on this project, anywhere from 1 class period (if students are already familiar with Size Wise) to 3 class periods.
Collaboration and Group Work
These lessons are designed for students to work individually, in pairs, or in groups. Each student should do all the work on their own sheets, and the iPad should be shared across group members as equally as possible.

We suggest that groups be no larger than four students. Four or more students in a group will require extra attention to make sure that every group member is contributing equally.

Lesson Plan

Introduction
Discuss and/or review forced perspective photography and infographics. For both, there are lots of inspiring examples and videos of images online.

To do
1) The student sheets guide them to make sketches and use Size Wise to find data.
2) Make sure they are making their sketches the same height, and not spending too much time drawing.
3) Looking at the questions, included below, gather data from the class for numbers 4 and 5 on the board in front of the room.
4) Circulate the room and check for understanding, help students as needed.

Sharing
1) With each lesson, spend some time allowing the students to share their work with the class. In this lesson, students can share difficulties they might be having as well as successes in finding equations and making their posters.
2) If possible, post their infographics around the room.
3) You might also invite students to continue thinking about noticing the relative sizes of things, opportunities for forced perspective photographs, and to keep an eye out for the ubiquity of infographics.

Wrapup
If necessary, have students label their iPads so they will be able to return to them for the next lessons.
Questions

1) In the form, \( y = mx + b \), what is the equation of the line between the 2nd and 4th objects? (Use the two \((x, y)\) coordinates to find the equation of the line.)

2) If you plug into your equation actual real heights for the 1st, 5th objects, and you, what do you get?

<table>
<thead>
<tr>
<th>Objects</th>
<th>Actual heights</th>
<th>Distance from camera based on equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) Size wise gave you a distance from camera for objects 1, 5 and you, and your equation probably gave you slightly different data. Explain this discrepancy.

4) The chart below shows actual heights of 3 different objects. Using your equation, estimate the distances they would have to be from the camera.

<table>
<thead>
<tr>
<th>Object</th>
<th>Actual Height</th>
<th>Distance from iPad so that it appears the same height as you and your other objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tallest tree in the world (A redwood in northern California called Hyperion)</td>
<td>380 ft.</td>
<td></td>
</tr>
<tr>
<td>Average hobbit</td>
<td>4 ft.</td>
<td></td>
</tr>
<tr>
<td>Tallest known dinosaur, the brachiosaurus</td>
<td>59 ft.</td>
<td></td>
</tr>
</tbody>
</table>

5) Compare the data you found in #4 with what your classmates find. Should you all be finding pretty close to the same distances? Explain any discrepancies.
LASTLY!

Now you have all the data you need and you're ready to create your final infographic on one coherent poster. For design inspiration, you can follow the example on the first page. Or formulate your own graphic design in a new way that makes sense of the data.

First create some rough sketches to layout your poster.

Then, use poster paper, color pencils or crayons or markers. You could also use printed images of your objects. Or, design the whole thing on a computer and print!

Students can start with rough sketches. Be sure to emphasize that their drawing abilities are not a barrier to a fantastic infographic.
Sample infographic poster made with Size Wise

<table>
<thead>
<tr>
<th>Height</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; tall</td>
<td>1' away</td>
</tr>
<tr>
<td>3' tall</td>
<td>5' away</td>
</tr>
<tr>
<td>5' tall</td>
<td>8' away</td>
</tr>
<tr>
<td>305' tall</td>
<td>700' away</td>
</tr>
<tr>
<td>1454' tall</td>
<td>2500' away</td>
</tr>
</tbody>
</table>

YOU

_SIZE WISE_

iPod