**Panoptes and the Bionic Eye Worksheet**

**Vocabulary**

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| **Word** | **Definition** | **Notes** |
| **retina** | The photo-sensitive region of the eye. |  |
| **cerebral cortex** | The outermost layer of the brain, which is responsible for high-level sensory processing and integration (and more). |  |
| **visual field** | The space visible to a person or other organism at a given time. |  |
| **visual cortex** | The area of the brain that is responsible for processing visual data. |  |
| **primary visual cortex (V1)** | The first area in the visual cortex to receive visual information from the eye. |  |
| **visual pathway** | The anatomical route that visual information takes from the eye through the central nervous system. |  |
| **neuron** | The primary cell of the central nervous system. |  |
| **histogram** | A graphical representation of quantities in different categories. |  |
| **receptive field** | A sub-region of the visual field that causes a reliable response from a given part of the visual pathway. |  |

**Blind Spot Questions**

1. Can you find your blind spots?
2. Why don’t you notice a “hole” in your vision all the time? How do you think your brain hides your blind spots?

**Running the Experiment: Collecting Data**

**Steps**

Find out how Panoptes sees the outside world by flashing the light in a regular pattern.

Quickly, make three or four passes of the zig-zag pattern shown below.

**Stim expert:**

* Hold the flashlight right up to the mask.
* Point the light straight ahead through the hole, and drag it along the path.
* Count off the holes as you pass them by.

**Recording expert:**

* Press the right arrow button on the NXT once each time the Stim expert counts.

**Tips:**

* Have the person scanning the light count off each hole **just before** shining light through it.
* The person marking time must mark every event **just once.**
* The amount of time the NXT can record is short, so move through the grid quickly, but shine through each hole for a full count.

**End of Stage 1**

**Making Histograms**

Often, “raw” data is not as clear as it could be. Summarize the spike counts caused by the randomized conditions below by making a bar chart (histogram) of the counts according to condition.



**Organizing the Results**

Notice that we started the zig-zag pattern at the top right—from our perspective. But from the perspective of Pantopes, it is the top-left. The visual field chart on the next page begins numbering the locations from the top-left.



**Visual Field Chart**

