

## Down Syndrome Lab

**Purpose:** To use measurements to predict individuals with Down syndrome

**Protocol:** You will be answering the first few questions based off the mini lecture that will be given before you start the lab. You will then take the lecture and apply it to your own research. You will be measuring with a ruler various mice in order to tell if they have Down syndrome or not. You will then fill out the provided data table with your results and use the results to create two different bar graphs in order to compare your data. You will then finish by explaining your data in the conclusion section and inform me of what mice have Down syndrome and what mice do not.

**Terms:**

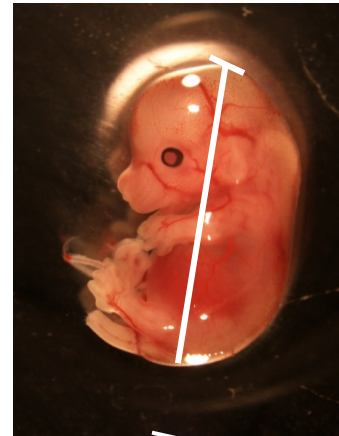
Crown: the top of the mouse's head

Rump: the place where the mouse's tail begins

Nasal-Anal Length: the length of the mouse from the nose tip to where the tail begins (in mm)

**Materials:**

- Ruler
- Pen/pencil
- Data tables
- Mouse Images



**Hypothesis:**

*Mouse models can be great tools to test human conditions such as Down syndrome.*

**Today's Activity:**

- 1) What are the similarities and what are the differences that you see in the pictures of the people shown?

Picture 1 & 2 similarities:

Picture 1 & 2 differences:

Picture 3 & 4 similarities:

Picture 3 & 4 differences:

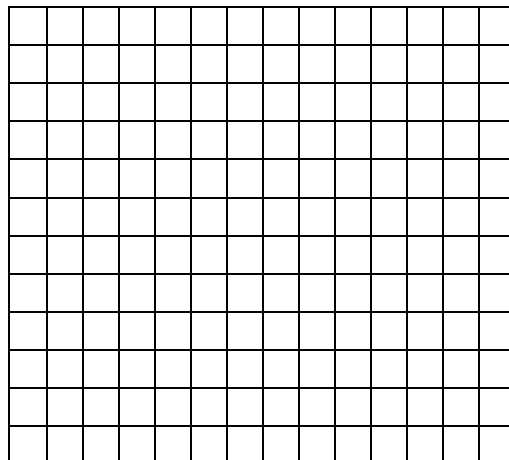
- 2) Using the following images in the *first appendix* you need to measure the nasal-anal length, or the length of the mouse from the nose tip to where the tail begins in mm. Place your results in *Table 1*.

Image Number	Length (mm)
<i>Figure A</i>	
<i>Figure B</i>	
<i>Figure C</i>	
<i>Figure D</i>	

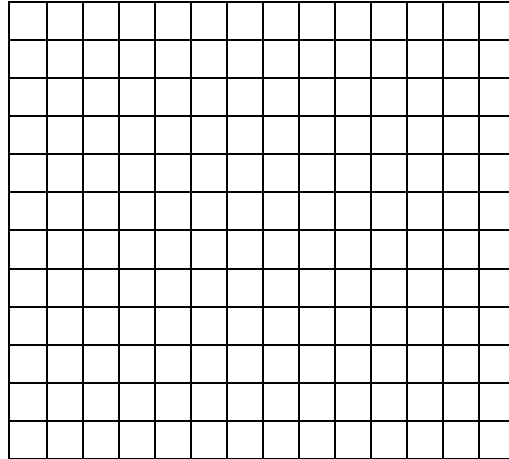
- 3) Using the following images in the *second appendix* you will need to measure the crown to rump length in mm. Place your results in *Table 2*.

Image Number	Length (mm)
<i>Figure 1</i>	
<i>Figure 2</i>	
<i>Figure 3</i>	
<i>Figure 4</i>	
<i>Figure 5</i>	
<i>Figure 6</i>	
<i>Figure 7</i>	
<i>Figure 8</i>	

- 4) Using the information from *Table 1* create a bar graph comparing the nasal-anal length of individual mice A-D.



- 5) Using the information from **Table 2** create a bar graph comparing the **crown-rump length** (in mm) of different mice shown 8 photos provided.



**Conclusions:** Scientists have found that mice carrying an extra chromosome are smaller than littermates with the expected number of chromosomes. Given that information, and the data you have graphed,

- 6) Which mice in Figures A – D are normal?
- 7) Which mice in Figures A – D have Down syndrome?
- 8) Which mice in Figures 1 – 8 are normal?
- 9) Which mice in Figures 1 – 8 have Down syndrome?
- 10) What conclusions can you come up with about the hypothesis?

*Appendix 1*



*Figure 1*



*Figure 3*



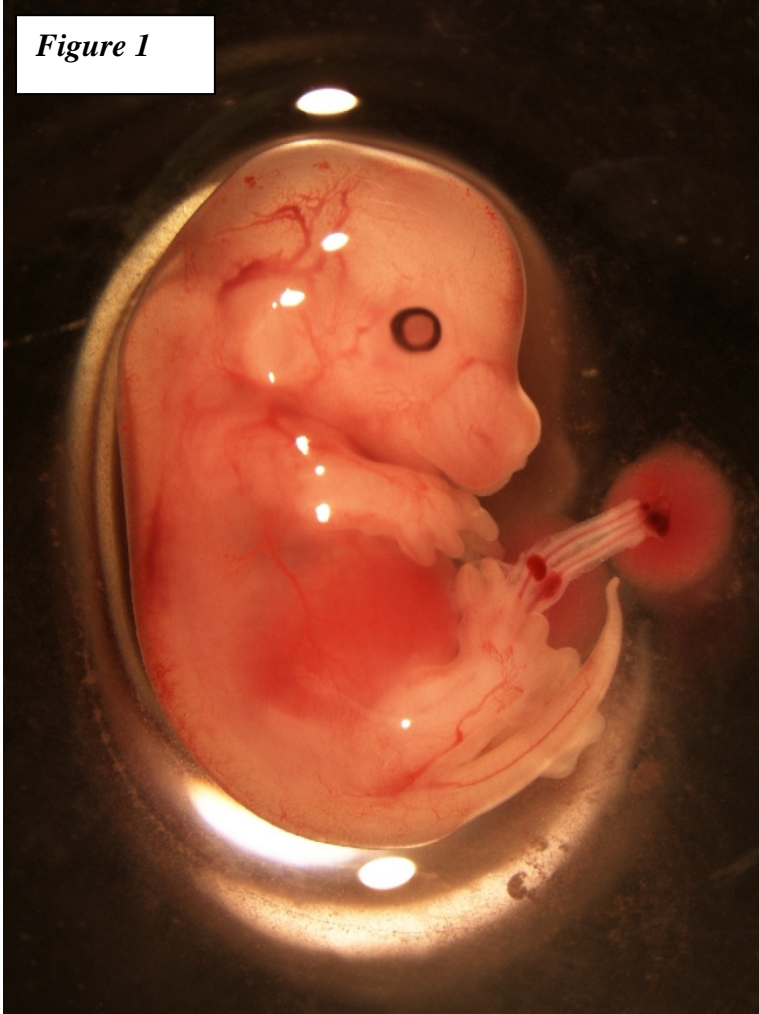
*Figure 2*



*Figure 4*

*Appendix 2*

*Figure 1*



*Figure 2*



*Figure 3*



*Figure 4*



*Appendix 2*

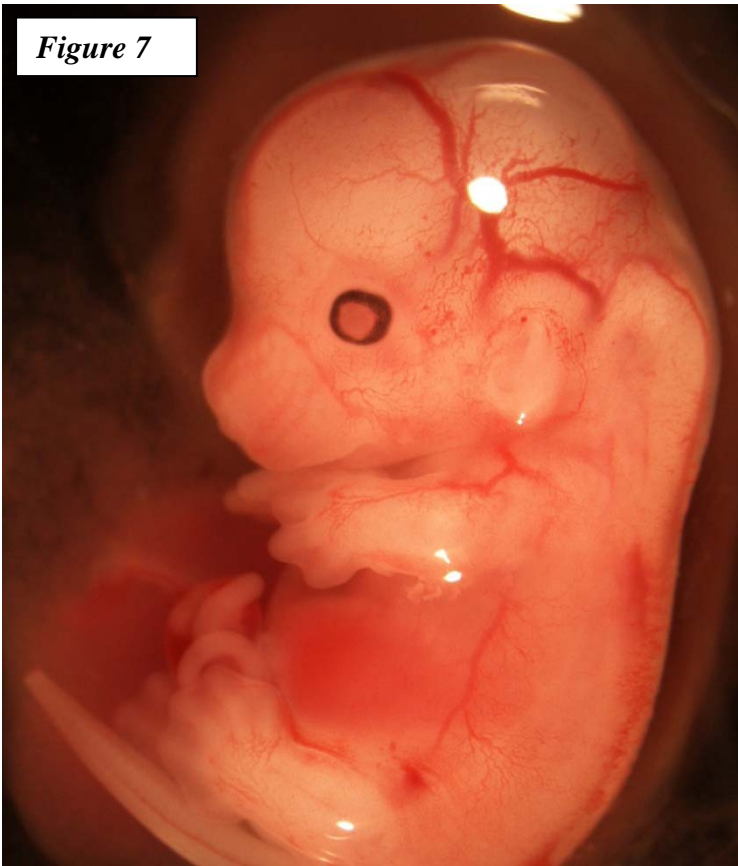
*Figure 5*



*Figure 6*



*Figure 7*



*Figure 8*

