Launch – Reaction Time   **Name:**_____

At the 2003 World Championships in Paris, American sprinter Jon Drummond was disqualified after a second false start in a 100-meter dash race. The reason Drummond and another man were disqualified from their heat was because their reaction times were too fast out of the starting blocks. Drummond's registered reaction time of 0.053 seconds is below the 0.1 second limit allowed in sprint races. What made this false start memorable was his protest after the disqualification. You can watch the video of Drummond's heat from the link below. It is a long clip but only the first 3 minutes or so is necessary. At 2:45 of the video, there is an overhead view of the reactions of the runners.

https://www.youtube.com/watch?v=Cxn7yaOfEoY

- Why is reaction time important in sprinting? What other activities would reaction time be important?

Baseball hitting link: http://www.exploratorium.edu/baseball/reactiontime.html

Baseball reaction time link: https://www.youtube.com/watch?v=tMujgAAyH-I

Questions to consider:
- How would flying drones and video gaming be similar?
- How do they train drone operators or airline pilots?

How Fast Are You?

In the 100-meter dash, the race is often decided by who can react to the gun the fastest.

In drag racing, reaction time at the start could earn you $1000's of dollars.

Popular game shows depend on having a quick reaction time to succeed in earning points.

There are separate competitions and races for male and female sprinters, but in the other two activities listed above males and females compete side by side.   Who has the advantage? Who has better reaction times: males or females? Write your prediction below:

Collect Data:
Go to the web site http://www.amstat.org/education/cas/2.cfm to test and record your reaction time.

After completing your trials, report your time(s) to your teacher. If you get a value of 1 second or greater, try again and don't record that value.

Trial	Time
1	
2	
3	

Copy the class charts below.

Male

Time	Time	Time

Female

Time	Time	Time

Create a dot plot of the data for males and females using technology.

Using the dot plots for the females' and males' reaction time, make an educated guess at what you think the mean is for each gender.

1. Males' Estimate: _____   Females' Estimate: _____

2. Explain how you estimated the means above. Provide one sentence for each estimation.

3. Include a screen shot of the dot plot for males' and females' mean reaction times.

Male

Female

4. Calculate the mean and median of the males and females in your class and mark them on your line plot. How far off were your predictions? (You may use Tuva to calculate.)

5. Describe the spread of the data for males and females in terms of the appearance and also using statistical computations.

6. Describe the distribution of reaction times from the line plot. *Why do you think it has this shape?* (Consider the physical capabilities of the human body.)

7. At the beginning of this lesson, the question was asked if females or males have faster reaction times. Answer this question and support your answer with statistical evidence as well as referencing the graph and your frequency tables. Write in complete sentences. Use all evidence pertinent in your response.

8. Do you believe the results of this experiment are accurate? Why or why not? If not, what could be modified to make the results more accurate and valid? Be specific and give details in your response.

9. Do you think that the results of the experiment we conducted could be generalized to all males and females of a similar age in the state? In the United States? Why or why not? Be specific.