Investigate Your Sense of Balance!

The sense of balance is complex since it combines sensory input from the eyes, inner ear, and stretch receptors located in the tendons and muscles. Today we are going to investigate the role your eyes play in keeping your balance.

Procedure:

1. Make sure your LabQuest is turned on and the Force Plate is plugged into Channel 1.
2. Double-check the settings on the right side of the screen. The Mode should be "time based", the Rate should be "50 samples/s", and the Duration should be "10 s". If any of these is not correct, tap on the box and edit it.
3. Zero the force sensor: tap on the red box that says "Ch 1: Force", then select "zero".
4. When the first person is ready, s/he should balance on one foot with eyes open and another person will press the "collect" button (green sideways triangle on bottom left of screen).
5. Data will stop collecting on its own at 10 seconds.
6. Now, tap on the menu heading (on top of the screen) "Analyze". Select Statistics.
7. Record the standard deviation (std.dev. in the data table below).
8. Tap on the menu heading (on top of the screen) "Table" then "Clear All Data".
9. Repeat steps 3-8 with the first person's eyes closed.
10. Repeat all again for everyone in your group.

Data Analysis:

Standard Deviations while you balance on one foot

Person	Eyes Open	Eyes Closed

1. The standard deviations you measured indicate how much you "wobbled" because it tells how far away a measurement is from the mean or average. In this case, the standard deviation of the force is a measure of how hard or easy it is for you to balance. So – was it easier to balance with your eyes open or closed?

2. Did everyone in your group have the same results? If not, why not?

Extension Activities:

You probably noticed that some people have a better sense of balance than others. Think of three reasons why this may be so. Then as a class, decide which one to test.