

## Balance

1. In the Electronic Resources you will find PDF and word-processing files of the student experiment. You can print the PDF, distribute it to students electronically, or post the file to a password-protected class web page or learning management system. Edit the word-processing file if you would like to tailor the experiment to suit your equipment and students. See Appendix A for more information or sign in to your account at [www.vernier.com/account](http://www.vernier.com/account) to access the Electronic Resources.
2. Ask students whether they are experiencing balance problems or any issues with their feet or legs before allowing them to proceed with the experiment.
3. Make sure subjects are clear of furniture or objects that could harm them if they lose their balance. You may also choose to appoint a spotter to each subject, especially when they are balancing with their eyes closed.
4. Some students have extremely poor balance. Reassure them that this is part of biological variability.
5. If you are using Go Direct sensors, see [www.vernier.com/start/go-direct](http://www.vernier.com/start/go-direct) for information about how to connect your sensor.
6. For additional information about the Vernier probeware used in this experiment, including tips and product specifications, visit [www.vernier.com/manuals](http://www.vernier.com/manuals) and download the appropriate user manual.

### ESTIMATED TIME

We estimate that this experiment can be completed in one 45–60 minute class period.

### NEXT GENERATION SCIENCE STANDARDS (NGSS)

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data	LS1.A: Structure and Function	Cause and Effect Structure and Function

**SAMPLE DATA**

Table 1: Standing on Both Feet	
	Acceleration (m/s <sup>2</sup> )
Eyes open	0.335
Eyes closed	0.972

Table 2: Standing on One Foot		
	Standing on left foot  Acceleration (m/s <sup>2</sup> )	Standing on right foot  Acceleration (m/s <sup>2</sup> )
Eyes open	0.757	0.541
Eyes closed	4.650	6.153

**ANSWERS TO THE DATA ANALYSIS QUESTIONS**

1. Answers will vary, but balance is typically more difficult to maintain when eyes are closed, even when standing on both feet. Students may see more movement in the form of increased acceleration when eyes are closed.
2. Balance on one foot should be noticeably more difficult to maintain without visual input. Movement should increase when eyes are closed.
3. Answers will vary. Many people find it easier to balance on one foot than the other.
4. Answers will vary. Regular participation in activities such as gymnastics and yoga tends to improve balance.