

# EXPERIMENT DESIGN TIPS

## EXPLORE 1B LESSON 17



### Support for Planning and Carrying Out an Investigation

<p>To determine the <b>PURPOSE</b> of your experiment, think about the following questions:</p> <ul style="list-style-type: none"> <li>• What claim are you trying to test?</li> <li>• Why are you trying to test this claim?</li> <li>• What will testing this claim allow you to do or figure out about the module phenomenon?</li> </ul>	<p>To determine <b>WHAT TYPE OF DATA</b> you need to collect, think about the following questions:</p> <ul style="list-style-type: none"> <li>• What are you trying to measure?</li> <li>• How will you determine how much carbon dioxide is produced when exhaling?</li> <li>• What type of measurements or observations will you need to record during your investigation?</li> <li>• To what level of precision are you able to measure?</li> </ul>
<p>To determine <b>HOW YOU WILL COLLECT AND ANALYZE YOUR DATA</b>, think about the following questions:</p> <ul style="list-style-type: none"> <li>• What are the independent, dependent, and controlled variables for your experiment?</li> <li>• What will serve as a control (or comparison) condition?</li> <li>• What types of treatment conditions will you need to set up, and how will you do it?</li> <li>• How often will you collect data, and when will you do it?</li> <li>• How many trials will you perform? <ul style="list-style-type: none"> <li>○ Why?</li> <li>○ How will you keep track of the data you collect, and how will you organize it?</li> </ul> </li> <li>• How will you analyze and present your data (e.g., data table, graph, using statistics such as mean, median, average, standard deviation)?</li> </ul>	<p>To help you <b>ELIMINATE CONFOUNDING VARIABLES</b> in your design, consider:</p> <ul style="list-style-type: none"> <li>• How do you know the experimental conditions are consistent across samples? Across trials?</li> <li>• How do you know that only the independent variable is changing between samples? Between trials?</li> <li>• How will you make sure that your data are of high quality (i.e., how will you reduce error and make sure other confounding variables do not influence your data)?</li> <li>• Could there be a third variable changing across your experiment that is not the independent or dependent variable?</li> <li>• What variables might you not be accounting for?</li> </ul>