

To test for student understanding, we should minimize other potential sources of variation. For instance, while we may want to test students' ability to generate a hypothesis, this skill requires much more content-specific knowledge. In addition, having students design experiments for domain areas that are new to them may make it difficult to determine whether they are struggling with the experimental design principles or with their understanding of the new content.

Prompt to elicit knowledge about experimental design that can be adapted for authentic assignments and tasks

An experimental hypothesis is used to predict a measurable variable. This measurable variable of a hypothesis (sometimes called a **dependent variable**) may depend on other variables that can be manipulated experimentally or observed (sometimes called **independent variables**). A well-designed experiment will:

- test how variation in the dependent variable is associated with variation in the independent variable(s)
- account for variables that could affect either the dependent or independent variables, for example by fixing their values or interpreting their effect on the dependent variable
- be able to provide evidence in support of (or against) the hypothesis.

[Given a content-specific testable hypothesis or a small set of hypotheses, refer to one already developed by student(s) in more authentic assignment]

Design/propose/reflect on an experiment to test your hypothesis that accounts for the above elements of experimental design.