**Independent and Dependent Variables**

In research, **variables**are any characteristics that can take on different values, such as height, age, species, or exam score.

In scientific research, we often want to study the effect of one variable on another one. For example, you might want to test whether students who spend more time studying get better exam scores.

The variables in a study of a cause-and-effect relationship are called the **independent and dependent variables**.

* The **independent variable** is the **cause**. Its value is *independent* of other variables in your study.
* The **dependent variable** is the **effect**. Its value *depends* on changes in the independent variable.

| **Examples of independent and dependent variables** | | |
| --- | --- | --- |
| **Research Question** | **Independent variable(s)** | **Dependent variable(s)** |
| **Do tomatoes grow fastest under fluorescent, incandescent, or natural light?** | * The type of light the tomato plant is grown under | * The rate of growth of the tomato plant |
| **What is the effect of diet and regular soda on blood sugar levels?** | * The type of soda you drink (diet or regular) | * Your blood sugar levels |
| **How does phone use before bedtime affect sleep?** | * The amount of phone use before bed | * Number of hours of sleep * Quality of sleep |
| **How well do different plant species tolerate salt water?** | * The amount of salt added to the plants’ water | * Plant growth * Plant wilting * Plant survival rate |