Analyzing Experiments Practice

> **Assignment Goal:** (1) practice identifying independent, dependent, and controlled variables, (2) practice writing hypotheses, and (3) practice writing axes labels on graphs.

Directions

1. Read the following passages about real experimental and observational studies completed in the last few years.

2. In each, identify the independent and dependent variables. It may help you to highlight the variables in the experimental question (the title of each page) and/or the passage.

3. For the graph sketch, write in the axes labels. If you are working on paper, sketch a line or bars to show how you think the graph might look. If you are working online, drag and adjust the bars or line from the side of the slide.

4. For the hypotheses, you are practicing the format of the hypothesis. It is okay to align your hypothesis with the actual results of the experiment! Think about the "because" - this is where your "educated guess" may be.

Do social isolation and lockdown help limit the spread of coronavirus?

Both Belgium and Rwanda have populations around 12 million people. In the first month that each country had cases of COVID-19, Belgium went from 2 cases to 7,400 while Rwanda went from 2 cases to only 134.

In Rwanda, officials immediately began contact tracing and isolated people who were potentially exposed to the virus. They locked down the country 7 days after the first confirmed case of the virus. In Belgium, it took 17 days before they began locking down regions of the country, and over a month before schools and restaurants closed.

Moore, J. "What African Nations Are Teaching the West About Fighting the Coronavirus." *The New Yorker*, 15 May 2020.

Independent Variable	
Dependent Variable	
Controlled Variable (list one)	
Hypothesis	If then because

# Does air pollution affect pregnancy outcomes?

In this study, the researchers looked at how pregnancy outcomes in the United States changed depending on the amount of air pollution in the area where the mother lived. Negative pregnancy outcomes included low birth weight, babies born too early, and babies who died. The looked at data from 2007 to 2019.

The researchers found that the higher the air pollution (they looked at ozone and particulate matter), the worse the pregnancy outcomes. One additional finding was that living in areas with worse air pollution was more common for Black women, which means that Black women will have worse pregnancy outcomes.

Bekkar, B., S Pancheco, and R. Basu. "Association of Air Pollution and Heat Exposure With Preterm Birth, Low Birth Weight, and Stillbirth in the US: A Systematic Review." *Journal of the American Medical Association Network Open*, vol. 3, no. 6, June 2020. doi:10.1001/jamanetworkopen.2020.8243

Independent Variable	
Dependent Variable	

Graph Sketch:
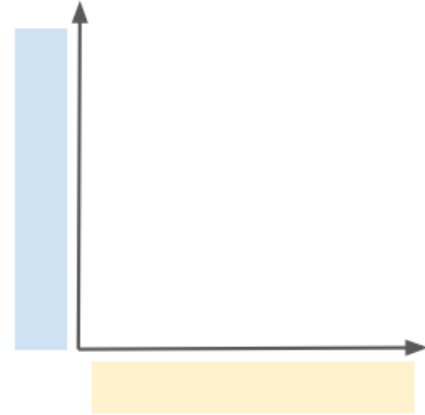
Can gut bacteria affect the risk of heart disease?

Some bacteria in the human intestines are considered "good" and some are considered "bad". Scientists have found that some "bad" bacteria produce a chemical called TMA, which causes clogged arteries that can lead to heart disease.

Scientists recently discovered a new bacteria. *E. limosum*, that stops TMA from being made. They think that more *E. limosum* people have in their intestines, the less likely they will be to have clogged arteries.

Kountz, D.J., E.J. Behrman, L. Zhang, and J.A. Krzycki. MtcB, a member of the MttB superfamily from the human gut acetogen Eubacterium limosum, is a cobalamin-dependent carnitine demethylase. *Journal of Biological Chemistry*, 2020. doi:10.1074/jbc.RA120.012934

Independent Variable	
Dependent Variable	

Graph Sketch: