Types of Data

Scientific Notation

The appropriate units to use when making measurements

Measurement	Units
Length	meter
Temperature	Kelvin
Mass	gram
Volume (liquid)	liter
Volume (solid)	$meter^3$
Time	second

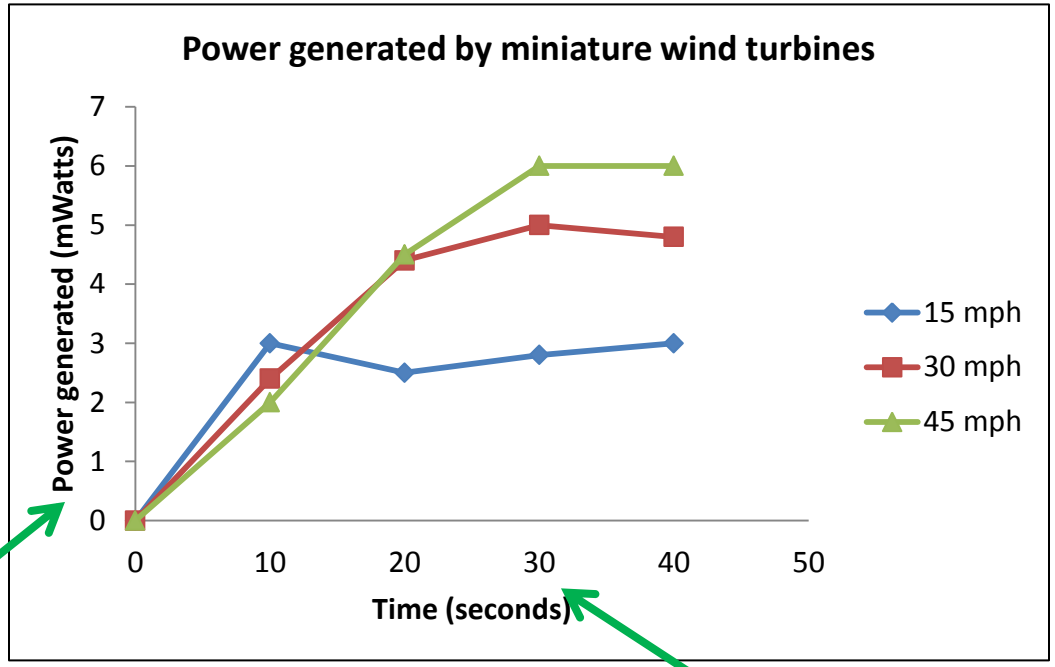
Prefixes: Kilo: 1000

centi: 1/100

milli: 1/1000

micro: 1/1000000

Presenting data using graphs



the dependent variable

the independent variable

Labeling Graphs

Graph titles should be *descriptive* and explain the results.

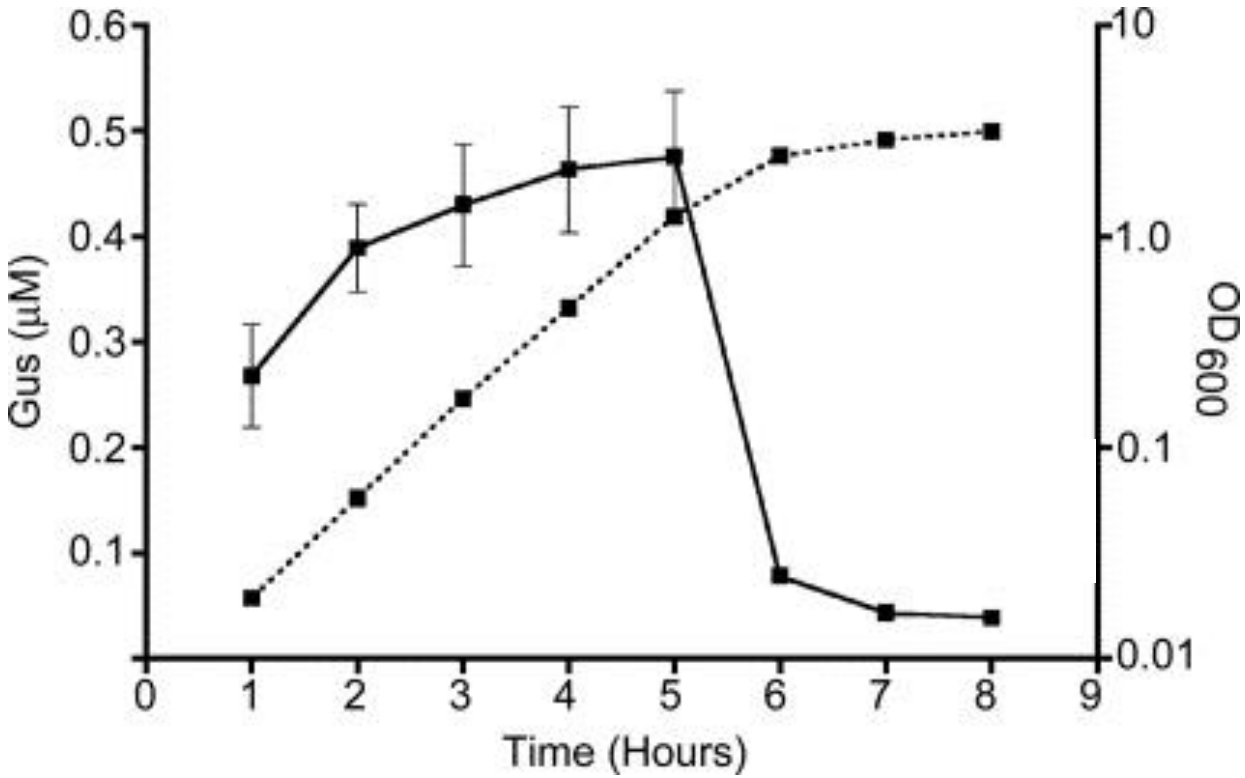
GRAPH TITLE FORMULAS:

The Effect of _____ on _____

The Relationship between _____ and _____

" _____ vs _____" is not acceptable

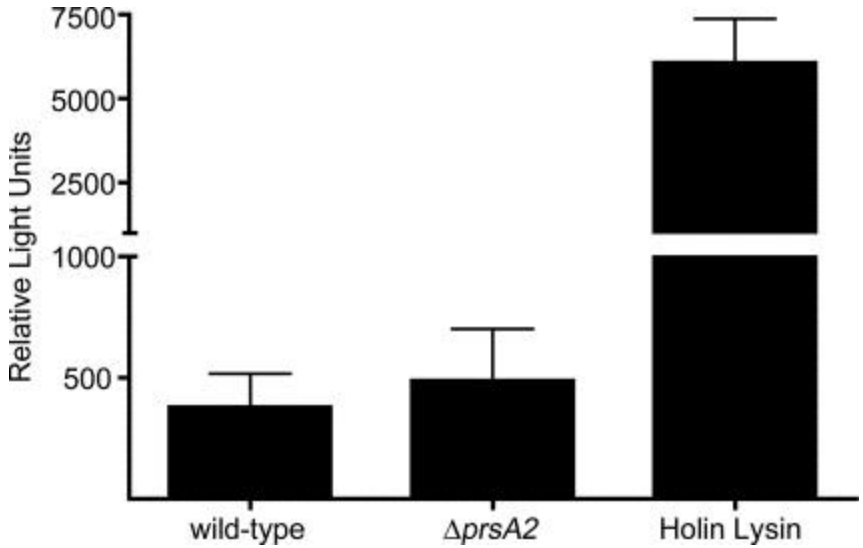
Presenting data using graphs (publications)



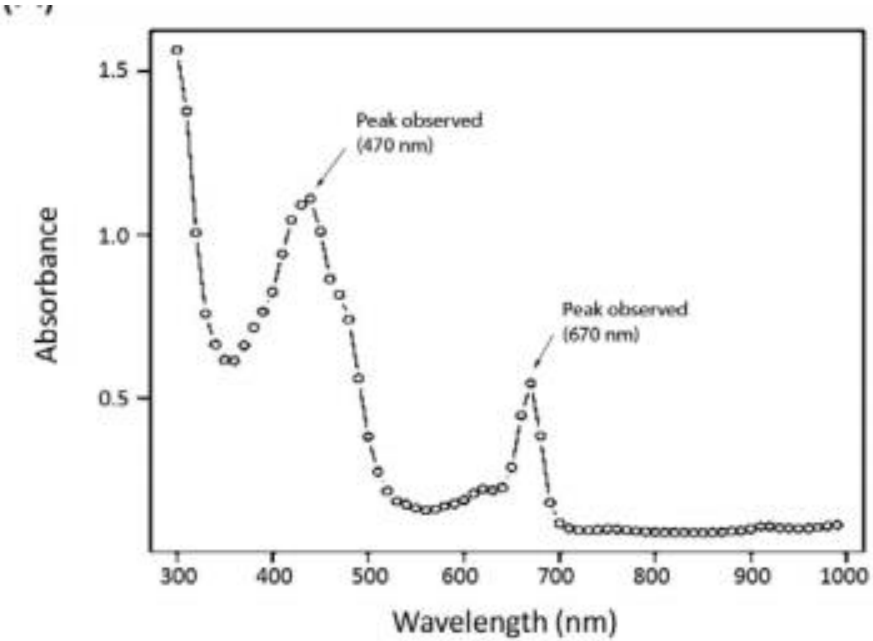
Forster et al. , 2011
J. Bacteriology

***prsA2* is expressed during exponential growth in broth culture.** *L. monocytogenes* strain 10403S carrying pJZ095 (strain DP-L5755) was grown for 8 h in BHI medium. Each hour, an OD_{600}measurement was taken, and the β-glucuronidase (Gus) level from 1 ml of culture was measured. The levels of Gus were normalized to the OD_{600} measurements of the culture at each time point. The error bars represent the standard errors of the means. Data were collected from duplicate samples from three independent experiments. Solid line: Gus concentration; Dashed line: OD_{600}.

When to use a bar graph OR line graph



Forster et al. , 2011
J. Bacteriology

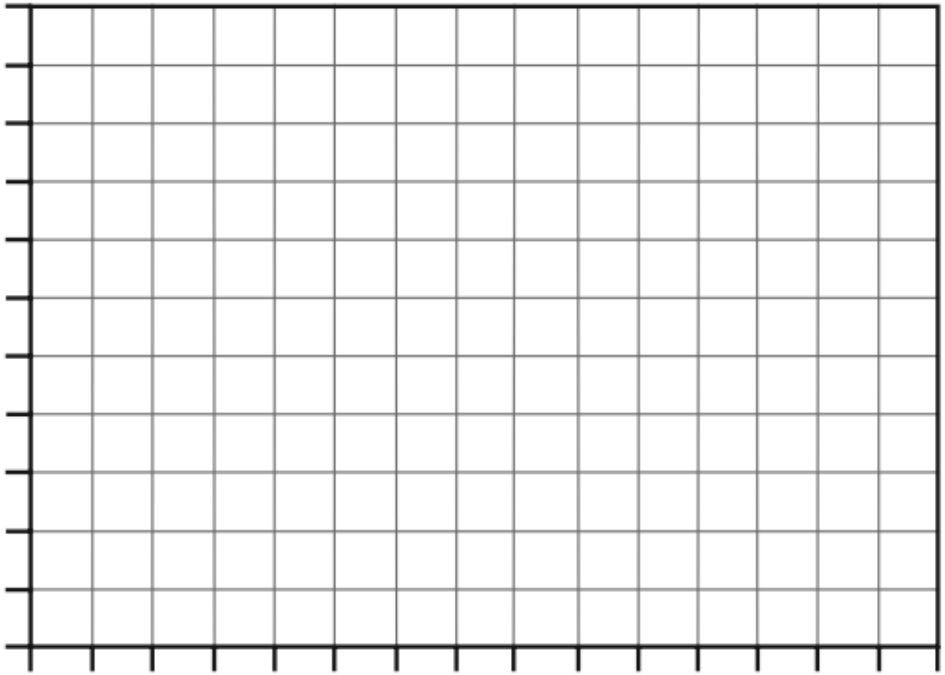


Ramirez et al.
JMBE (In Review)

Properly preparing a graph

In order to determine the effect of a certain antibiotic on a bacterium, an experiment was performed. The antibiotic was added to a culture of bacteria. Every couple of days, a sample of the culture was taken and the number of bacteria present was counted. The results are shown below.

Days incubated with antibiotic	0	1	3	5	6	7
# of Bacteria Present in Culture	1000	500	50	200	500	1000



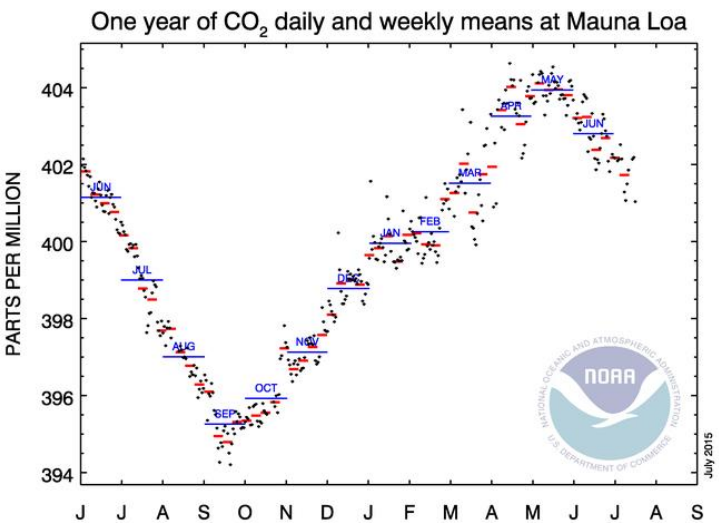
Writing a valid conclusion from a graph

State the relationship between the independent and dependent variable.

*Give a scientifically valid **reason** as to why you see this trend in the data.*

_____. This may be due to _____.

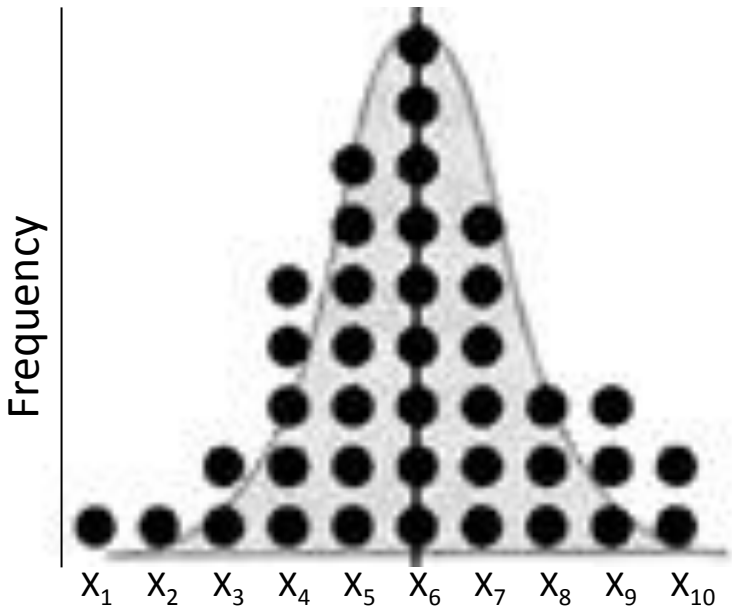
Example:



Measures of Central Tendency

When looking at your data, you may notice that the majority of the numbers focus around the center of your data set or distribution. Three measures of central tendency include:

Sample Data



Mean:

Median:

Mode:

Measures of Central Tendency

The table below shows the temperature outside Connelly Hall at 11:00am for 5 consecutive days.

Monday	Tuesday	Wednesday	Thursday	Friday
20°C	13.4°C	22.8°C	19.5°C	13.4°C

Mean:

Median:

Mode: