How has the bloom timing of forsythia changed in the state of Maine over the last 30 years?

What question would you like to explore? Write your question as a complete sentence.

Does your question ask about the **variability** within a group of data points?

(i.e. the range of the data, the shape of the distribution, or what the center of the data is)

(one group, one variable)

YES

Examples:
1. Do all high tides rise to the same height?
2. How variable are windspeeds here?
3. What is the range and distribution of incomes in the United States?
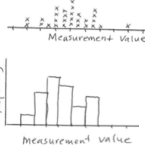
make a → **FREQUENCY PLOT**

For each group make a

either → **DOT PLOT**

HISTOGRAM

BOX PLOT

Do you want to compare the **variability of all data points** in each group to decide if any difference between the groups is *meaningful?*

Examples:
1. Which of the two car designs is most consistently the fastest?
2. Is there a meaningful difference in the heights of fertilized and unfertilized bean plants?

Does your question **compare two or more groups** to decide if the groups are the same or different?
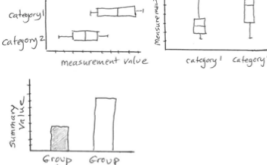
(two groups, one variable)

YES

Are you comparing **single numbers** that summarize a group? (such as mean, median, or total...)

Examples:
1. Was the total snowfall greater this winter than last winter?
2. Do cats and dogs have the same average body temperature?
3. How do the median incomes for the U.S. and Sweden compare?

make a → **BAR GRAPH**

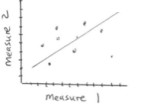Does your question ask if **two numeric factors are correlated?**

(one group, two variables)

YES → Does it ask about how something changes through **linear TIME?**

NO

Examples:
1. Is the fuel efficiency of a car related to its weight?
2. Are smoking rates correlated with median income?
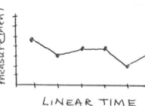3. Given a fixed volume, how are temperature and pressure related?

make a → **SCATTER PLOT**

YES

Examples:
1. Have summer lake water temperatures warmed over the last ten years?
2. How did my weight change over the last 3 months?

make a → **LINE GRAPH**

Does your question ask how a **total** is **proportioned** into sub-groups? (Or what proportion a sub-group is of a total?)

(one group with sub-groups, one variable)

YES

Examples:
1. Which circuit accounts for the largest proportion of the electricity use by our household?
2. What proportion of U.S. energy comes from wind?
3. What proportion of U.S. residents take public transportation to work?

make either → **PIE CHART**

STACKED BAR CHART

The Maine Data Literacy Project -- Graph Choice Chart
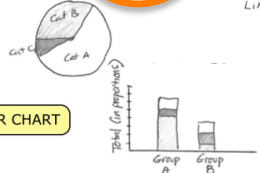©2011- Schoodic Institute - University of Maine (rev.25 Mar 2014)

Figure 3: Example using the Graph Choice Chart