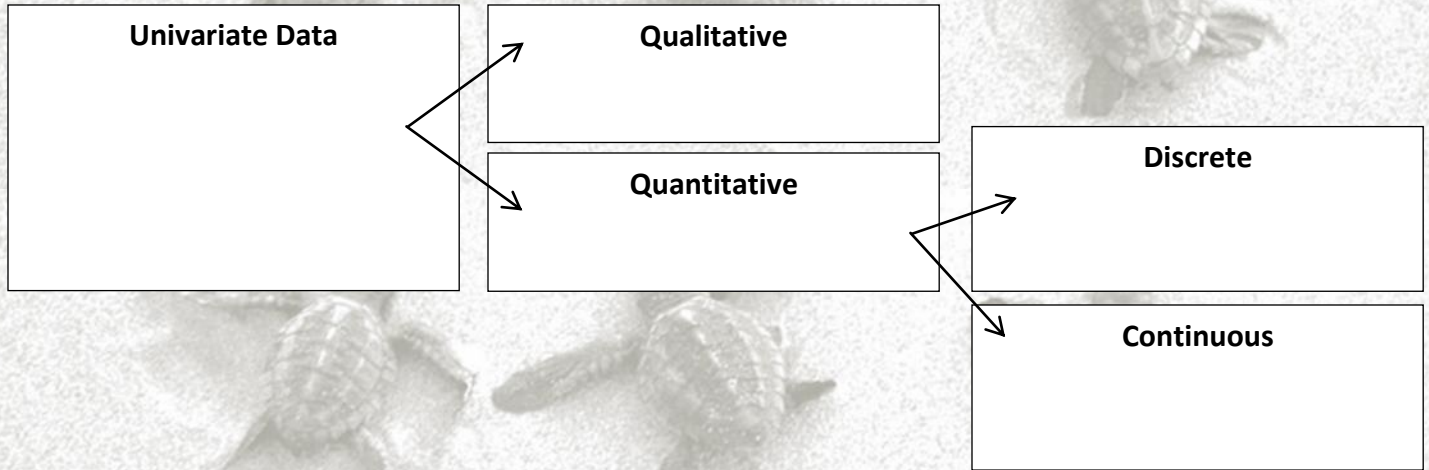


Types of Data



Bar Chart or Histogram?

Classify each of the following quantitative data types as either discrete or continuous.

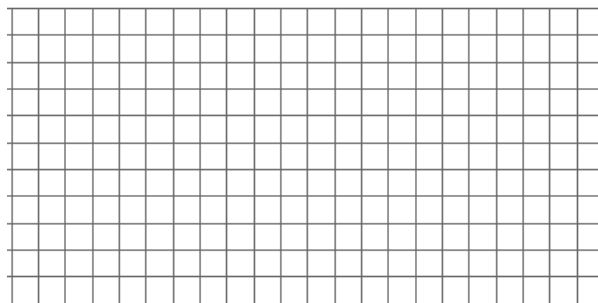
1. The number of sea turtles tagged by researchers.
2. The length of the sea turtle.
3. The time taken to catch, tag, and release the sea turtle.
4. The number of biologists working to tag the sea turtle.
5. The number of sea turtle nests along the Atlantic Coast in 2014.
6. The time sea turtle eggs incubate before hatching.

An easy way to look for patterns in a large set of data is to create a frequency table, bar chart, or histogram.

A researcher catches 100 sea turtles. The turtles are measured and then released. The lengths, t cm, of these turtles are shown in the frequency table.

Length (t cm)	$0 \leq t < 25$	$25 \leq t < 50$	$50 \leq t < 75$	$75 \leq t < 100$
Frequency (Number of Turtles)	17	28	40	15

Determine whether the data should be displayed in a bar chart or a histogram and create the appropriate display.



Creating a Box Plot

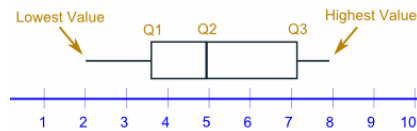
What are they and why are they useful?

A box plot is a type of graph used to represent univariate data.

They are useful because they show:

- _____
- _____
- _____
- _____

A box plot is a graph of a data set along a number line where the box represents the middle 50% of data and the whiskers extend to the maximum and minimum values to represent the other 50% of the data.



How do I make one?

Step 1:

Find the 5-Number Summary for the data: the minimum, maximum, median (Q2), first quartile (Q1), and third quartile (Q3).

Step 2:

Construct a consistent scale with values that include the minimum and maximum.

Step 3:

Construct a box (rectangle) extending from Q1 to Q3 and draw a vertical line in the box at the median value (Q2).

Step 4:

Draw lines extending outward to the minimum and maximum values.

What about outliers?

An outlier is a value that is located _____ from almost all of the other values.

Outliers can have a dramatic effect on the _____, _____, & _____ of a data set.

Mathematically, an outlier is a value that is:

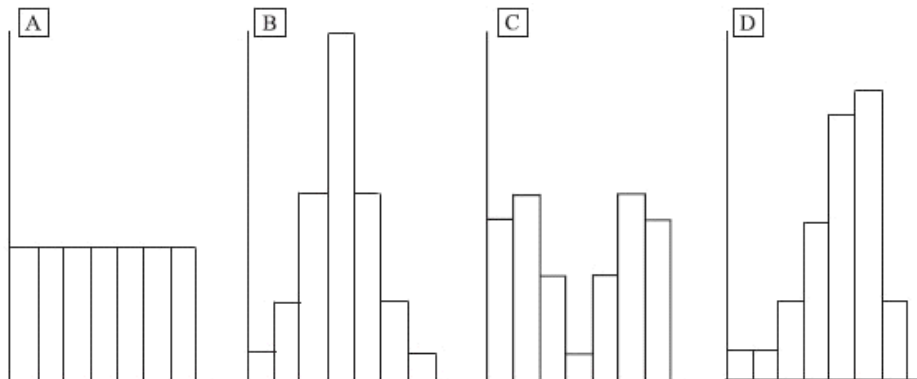
- Above Q3 (or below Q1) by an amount greater than _____

The IQR is the Interquartile Range, or _____.

The box plot is modified by extending the whiskers to the minimum or maximum value that is not an outlier.

Example

The four populations A, B, C and D are the same size and have the same range. Frequency histograms for the four populations are given below.



Each of the three box and whisker plots below corresponds to one of the four populations. Write the letter of the correct population above each plot.



Data Analysis

Sea Turtle Nesting Data



“The Statewide Nesting Beach Survey (SNBS) program was initiated in 1979 under a cooperative agreement between the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service. Its purpose is to document the total distribution, seasonality and abundance of sea turtle nesting in Florida. Three species of sea turtles, the loggerhead (*Caretta caretta*), the green turtle (*Chelonia mydas*), and the leatherback (*Dermochelys coriacea*), nest regularly on Florida's beaches. Two other species, the hawksbill (*Eretmochelys imbricata*) and Kemp's ridley (*Lepidochelys kempii*), nest infrequently. All five species are listed as either threatened or endangered under the Endangered Species Act.”

[-Florida Fish and Wildlife Conservation Commission](#)

Small Group Task

Objective: Classify, organize, represent, and analyze a set of univariate quantitative data.

Materials: Notebook paper, poster paper (or use the back of this sheet), markers/colored pencils, rulers, stapler/tape, calculators

1. Determine whether the given sea turtle nesting data on the following page is discrete or continuous. *Be prepared to defend your answer!*
2. Based on your decision from #1 above, create either a bar chart or histogram to represent the Atlantic Coast nesting data for the year your group was assigned.
3. Next, find the 5-number summary for your group's data. *Remember to identify any outliers!*
4. Create a box plot to represent your summary. Label any outliers with the county name.
5. Display your group's graphs on a poster that can easily be seen by the entire class and attach all of the work on the back of the poster.
6. When your group is finished, hang the poster for the class to see.
7. Finally, after all posters are displayed, discuss the following questions within your group and come to a consensus for the answers you will share with the class.

Questions for Small Group Discussion

1. Describe any yearly trends or fluctuations in the nesting data that you observe for the Atlantic Coast. What do you think may have caused these trends/fluctuations?
2. What counties are the outliers each year? Explain why, mathematically, these counties are considered to be outliers.
3. Would you consider these outliers to be a part of the sample worth discarding or worth investigating further? Explain your reasoning.
4. What factors do you think exist that could make Brevard, St. Lucie, and Palm Beach counties have the highest sea turtle nesting densities in the entire state? Justify your reasoning.



Statewide Sea Turtle Nesting Data

Number of Loggerhead Nests Statewide by County

		County	2010	2011	2012	2013	2014
Atlantic Coast		Nassau	199	146	208	184	114
		Duval	154	152	187	186	119
		St. Johns	825	597	651	675	446
		Flagler	458	371	563	458	400
		Volusia	2270	1978	2885	2279	1643
		Brevard	25742	22893	33799	24630	23457
		Indian River	5147	4523	6729	5101	4482
		St. Lucie	5459	5763	5840	5775	5440
		Martin	9120	7475	10441	8498	10805
		Palm Beach	15776	15282	22192	16986	24951
		Broward	2283	2126	3284	2456	2878
	Miami-Dade	352	393	498	484	485	
Gulf West Coast		Monroe	254	159	358	311	600
		Collier	778	757	1250	1091	1376
		Lee	750	961	1316	1315	1509
		Charlotte	527	713	1094	909	1323
		Sarasota	2517	2941	4695	4185	4884
		Manatee	274	280	634	690	539
		Hillsborough	29	54	61	79	47
		Pinellas	153	159	316	385	363
Gulf Panhandle		Franklin	307	387	628	665	415
		Gulf	187	251	561	292	328
		Bay	77	76	143	125	105
		Walton	36	44	118	67	60
		Okaloosa	9	31	55	56	34
		Santa Rosa	5	12	17	21	12
		Escambia	21	85	79	72	55
			73709	68609	98602	77975	86870