

Lesson Summary

- A scatter plot is a graph of numerical data on two variables.
- A pattern in a scatter plot suggests that there may be a relationship between the two variables used to construct the scatter plot.
- If two variables tend to vary together in a predictable way, we can say that there is a statistical relationship between the two variables.
- A statistical relationship between two variables does not imply that a change in one variable causes a change in the other variable (a cause-and-effect relationship).

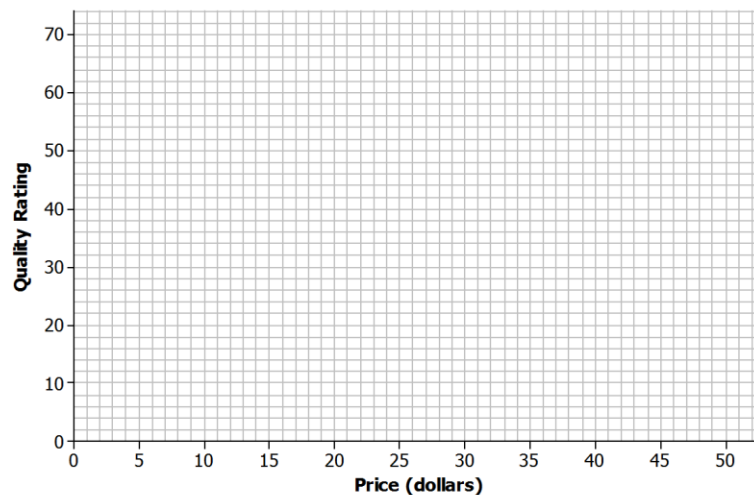
Problem Set

1. The table below shows the price and overall quality rating for 15 different brands of bike helmets.

Data source: www.consumerreports.org

Helmet	Price (dollars)	Quality Rating
A	35	65
B	20	61
C	30	60
D	40	55
E	50	54
F	23	47
G	30	47
H	18	43
I	40	42
J	28	41
K	20	40
L	25	32
M	30	63
N	30	63
O	40	53

Construct a scatter plot of price (x) and quality rating (y). Use the grid below.



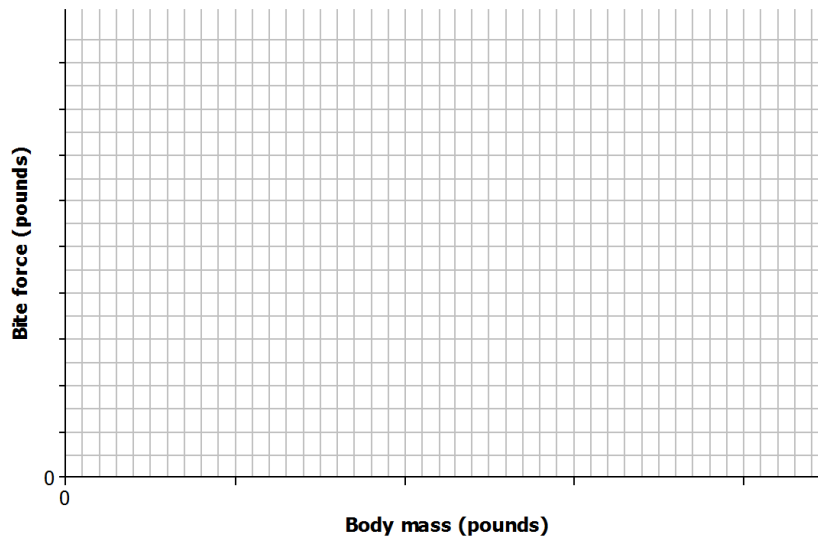
2. Do you think that there is a statistical relationship between price and quality rating? If so, describe the nature of the relationship.
3. Scientists are interested in finding out how different species adapt to finding food sources. One group studied crocodilian species to find out how their bite force was related to body mass and diet. The table below displays the information they collected on body mass (in pounds) and bite force (in pounds).

Species	Body Mass (pounds)	Bite Force (pounds)
Dwarf crocodile	35	450
Crocodile F	40	260
Alligator A	30	250
Caiman A	28	230
Caiman B	37	240
Caiman C	45	255
Crocodile A	110	550
Nile crocodile	275	650
Crocodile B	130	500
Crocodile C	135	600
Crocodile D	135	750
Caiman D	125	550
Indian Gharial crocodile	225	400
Crocodile G	220	1,000
American croc	270	900
Crocodile E	285	750
Crocodile F	425	1,650
American alligator	300	1,150
Alligator B	325	1,200
Alligator C	365	1,450

Data Source: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0031781#pone-0031781-t001>

(Note: Body mass and bite force have been converted to pounds from kilograms and newtons, respectively.)

Construct a scatter plot of body mass (x) and bite force (y). Use the grid below, and be sure to add an appropriate scale to the axes.



4. Do you think that there is a statistical relationship between body mass and bite force? If so, describe the nature of the relationship.
5. Based on the scatter plot, can you conclude that increased body mass causes increased bite force? Explain.