Unit 5, Lesson 23

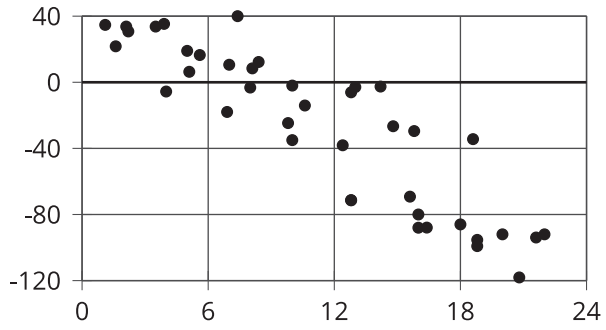
Observing More Patterns in Scatter Plots

Let's look for other patterns in data.

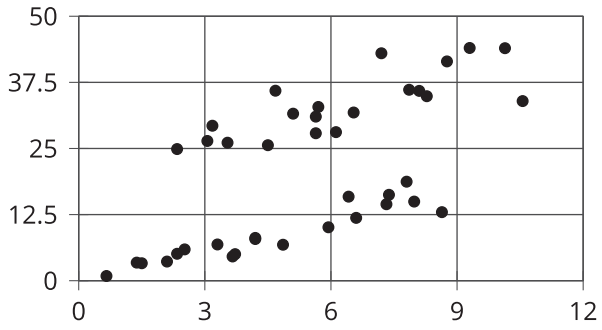
23.1 Clustering

Find groups of 2 or 3 scatter plots that share something in common that the others do not. What do they have in common?

A



B



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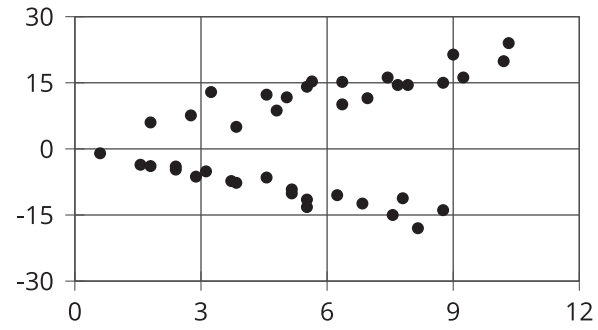

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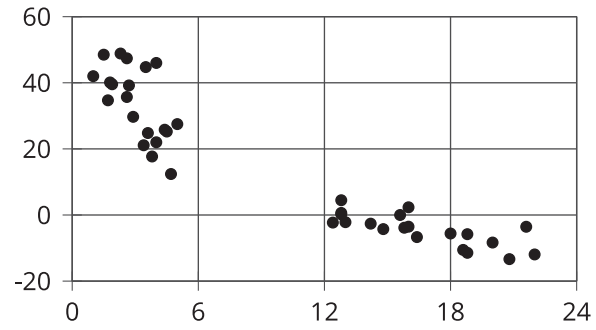


23.2 Scatter Plot City

Your teacher will give you a set of cards. Each card shows a scatter plot.

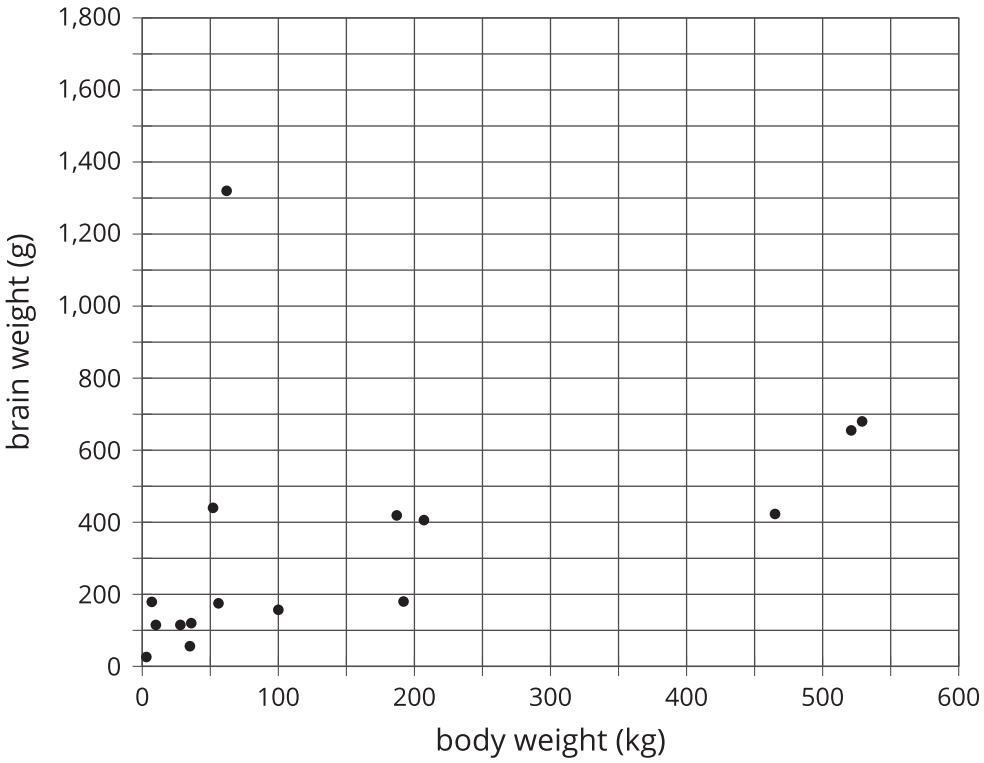
1. Sort the cards into categories and describe each category.
2. Explain the reasoning behind your categories to your partner. Listen to your partner's reasoning for their categories.
3. Sort the cards again into categories based on their associations: positive association, negative association, and neither. Compare your sorting with your partner's and discuss any disagreements.
4. Sort the cards into 2 categories: linear associations and non-linear associations. Compare your sorting with your partner's and discuss any disagreements.

23.3 Animal Brains

Is there an association between the weight of an animal's body and the weight of the animal's brain?

A scatter plot has been made using the data in the table. Identify any outliers?

animal	body weight (kg)	brain weight (g)
cow	465	423
grey wolf	36	120
goat	28	115
donkey	187	419
horse	521	655
potar monkey	10	115
cat	3	26
giraffe	529	680
gorilla	207	406
human	62	1,320
rhesus monkey	7	179
kangaroo	35	56
sheep	56	175
jaguar	100	157
chimpanzee	52	440
pig	192	180



1. After removing the outliers, does there appear to be an association between body weight and brain weight? Describe the association in a sentence.

2. Using a piece of pasta and a straightedge, fit a line to your scatter plot, and estimate its slope. What does this slope mean in the context of brain and body weight?

3. Does the fitted line help you identify more outliers?

Are you ready for more?

Use one of the suggestions or find another set of data that interests you to look for associations between the variables.

- Number of wins vs. number of points per game for your favorite sports team in different seasons
- Amount of money made vs. critic rating for your favorite movies
- Price of a ticket vs. stadium capacity for popular bands on tour

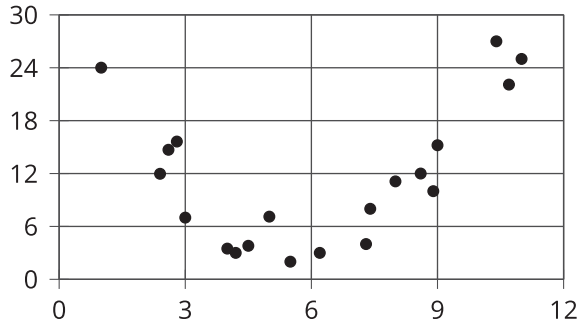
After you have collected the data,

1. Create a scatter plot for the data.
2. Are any of the points very far away from the rest of the data?
3. Would a linear model fit the data in your scatter plot? If so, draw it. If not, explain why a line would be a bad fit.
4. Is there an association between the 2 variables? Explain your reasoning.

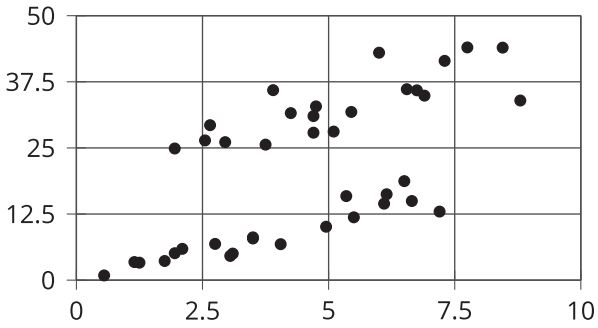
Lesson 23 Summary

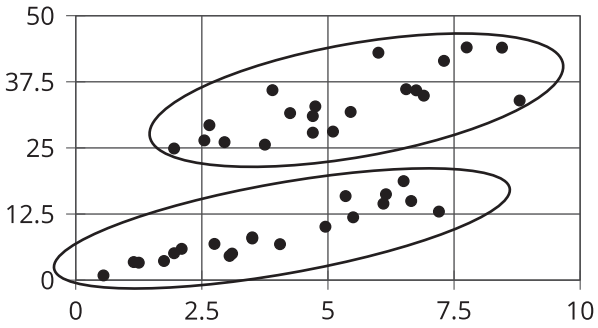
Sometimes a scatter plot shows an association that is not linear:

In this scatter plot, the data initially shows a negative trend then later a positive trend. Because the variables appear to be associated, but not in a linear way, we call this a *non-linear association*. In later grades, you will study functions that can be models for non-linear associations.



Sometimes in a scatter plot we can see separate groups of points.





We call these groups “clusters.” Clusters often appear when multiple patterns are present within the data. There may be subgroups within the overall data set that affect the variables.