Scatterplots

Suggested time: 75 min

What's important in this lesson:
Interpret the meaning of a point on a scatterplot.
Describe trends and relationships observed in data.

Complete these steps:

1. Complete the "Interpreting Scatterplots" handout. Check your answers,
2. Complete the "Forensic Analysis" activity.
3. Check your work with your teacher.
4. Complete Unit 3, Lesson 2 Assignment

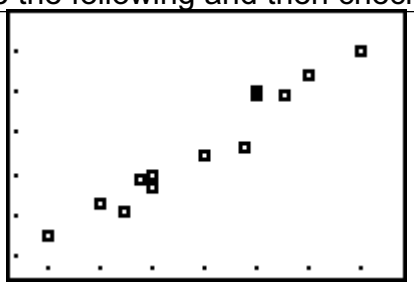
Hand-in the following to your teacher:

1. Unit 3, Lesson 2 Assignment

Questions for the teacher:

Interpreting Scatterplots

Complete the following and then check your work on the next page.

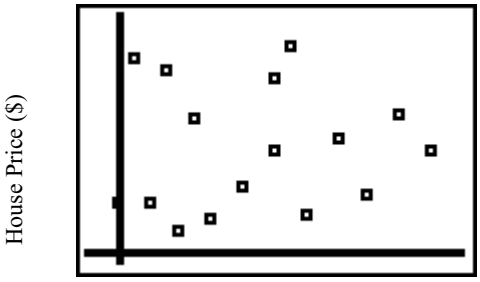


A

1. The graph shows the plotted points rising upwards to the right.
   Agree Disagree Pass
2. As the length of the tibia increases the length of the leg increases
   Agree Disagree Pass
3. The graph can be used to determine the length of a person's leg if you know the length of the tibia bone
   Agree Disagree Pass

B

1. The graph shows the plotted points falling to the right
   Agree Disagree Pass
2. As the distance from the net increases the number of baskets made decreases.
   Agree Disagree Pass
3. The graph can be used to determine the number of baskets you will make if you know the distance from the basket.
   Agree Disagree Pass



C

1. The graph shows the plotted points scattered.
   Agree Disagree Pass
2. As the age of the house increases the price of the house is either large or small.
   Agree Disagree Pass

	3. The graph can't be used to determine the price of the house if you know how old it is. Agree Disagree Pass

* bone in lower leg

Interpreting Scatterplots

Check your work…

A. Leg Length
1. agree 2. agree 3. agree
this graph has a positive correlation (increasing)

B. Throwing Baskets
1.agree 2. agree 3. agree
this graph has a negative correlation (decreasing)

C. House Prices
1.agree 2. agree 3. agree
this graph has no correlation (no pattern)

Graphing Using a Table of Values

Relationships between 2 variables can be represented by an equation, a table of values, and a graph.

Complete the table of values and graph the relationship.

Example. Y = -3x+10
To calculate each corresponding y value, substitute the given value of x.

For x=1
Y = -3(1)+10
Y = -3+10
Y = 7 Therefore, the first point is (1, 7)

For x=2
Y= -3(2)+10
Y = -6+10

Y = 4 Therefore, the next point is (2, 4)

Continue for x=3, 4, and 5

x	***y***
1	***7***
2	***4***
3	
4	

5	

(a) $y = 2x - 5$

x	***y***
1	
2	
3	
4	

5	

(b) $y = x^2+1$

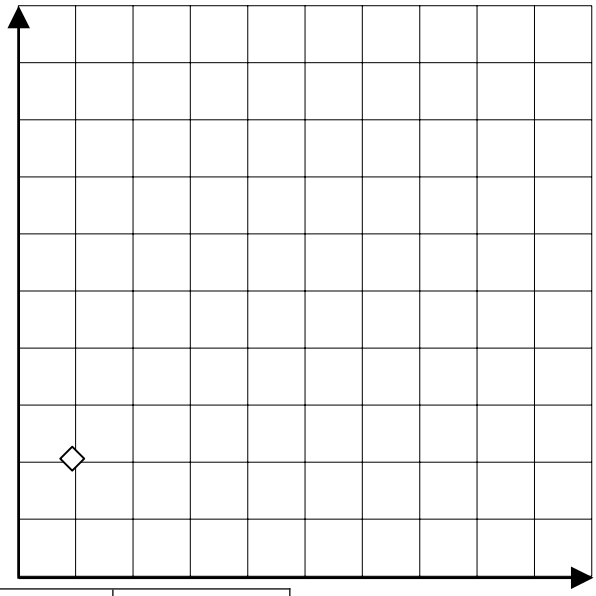
x	***y***
-2	
-1	
0	
1	

2	

Application

Jody works at a factory that produces square tiles for bathrooms and kitchens. She helps determine shipping costs by calculating the perimeter of each tile. The perimeter is determined by adding the lengths of the 4 sides of each tile.

Calculate the perimeter and record your observations in column 2.



Side Length (cm)	***Perimeter (cm)***
1	***4***
2	
3	
4	
5	

Describe what happens to the perimeter of each tile when the side length increases by one centimetre.

Construct a graph of the perimeter of a tile vs. the side length of the tile.

a) Which variable is the independent variable?

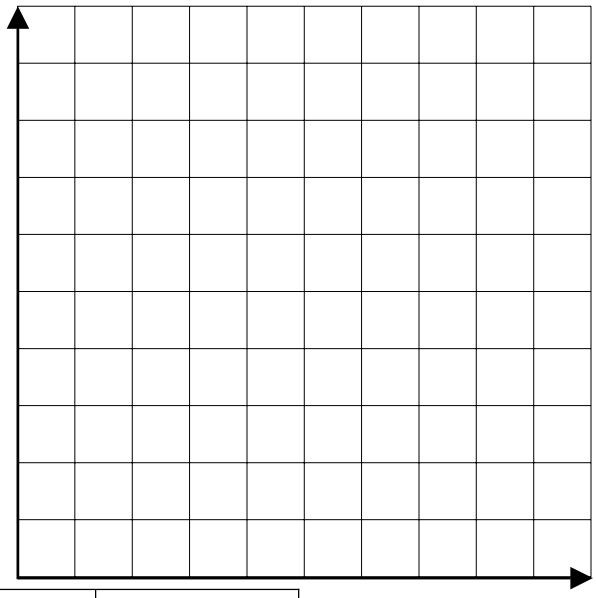
b) Which variable is the dependent variable?

c) Use the graph to describe the relationship between the perimeter and side length of a tile.

d) Describe the shape of the graph.

Jody's is paid $8/hour to calculate perimeters.

Calculate her pay and record your observations in column 2.



Number of Hours	***Pay ($)***
0	
1	
2	
3	
4	
5	

Describe what happens to her pay when the number of hours she works increases by one hour.

Construct a graph of her pay vs. the number of hours she works.

a) Which variable is the independent variable?

b) Which variable is the dependent variable?

c) Use the graph to describe the relationship between her pay and the number of hours she works.

d) Describe the shape of the graph.

Graphing using Table of Values

Complete the following table of values and graph.
(a) y = - x +2

x	*y*
-2	
-1	
0	
1	

2	

(b) $y = 5 - x^2$

x	***y***
-2	
-1	
0	
1	

Application: Forensic Analysis

Anthropologists and forensic scientists use data to help them determine information about people. Often only a few bones are available or the evidence is in inconclusive. In spite of these difficulties, by accessing the information in large databases and investigating relationships between data scientists can determine information about the height, age, and sex of the person they are examining.

1. Construct a Graph on the next page using this table of values.
   (a) label the horizontal axis "radius"
   (b) label the vertical axis "humerus"
   (c) choose an appropriate scale for each axis – you may use a break on your axis to indicate a jump in numbers (radius scale has been provided)

Radius (lower arm) **(cm)**	**Humerus** (upper arm) **(cm)**
25	29.7
22	26.5
23.5	27.1
22.5	26
23	28
22.6	25.2
21.4	24
21.9	23.8
23.5	26.7
24.3	29
24	27

2. Circle the point on the graph that represents the data for a radius that is 21.9 cm long. How long is the humerus? _____.

3. Put a box around the point on the graph that represents the data for a humerus that is 27.1 cm long. How long is the radius? _____.

4. Underline the statement that describes the direction of the plotted points in the graph?
   - The plotted points rise upward to the right.
   - The plotted points fall downward to the right.
   - The plotted points are scattered across the graph.
   - The plotted points lie flat along the horizontal.

5. As the length of the radius gets longer, what happens to the length of the humerus?

6. Do you think that you can use the length of the radius to predict the length of the humerus? Explain.

7. Do you think that you can use the length of the humerus to predict the length of the radius? Explain.