Name: _____ Date: _____
Ms. Scherben/**Science** Bronx Preparatory Charter School/ _____

Analyzing Data, Graphing and Drawing Conclusions

Date	Assignment	Grade
	Tables and Trends	_____/14
	Making Tables	_____/20
	Assessment Practice (Making Tables)	_____ /6
	Graphing 101 Tables to Graphs	_____ /17
	Graphing Line or Bar	_____ /24
	Don't Be a Fool Stay in School	_____ /20

Packet must be in complete sentences, unless specified.

Tables and Trends

Aim:_____

Brain Starter: What are some current trends that you know about?

_____

_____

_____

_____

In science trends are useful because they help us make

_____

When describing trends good words to use are:

_____ or _____

Practice

Ex. 1: What TREND does this data show?

Every time the weight of the bench press _____ *the number of reps* _____.

Weight Bench Pressed (kg)	Number of Reps
100	32
115	24
130	16
145	8

Can we make this trend more specific?

Every time the weight of the bench press _____ *by* _____, *the number of reps* _____*by*_____.

Ex. 2 What TREND does this data show?

Pressure on Balloon (N/cm^2)	Volume of Balloon (mL)
0.35	980
0.70	400
1.04	320
1.42	220
1.75	180

Can we be more specific? Why or why not?

Ex. 2: **What TREND does this data show?**

Mass of Object (kg)	**Time it takes to fall in a vacuum (seconds)**
2	4.9
42	4.9
82	4.9
122	4.9

Ex. 4: What TREND does this data show? (Be Specific)

Minutes on a Hot Plate	Temperature **°C**
0	25
5	30
10	35
15	40

Ex. 5

Protein and fiber are parts of a healthy diet.

Protein and Fiber Content of Different Flours

Type of Flour	Protein Content (grams per serving)	Dietary Fiber Content (grams per serving)
Whole wheat	4	4
White wheat	3	<1
Oat	4	3
Rice	3	1

Using that information, which of the types of flour is the HEALTHIEST?

Ex. 6

Independent Project

WHAT TIME OF DAY ARE YOU MOST ALERT?

Assumption: The ability to sort playing cards is an indication of alertness.

Procedure:

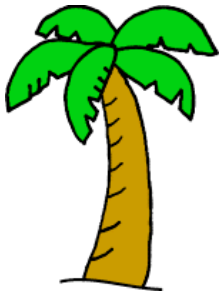
1. Shuffle a deck of playing cards four times
2. Time how long it takes to sort the cards into the four suits
3. Repeat the activity at the same times for five days

Data

Time of Day	Average Sorting Time (s)
8:00 A.M.	130
12:00 NOON	105
4:00 P.M.	122
8:00 P.M.	127

What CONCLUSION can you make based on the information above?

Making Predictions from Data



Ex.1: Find out how much the table changes each time.

Amount of water (liters)	Tree Growth (meters)
2	5
4	10
6	15
8	20

Changes by _____ each time

Changes by _____ each time

What is the trend?

_____

_____

Ex.2: Complete the table after finding out how much the table changes each time.

Time Burned (hours)	Height of Candle (centimeters)
1	50
3	
	30
7	20

Changes by _____ each time

Changes by _____ each time

What is the trend?

_____

_____

Ex.2: Complete the table after finding out how much the table changes each time.

Changes by _____ each time	Number of Classes Skipped	Average Grade	Changes by _____ each time
	0	100	
		90	
	2		
	3		

What is the trend?

_____

_____

Ex.4: Complete the table after finding out how much the table changes each time.

Changes by _____ each time	Voltage (Volts)	Current (Amps)	Changes by _____ each time
	2	20	
	4	40	
	6	60	
	8	80	

What is the trend?

_____

_____

What would the current be if the voltage was 10? _____

Ex. 5: Fill in the rest of the table.
What is the trend?

_____

_____

_____

_____

_____

Average Radius of Trees in a Forest

Age of Trees (years)	Average Radius (cm)
1	2.2
2	2.6
3	
4	
5	
6	4.4

Ex. 6
What is the trend?

_____

_____

_____

_____

Force (Newtons)	**Acceleration (m/s^2)**
10	3
20	6
30	9
40	12

What would the acceleration be if the force was 80 Newtons? _____

Tables and Trends

_____/14

Making Tables

Aim:_____

Brain Starter: Check out this table of hypothetical computers (DigiTek, Compex, and Cyberdyne). Answer the following questions about the table above.

	DigiTek	Compex	Cyberdyne
Base Cost	$750	$850	$950
+ 1GB RAM	$300	$200	$100
+ 70GB Hard Drive Space	$300	$260	$200
TOTAL COST	$1,350	$1,310	$1,250

1. Which computer has the cheapest extra gigabyte of Random Access Memory (RAM)?

2. If you wanted to buy a computer without extra RAM or hard drive space, which computer is the best to buy?

3. Which computer is the most expensive if you buy it with all the extra options?

4. Which computer is the best deal if you really need extra RAM but not extra drive space?

5. How much would it cost to buy a Compex computer with an extra 70GB of hard drive space (but no extra RAM)?

Practice Makes Perfect

Ex. 1. Rashawn wants to test if a weight of a basketball affected how far he could throw it.

a. Identify the independent variable:_____

b. Identify the dependent variable: _____

c. What are three things that Rashawn would have to keep constant?

1) _____

2) _____

3) _____

d. What is your hypothesis?

_____

_____

e. In the results, Rashawn would measure _____ and record it in a data table.

Rashawn finds that he can throw a 10 kg basketball 50 meters, he can throw a 20 kg shotput 40 meters, he can throw a 30 kg shotput 30 meters, and he can throw a 40 kg shot 20 meters. Make a data table showing the results.

d. Set up table: 1) Title (state cause and effect relationship), 2) Label Categories, 3) Input data

Title	
Independent Variable	Dependent Variable

e. What is the trend?

_____

_____

f. Draw a conclusion: Did the data support or disprove your hypothesis?

_____

_____

Ex. 2: Jennifer was conducting the experiment testing the question: "What is the effect of different colors of light on plant height?" In her experiment she was going to test red, yellow, green and blue light for six days. She measured the plants after each day.

a. Identify the independent variable:
_____

b. Identify the dependent variable:
_____

c. What are three things that Jennifer would have to keep constant?

1) _____

2) _____

3) _____

d. What is your hypothesis?

_____

_____

e. In the results, Jennifer would measure _____ and record it in a data table.

d. Set up table: 1) Title (state cause and effect relationship), 2) Label Categories, 3) Input data

Title						

Practice putting your observations into the data table above.

Day 1: Red 2cm, Yellow 2cm, Green 2cm, Blue 2cm

Day 2: Red 2cm, Yellow 2cm, Green 3cm, Blue 3cm

Day 3: Red 3cm, Yellow 2cm, Green 4cm, Blue 3cm

Day 4: Red 3cm, Yellow 2.5cm, Green 4.5cm, Blue 3.5cm

Day 5: Red 3.5cm, Yellow 3cm, Green 5cm, Blue 3.5cm

Day 6: Red 3.5cm, Yellow 3.5cm, Green 5.5cm, Blue 4cm

e. Were there any trends? (Hint you can compare different plants but they have to be on the same day)

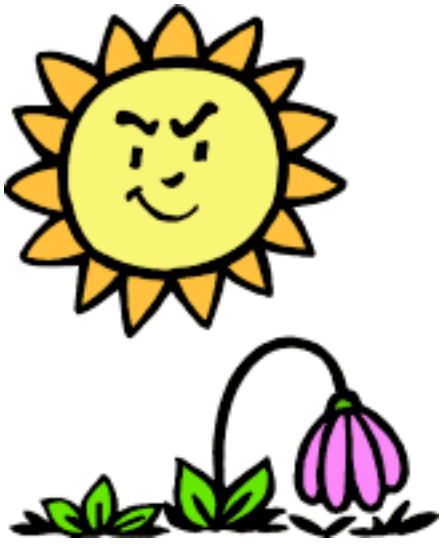
_____

_____

f. Draw a conclusion: Did the data support or disprove your hypothesis?

_____

_____



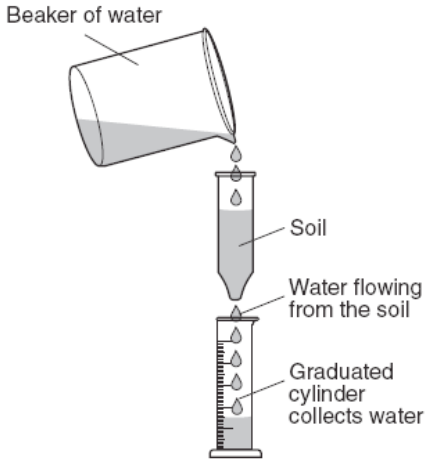
Making Tables

_____/20

Assessment Practice.

Directions: Read the following passage and use the information given to answer the questions.

22. Amanda made this entry in her laboratory notebook: "We are doing an experiment to determine if the size of soil particles affects the amount of water that flows through soil. We poured 100 milliliters (mL) of water through four different types of soil. The equipment is shown below.



We got the following results: With gray soil, the average particle size was 2.0 millimeters (mm) and 80 mL of water flowed through. We then used tan soil. Its average particle size was 0.5 mm and 40 mL of water flowed through. With brown soil, 60 mL of water flowed through. Brown soil has an average particle size of 1.5 mm. In our last trial we used black soil. It has an average particle size of 1.0 mm and 50 mL of water flowed through."

a Using the data table below, organize the results to show the average particle size and the amount of water that flowed through for each type of soil. Be sure to include column headings, data, and units in the table. [6 points]

Data Table

Soil Color		
gray		
brown		
black		
tan		

b What is the dependent variable in this experiment? [2 points]

_____.

c What conclusion can be drawn from the data that the students collected? [4 points]

Assessment Practice

_____/6

Graphing 101

Aim:_____

Brain Starter:

Ex7: **What is the trend?**

_____

_____

_____

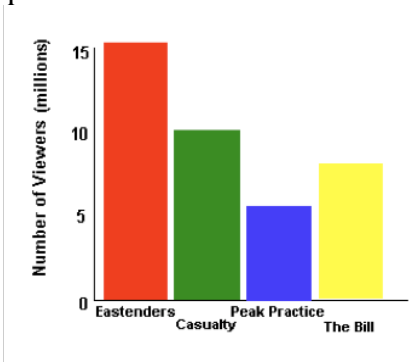
_____

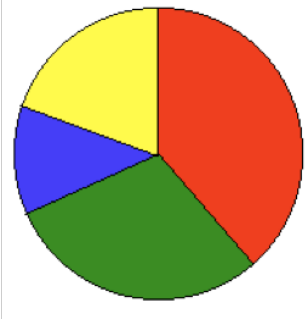
Temperature (°C)	Amount of Dissolved Oxygen (mg/L)
10	1000
15	950
20	900
25	850

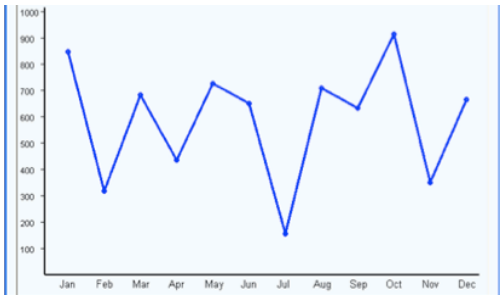
How much dissolved oxygen would there be if the temperature was 45°C?

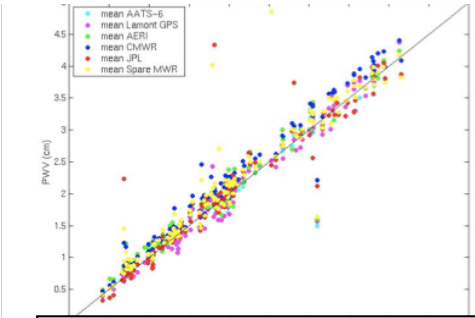
_____

Types of Graphs









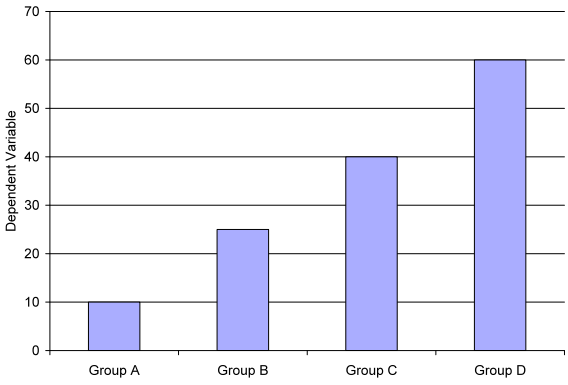
This year in science we are going to focus on two types of graphs. They are _____ and _____graphs.

GRAPHS

Scientists use graphs because ….

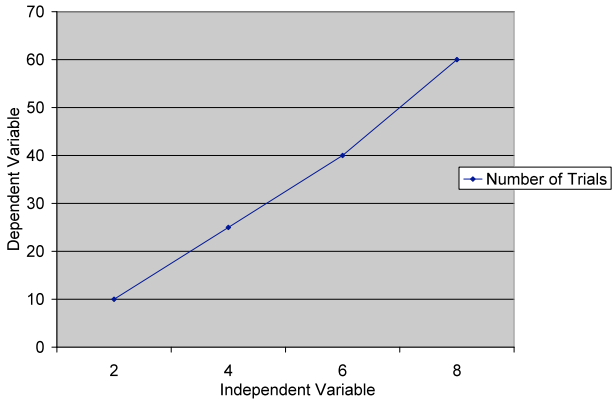
_____

_____

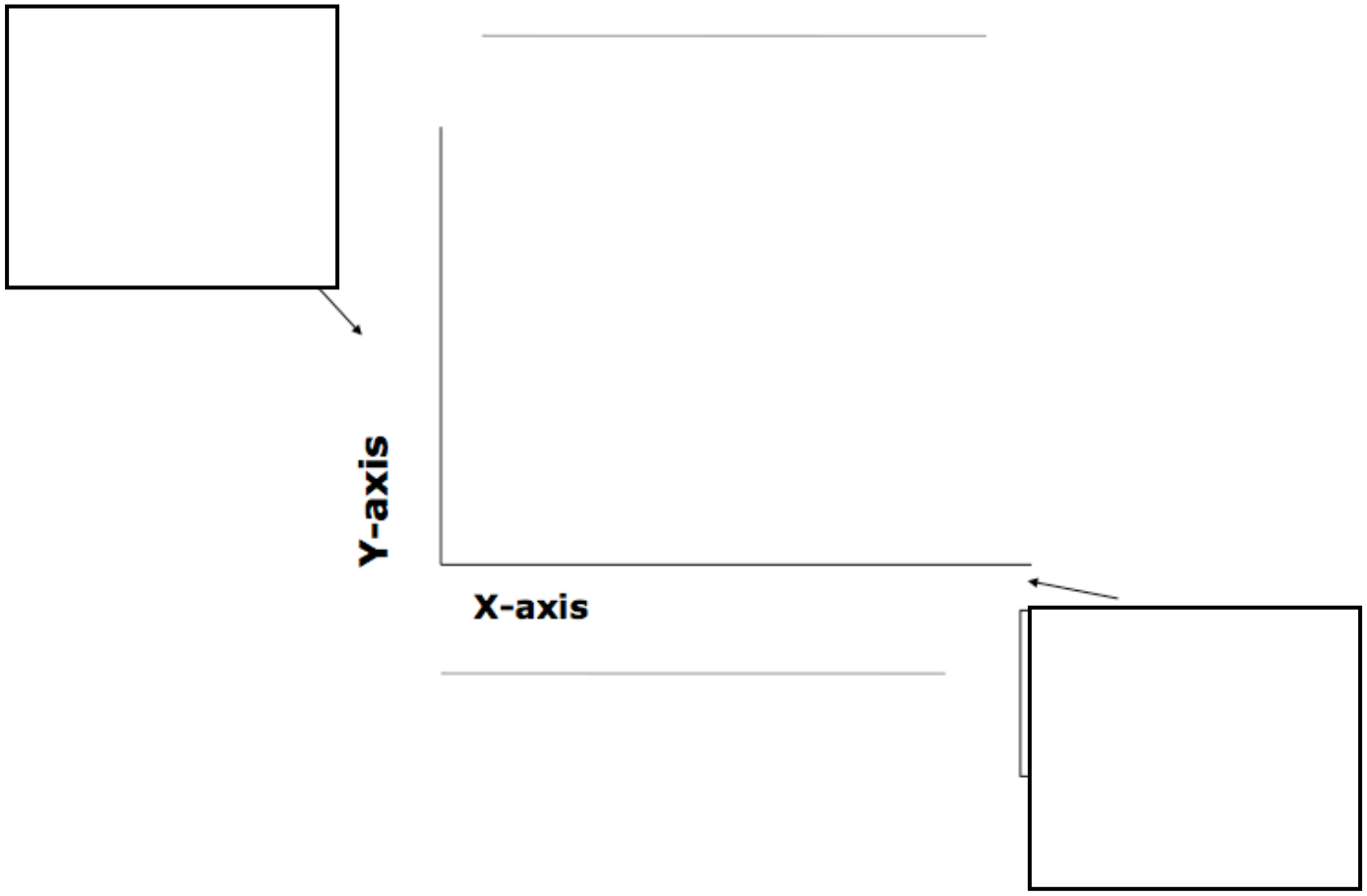


Bar graphs are used when the independent variable is _____ and the dependent variable is _____.

Line graphs are used when the independent variable is _____ and the dependent variable is _____.



Parts of a Graph

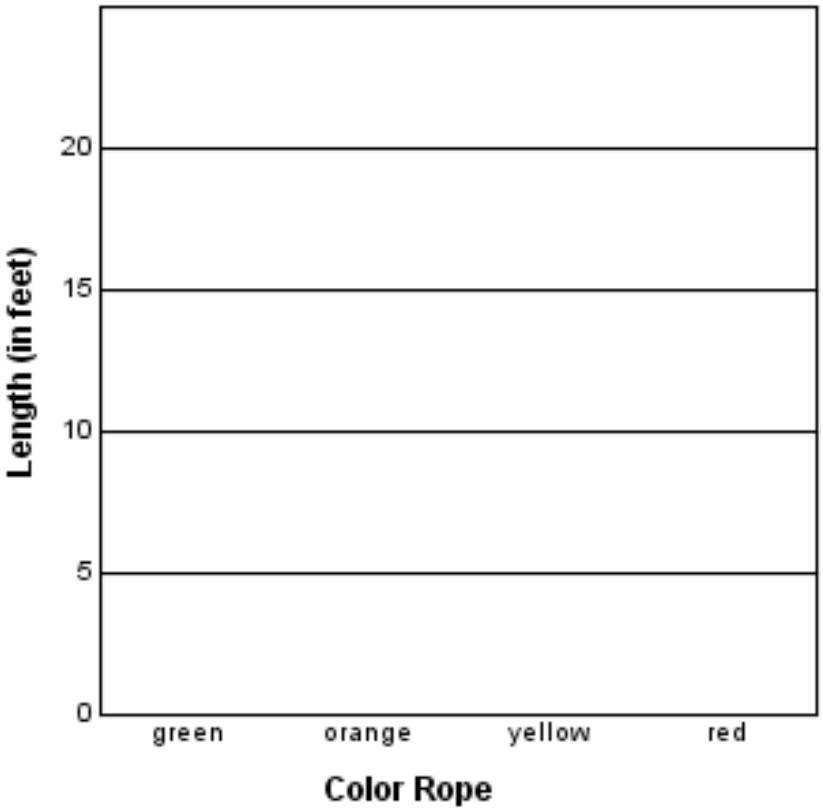


Check list for Graphs

Graph Element	Criteria	√
Title	Communicates experiments purpose; identifies variables being investigated.	
Label axes	*x*-axis correctly labeled with the name/unit of independent variable	
	y-axis correctly labeled with the name/unit of dependent variable	
Determine scales for axes	*x*-axis correctly divided into a scale for a line graph or into categories for a bar graph	
	y-axis correctly subdivided into a scale	
Plot data points	Data pairs correctly plotted.	
Analyze trends	Trend is described accurately.	

Tables to Graphs

Length of Pieces of Rope



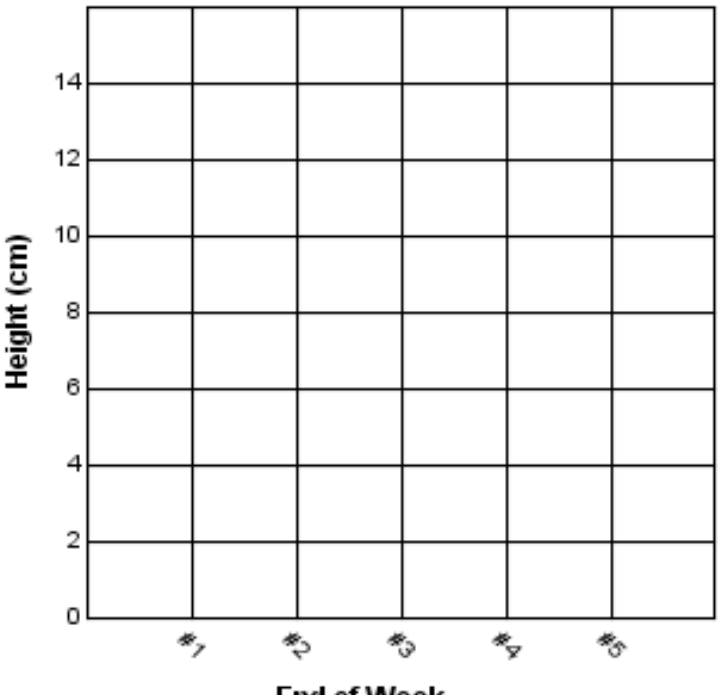
Color Rope	Length (in feet)
green	15
red	19
orange	13
yellow	21

If it takes twenty-one inches of rope to go all the way around the fence post, how many times will the orange rope go around the post?

Which piece of rope is 15 yards long?

Which piece or pieces of rope are more than 12 feet long but less than 22 feet long?

The Weekly Growth of a Plant.



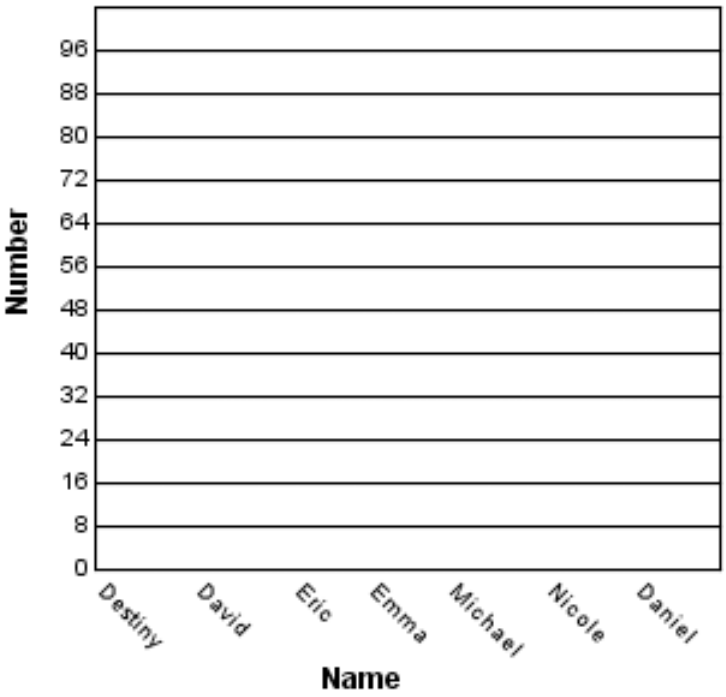
End of Week	Height (cm)
#1	2
#2	8
#3	10
#4	12
#5	14

At the end of which week(s) was the plant taller than 2 centimeters?

At the end of which week(s) was the plant no more than 8 centimeters tall?

How tall was the plant at the end of week #5?

Number of Books Owned



Number of Books Owned	
Name	**Number**
David	60
Eric	100
Nicole	68
Daniel	52
Michael	44
Destiny	96
Emma	88

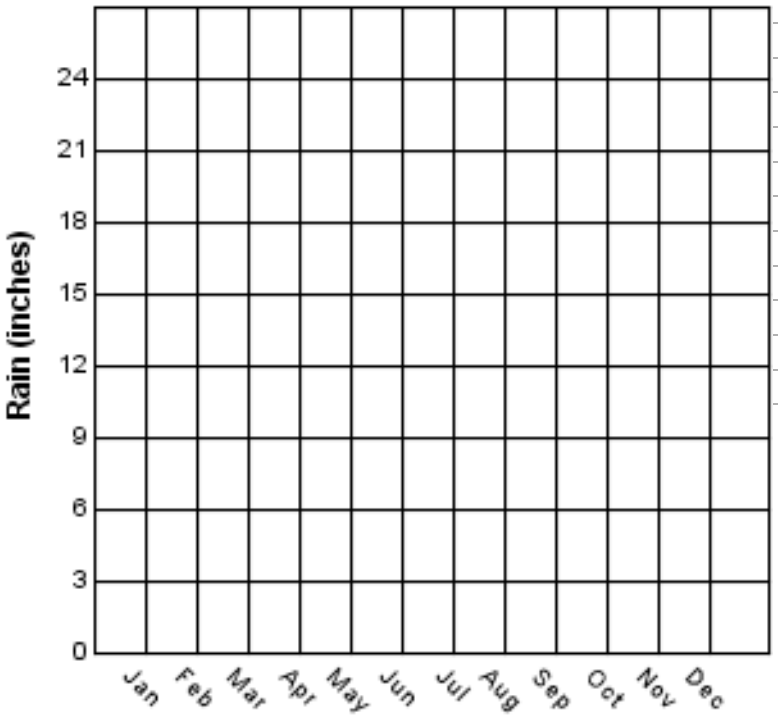
Which of the children own at least 68 books?

Michael received three books on his birthday. On the same day, Michael gave Nicole four books. How many books does Michael have?

If Emma gave ten books to Daniel, how many books would Daniel have?

Monthly Rain Fall in Muddytown

Between which two months did the monthly rainfall inch?



Monthly Rain Fall in Muddytown	
Month	**Rain (inches)**
Jan	6
Feb	7
Mar	16
Apr	22
May	24
Jun	18
Jul	10
Aug	9
Sep	7
Oct	6
Nov	5
Dec	9

total increase by 1

Which month had the lowest monthly rainfall?

Which month had the most monthly rainfall?

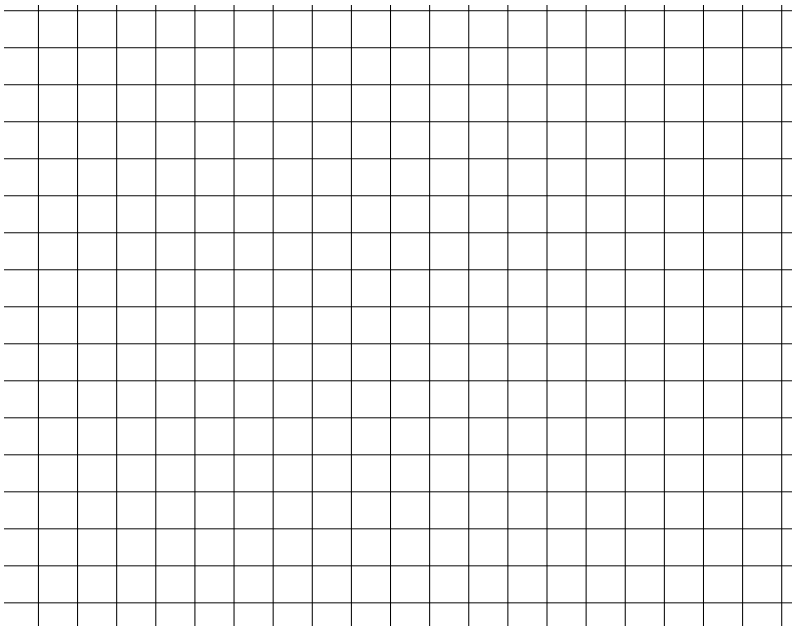
Challenge

A group of students were trying to figure out if the temperature of the water affected the speed of a crawfish. They set up 8 tanks of water and kept them at different temperatures. They then placed crawfish in each tank and made them swim and measured their speed. Using the data at the left, construct a graph that shows the relationship between water temperature and crawfish speed.

Don't forget to:

1) Create a title
2) Label your axes
3) Make an appropriate scale
4) Mark an X at each data point and connect them with a line

Water Temp (^oC)	Crawfish Speed (m/s)
15	1.0
20	1.7
25	2.0
30	2.5
35	2.5
40	1.9
45	1.5
50	1.2



Tables to Graphs

_____/17

Graphing: Line or Bar?

Aim:_____

Brain Starter:

Ex.2: Complete the table after finding out how much the table changes each time.

Changes by _____ each time

Height of Ramp (cm)	Speed of Ball Cm/s
10	20
30	
	40
70	50

Changes by _____ each time

What is the trend?

_____

_____

Which one is it? Write if it is a bar or line graph.

_____ 1. The Rate at Which Water Drains Through Different Brands of Coffee Filters

_____ 2. The Effect of Color on Sales of Roses at a Florist

_____ 3. The Effect of Depth on Water Temperature in a Lake

_____ 4. The Effect of Temperature on the Amount of Sugar that Dissolves in Tea

Note About How to Make the Best Scale.

Almost always start at zero.
Scales always increase by the same amount.
One way to do it is to see the highest and lowest value of a group. If there is a large difference for example 0 to 100. Then you might want to count by a large number like 10. If it is 1 to 10 then you might want to count by 1s.
What ever you do make sure you are always increasing by the same amount. For example:
(0, 2, 4, 6, 8, 10)
(0, 0.5, 1.0. 1.5, 2.0, 2.5)
(0, 5, 10, 15, 20, 25)

Graph the following charts as either a line or bar graph. Make sure to check off all of the steps.

Graph Element	Criteria	√
Title	Clearly identifies what was being measured	
Draw and label axes	*x*-axis correctly labeled with the name/unit of independent variable	
	y-axis correctly labeled with the name/unit of dependent variable	
Determine scales for axes	*x*-axis correctly subdivided—into a scale for a line graph, into categories for a bar graph	
	y-axis correctly subdivided into a scale	
Plot data points	Data points correctly written.	
	Data pairs correctly plotted.	
Analyze Trends	Trend or Data was analyzed accurately and clearly.	

Gasoline Mileage of Different Compact Cars

Compact Car Manufacturer	Miles to the Gallon
Ford	40
Porsche	25
Toyota	20
BMW	30

If you were looking to buy a car that was good on gas, what would be your top two choices and why? Use the data to explain your answer.

_____

_____

Graph Element	Criteria	√
Title	Clearly identifies what was being measured	
Draw and label axes	*x*-axis correctly labeled with the name/unit of independent variable	
	y-axis correctly labeled with the name/unit of dependent variable	
Determine scales for axes	*x*-axis correctly subdivided—into a scale for a line graph, into categories for a bar graph	
	y-axis correctly subdivided into a scale	
Plot data points	Data points correctly written.	
	Data pairs correctly plotted.	
Analyze Trends	Trend or Data was analyzed accurately and clearly.	

The Effects of Temperature on the Germination of a Radish Seeds

Temperature (C)	Average Germination Rate (%)
0	0
5	5
10	15
20	30
30	45

Describe the trend.

_____

_____

Line or Bar

_____/24

Name **Date**:

Science **Bronx Prep/ _____**

Dont Be a Fool, Stay In School.
Statistical Evidence that Grades Pay.

Create a graph from the following charts. Determine which one is a line and bar graph. Use the check list to make sure your graphs are complete and correct.

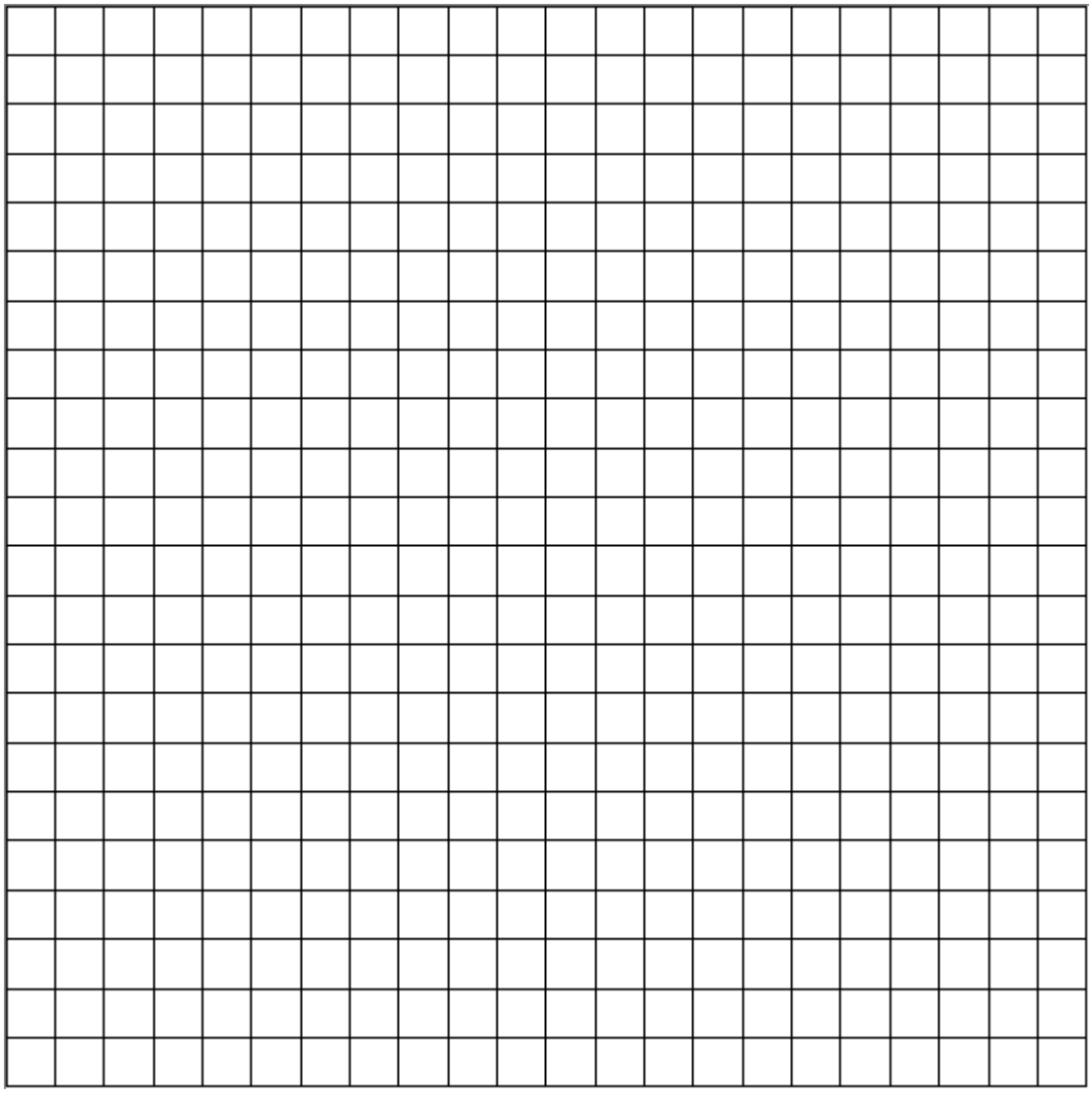
Graph Check List			
Graph Element	**Criteria**	**Graph 1**	**Graph 2**
Title	Communicates experiments purpose; identifies variables being investigated.		
Draw and label axes	*x*-axis correctly labeled with the name/unit of independent variable		
	y-axis correctly labeled with the name/unit of dependent variable		
Determine scales for axes	*x*-axis correctly subdivided—into a scale for a line graph, into categories for a bar graph		
	y-axis correctly subdivided into a scale		
Plot data points	Data points correctly written.		
	Data pairs correctly plotted.		
Analyze Trends	Described the trend accurately using the terms increase or decrease.		

Chart 1.

Years in school	Yearly Income
11 or less	$20,000
12	$26,000
13	$28,000
14	$30,000
15	$32,000
16	$44,000
17	$46,000
18	$57,000

Chart 2.

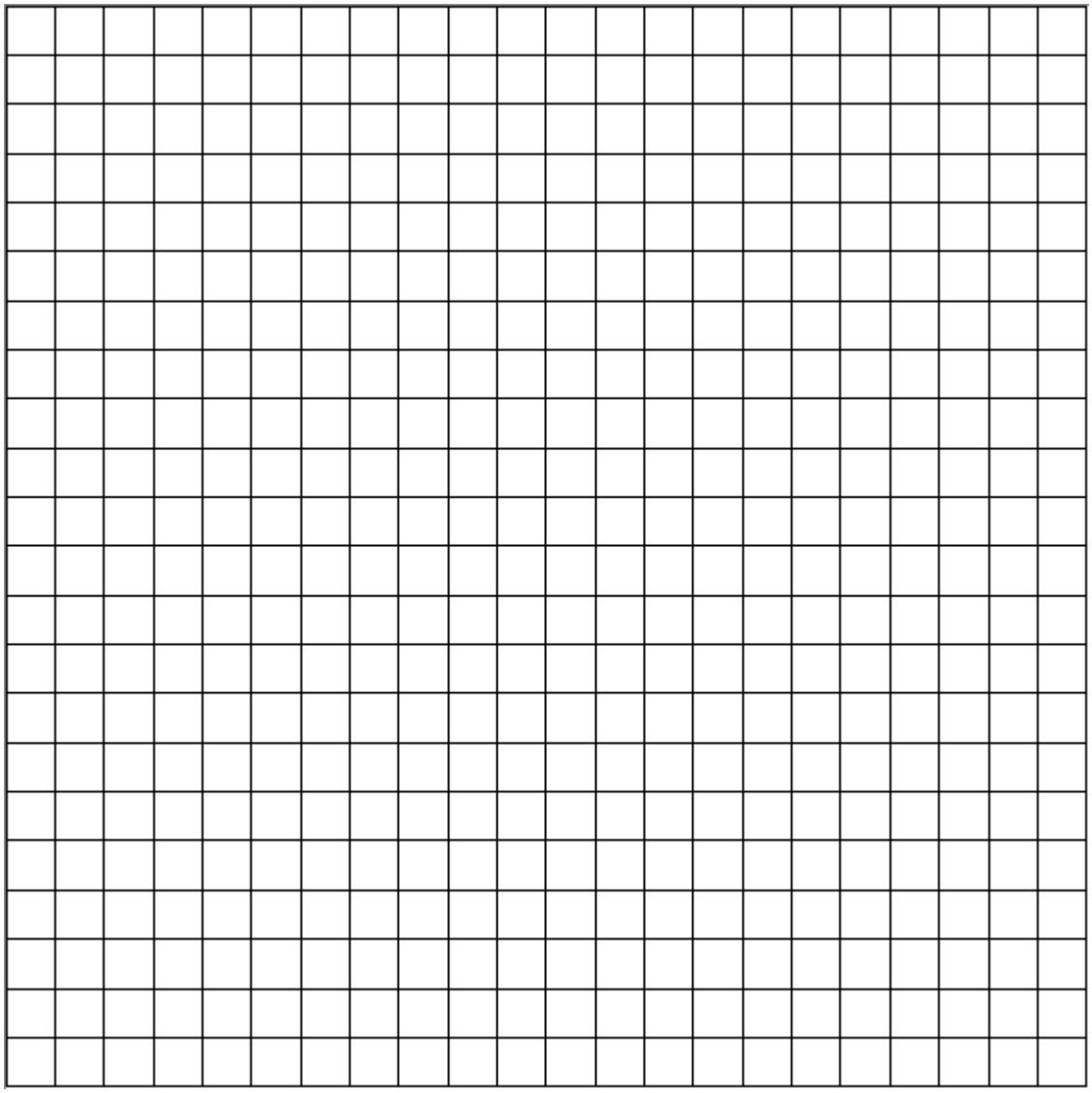
Level of Education	Yearly Income
High School Dropout	$20,000
High School Graduate	$26,000
Some College	$32,000
College Graduate	$44,000
Graduate degree	$57,000



Describe the trend.

_____

_____



Describe the trend.

_____

_____

Don't Be a Fool

_____/20

Prepare for a quiz and test soon.

Question Box