Name _____

Date _____

Epidemiologist- "Disease Detective"

Background Information

Emergency! There has been a serious outbreak that has just occurred in Ms. Kirby's class. It is your job as an epidemiologist- "disease detective" to investigate the illness, the students involved, the cause of the illness, and the place where the illness took place.

Materials

1. Calculator
2. Colored pencils (optional)
3. Graph paper (optional)
4. Microsoft Excel (optional)

Directions

A. Read the following hypothetical case study:

On Thursday, March 17, 2011, *Ms. Kirby* noticed that 18 students were absent out of a total of 28 students. He was very concerned about the students because the day before many of them complained of drowsiness and nausea. You, as the epidemiologist- "disease detective," were called in to investigate the situation. You begin by calling parents to check on the students. You discover that many of the students are suffering from vomiting, diarrhea; but none of them have a fever! After talking to many of the parents and reviewing the situation, you conclude that all of the students share one commonality- they ate in the cafeteria for lunch the entire week. Here is what each sick student ate:

1. Tiffany ate steak, rice, pudding, and salad.
2. Steven ate fish, pudding, rice, and drank soda.
3. Mike ate steak, pudding, salad, and beans.
4. April ate chicken, salad, and beans.
5. Sarah ate chicken, chips, and drank milk.
6. Karen ate steak, rice, and drank milk.
7. Bryan ate fish, pudding, rice, chips, beans, drank soda and milk.
8. Julia ate fish, pudding, rice, and chips.
9. Tim ate steak, rice, and salad.
10. Julie ate chicken and drank soda.
11. Rhonda ate chicken, rice, and drank milk.
12. John ate chicken, beans, and drank milk.
13. Amy ate fish, rice, and beans.
14. Rich ate fish, rice, pudding, and chips.
15. Thomas ate chicken, fish, pudding, and rice.
16. Albert ate steak, rice, pudding, and drank milk.
17. Joe ate steak, chips, pudding, rice, and drank soda.
18. Heather ate fish, salad, and rice.

You also talked with the students who were not sick and found that each student ate:

1. TJ ate steak, pudding, and salad.
2. Crystal ate fish, rice, and drank soda
3. Michelle ate steak, pudding, and beans.
4. January ate chicken, salad, and beans.

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5. Carl ate steak, beans, and drank milk.
6. Matthew ate fish, pudding, rice, beans, and drank milk.
7. Jacob ate fish, pudding, and chips.
8. Tara ate steak, pudding, and salad.
9. Ashley ate chicken, chips, and drank soda.
10. Tina ate chicken, salad, and drank milk.

B. Write a hypothesis on which food you think might have contributed to the outbreak. Your hypothesis should be an educated guess based on the data given in part **A**. Write your hypothesis before moving to part **C**.

_____

_____

C. It is now time for you to chart the data that you have found in the charts below:

Students who are sick.

Students	Fish	Rice	Chicken	Steak	Soda	Pudding	Milk	Salad	Beans	Chips
1. Tiffany										
2. Steven										
3. Mike										
4. April										
5. Sarah										
6. Karen										
7. Bryan										
8. Julia										
9. Tim										
10. Julie										
11. Rhonda										
12. John										
13. Amy										
14. Rich										
15. Thomas										
16. Albert										
17. Joe										
18. Heather										
Total										

Students who are not sick.

Students	Fish	Rice	Chicken	Steak	Soda	Pudding	Milk	Salad	Beans	Chips
1. TJ										
2. Crystal										
3. Michelle										
4. January										
5. Carl										
6. Matthew										
7. Jacob										
8. Tara										
9. Ashley										
10. Tina										
Total										

D. Now graph the following data in two bar graphs:

Graph #1: Foods eaten by sick students vs. number of students who ate that food (bar graph).

1. Which item is the independent variable- foods eaten by sick students or number of students who ate that food? (Circle one)

2. Which item is the dependent variable- foods eaten by sick students or number of students who ate that food? (Circle one)

                Remember to label your graph with a title and with the X axis and Y axis titles.
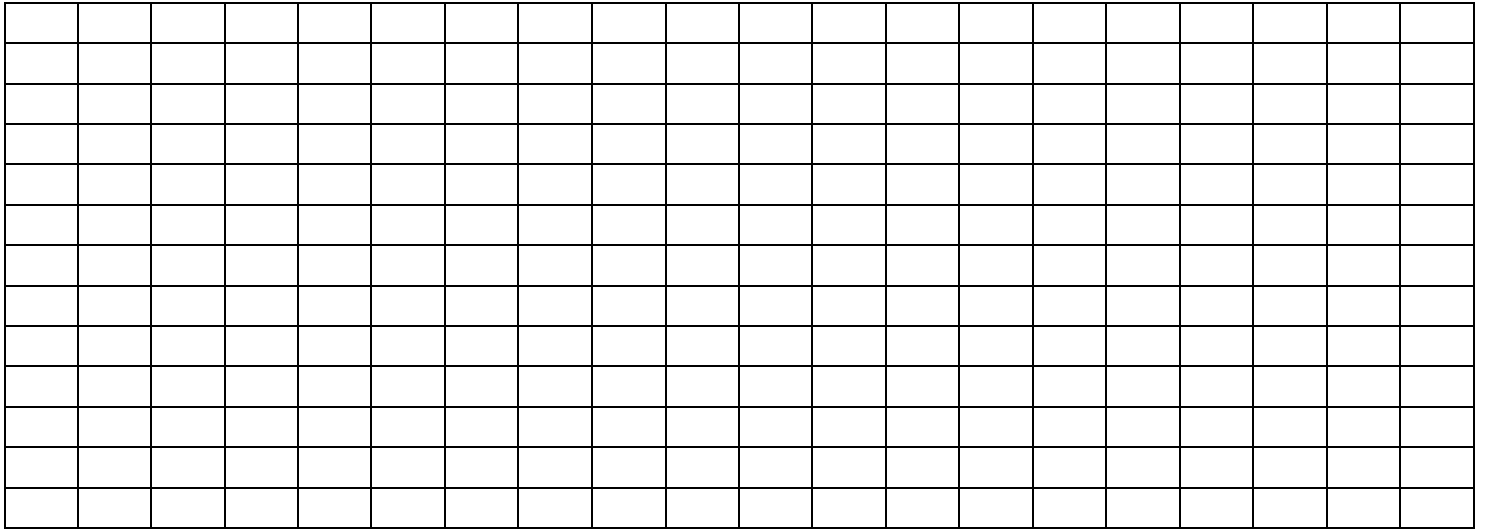
Graph #2: Foods eaten by healthy students vs. number of students who ate that food.

1. Which item is the independent variable- foods eaten by healthy students or number of students who ate that food? (Circle one)

2. Which item is the dependent variable- foods eaten by healthy students or number of students who ate that food? (Circle one)

                Remember to label your graph with a title and with the X axis and Y axis titles.
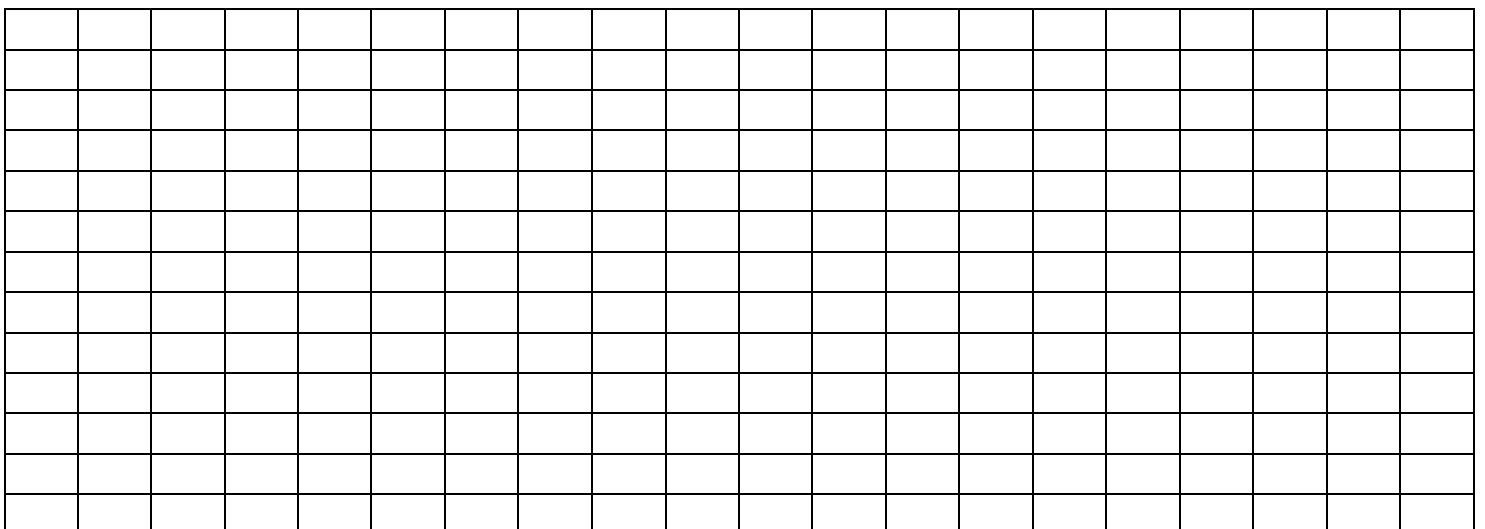
Be an Epidemiologist- "Disease Detective":
Attack Rates

Now take the data from your charts in Be an Epidemiologist- "Disease Detective" worksheet and enter the data to find out which food caused the outbreak. This worksheet will be graded as follows: there are 10 foods and 10 charts. Each chart is worth 4 points to equal 40 points.

Sample:

	Sick	Well	Total	Attack rate
Ate food	a	b	a+b	a/(a+b) x 100%
Did not eat food	c	d	c+d	c/(c+d) x 100%
Total	a+c	b+d	a+b+c+d	

1. Fish (4 points)

	Sick	Well	Total	Attack rate
Ate fish				
Did not eat fish				
Total				

2. Rice (4 points)

	Sick	Well	Total	Attack rate
Ate rice				
Did not eat rice				
Total				

3. Chicken (4 points)

	Sick	Well	Total	Attack rate
Ate chicken				
Did not eat chicken				
Total				

4. Steak (4 points)

	Sick	Well	Total	Attack rate
Ate steak				
Did not eat steak				
Total				

5. Soda (4 points)

	Sick	Well	Total	Attack rate
Drank soda				
Did not drink soda				
Total				

6. Pudding (4 points)

	Sick	Well	Total	Attack rate
Ate pudding				
Did not eat pudding				
Total				

7. Milk (4 points)

	Sick	Well	Total	Attack rate
Drank milk				
Did not drink milk				
Total				

8. Salad (4 points)

	Sick	Well	Total	Attack rate
Ate salad				
Did not eat salad				
Total				

9. Beans (4 points)

	Sick	Well	Total	Attack rate
Ate beans				
Did not eat beans				
Total				

10. Chips (4 points)

	Sick	Well	Total	Attack rate
Ate chips				
Did not eat chips				
Total				

Name _____
Date _____

Be an Epidemiologist- "Disease Detective":
Now it's time to analyze your data

Directions: Take the results from your attack rate calculations and place them into the chart below.

Food	Attack rate of students who ate the food	Attack rate of students who did not eat the food	Calculate the attack rate ratio
Fish			
Rice			
Chicken			
Steak			
Soda			
Pudding			
Milk			
Salad			
Beans			
Chips			

What food caused the outbreak and how do you know it caused the outbreak?

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_____

Name _____

Date _____

Be an Epidemiologist- "Disease Detective":
Lab Report

Directions: It is time to put all that you have learned on one sheet of paper. Fill in the blanks below.

I.   **Objective:** State in two sentences your objective for this assignment.

_____

_____

_____

II.   **Methods and Procedure:**

a. All epidemiologists have to answer several questions to solve an outbreak. 4(pts)

i.   Where did the outbreak occur?

_____

ii.   Who did the illness affect?

_____

iii. When did it affect the students?

_____

iv.   How many did it affect?

_____

b. Describe how you solved the outbreak. Discuss every step that was taken and why you have to complete that step to solve your outbreak. You must have at least four steps. (4pts)

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III. **Conclusion:** Write a five sentence paragraph on your conclusion of this lab. Please state whether your hypothesis was true or false. Explain. What type of errors occurred in your experiment? (4pts)

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