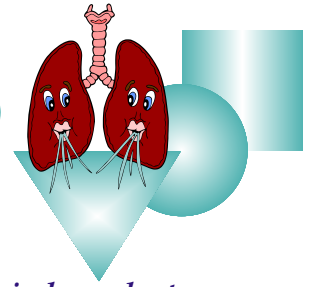


Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



Student Data Page Activity 5D

1. IDENTIFYING VARIABLES:

In activity, you will be conducting an experiment. This experiment has an *independent variable* and a *dependent variable*. The *independent variable* in an experiment is the variable chosen by the experimenter and it is manipulated or changed by the experimenter. The *dependent variable* is measured for the effect the independent variable has on it. Identify the *independent* and *dependent* variables in this experiment.

INDEPENDENT VARIABLE: _____

DEPENDENT VARIABLE: _____

In order to have a *controlled experiment*, all variables except the independent and dependent variables must be controlled. This is done by making sure that they are the same for all test groups. These are called *constants* in an experiment. List 3 variables that are made constant in this experiment.

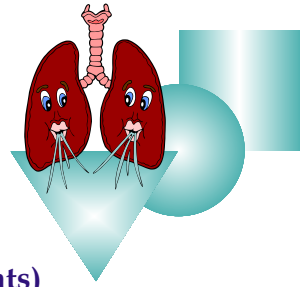
State a *hypothesis* by predicting how the restriction mouthpieces will affect the distance traveled by the *pom-poms*. Be sure to explain why you think this to be true.

2. As you rotate through each lab, record the data in the appropriate areas on *Data Table 1*.

Data Table 1- Distance Pom-Pom Traveled

Trial	Station 1	Station 2	Station 3	Station 4	Station 5
	Peak Flow	0% Restriction	25% Restriction	50% Restriction	75% Restriction
1					
2					
3					
Final Results:	Liters per minute <i>Highest</i>	(cm) <i>Average</i>	(cm) <i>Average</i>	(cm) <i>Average</i>	(cm) <i>Average</i>

(Restriction measurements in the "restriction mouthpieces" are approximations)



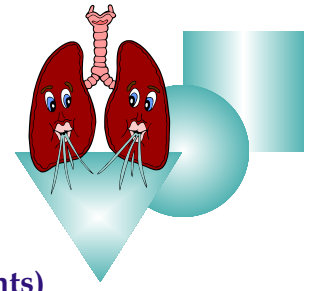
3. Using *Class Data Table 2*, collect a class set of data. You will use this data to calculate *mean, mode, median, and range*.

Class Data Table 2 - Distance Pom-Pom Traveled (Female Students)

Female Students	Peak Expiratory Flow	0% Restriction	25% Restriction	50% Restriction	75% Restriction
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
<i>Calculate the following:</i>					
<i>Mean</i>					
<i>Mode</i>					
<i>Median</i>					
<i>Range</i>					



LESSON 5
ACTIVITY 5D

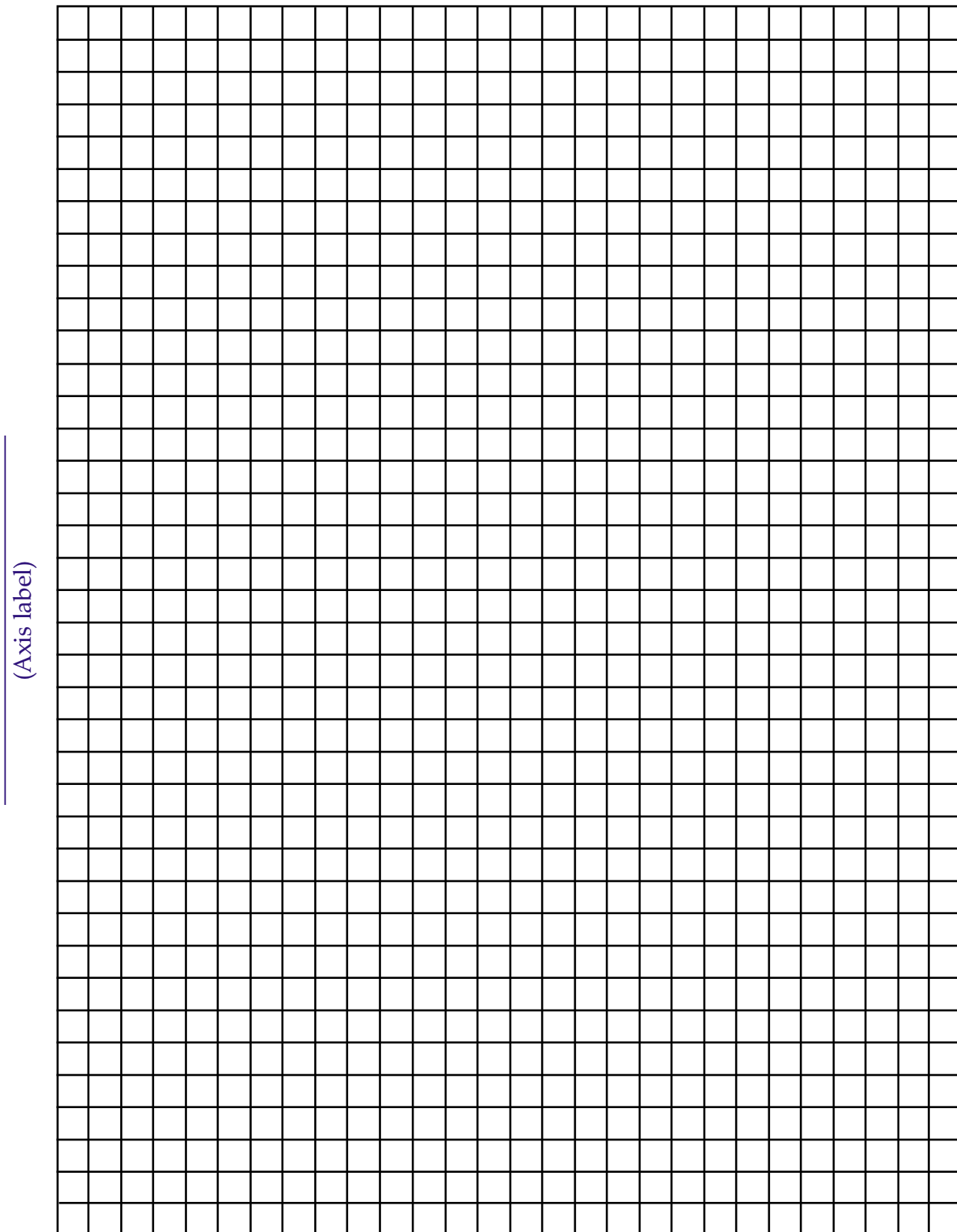


Class Data Table 2 - Distance Pom-Pom Traveled, (Male Students)

Male Students	Peak Expiratory Flow	0% Restriction	25% Restriction	50% Restriction	75% Restriction
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
<i>Calculate the following:</i>					
<i>Mean</i>					
<i>Mode</i>					
<i>Median</i>					

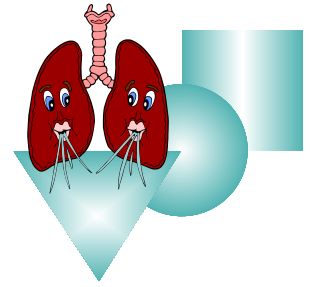
4. Create a bar-graph of the highest PEF and the average data for males and females. Use one color for females and another color for males. Be sure to include a legend on your graph.

Title _____



Legend: Male Female

5. Did you accept or reject your hypothesis? Explain your reason.



6. Answer the following questions using *Data Table 2*:

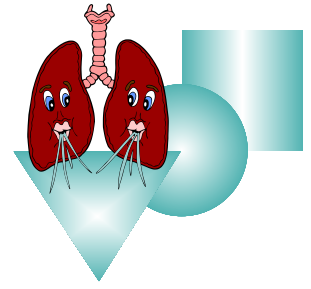
a. What is *Peak Expiratory Flow* (PEF)?

b. Using the *data in Table 2*, predict how distance might be related to *Peak Expiratory Flow*. Explain your answer.

c. Explain how the restriction end caps affected the distance traveled by the *pom-poms*.

d. Based upon your observations and the data in *Class Data Table 2*, what inferences can be made about restricted airways and lung function?

e. What types of pulmonary disease might the restriction end caps represent?



f. How could the *pom-pom shooter* be improved to better simulate peak flow?

g. Explain how to conduct an experiment to determine the effect of height on PEF?
