		Date
TITLE	TITLE	
In Class	Activity	

Which Paper Towel is More Absorbent?

Boyer, Rumsey, Bilder, & Malone. Retrieved at https://www.causeweb.org/repository/StarLibrary/activities/ Modified and used with permission.

Gı	oup Names:
0	bjective
	ne purpose of this activity is to conduct an experiment to compare the absorbency properties of two ands of paper towels by measuring the amount of water each can absorb.
Pa	art One – Prepare for the Experiment
	Roles of the Team Members (write the name of the person taking the role in the blank)
1.	One person will fold and dip the paper towel in the cup of water.
2.	A second person will read all the water measurements using the ruler.
3.	Someone will need to record the data into the workbook for the group.
4.	Another group member can be the timer to measure how long the towel is left in cup absorbing the water and how long it is allowed to drip (for consistency).
	The Experimental Design Process
1.	Start by deciding how many measurements (trials) you will make on each brand.
	(A minimum of 4 is required.) Write down this number here:
	Explain why you need to have as many trials as you do.
2.	Have the person appointed to dip the paper towel describe the method by which they will insert the towel into the cup of water. For example, are they going to fold it carefully first, or will they wad it up, or will they just kind of cram it in? If folding, you need to consider exactly how many folds are made and in what direction the folds are made. Write 1-2 sentences to describe the paper towel dipping process here:
3.	Determine the starting level (height) of the water in the "dipping" cup. This needs to be the same for <i>every</i> trial of the experiment. (About 10 cm high works pretty well.)

4.	how long will	the paper towel		ng process for the experimer water and how long will it di process here:	•
5.	absorbed, con	sidering the pla	•	the ruler for the measuring the units you will use, and the less here:	
6.	Finally, as a cla	ass, you need to	decide which brand to	designate as Brand A:	
	and which bra	nd of paper tow	vel to designate as Bran	d B:	
D۵	rt Two – Cor	duct the Expe	eriment to Collect D	ata	
ΓД					
	•	•		d Brand B, according to your	•
	design proces	s discussed in Pa	art One. Record your da		<i>.</i> /.
	design proces Try to duplica	s discussed in Pa te the condition	art One. Record your da s of the experiment for	ita into the tables that follow	ı. ole.
1.	design proces Try to duplicate It may not be	s discussed in Pa te the condition	art One. Record your da s of the experiment for 10 observations for ea	eta into the tables that follow each trial as nearly as possib	ı. ole.
1.	design proces Try to duplicate It may not be	s discussed in Pa te the condition necessary to do	art One. Record your da s of the experiment for 10 observations for ea	eta into the tables that follow each trial as nearly as possib	ı. ole.
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Observation Number (Trial)	Initial Water Level (cm)	Water Level after Towel Dunking (cm)	Difference in Water Level (Amount Absorbed, cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Data for Brand B, known as: _____

Observation Number (Trial)	Initial Water Level (cm)	Water Level after Towel Dunking (cm)	Difference in Water Level (Amount Absorbed, cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

2. Record your water level differences (the amount absorbed) for each brand in the table below. Refer back to the far right column of each table, from number 1 above.

Then transfer these difference data to lists L1 (Brand A) and L2 (Brand B) in your calculator.

Observation Number (Trial)	Difference in Water Level, or Amount Absorbed (Brand A)	Difference in Water Level, or Amount Absorbed (Brand B)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Part Three – Analyze the Data and Draw Conclusions

1.	Discuss with your group appropriate techniques for examining how the absorbencies of each paper towel are different. Use your calculator to make a boxplot display of your data for each brand.
	a. Draw and label your boxplots below.
	b. Does there appear to be a difference between the brands? Explain.
2.	Next, decide which hypothesis test can be conducted to determine whether or not there is a <i>significant</i> difference between the absorbency of the two brands. Write down the null and alternative hypotheses below, both symbolically and in words:
3.	Perform the hypothesis test. Record your results and state your decision about the null hypothesis.
	a. Test Statistic: (rounded to 2 decimal places)
	b. <i>p</i> -value = (rounded to 3 decimal places)
	c. Decision about the null hypothesis:
4.	Based on your hypothesis test, does there appear to be a <i>significant</i> difference between the two brands of paper towels? Explain briefly, using your results from the previous question.
5.	Discuss with your group any problems that came about in conducting this experiment. If you had the opportunity to redesign this experiment, what changes would you have made, and why? Write a few sentences about the design of your experiment in terms of any of the following: • How was the experiment conducted (same way each time, same person doing task each time)? • How were the measurements taken (was this accurate & consistent)? Was randomization used? • Are the paper towels you used in the experiment a representative sample of the whole population of paper towels from each of these two brands? • What problems arose that you can try to prevent next time?
M	AIN IDEAS: List the Main Ideas for Today's Lesson
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