

Date: 08.12.2018	Topic: THE SCIENTIFIC METHOD
Questions / Key Points:	Notes:
THE SCIENTIFIC METHOD	INCLUDES PURPOSE, RESEARCH, HYPOTHESIS, EXPERIMENT, ANALYSIS, & CONCLUSION • PRINCIPLES & PROCEDURES FOR THE SYSTEMATIC PURSUIT OF KNOWLEDGE INVOLVING THE RECOGNITION & FORMULATION OF A PROBLEM, THE COLLECTION OF DATA THROUGH OBSERVATION & EXPERIMENT, & THE FORMULATION & TESTING OF HYPOTHESES
PURPOSE	THE PROBLEM OR RESEARCH QUESTION IS THE MOST IMPORTANT PART OF THE SCIENTIFIC METHOD EVERY PART OF THE EXPERIMENT IS DESIGNED TO SOLVE THIS PROBLEM OR ANSWER THIS QUESTION.
RESEARCH	WHAT KIND OF SCIENTIFIC PROBLEM ARE YOU TRYING TO ANSWER? DOES RESEARCH ALREADY EXIST? DOES THE DATA SUPPORT OR CONTRADICT YOUR INITIAL INTEREST? * CITE YOUR SOURCES!

Summary:

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HYPOTHESIS	THE STATEMENT USED TO PREDICT THE OUTCOME OF AN EXPERIMENT SHOULD BE AN <u>EDUCATED</u> GUESS BE AS SPECIFIC AS POSSIBLE	E:
EXPERIMENT	DESIGN & PERFORM AN EXPERIMENT TO TEST YOUR HYPOTHESIS EXPERIMENTS SHOULD HAVE AN <u>INDEPENDENT</u> & <u>DEPENDENT</u> VARIABLE	
INDEPENDENT VARIABLE (MANIPULATED)	REPRESENTS THE TREATMENT OR EXPERIMENTAL VARIABLE THAT IS MANIPULATED BY THE RESEARCHER TO CREATE AN EFFECT ON THE DEPENDENT VARIABLE.	
DEPENDENT VARIABLE (MEASURED)	IN A MATHEMATICAL EQUATION OR RELATIONSHIP BETWEEN 2 OR MORE VARIABLES, A VARIABLE WHOSE VALUE DEPENDS ON THOSE OF OTHERS REPRESENTS A RESPONSE, BEHAVIOR, OR OUTCOME THAT THE RESEARCHER WISHES TO PREDICT OR EXPLAIN	S.
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EXPERIMENT BREAKDOWN	WHEN PERFORMING AN EXPERIMENT, LAB WRITE UPS NEED TO INCLUDE A FEW EXTRA STEPS
PROCEDURE	• STEP-BY-STEP DESCRIPTION OF HOW YOU CONDUCTED YOUR EXPERIMENT • BE CLEAR ABOUT THE VARIABLES VS. YOUR CONTROLS • BE SPECIFIC ABOUT HOW YOU MEASURE RESULTS TO PROVE OR DISPROVE YOUR HYPOTHESIS
MATERIALS	LIST ALL SUPPLIES & EQUIPMENT USED IN CONDUCTING YOUR RESEARCH OR EXPERIMENT MATERIALS SHOULD MATCH ALL MATERIALS LISTED THROUGHOUT THE PROCEDURE
SAFETY EQUIPMENT & PROCEDURES	• ANY IMPORTANT SAFETY EQUIPMENT (PPE) OR PROCEDURES SHOULD ALSO BE INCLUDED • THIS CAN BE SEPARATE, OR BUILT INTO YOUR NORMAL MATERIALS & PROCEDURES SECTION IF INCORPORATED, PLEASE HIGHLIGHT SAFETY SPECIFICS
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ANALYSIS	RECORD OBSERVATIONS & ANALYZE WHAT THE DATA MEANS OFTEN, YOU'LL PREPARE A TABLE OR GRAPH OF THE DATA
QUANTITATIVE VS QUALITATIVE DATA	QUANTITATIVE DATA REFERS TO MEASURABLE OBSERVATIONS TOOLS FOR QUANTITATIVE DATA INCLUDE, THERMOMETERS, SCALES, TAPE MEASURER, & CLOCK. QUALITATIVE DATA REFERS TO OBSERVATIONS USING 5 SENSES SIGHT, HEARING, TASTE, TOUCH, & SMELL
QUANTITATIVE DATA (QUANTITY)	NUMERICAL VALUES, MEASURABLE, SUCH AS: LENGTH, HEIGHT, AREA, VOLUME, WEIGHT, SPEED, TEMPERATURE, AGE, ETC
QUALITATIVE DATA (QUALITY)	DESCRIPTIVE VALUES, OBSERVABLE BUT NOT MEASURABLE SUCH AS: COLORS, TEXTURES, SMELL, TASTE, ETC
Summary:	

Date:	Topic: GRAPHS / DATA
Questions / Key Points:	Notes:
GRAPHS	(SEE ATTACHED PAPER / DIAGRAMS)
	QUANTITATIVE GRAPHS INCLUDE:
HISTOGRAM	(OR BAR GRAPH) OF A FREQUENCY DISTRIBUTION OF QUANTITATIVE DATA; THE HORIZONTAL AXIS IS A NUMBER LINE
TIME SERIES	(OR LINE GRAPH) USES STRAIGHT LINES TO CONNECT POINTS PLOTTED AT THE VALUE OF EACH <u>MEASUREMENT</u> ABOVE THE <u>TIME</u> IT WAS TAKEN.
STEM & LEAF PLOT	RETAINS THE ORIGINAL DATA; THE LEAVES ARE THE LAST SIGNIFICANT DIGIT IN EACH DATA VALUE & THE STEMS ARE THE REMAINING DIGITS
	QUALITATIVE GRAPHS INCLUDE:
PIE CHART	(OR CIRCLE GRAPH) SHOWS HOW LARGE EACH CATEGORY IS IN RELATION TO THE WHOLE;
BAR GRAPH	BARs ARE USED TO REPRESENT THE AMOUNT OF DATA IN EACH CATEGORY; ONE AXIS DISPLAYS THE CATEGORIES OF QUALITATIVE DATA & THE OTHER AXIS DISPLAYS THE FREQUENCIES.

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CONCLUSION	SUMMARIZE THE RESEARCH & THE RESULTS OF THE EXPERIMENT
	ANSWER THE QUESTION OR PROBLEM PROPOSED
	EXPLAIN IF YOUR HYPOTHESIS WAS SUPPORTED OR NOT
	USE DATA TO SUPPORT YOUR FINDINGS!
	IF INCONCLUSIVE, ADD SUGGESTIONS FOR FUTURE EXPERIMENTS IN ORDER TO GET MORE CONCLUSIVE RESULTS
	* SEE YOUR LAB WRITE UP RUBRIC FOR MORE INFO REGARDING YOUR LAB WRITE UPS
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