SCIENCE & THE SCIENTIFIC METHOD

What is SCIEN	CE? My own De	efinition: (Stud	dent write down	their own definition).
	Teacher's D	efinition: atte	empt to obtain t	truth through observations and experiments.
What is PHYSI	ICS?			
PHYSICS: Ph	ysics is about forc	ces, motion, a	nd energy. "Fo	undation Science."
CHEMISTRY:	Chemistry is the	science of at	oms. "Central	Science."
BIOLOGY: B i	iology is the scien	ce of living or	rganisms. "Pea	k Science" Physics
History of Scie	nce:			
	PHASE	WHO	WHEN/ WHERE	DESCRIBE
1.	Superstition	Ancient Man	Everywhere	Used magic and religion to explain everything.
2.	Philosophy	Aristotle	Greece 384 BC	Used logic. Based on ideas instead of experiments. Influenced Europe for 2000 yrs.
3.	Scientific Revolution	Galileo	Italy 1564	Used experiments and observations to generate theories. (Father of science).
4.	Mathematics	Newton	England 1642	Used math formulas to describe natural patterns.
5.	Modern	Einstein	Germany/ USA 1879	Tries to explain WHY the universe is the way it is.
TREND:	Aristotle = Gr Galileo = Italy	eece = Greek = Roman En	Empire npire	
	Newton = Engl Einstein = Amo	and = British erica = currer	n Empire nt superpower	
	Political power	and science	are linked. Wl	natever country rules science rules the world.

Notes Term 1 Unit 1 Day 1

fic Method:
Observation: open your eyes and look around.
Question: ask yourself a question about what you see.
Hypothesis: educated guess about what the answer might be.
Experiment: design a way to test your hypothesis.
Variables: things that change during the experiment.
Constants: Something that you purposely keep the same.
Data Collection: record your results.
Quantitative: Any data that can be written as a number.
Qualitative: Any data that uses adjectives.
Data Analysis: figure out what the data means.
<u>Conclusion:</u> answers the question, "Was my hypothesis right?" declare the overall results of your experiment.
Evaluation: answers the question "Do I trust my results?"
Keep An Open Mind: willing to accept new evidence when seen.

Scientific "PROOF"

- Proving something is TRUE is hard!
- Proving something is FALSE is easy!
- Therefore, scientists do NOT try to prove something is true. Rather, they try to prove it is false. If they can't, then it is accepted as a theory.

VARIABLES

Independent variable = <u>What we change</u>	Dependent Variable = <u>What we measured</u>
In a data table it goes on the Left	In a data table it goes on the Right
In a graph in goes <u>on the x - axis</u>	In a graph it goes <u>on the y - axis</u>
Data table columns should ALWAYS includeLabo	lsandUnits
Both graph axes should ALWAYS includeLabe	s and Units. Write them like: Label (Units)

Read the following scenarios. Identify the independent & dependent variable and sketch what the data tables & graphs would look like. (Just their labels.)

experiment. She ties a thermometer to a string and sinks it six			i nen sne records	liic
temperature She repeats this process at a depth of 12 inches at	nd 18 inches	s water. I		
······································	Depth 1	Temp		I
Independent Variable = water depth DATA TABLE:	(inches)	(°C)	GRAPH: Tem	p
			(ªC	C)
Dependent Variable = temperature				
Possible Constants = using the same thermometer, measurin	g in the sar	me lake, s	ame time of day	Depth (inches)
Matsuka is huilding a ninewood derby car to race. He thinks the	nat adding a	ome weig	ht to the car with	modeling elev
might help it go faster. First he races the car by itself. He reco	rds the time	one weig it takes to	o reach the botton	modeling clay
Then he adds 50 grams of modeling clay and races it again $H\epsilon$	e repeats the	e process v	with 100 grams a	nd 150 grams
	· · · · ·	- F		
Independent Variable = adding modeling clay DATA T	ABLE:	lass Tin	GRAPH:	Time
		(g) (s)	(s)
Dependent Variable = time it takes to reach				
the bottom of the ramp				
Possible Constants = using the same derby car, the same ram	np			Mass (g)
			L	
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