Draft *Nature of science* Conceptest questions

Where do all scientific investigations begin?

A. With an observation
B. With an experimental design
C. With the formulation of an hypothesis
D. With a theoretical idea
E. *Any of the above

When is a scientific investigation completed? (**NOTE: more than one answer is currently indicated; this needs to be fleshed out!)**

A. When you're tired
B. When you publish a paper
C. When the topic is explained in a textbook
D. When you formulate a theory to explain the result
E. When the results are replicated
F. *When the hypothesis is rejected
G. When the results are published in the New York Times
H. *Never, the process is cyclic
I. Never, because there are no "right" answers
J. When Truth is found

Are facts always true?

A. Yes
B. No

Which are facts and which are inferences?

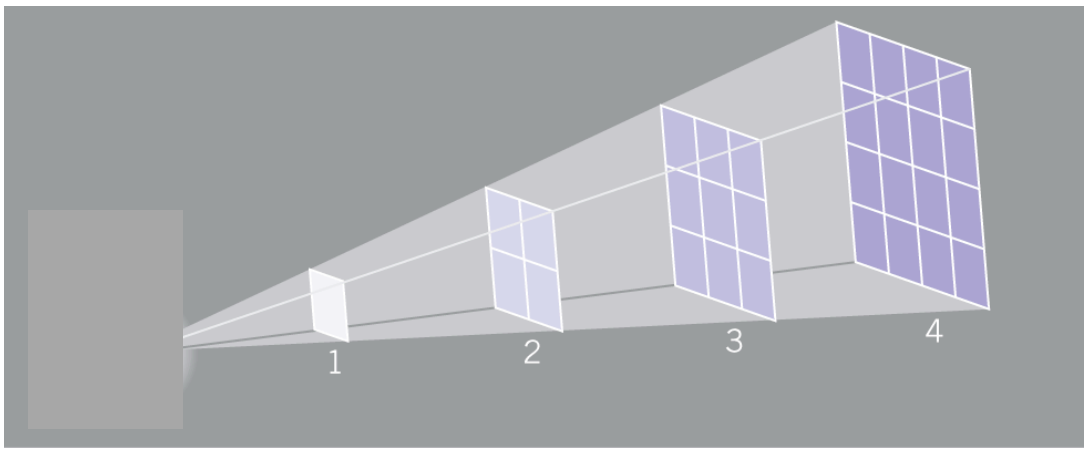
A. The diameter of the table is 80 cm
B. The diameter of the table is 80±0.5cm
C. The distance to the nearest star is 4.3 light years **(ONLY INFERENCE!)**
D. The volume of the object is less than $5m^3$
E. Water is wet
F. Pi (π) = circumference divided by the diameter of a circle
G. Earth is a planet
H. Distance = rate times time

A theory is

A. A collection of observations
B. *A collection of explanations of observations
C. A guess
D. A possible explanation
E. Truth

You conduct an experiment to test an idea; the results are inclusive. What does this tell you, and how do you proceed?

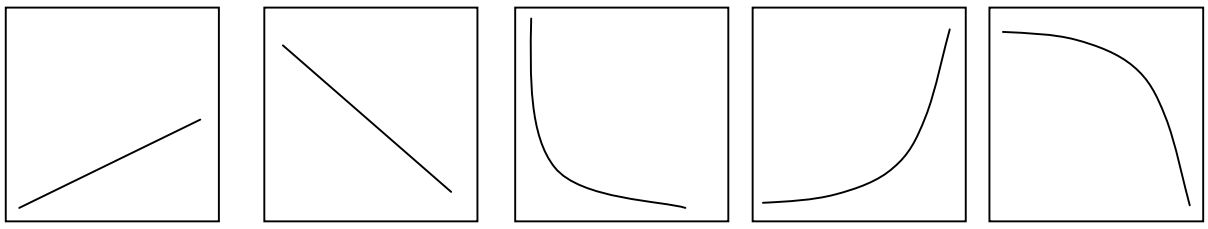
A. It's a poorly designed experiment; revise and rerun
B. It refutes the idea; reject the idea and develop a new one
C. It tells you nothing; rerun the experiment without modification
D. *It tells you nothing; develop a new experiment to test the same idea



The above diagram is a model for a _____ relationship for the intensity of light or the strength of gravity.

A. Linear
B. Square
C. *Inverse square
D. Exponential

Which graph demonstrates an inverse square relationship?



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