


Pool Canvas

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Name TestBank Chapter 01: Scientific Thinking: Your best pathway to understanding the world

Description Question pool for TestBank Chapter 01: Scientific Thinking: Your best pathway to understanding the world

Instructions

[Modify](#)

[◀ Add Question Here](#)

Question 1 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Biology is _____.

Answer

- mostly a collection of facts that can be ordered and memorized
- ✓ the study of living things
- a separate branch of science from the study of how organisms interact with each other and with their environment
- always used responsibly in advertising claims
- Both a) and b) are true.

[◀ Add Question Here](#)

Question 2 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Biology is to science as _____ is to _____.

Answer

- college baseball; professional baseball
- ✓ basketball; sports
- American soccer; European football
- baseball; tennis
- the home team; the visiting team

[◀ Add Question Here](#)

Question 3 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

All of the following are elements of biological literacy EXCEPT:

Answer

- the ability to communicate with others about issues having a biological component.
- the ability to use the process of scientific inquiry to think creatively about real-world issues having a biological component.
- the ability to integrate thoughts about issues having a biological component into your decision-making.
- the ability to write clearly and precisely about your observations, data gathering, and conclusions.
- ✓ All of the above are elements of biological literacy.

[◀ Add Question Here](#)

Question 4 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Biological literacy is the ability to:

Answer

- use the process of scientific inquiry to think creatively about real-world issues that have a biological component.
- communicate ideas about biology to others.
- integrate ideas about biology into your decision making.
- ✓ All of the above are components of biological literacy.
- Only b) and c) are components of biological literacy.

[◀ Add Question Here](#)

Question 5 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

You would have a richer understanding of which of the following social and political issues if you increased your biological literacy?

Answer

- the collapse of financial markets
- the housing crisis
- ✓ stem cell research
- tax cuts
- All of the above are correct.

[◀ Add Question Here](#)

Question 6 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Superstitions are:

Answer

- ✓ irrational beliefs that actions not logically related to a course of events influence its outcome.
- proof that the scientific method is not perfect.
- held by some humans but not by any non-human species.
- just one of many possible forms of scientific thinking.
- true beliefs that have yet to be fully understood.

[◀ Add Question Here](#)

Question 7 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Thinking scientifically relies on which of the following?

- Answer** ✓
- objective observation and experimentation
 - learning a list of facts
 - intuition
 - applying your preconceptions
 - statements from authorities

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 8 Multiple Choice**0 points****Question**

Your friend believes astrology should be considered a scientific discipline and you want to explain to her why it is not. Which of the following arguments is the MOST sound reason why astrology is not considered a true scientific discipline?

- Answer**
- Astrology is not followed by anyone of true intelligence.
 - ✓ Astrology cannot be tested and proved by controlled experiments.
 - Astrology does not attempt to answer and explore unknown questions.
 - Astrology is not taught at universities.
 - Astrology is not based on any form of observations.

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 9 Multiple Choice**0 points****Question**

Science is self-correcting. This means that:

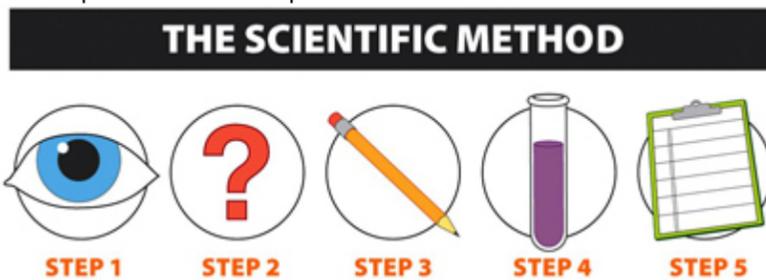
- Answer**
- scientists correct their own biases before engaging in scientific study.
 - scientists have impeccable manners.
 - science is incapable of producing mistaken beliefs if its studies are carefully done.
 - when scientists make mistakes in their statistical analyses, their statistical software always catches those mistakes.
 - ✓ science actively seeks to disprove its own theories and hypotheses.

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 10 Multiple Choice**0 points****Question**

What is Step 4 in the scientific process?



- Answer**
- Devise a testable prediction.
 - Make observations.
 - Draw conclusions and make revisions.
 - ✓ Conduct a critical experiment.
 - Formulate a hypothesis.

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 11 Multiple Choice**0 points****Question**

What should you do when something you believe turns out to be wrong?

- Answer**
- doubt your ability to properly perceive the sensory stimuli of the world
 - blame the government
 - hold to your beliefs
 - ✓ change your mind
 - feel ashamed

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 12 Multiple Choice**0 points****Question**

In a recent study, patients treated with a genetically engineered heart drug were able to walk on a treadmill for 26 seconds longer than those not receiving the drug and showed no side-effects. Can we conclude that this drug is an effective treatment for heart disease?

- Answer**
- No. Genetically engineered drugs cannot be tested via the scientific method. They require comparative observations.
 - No. It is not clear how many subjects were in the study.
 - No. It is not clear that the drug is not a placebo.
 - Yes.
 - ✓ No. It is not clear that the proper controls were made.

[◀ Add Question Here](#)

[Modify](#) [Remove](#)

Question 13 Multiple Choice**0 points****Question**

You note a fuzzy growth on some of the gels in your incubator. What is the name given to this step of the scientific method?

- Answer**
- confirmation
 - hypothesis
 - ✓ observation
 - theory
 - law

[◀ Add Question Here](#)Question 14 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

Which of the following is usually employed before the others by an investigator using the scientific method?

Answer

- conduct a critical experiment
- make observations
- devise a testable prediction
- analyze data
- formulate a hypothesis

[◀ Add Question Here](#)Question 15 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

Scientific study always begins with:

Answer

- hypotheses.
- experiments.
- conclusions.
- predictions.
- observations.

[◀ Add Question Here](#)Question 16 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

The raw materials of science are:

Answer

- predictions.
- theories.
- hunches.
- hypotheses.
- observations.

[◀ Add Question Here](#)Question 17 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

Scientific data:

Answer

- must be collected in laboratories.
- cannot be collected in a completely unbiased way.
- are used to support or refute a hypothesis.
- are always true.
- All of the above are true.

[◀ Add Question Here](#)Question 18 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

In a well-designed experiment:

Answer

- the prediction will be highly probable if the explanation is true.
- the prediction will be highly improbable if the explanation is not true.
- the null hypothesis will not be tested.
- the prediction will most likely be true.
- a) and b) are both correct.

[◀ Add Question Here](#)Question 19 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

A null hypothesis:

Answer

- results from an improperly controlled experiment.
- is the premise that no difference exists between a treatment and control group.
- cannot be rejected.
- is a hypothesis that the experimenter hopes will be falsified.
- is the premise that treatment groups were not adequately controlled.

[◀ Add Question Here](#)Question 20 **Multiple Choice** **0 points**[Modify](#) [Remove](#)**Question**

Which of the following statements is CORRECT?

Answer

- A hypothesis that does not generate a testable prediction is not useful.
- Common sense is usually a good substitute for the scientific method when trying to understand the world.
- It is not necessary to make observations as part of the scientific method.
- The scientific method can be used only to understand scientific phenomena.
- All of the above are correct.

[◀ Add Question Here](#)Question 21 **Multiple Choice** **0 points**[Modify](#) [Remove](#)

Question

“Engaging in aerobic activity three times each week will reduce cholesterol levels” is a:

- Answer**
- testable hypothesis.
 - control group.
 - scientific control.
 - critical experiment.
 - All of the above are correct.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 22 **Multiple Choice** **0 points**

Question

The proposed explanation for a phenomenon is BEST described as:

- Answer**
- a testable prediction.
 - an observation.
 - a hypothesis.
 - a theory.
 - an experiment.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 23 **Multiple Choice** **0 points**

Question

Which of the following is MOST correct?

- Answer**
- Accepting or rejecting a hypothesis is the same as proving whether or not the hypothesis is true.
 - By rejecting a hypothesis, you also reject any theory that was correlated with that hypothesis.
 - You can prove a hypothesis to be true.
 - You can accept or reject a hypothesis, but never prove it to be true.
 - You can prove a hypothesis to be false.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 24 **Multiple Choice** **0 points**

Question

If your hypothesis is “Estrogens in sewage runoff turn fish into hermaphrodites,” what is your null hypothesis?

- Answer**
- Estrogens in sewage runoff turn turtles into hermaphrodites.
 - Estrogens in sewage runoff have no effect in turning fish into hermaphrodites.
 - Testosterones in sewage runoff have no effect in turning fish into hermaphrodites.
 - Testosterones in sewage runoff turn fish into hermaphrodites.
 - Estrogens in sewage runoff turn hermaphroditic fish into unisexual fish.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 25 **Multiple Choice** **0 points**

Question

When conducting a scientific experiment, which of the following is tested?

- Answer**
- a prediction
 - a result
 - a theory
 - a question
 - an observation

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 26 **Multiple Choice** **0 points**

Question

After generating a hypothesis, a scientist next:

- Answer**
- does an experiment.
 - formulates a theory.
 - writes a grant proposal.
 - makes a prediction.
 - designs a series of tests.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 27 **Multiple Choice** **0 points**

Question

If your hypothesis is “Echinacea reduces the duration and severity of the common cold,” which of the following is the BEST testable prediction for this hypothesis?

- Answer**
- If echinacea reduces the duration and severity of the symptoms of the common cold, then individuals taking echinacea should get sick less frequently than those not taking it.
 - If echinacea reduces the duration and severity of the symptoms of the common cold, then individuals taking echinacea should get sick less frequently than those not taking it, and when they do get sick, their illness should not last as long.
 - If echinacea reduces the duration and severity of the symptoms of the common cold, then individuals taking echinacea should get sick more frequently than those not taking it, and when they do get sick, their illness should last longer.
 - If echinacea reduces the duration and severity of the symptoms of the common cold, then individuals taking echinacea who get sick should have illness that do not last as long.
 - None of the above is a reasonable testable prediction for this hypothesis.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 28 **Multiple Choice** **0 points**

Question

Kyle Lohse is currently a starting pitcher for the St. Louis Cardinals. Interestingly, there have been only nine players in major league history who have had the first name "Kyle," and ALL NINE HAVE BEEN PITCHERS. You hypothesize that there is a causal connection between having the name Kyle and becoming a pitcher. Which of the following is a reasonable testable prediction for your hypothesis?

- Answer** ✓ Examination of the list of all minor league players named Kyle will reveal that they are all pitchers as well.
- A random, double-blind survey of little league coaches will reveal that when they have a player named Kyle they make that player into a pitcher.
- A random, double-blind survey of American parents who have named their child Kyle will reveal that they wanted their child to be a pitcher.
- All of the above are reasonable testable predictions for the hypothesis.
- Only b) and c) are reasonable testable predictions for the hypothesis.

◀ [Add Question Here](#)

Question 29 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

A _____ is a pill that looks identical to a pill that contains the active ingredient in a scientific trial, but contains no active ingredient itself.

- Answer**
- tablet
 - barbiturate
 - ✓ placebo
 - capsule
 - treatment

◀ [Add Question Here](#)

Question 30 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

Once a scientist has formulated a hypothesis that generates a testable prediction, she will:

- Answer**
- draw conclusions.
 - make revisions.
 - ✓ conduct a critical experiment.
 - formulate a second hypothesis.
 - make observations.

◀ [Add Question Here](#)

Question 31 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

When conducting a critical experiment to test whether taking echinacea reduces the duration or severity of a cold, which of the following is NOT an important step?

- Answer**
- providing some groups with echinacea and others with a placebo
 - providing some groups with treatments of longer duration than others
 - randomly dividing volunteers into treatment groups
 - ✓ exposing some groups, but not others, to the cold virus
 - All of the above are important steps.

◀ [Add Question Here](#)

Question 32 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

Some have claimed that the herb echinacea reduces the likelihood of catching the common cold. In many hundreds of studies, this claim has been refuted. Assuming these studies were properly conducted, which of the following is a scientifically responsible claim that an echinacea advocate could make in support of further research on this subject.

- Answer**
- The effective dosage of echinacea was outside the range of the dosages given in the scientific studies.
 - The investigators were paid off by the drug companies.
 - The effective length of time needed for taking echinacea is longer than that provided in any of the scientific studies.
 - All of the above are scientifically responsible claims that an echinacea advocate could make in support of further research on this subject.
 - ✓ Only a) and c) scientifically responsible claims that an echinacea advocate could make in support of further research on this subject.

◀ [Add Question Here](#)

Question 33 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

Which of the following is the BEST way to state the relationship between "data" and "results"?

- Answer** ✓ "Data" are the facts you collect from your experiment, while "results" are your interpretation of what the data mean.
- Any two scientists reporting the same "results" must have been using the same "data."
- "Data" and "results" are two names for the same thing.
- The "data" section should always come before the "results" section in a scientific paper.
- Any two scientists examining the same "data" would draw the same "results."

◀ [Add Question Here](#)

Question 34 Multiple Choice**0 points**

[Modify](#) [Remove](#)

Question

If your hypothesis is rejected, then:

- Answer** ✓ you may still have learned something important about the system you were testing.
- you should change the level of statistical significance until your hypothesis is accepted.
- your experiment was poorly designed.
- your experiment was a success.
- your experiment was a failure.

◀ [Add Question Here](#)

- Question 35 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
If the results of an experiment turn out differently from what you expected, then:
- Answer**
- you didn't follow the scientific method.
 - your instruments were probably at fault.
 - you need to redo your experiment until you get the expected result.
 - you should explore the reasons for this in the "conclusions" section of your experimental write-up.
 - your experiment was a failure.
- [Add Question Here](#)
- Question 36 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
If you conduct an experiment that rejects your hypothesis, then:
- Answer**
- your experiment was poorly designed.
 - you should change your major.
 - you should publish your results anyway.
 - your experiment was a failure.
 - the null hypothesis was a better fit to your data.
- [Add Question Here](#)
- Question 37 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
Which of the following is NOT an example of a theory?
- Answer**
- Diseases are caused by germs.
 - Molecules are composed of atoms.
 - Organisms are composed of cells.
 - Species evolve through natural selection.
 - All of the above are considered to be theories.
- [Add Question Here](#)
- Question 38 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
A scientific theory is one that:
- Answer**
- is supported by many years of experimentation all supporting the hypothesis.
 - is based on hunches with no actual supporting evidence.
 - sounds the most plausible.
 - is the result of all scientific experiments.
 - changes each time a different observation is made.
- [Add Question Here](#)
- Question 39 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
In science, theories tend to be _____ than hypotheses.
- Answer**
- more experimental
 - more empirical
 - less scientific
 - more speculative
 - broader in scope
- [Add Question Here](#)
- Question 40 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
Scientific theories do not represent speculations or guesses about the natural world. Rather they are hypotheses—proposed explanations for natural phenomena—that have been:
- Answer**
- found to be statistically significant.
 - used to support the political stances of the scientists that have developed them.
 - validated by the International Board of Scientific Theories.
 - verified by at least one critical experiment.
 - so strongly and persuasively supported by empirical observation that the scientific community views them as unlikely to be altered by new evidence.
- [Add Question Here](#)
- Question 41 **Multiple Choice** **0 points** [Modify](#) [Remove](#)
- Question**
In controlled experiments:
- Answer**
- one variable is manipulated while others are held constant.
 - all variables are held constant.
 - all critical variables are manipulated.
 - all variables are dependent on each other.
 - all variables are independent of each other.
- [Add Question Here](#)
- Question 42 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

In a randomized, controlled, double-blind study:

- Answer**
- experimental subjects are blind-folded when given the experimental treatment.
 - individuals will be assigned to an experimental or control group depending on whether or not they took part in a pilot study.
 - all experimental variables are held constant.
 - neither the experimenter nor the subject know whether the subject is in a control group or an experimental group.
 - All of the above.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 43 **Multiple Choice** **0 points**

Question

An experimental condition applied to research subjects is called a:

- Answer**
- control.
 - treatment.
 - variable.
 - randomization.
 - placebo.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 44 **Multiple Choice** **0 points**

Question

The placebo effect:

- Answer**
- demonstrates that most scientific studies cannot be replicated.
 - reveals that experimental treatments cannot be proven as effective.
 - reveals that sugar pills are generally as effective as actual medications in fighting illness.
 - is an urban legend.
 - is the frequently observed, poorly understood, phenomenon that people tend to respond favorably to any treatment.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 45 **Multiple Choice** **0 points**

Question

Which of the following is the BEST description of a control group in an experiment?

- Answer** The control group is identical to each test group except for one variable.
- The control group is a test group which is chosen at random.
 - There should be more than one control group in any experiment.
 - The control group and the test groups may have several differences between them.
 - There can be more than one difference between the control group and test groups, but not several differences or else the experiment is invalid.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 46 **Multiple Choice** **0 points**

Question

If a researcher uses the same experimental setup as another study to collect data, but uses different research subjects, it is considered:

- Answer**
- extrapolation.
 - exploration.
 - replication.
 - a two-tailed test of the hypothesis.
 - inductive reasoning.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 47 **Multiple Choice** **0 points**

Question

Which of the following is an important feature of the scientific method?

- Answer** Anyone should be able to repeat an experiment.
- Once demonstrated, conclusions cannot be changed.
 - If research results are not conclusive, the opinion of experts should be relied upon.
 - A researcher's methods should not be described once desired results have been obtained.
 - A good hypothesis does not necessarily need to be tested.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 48 **Multiple Choice** **0 points**

Question

In a scientific experiment, a control group:

- Answer**
- is less important than an experimental group.
 - can be compared with an experimental group to assess whether one particular variable is causing a change in the experimental group.
 - must be kept in a laboratory.
 - makes the experiment better, but is not essential.
 - All of the above are correct.

[◀ Add Question Here](#)

[Modify](#) | [Remove](#)

Question 49 **Multiple Choice** **0 points**

Question

Alon claimed that a tincture of a local herb was effective in lowering anxiety and was planning to invest in the product. As evidence of his claim, Alon, who had anxiety over his financial situation, said that he felt much better after the treatment, was much more relaxed, and no longer worried about his finances. Which of the following combinations of methodological flaws BEST characterizes Alon's investigation?

- Answer**
- lack of appropriate controls and lack of an appropriate outcome measure
 - ✓ lack of appropriate outcome measure, replication, randomization, and controls
 - lack of replication and lack of appropriate controls
 - lack of an appropriate outcome measure
 - lack of randomization, lack of replication, and lack of an appropriate outcome measure

[◀ Add Question Here](#)

Question 50 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

A powerful way to demonstrate that observed differences between a treatment group and a control group truly reflect the effect of the treatment is for researchers:

- Answer**
- to get their study published in a scientific journal.
 - make more observations.
 - ✓ to conduct the experiment over and over again.
 - formulate as many hypotheses as they can.
 - to use a variety of statistical tests until they find one that shows statistical significance.

[◀ Add Question Here](#)

Question 51 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

What is the best way for a scientist to address his/her own biases?

- Answer**
- There is no way a scientist can deal with biases.
 - ✓ use careful controls to minimize them
 - understand his/her biases and interpret the data differently as a result
 - make sure that no biases influence his/her work
 - never be involved any kind of scientific study where his/her possible biases might impact the study

[◀ Add Question Here](#)

Question 52 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

_____ may have biases that affect their abilities to perform in an objective fashion.

- Answer**
- Research assistants
 - Scientists
 - Authors of Prep-U questions
 - Politicians
 - ✓ All of the above are correct.

[◀ Add Question Here](#)

Question 53 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Statistical methods make it possible to:

- Answer**
- unambiguously learn the truth.
 - choose the best answer to value-based questions.
 - test non-falsifiable hypotheses.
 - ✓ determine how likely it is that certain results may have occurred by chance.
 - reject any hypothesis.

[◀ Add Question Here](#)

Question 54 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

If a report states, "the female subjects in the study are 5 feet 6 inches \pm 3 inches," this indicates that:

- Answer**
- 90% of the women are between 5 feet 3 inches and 5 feet 9 inches.
 - the variation among all women is 3 inches in height.
 - all of the women are between 5 feet 3 inches and 5 feet 9 inches.
 - ✓ two thirds of the women are between 5 feet 3 inches and 5 feet 9 inches.
 - the investigator is unsure of her data.

[◀ Add Question Here](#)

Question 55 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

The set of analytical and mathematical tools designed to help researchers gain understanding from the data they gather is called:

- Answer**
- experimentation.
 - ✓ statistics.
 - geometry.
 - genetics.
 - biology.

[◀ Add Question Here](#)

Question 56 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Suppose you measure the height of two people. One is a woman who is 5 feet 10 inches tall. The other is a man who is 5 feet 6 inches tall. Which of the following is an appropriate conclusion to draw from these measurements?

- Answer**
- Some men are taller than some women.
 - Men are taller than women.
 - ✓ Some women are taller than some men.
 - The tallest woman is 5 feet 10 inches tall.

Women are taller than men.

[Add Question Here](#)

Question 57 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

If you toss a coin and it comes up tails on eight consecutive tosses, what is the likelihood it will come up heads on the ninth toss?

Answer

- 1
- 1/2
- 0
- 5/9
- 4/9

[Add Question Here](#)

Question 58 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

When comparing two groups, _____ the more confident we are of the conclusion that there is a significant difference in the groups.

Answer

- the larger the variation in each group
- the fewer the number of individuals in each group
- the more variables we measure
- the smaller the difference between the two groups
- the smaller the variation in each group

[Add Question Here](#)

Question 59 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

In a series of studies, researchers found a statistically significant positive correlation between the number of fire-fighters present at a fire and the amount of damage that the fire does. Which of the following is the BEST conclusion to be drawn from these studies?

Answer Statistical data must be put in its proper context to be understood.

To more accurately estimate the effect of the number of fire-fighters on the amount of damage, we would need to compare the amount of damage from fires of different sizes that are fought by similar numbers of fire-fighters.

Fire-fighters make fires worse.

Causation is not correlation.

Fire-fighters are effective in fighting fires.

[Add Question Here](#)

Question 60 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Which of the following statements BEST explains the observation that there are more autism cases now than in the past?

Answer There are more parents who neglect their children, which is a cause of autism, now than in the past.

Autism has been selected for in recent generations by natural selection.

The vaccine for measles, mumps, and rubella has been established as a significant cause of autism.

Doctors are more aware of the condition and have better techniques for diagnosing and reporting it.

All of the above are equally good explanations for the observation that there are more autism cases now than in the past.

[Add Question Here](#)

Question 61 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

When a chewing gum manufacturer makes the claim, "Four out of five dentists surveyed recommend sugarless gum for their patients that chew gum," how many dentists need have been surveyed for the statement to be factually accurate?

Answer five

at least one hundred

at least five hundred

ten

four

[Add Question Here](#)

Question 62 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Anecdotal evidence:

Answer is a more efficient method for understanding the world than the scientific method.

is often the only way to prove important causal links between two phenomena.

can appear to reveal links between two phenomena that do not actually exist.

tends to be more reliable than data based on observations of large numbers of diverse individuals.

is a necessary part of the scientific method.

[Add Question Here](#)

Question 63 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Pseudoscience capitalizes on the belief shared by most people that:

Answer the scientific bases for scientific-sounding claims are often not clear.

scientific claims can be evaluated through the political process.

scientific thinking is a powerful method for learning about the world.

scientific thinking is beyond the reach of the average person.

science is intimidating.

[Add Question Here](#)

Question 64 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

Science as a way of seeking principles of order differs from art, religion, and philosophy in that:

- Answer** science limits its search to the natural world of the physical universe.
 science deals exclusively with known facts.
 science denies the existence of the supernatural.
 there is no room for intuition or guessing.
 all scientific knowledge is gained by experimentation.

[Add Question Here](#)

Question 65 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

All of the following are branches of science EXCEPT:

- Answer** zoology.
 physics.
 geology.
 astronomy.
 logic.

[Add Question Here](#)

Question 66 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

How can science best help each of us understand the role of humans in nature?

- Answer** Science can provide us with a set of moral precepts.
 Science can provide understanding of how the systems of nature work.
 Science can provide us with a specific political agenda.
 Science can teach us to love nature.
 None of the above is correct.

[Add Question Here](#)

Question 67 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

Which of the following terms and phrases best describes the application of scientific knowledge to specific purposes?

- Answer** deduction
 technology
 junk science
 statistics
 pseudoscience

[Add Question Here](#)

Question 68 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

Which of the following questions would be LEAST helped by application of the scientific method?

- Answer** evaluating the relationship between violence in videogames and criminal behavior in teens
 comparing the effectiveness of two potential antibiotics
 formulating public policy on euthanasia
 determining the most effective safety products for automobiles
 developing more effective high school curricula

[Add Question Here](#)

Question 69 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

Why is it that creationism can never be accepted as a scientific explanation of the origin of life?

- Answer** Because the age of the earth, as given in Genesis, can never be determined.
 Because the ideas of creationism cannot be tested through experiment and observation.
 Because creationism, like evolution, is a theory and therefore cannot be proved.
 Because most scientists are not deeply religious people.
 None of the above; creationism can be accepted as a scientific explanation of the origin of life.

[Add Question Here](#)

Question 70 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

Which of the following questions CANNOT be answered by the scientific method?

- Answer** Is eyewitness testimony in criminal proceedings reliable?
 Does chemical runoff give rise to hermaphrodite fish?
 Does hair that is shaved grow back coarser?
 Does taking echinacea reduce the intensity or duration of the common cold?
 Did the United States act appropriately when it invaded Iraq?

[Add Question Here](#)

Question 71 **Multiple Choice** **0 points** [Modify](#) [Remove](#)

Question

The scientific method will never prove or disprove:

- Answer**
- the existence of God.
 - the beauty of Shakespeare's sonnets.
 - the ability of echinacea to prevent the common cold.
 - All of the above are examples of statements that the scientific method will never prove or disprove.
 - ✓ Only a) and b) are examples of statements that the scientific method will never prove or disprove.

[◀ Add Question Here](#)

Question 72 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Despite all of the intellectual analyses the scientific method gives rise to and objective conclusions it makes possible, it CANNOT:

- Answer**
- affect one's opinions about social issues.
 - generate new hypotheses.
 - reject false claims.
 - aid in technical advances.
 - ✓ generate moral statements.

[◀ Add Question Here](#)

Question 73 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

All of the following are branches of biology EXCEPT:

- Answer**
- ecology.
 - evolution.
 - ✓ geology.
 - genetics.
 - behavior.

[◀ Add Question Here](#)

Question 74 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Which of the following areas is NOT heavily influenced by biology?

- Answer**
- environmental issues
 - agriculture
 - criminology
 - behavioral issues
 - ✓ Biology heavily influences ALL of these areas.

[◀ Add Question Here](#)

Question 75 **Multiple Choice** **0 points**

[Modify](#) [Remove](#)

Question

Which of the following is NOT of central importance to the study of biology?

- Answer**
- evolution
 - the hierarchical organization of life
 - the scientific method
 - ✓ the technical application of research findings
 - All of the above are of central importance to the study of biology.

[◀ Add Question Here](#)

Question 76 **Essay** **0 points**

[Modify](#) [Remove](#)

Question

Describe the characteristics of a question that can be addressed through the scientific method and give some examples.

Answer A good question to address using the scientific method should relate to observed patterns or cause-and-effect relationships. The question should also be one that can be tested through measurement of some kind. The book proposes questions about the effects of Echinacea on cold symptoms, and a potential link between chemical runoff and hermaphroditic fish, among others. You may be able to think of other examples.

[◀ Add Question Here](#)

Question 77 **Essay** **0 points**

[Modify](#) [Remove](#)

Question

Does reading your textbook improve your grade in a biology course? List a hypothesis and prediction that address this question as an *if...then* statement.

Answer *If* reading a textbook improves grade in a biology course, *then* students who read their textbook will receive higher grades than students who do not read their textbook.

[◀ Add Question Here](#)

Question 78 **Essay** **0 points**

[Modify](#) [Remove](#)

Question

How would you construct control and experimental groups in the experiment listed above? Should you ask for volunteers for each group?

Answer The class should be divided into two groups, one group with access to the textbook and another group without such access. Students should not be allowed to volunteer for a specific group, as this group might no longer be representative of the larger group. Rather, students should be placed at random into one of these groups.

[◀ Add Question Here](#)

Question 79 **Essay** **0 points**

[Modify](#) [Remove](#)

Question

Students in the textbook-reading group in the above question received a range of scores on their first exam, and students in the non-textbook-reading group received an overlapping range of scores on their first exam. How can one determine whether one group performed better than the other given the overlapping nature of these ranges of scores?

Answer Statistical analysis can compare these groups, computing differences and determining how reliable these differences are.

[◀ Add Question Here](#)Question 80 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

Does the statement, "Evolution is just a theory" have any merit? Explain.

Answer No. This statement incorrectly equates the everyday definition of the term theory with a scientific theory. These two terms are very different, as a *scientific theory* is supported by a large body of evidence, whereas a *theory* in the everyday usage of the term may be supported by little or no evidence.

[◀ Add Question Here](#)Question 81 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

While watching television or reading product advertisements on websites over the next few days, try to find an example of pseudoscience or misleading anecdotal evidence. What claim is being made? Why is such a claim being made?

Answer Though the advertisements students choose will be very diverse, they will generally be incidences where the appearance of scientific backing is used to promote the sale of a product.

[◀ Add Question Here](#)Question 82 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

Design an experiment using all the steps of the scientific method.

Answer In answering this question, the student should first be sure to choose a question that can be answered using the scientific method. The answer should include at least the five basic steps of the scientific method: (1) making an observation, (2) formulating a hypothesis, (3) making a testable prediction, (4) detailing a controlled experiment, and (5) drawing a conclusion. The experiment that the student designs should contain an experimental group, a control group, and a description of the experimental and dependent variables and how the experiment would be performed. Finally, the student should explain what they would do after the results have been compiled, that is, what changes or revisions they would propose for the experiment as well as any ideas for further experimentation on the subject that they might later pursue.

[◀ Add Question Here](#)Question 83 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

Give an example of a controlled experiment and an example of one that is not controlled. Explain the differences and make a judgment about which experiment is more scientifically valid.

Answer The student can give examples of their own or describe the examples given in the textbook, making sure to note the importance not only of a control group, but also why it is important that the control and experimental groups be as similar as possible. The placebo effect might also be mentioned as another reason to use treatments that are as identical as possible, in addition to similar demographics in the groups. Experimenter bias and unconscious influence on the results of the experiment may also be mentioned as pitfalls that can be avoided by designing a well-controlled experiment.

[◀ Add Question Here](#)Question 84 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

What is the difference between the meaning of the word "theory" in science and the non-scientific meaning of the term? Comment on the statement, "The biblical accounts of creation are just as valid as the theory of evolution by natural selection because, after all, it is just a theory, not a fact."

Answer This answer should contain the definition of *theory* in science: as a hypothesis that has the weight of so much empirical evidence behind it that it is extremely unlikely to be altered or discarded because of new evidence. The student should then point out that the statement bases its assertion on the non-scientific meaning of the word "theory," which, for all intents and purposes, just means a hypothesis or educated guess. However, that is not the case in science because scientific theories are evidence-based.

[◀ Add Question Here](#)Question 85 **Essay****0 points**[Modify](#) | [Remove](#)**Question**

Give an example of a pseudoscientific claim that you have encountered in your everyday life, and explain why it has no scientific validity.

Answer The answers here will vary greatly, with some students using the examples given in the textbook. The interesting and significant aspect of all of these answers lies in the students' explanations as to why the claims are invalid. The student may also comment on the value of knowing the scientific method in order to be able to assess critically those claims that are encountered regularly, especially in advertising.

[◀ Add Question Here](#)

OK