

## Nature of Science Practice test

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- \_\_\_ 1. Which of the following is NOT a goal of science?
  - a. to investigate and understand the natural world
  - b. to explain events in the natural world
  - c. to establish a collection of unchanging truths
  - d. to use derived explanations to make useful predictions
  
- \_\_\_ 2. Science differs from other disciplines, such as history and the arts, because science relies on
  - a. facts.
  - b. testing explanations.
  - c. observations.
  - d. theories.
  
- \_\_\_ 3. Scientists will never know for sure why dinosaurs became extinct. Therefore, scientists should
  - a. stop studying dinosaurs and study only living animals.
  - b. work to raise live dinosaurs to study.
  - c. continue to learn as much as they can about dinosaur extinction.
  - d. accept the current theory about dinosaur extinction as the best possible theory.
  
- \_\_\_ 4. Science is best described as a
  - a. set of facts.
  - b. way of knowing.
  - c. collection of beliefs.
  - d. list of rules.
  
- \_\_\_ 5. The work of scientists usually begins with
  - a. testing a hypothesis.
  - b. careful observations.
  - c. creating experiments.
  - d. drawing conclusions.
  
- \_\_\_ 6. Information gathered from observing a plant grow 3 cm over a two-week period is called
  - a. inferences.
  - b. variables.
  - c. hypotheses.
  - d. data.
  
- \_\_\_ 7. Based on your observations, you suggest that the presence of water could accelerate the growth of bread mold. This is
  - a. a conclusion.
  - b. a hypothesis.
  - c. an experiment.
  - d. an analysis.
  
- \_\_\_ 8. A scientific hypothesis
  - a. can be based on personal beliefs or opinions.
  - b. can be tested by experiments or observations.
  - c. does not have to be tested to be accepted as correct.

- d. is a proven fact with much evidence to support it.
- \_\_\_\_\_ 9. During a controlled experiment, a scientist isolates and tests
- a. a conclusion.
  - b. a mass of information.
  - c. a control group.
  - d. a single variable.
- \_\_\_\_\_ 10. A student sees a bee on a flower. The student wonders how the bee finds flowers. This student is displaying the scientific attitude of
- a. creativity.
  - b. curiosity.
  - c. open-mindedness.
  - d. skepticism.
- \_\_\_\_\_ 11. Suppose that a scientist proposes a hypothesis about how a newly discovered virus affects humans. Other virus researchers would likely
- a. reject the hypothesis right away.
  - b. change the hypothesis to fit their own findings.
  - c. design new experiments to test the proposed hypothesis.
  - d. assume that the hypothesis is true for all viruses.
- \_\_\_\_\_ 12. Why is creativity considered a scientific attitude?
- a. Scientists need creativity to make good posters to explain their ideas.
  - b. Creativity helps scientists come up with different experiments.
  - c. Creative scientists imagine the results of experiments without doing them.
  - d. Scientists who are creative are better at handling and training animals.
- \_\_\_\_\_ 13. After a scientist publishes a paper, someone else finds evidence that the paper's hypothesis may not be correct. The scientist is unhappy, but studies the new evidence anyway. The scientist is showing which scientific attitude?
- a. creativity
  - b. curiosity
  - c. open-mindedness
  - d. skepticism
- \_\_\_\_\_ 14. Suppose a scientist must choose whether to publish a report in a newspaper or in a peer-reviewed journal. What is a benefit of publishing in the journal?
- a. Other scientists will know that everything in the report is true.
  - b. The reviewers will fix mistakes in the report's experiment.
  - c. The report will be published more quickly in the journal.
  - d. The quality of the report will meet high scientific standards.
- \_\_\_\_\_ 15. Who reviews articles for peer-reviewed journals?
- a. friends of the scientists who wrote the articles
  - b. anonymous and independent experts
  - c. the scientists who did the experiments
  - d. people who paid for the experiments
- \_\_\_\_\_ 16. How does sharing ideas through peer-reviewed articles help advance science?
- a. Peer-reviewed articles are published only when the ideas they contain have been accepted by most scientists.
  - b. Experiments in peer-reviewed articles do not need to be repeated.

- c. Scientists reading the articles may come up with new questions to study.
- d. Ideas in the articles always support and strengthen dominant theories.

- \_\_\_\_\_ 17. A scientist discovers an important breakthrough in cancer treatment. The scientist thinks the information could save thousands of lives and immediately announces the results on national television, skipping peer review. How might other scientists react to this news?
- a. They will be skeptical because the report was not peer-reviewed.
  - b. They will quickly start to use the new treatment on their patients.
  - c. They will congratulate the scientist for the discovery.
  - d. They will denounce the work and call the scientist a fraud.
- \_\_\_\_\_ 18. What does a reviewer do during peer-review?
- a. Focus on mistakes in spelling.
  - b. Change data to support results.
  - c. Check for mistakes and bias.
  - d. Repeat the experiments in the article.
- \_\_\_\_\_ 19. Suppose that a scientific idea is well-tested and can be used to make predictions in numerous new situations, but cannot explain one particular event. This idea is a
- a. hypothesis that is incorrect.
  - b. hypothesis that must be retested.
  - c. theory that should be discarded.
  - d. theory that may need revision.
- \_\_\_\_\_ 20. A theory
- a. is always true.
  - b. is the opening statement of an experiment.
  - c. may be revised or replaced.
  - d. is a problem to be solved.
- \_\_\_\_\_ 21. How do scientific theories compare to hypotheses?
- a. Theories are the same as hypotheses.
  - b. Theories unify a broad range of observations and hypotheses.
  - c. Hypotheses combine the ideas of several theories to explain events.
  - d. Hypotheses are the dominant view among scientists.
- \_\_\_\_\_ 22. A well-tested explanation that explains a lot of observations is
- a. a hypothesis.
  - b. an inference.
  - c. a theory.
  - d. a controlled experiment.
- \_\_\_\_\_ 23. Which of the following is a question that can be answered by science?
- a. What is beauty?
  - b. Is it ethical to do experiments on animals?
  - c. How does DNA influence a person's health?
  - d. Do people watch too much television?
- \_\_\_\_\_ 24. A personal preference or point of view is
- a. a bias.
  - b. a theory.
  - c. a hypothesis.
  - d. an inference.

- \_\_\_\_\_ 25. How does society help science advance?
- a. Society's biases steer scientists toward studying certain ideas.
  - b. Society produces technology that can be used in science.
  - c. Society's morals help scientists make good decisions.
  - d. Society raises questions that science can help answer.
- \_\_\_\_\_ 26. How does studying science help you be a better member of society?
- a. Learning the biases of science will help you know what is right or wrong.
  - b. Understanding how science works will help you make better decisions.
  - c. Memorizing science facts will help you become more intelligent.
  - d. Knowing science will help you live without the aid of technology.
- \_\_\_\_\_ 27. Which of the following is NOT a way that science influences society?
- a. Science provides answers to some of society's practical problems.
  - b. Science gives society answers to difficult ethical issues.
  - c. Science advances technology that is useful to society.
  - d. Science increases society's understanding of how people affect the environment.
- \_\_\_\_\_ 28. Scientists often try to repeat each other's results. Which of the following should a scientist do to make it easier for others to replicate his or her experiment?
- a. Not use a control to save time.
  - b. Collect only one set of data.
  - c. Skip peer-review so the results are available sooner.
  - d. Use the metric system when communicating procedures and results.

## Nature of Science Practice test Answer Section

### MULTIPLE CHOICE

- ANS: C                   PTS: 1                   DIF: L2                   REF: p. 5  
OBJ: 1.1.1 State the goals of science.                   STA: SC.912.N.1.1.1 | SC.912.N.2.1 | SC.912.N.2.2  
TOP: Foundation Edition                   MSC: knowledge
- ANS: B                   PTS: 1                   DIF: L3                   REF: p. 5  
OBJ: 1.1.1 State the goals of science.                   STA: SC.912.N.1.1.1 | SC.912.N.2.1 | SC.912.N.2.2  
MSC: evaluation
- ANS: C                   PTS: 1                   DIF: L2                   REF: p. 5  
OBJ: 1.1.1 State the goals of science.                   STA: SC.912.N.1.1.1 | SC.912.N.2.1 | SC.912.N.2.2  
TOP: Foundation Edition                   MSC: evaluation
- ANS: B                   PTS: 1                   DIF: L1                   REF: p. 5  
OBJ: 1.1.1 State the goals of science.                   STA: SC.912.N.1.1.1 | SC.912.N.2.1 | SC.912.N.2.2  
TOP: Foundation Edition                   MSC: knowledge
- ANS: B                   PTS: 1                   DIF: L1                   REF: p. 6  
OBJ: 1.1.2 Describe the steps used in scientific methodology.                   TOP: Foundation Edition  
STA: SC.912.N.1.1.6 | SC.912.N.1.1.8 | SC.912.N.1.2  
MSC: knowledge
- ANS: D                   PTS: 1                   DIF: L2                   REF: p. 8  
OBJ: 1.1.2 Describe the steps used in scientific methodology.                   MSC: application  
STA: SC.912.N.1.1.6 | SC.912.N.1.1.8 | SC.912.N.1.2
- ANS: B                   PTS: 1                   DIF: L2                   REF: p. 7  
OBJ: 1.1.2 Describe the steps used in scientific methodology.                   TOP: Foundation Edition  
STA: SC.912.N.1.1.6 | SC.912.N.1.1.8 | SC.912.N.1.2  
MSC: analysis
- ANS: B                   PTS: 1                   DIF: L2                   REF: p. 9  
OBJ: 1.1.2 Describe the steps used in scientific methodology.                   TOP: Foundation Edition  
STA: SC.912.N.1.1.6 | SC.912.N.1.1.8 | SC.912.N.1.2  
MSC: synthesis
- ANS: D                   PTS: 1                   DIF: L2                   REF: p. 7  
OBJ: 1.1.2 Describe the steps used in scientific methodology.                   TOP: Foundation Edition  
STA: SC.912.N.1.1.6 | SC.912.N.1.1.8 | SC.912.N.1.2  
MSC: comprehension
- ANS: B                   PTS: 1                   DIF: L1                   REF: p. 10  
OBJ: 1.2.1 Explain how scientific attitudes generate new ideas.                   TOP: Foundation Edition  
STA: SC.912.N.1.7 | SC.912.N.2.4 | SC.912.L.17.15  
MSC: application
- ANS: C                   PTS: 1                   DIF: L3                   REF: p. 10  
OBJ: 1.2.1 Explain how scientific attitudes generate new ideas.                   MSC: application  
STA: SC.912.N.1.7 | SC.912.N.2.4 | SC.912.L.17.15
- ANS: B                   PTS: 1                   DIF: L2                   REF: p. 10  
OBJ: 1.2.1 Explain how scientific attitudes generate new ideas.                   TOP: Foundation Edition  
STA: SC.912.N.1.7 | SC.912.N.2.4 | SC.912.L.17.15  
MSC: comprehension
- ANS: C                   PTS: 1                   DIF: L2                   REF: p. 10  
OBJ: 1.2.1 Explain how scientific attitudes generate new ideas.

- STA: SC.912.N.1.7 | SC.912.N.2.4 | SC.912.L.17.15      TOP: Foundation Edition  
 MSC: application
14. ANS: D      PTS: 1      DIF: L2      REF: p. 12  
 OBJ: 1.2.2 Describe the importance of peer review.      STA: SC.912.N.1.1.11 | SC.912.N.1.3  
 TOP: Foundation Edition      MSC: evaluation
15. ANS: B      PTS: 1      DIF: L2      REF: p. 12  
 OBJ: 1.2.2 Describe the importance of peer review.      STA: SC.912.N.1.1.11 | SC.912.N.1.3  
 MSC: knowledge
16. ANS: C      PTS: 1      DIF: L2      REF: p. 12  
 OBJ: 1.2.2 Describe the importance of peer review.      STA: SC.912.N.1.1.11 | SC.912.N.1.3  
 TOP: Foundation Edition      MSC: comprehension
17. ANS: A      PTS: 1      DIF: L3      REF: p. 12  
 OBJ: 1.2.2 Describe the importance of peer review.      STA: SC.912.N.1.1.11 | SC.912.N.1.3  
 MSC: application
18. ANS: C      PTS: 1      DIF: L1      REF: p. 12  
 OBJ: 1.2.2 Describe the importance of peer review.      STA: SC.912.N.1.1.11 | SC.912.N.1.3  
 TOP: Foundation Edition      MSC: knowledge
19. ANS: D      PTS: 1      DIF: L3      REF: p. 13  
 OBJ: 1.2.3 Explain what a scientific theory is.      STA: SC.912.N.3.1 | SC.912.N.3.4  
 MSC: synthesis
20. ANS: C      PTS: 1      DIF: L2      REF: p. 13  
 OBJ: 1.2.3 Explain what a scientific theory is.      STA: SC.912.N.3.1 | SC.912.N.3.4  
 TOP: Foundation Edition      MSC: comprehension
21. ANS: B      PTS: 1      DIF: L2      REF: p. 13  
 OBJ: 1.2.3 Explain what a scientific theory is.      STA: SC.912.N.3.1 | SC.912.N.3.4  
 TOP: Foundation Edition      MSC: analysis
22. ANS: C      PTS: 1      DIF: L1      REF: p. 13  
 OBJ: 1.2.3 Explain what a scientific theory is.      STA: SC.912.N.3.1 | SC.912.N.3.4  
 TOP: Foundation Edition      MSC: knowledge
23. ANS: C      PTS: 1      DIF: L3      REF: p. 14  
 OBJ: 1.2.4 Explain the relationship between science and society.  
 STA: SC.912.N.2.5 | SC.912.N.3.3 | SC.912.N.4.1      MSC: evaluation
24. ANS: A      PTS: 1      DIF: L1      REF: p. 14  
 OBJ: 1.2.4 Explain the relationship between science and society.  
 STA: SC.912.N.2.5 | SC.912.N.3.3 | SC.912.N.4.1      TOP: Foundation Edition  
 MSC: knowledge
25. ANS: D      PTS: 1      DIF: L2      REF: p. 14  
 OBJ: 1.2.4 Explain the relationship between science and society.  
 STA: SC.912.N.2.5 | SC.912.N.3.3 | SC.912.N.4.1      TOP: Foundation Edition  
 MSC: comprehension
26. ANS: B      PTS: 1      DIF: L2      REF: p. 14 | p. 15  
 OBJ: 1.2.4 Explain the relationship between science and society.  
 STA: SC.912.N.2.5 | SC.912.N.3.3 | SC.912.N.4.1      TOP: Foundation Edition  
 MSC: analysis
27. ANS: B      PTS: 1      DIF: L2      REF: p. 11 | p. 14  
 OBJ: 1.2.4 Explain the relationship between science and society.  
 STA: SC.912.N.2.5 | SC.912.N.3.3 | SC.912.N.4.1      TOP: Foundation Edition  
 MSC: comprehension
28. ANS: D      PTS: 1      DIF: L2      REF: p. 24

OBJ: 1.3.4 Discuss the importance of a universal system of measurement.  
STA: SC.912.N.1.1.6 | SC.912.N.1.2 TOP: Foundation Edition  
MSC: comprehension