February 2001

Nevada High School Proficiency Examination

PRACTICE TEST IN SCIENCE

FORM C

DO NOT OPEN BOOKLET UNTIL INSTRUCTED TO DO SO.

Nevada Department of Education

Open Response Items for HSPE Science Practice Test – Form C

Directions:

- **Carefully read the two written-response questions that follow. Your answers should cover all parts of the question and should contain all examples requested.**
- **Allow time to review and proofread your work and to make any revisions or corrections. Your responses will be evaluated on the completeness of your answer and your demonstrated understanding of relevant concepts.**
- **Write your answers on the appropriate sections of the answer form. WRITING THAT APPEARS IN THIS TEST BOOKLET WILL NOT BE SCORED.**

Question 1.

Construct a data table using the following information: An experiment was conducted to determine the conditions under which a plant grows best. After two weeks, the results were as follows:

- 10 pea seedlings exposed to light for 8 hours a day reached an average height of 13.0 cm.
- 10 pea seedlings exposed to light 8 hours a day grew to an average height of 12.2 cm.
- 16 pea seedlings exposed to light for 6 hours a day grew to an average height of 8.9 cm.
- 8 pea seedlings exposed to light for 4 hours a day reached an average height of 6.5 cm.
- 12 pea seedlings exposed to light for 14 hours a day reached an average height of 14.0 cm.

What conclusions can you make about the effect that amount of light has on plant growth? Use data from the experiment to support your answer.

Question 2.

You have an empty balloon of known mass that you inflate with helium gas. Will the inflated balloon have more mass, less mass, or the same mass as the empty balloon? Explain your answer.

12. Color, odor, density, specific heat, and boiling point are examples of

A. chemical properties of matter.
B. physical properties of matter.
C. physical changes in matter.
D. chemical changes in matter.

13. One reason for organizing, analyzing, and classifying data is

A. so that computers can be used.
B. to prove a law.
C. to find relationships among the data.
D. to separate qualitative and quantitative data.

14. A plane trip from Las Vegas, NV to Washington, D.C. takes 5 hours. If a plane leaves Las Vegas at 9:00 am (Pacific time zone), at what time will it land in Washington D.C. (Eastern time zone)?

A. 2:00 p.m. eastern time
B. 5:00 p.m. eastern time
C. 5:00 p.m. pacific time
D. 11:00 a.m. pacific time

15. In the nucleus of a cell, the DNA molecule functions most like a

A. pair of scissors.
B. computer memory chip.
C. ballpoint pen.
D. power generating plant.

16. Did early cave dwelling humans ever see a dinosaur?

A. Yes, they lived near the dinosaurs.
B. Yes, they lived near the seashore and dinosaurs lived inland.
C. No, earlier humans hunted the dinosaurs to extinction.
D. No, the dinosaurs were extinct before humans appeared.

17. When a fast moving car is brought to a stop, the brakes become hot. Which of the following statements **BEST** explains this?

A. Energy of rest is changed to energy of motion.
B. Energy of motion is changed to resting energy.
C. Energy of motion is changed to heat energy.
D. Energy of rest is changed to heat energy.

18. Isaac Newton discovered and described many ideas about how the physical world works. These ideas have been tested and supported by many other scientists since Newton. Therefore, these ideas are now considered to be scientific

A. opinions.
B. hypotheses.
C. theories.
D. laws.

1. Three students collected aluminum cans as part of a recycling project. What is the most appropriate unit to measure the weight of the cans they collected?

   A. square inches
   B. kilograms
   C. liters
   D. cubic yards

2. Which of the following substances would be an example of an element?

   A. gold
   B. toothpaste
   C. salt
   D. cotton

Look carefully at the chart of solar system data below before responding to questions 3, 4, & 5.

Solar System Data

Planet	Mean Distance from Sun (millions of km)	Period of Revolution	Period of Rotation	Equatorial Diameter (km)	Density (g/cm^3)
Mercury	57.9	88.00 days	59 days	4,880	5.4
Venus	108.2	224.70 days	243 days	12,104	5.2
Earth	149.6	365.26 days	23 hours, 56 min.	12,756	5.5
Mars	227.9	687.00 days	24 hours, 37 min.	6,787	3.9
Jupiter	778.3	11.86 years	9 hours, 50 min.	142,800	1.3
Saturn	1,427.0	29.46 years	10 hours, 14 min.	120,000	0.7
Uranus	2,869.0	84.00 years	11 hours	51,800	1.2
Neptune	4,496.0	164.08 years	16 hours	49,500	1.7
Pluto	5,900.0	247.70 years	6 days, 9 hours	2,300	2.0

3. The planet that is physically most similar to the Earth is

   A. Mars.
   B. Uranus.
   C. Venus.
   D. Mercury.

4. According to the data, the farther a planet is from the sun

   A. the longer it takes for it to complete one revolution.
   B. the longer it takes for it to complete one rotation.
   C. the less dense it is.
   D. the smaller it is.

5. What is the relationship between the size (diameter) of a planet and the length of one day on the planet?

A. As the diameter gets larger the day gets longer.
B. As the diameter gets larger the day gets shorter.
C. As the diameter changes the length of the day stays the same.
D. As the diameter changes the length of the day is not predictable.

6. Students looking at a fish tank in their classroom found water, fish, plants, and gravel. Which of these objects are made of cells?

A. water and fish only
B. fish and plants only
C. plants and gravel only
D. water, fish, plants, and gravel

7. A 10-gram sugar cube and a 10-gram sample of powdered sugar are placed in two cups with the same volume of water at the same temperature. Which of the following statements is true?

A. The sugar cube dissolves faster because it has fewer molecules.
B. The powdered sugar dissolves faster because it has more surface area.
C. The sugar cube dissolves faster because it has more surface area.
D. The powdered sugar dissolves faster because it has more volume.

8. The extinction of a species

A. will never happen in a freshwater environment.
B. cannot occur if a very small gene pool is present.
C. is a natural event experienced by most species.
D. is almost always caused by human activities.

9. In estimating the age of fossil specimens, an important concept is that

A. in undisturbed layers of the Earth's crust, the oldest layers are the deepest, and each succeeding layer is younger than the one below it.
B. the structures of animal fossils found in different countries cannot be compared.
C. in undisturbed layers of the Earth's crust, the older layers are nearer the surface.
D. fossil animals must have skin attached to the bones in order to determine the age of the fossil.

10. According to the law of conservation of mass, how does the mass of the products in a chemical reaction compare to the mass of the reactants?

A. The mass of the products is greater.
B. The mass of the reactants is greater.
C. The masses are equal.
D. There is no relationship.

11. Atoms of elements form molecules using bonds created by transferring or sharing

A. protons.
B. electrons.
C. neutrons.
D. magnetism.

19. Which of the following statements can **NOT** be tested by scientific study?

A. Nuclear power plants release fewer pollutants into the air than coal-burning power plants.
B. The burning of fossil fuels releases carbon dioxide into the air.
C. Solar energy panels release fewer pollutants into the air than fossil fuels.
D. Fossil fuels should be avoided because it is wrong to pollute the air.

20. A tree grows from a small seed into a 200-foot tall redwood. Most of the tree's mass came from

A. minerals in the soil.
B. carbon dioxide in the air.
C. oxygen in the air.
D. nitrogen in the soil.

21. The moon has less gravity than Earth because

A. the moon is farther from the sun.
B. the moon has no atmosphere.
C. the moon has less mass than Earth.
D. the moon is made of volcanic rock.

22. Which of the following meanings of theory best fits the meaning scientists use when they refer to "Cell Theory" or the "Theory of Evolution"?

A. possible but untested ideas about how or why something happened
B. an idea someone has about how or when or why something happened
C. a fact or bit of evidence available to explain an event or observed phenomena
D. a set of tested explanations and concepts that explain and predict an event or observed phenomena

Melting and Boiling Points of Common Substances

Substance	Melting Point (°C)	Boiling Point (°C)
water	0	100
alcohol	–117	78
nitrogen	–210	–196
oxygen	–218	–183

23. Which substance should be a liquid at –90° C?

A. water
B. alcohol
C. nitrogen
D. oxygen

24. If you wished to test the hypothesis that atomic radiation slows down the rate of radish seed germination, which of the following experimental designs would you use?

A. Use 25 radish seeds and 25 bean seeds and compare results.
B. Plant 50 irradiated seeds and note the effects of the radiation.
C. Plant 25 irradiated seeds and 25 normal seeds at the same time and compare results.
D. Plant 25 normal seeds, note the results then plant 25 irradiated seeds and compare results.

25. Scientists have been able to produce mutations in plants by irradiating their seeds with gamma rays. The result of one of the mutations was a plant that could not produce flowers. Because of this lack of flowers, the plant would **NOT** be able to

A. carry out photosynthesis.
B. transport water.
C. produce seeds.
D. grow more than a few inches tall.

26. When you hold an ice cube, your hand feels cold because

A. the cold flows from the ice cube to your hand.
B. heat flows from your hand to the ice cube.
C. ice is a poor conductor of heat.
D. your hand is a better conductor of heat than the ice cube.

27. After owls eat, they bring back up the indigestible remains of their meals. These regurgitated "pellets" contain the fur and skeletal parts of their prey. A student plans to examine an owl pellet as part of a class project. What type of information might the student learn from this investigation?

A. the age of the owl
B. how many worms the owl eats in a day
C. what kinds of small animals live in the owl's hunting area
D. how successful the owl was in raising a family last year

28. The long necks of a giraffe may best be explained by

A. giraffes constantly stretching their necks over time.
B. short-necked giraffes being less able to compete for food.
C. the theory of use and disuse of organs.
D. the extinction of other long-necked animals due to climate change.

29. A student has written the following hypothesis:
As more salt is added to a container of ice, the temperature of the mixture will become lower.
What are two factors that need to be kept constant to test this hypothesis?

A. amount of salt and amount of ice
B. type of salt and amount of ice
C. size of container and amount of time
D. amount of salt and amount of time

30. If you get vaccinated against chicken pox when you are young, you are not likely to get the disease. One reason for this is that

A. the virus that causes chicken pox cannot enter your body after vaccination.
B. the medicine in the vaccination is stored in your body.
C. the chicken pox virus is not harmful to you when you are older.
D. the vaccination causes your body to form antibodies against the virus.