



## 2003310/2003320- Physical Science/Honors Sample Questions

1. SC.912.L.18.12 – Which property of water **best** describes why water can store lots of thermal energy without large changes in temperature?
  - A. Polarity
  - B. High Specific Heat
  - C. High Surface Tension
  - D. Boiling Point = 100°C
2. SC.912.N.1.1 – During an experiment, a doctor gives a patient a blue pill each day and tells them to meditate one hour each day. After a week of treatment, the patient feels better. Which of the following choices best describes a valid conclusion the doctor can make about the effectiveness of the blue pill?
  - A. It worked. The medicine is effective.
  - B. It didn't work. The medicine is ineffective.
  - C. The meditation was more effective than the blue pill.
  - D. It's impossible to tell because there was no control variable.
3. SC.912.P.8.2 – Which of the following is a physical property of matter?
  - A. pH
  - B. polarity
  - C. melting point
  - D. oxidation reactivity
4. SC.912.P.8.4 – Which of the following choices correctly compares and contrasts neutrons and protons?
  - A. Neutrons are significantly more massive than protons, and located in the nucleus.
  - B. Neutrons and protons have roughly the same mass, and are located in the nucleus.
  - C. Neutrons are significantly less massive than protons, and located outside of the nucleus.
  - D. Neutrons and protons have roughly the same mass, and are located outside of the nucleus.

5. SC.912.P.8.5 – Which of the following statements is true regarding different elements on the periodic table?
- A. Different elements in the same row likely have similar chemical properties.
  - B. Different elements in the same row likely have identical physical properties.
  - C. Different elements in the same column likely have similar chemical properties.
  - D. Different elements in the same column likely have identical physical properties.
6. SC.912.P.8.7 – Ethane,  $C_2H_8$ , does not dissolve in water easily. Based on this, what types of bonds/forces are **most likely** to be responsible in holding together the atoms in an ethane molecule?
- A. ionic bonds
  - B. covalent bonds
  - C. hydrogen bonds
  - D. Van der Waals forces
7. SC.912.P.8.8 – What type of chemical reaction is characterized by two or more reactants forming one product?
- A. synthesis
  - B. combustion
  - C. decomposition
  - D. single replacement
8. SC.912.P.10.1 – A 100kg cart is 10 meters off the ground on a roller coast track. The other side of the track goes up infinitely. Assume the track is a frictionless surface. If the cart starts rolling down the track, how far up will it go on the other side before it stops and falls back down again?
- A. 9.81 meters
  - B. 10 meters
  - C. > 10 meters
  - D. It's impossible to tell because you don't have enough information
9. SC.912.P.10.3 – A man pushes a block with a force of 20 newtons surface, 5 meters. How much work did he do?
- A. 10 joules
  - B. 15 joules
  - C. 25 joules
  - D. 100 joules

10. SC.912.P.10.4 – A turkey is cooking inside an oven. Although the pan is hot, the majority of the heat transferring into the turkey comes from the warm air inside the oven. What type of heat transfer happens due to moving air currents?
- A. radiation
  - B. convection
  - C. conduction
  - D. specific heat
11. SC.912.P.10.5 – A sword is heated inside a blacksmith's forge until it glows red hot. What is happening to the molecules of iron inside the blade?
- A. The iron atoms are gaining mass.
  - B. The iron atoms are becoming stronger.
  - C. The iron atoms are wiggling in place quickly.
  - D. The iron atoms are hard now, and do not move.
12. SC.912.P.10.7 – The Inuit people of northern Canada recommend eating seal blubber to stay warm. Based on this, what is digesting seal blubber?
- A. exothermic reaction
  - B. exoskeletal reaction
  - C. endoscopic reaction
  - D. endothermic reaction
13. SC.912.P.10.10 – Which of the four fundamental forces is responsible for binding nucleons together in the nucleus?
- A. gravity
  - B. electromagnetism
  - C. weak nuclear force
  - D. strong nuclear force
14. SC.912.P.10.11 – Which type of nuclear reaction results in the breakdown of unstable nuclei into smaller nuclei and high energy particles, over a long period of time?
- A. nuclear fission
  - B. nuclear fusion
  - C. radioactive decay
  - D. radioactive fusion

15. SC.912.P.10.14 – Rubber does not allow electrons to flow easily across its surface. Based on this description, what is rubber?
- A. insulator
  - B. conductor
  - C. semiconductor
  - D. semi-insulator
16. SC.912.P.10.15 – Ohm’s law describes the relationship between voltage, current and resistance. Unfortunately, it doesn’t perfectly describe the behavior of a circuit because as current flows, the circuit heats up, and as it heats up, resistance drops. Assuming voltage stays the same and resistance drops by half, what will happen to current?
- A. It will halve.
  - B. It will double.
  - C. It will quadruple.
  - D. It will stay the same.
17. SC.912.P.10.18 – As light enters a dense transparent medium like water, it is absorbed and retransmitted by the molecules of the medium. This process of absorption and retransmission takes a little bit of extra time, so in a dense medium light will slow down. Higher frequency waves slow down less than lower frequency waves, so the wave appears to spread out and make a spectrum. What is this process called?
- A. reflection
  - B. refraction
  - C. absorption
  - D. spectroscopy
18. SC.912.P.10.21 – Red light is lower frequency than blue light. Many of the stars in the night sky are redder than one would expect. According to the Doppler effect, why are those stars more red?
- A. They are weaker than normal stars.
  - B. They are moving towards us and accelerating.
  - C. They are moving towards us with constant velocity.
  - D. They are moving away from us with constant velocity.
19. SC.912.12.2 – What would the slope of a line on an acceleration-time graph look like for an object that is moving with constant velocity?
- A. The slope would be a curve like this: J.
  - B. The slope would be a straight horizontal line: - .
  - C. The slope would be a straight diagonal line in this direction: \.
  - D. The slope would be a straight diagonal line in this direction: /.

20. SC.912.P.12.3 – Which of Newton’s laws explains that an object in motion will continue moving unless acted upon by an outside unbalanced force?
- A. Newton’s First Law
  - B. Newton’s Second Law
  - C. Newton’s Third Law
  - D. Newton’s Law of Universal Gravitation
21. SC.912.P.12.7 – Scientists recently announced that they had discovered small massive particles called neutrinos that apparently moved faster than the speed of light. Much of the scientific community was intrigued, baffled and doubtful of this result. Why would this result be unlikely to be true?
- A. Neutrinos are a well-known hoax.
  - B. Nothing travels faster than light through a medium.
  - C. Nothing travels as fast or faster than light in a vacuum.
  - D. It is true and absolutely likely that neutrinos can go faster than light speed.
22. SC.912.P.12.10 – Assuming volume is held constant and the quantity of gas doesn’t change, if you halve the pressure of a gas, what will happen to the temperature of the gas?
- A. It will halve.
  - B. It will double.
  - C. It will quadruple.
  - D. It will stay the same.
23. SC.912.P.12.11 – Molecules of an unknown sample are bouncing around rapidly. The intermolecular attractive forces between the molecules are almost zero. There is a large amount of space between the molecules. Based on this description, what state of matter is this unknown sample currently in?
- A. gas
  - B. solid
  - C. liquid
  - D. melting from solid to liquid

Correct Answers:

1. B
2. D
3. C
4. B
5. C
6. B
7. A
8. B
9. D
10. B
11. C
12. A
13. D
14. C
15. A
16. B
17. B
18. D
19. B
20. A
21. C
22. A
23. A