

## 2023 Science Challenger D3 Physical Science QUESTIONS

1. Which element is the primary reason for Earth's magnetic field?
  - a. Cobalt
  - b. Aluminum
  - c. Iron
  - d. Magnesium
2. Which of the following places will receive the most sunlight on June 5th?
  - a. Toronto
  - b. Seattle
  - c. Anchorage
  - d. Houston
3. How does a solar eclipse occur?
  - a. Moon goes too far from Earth
  - b. Moon is between Earth and sun
  - c. Sun rotates away from Earth
  - d. Earth blocks the sunlight from reaching the moon
4. Why do some planets have rings?
  - a. Gravitational pull on ice and dust
  - b. Gasses form in a ring shape
  - c. Parts of the planet are broken off and compressed
  - d. There's no reason. It is just completely random
5. Which of the following is evidence of Pangaea existing?
  - a. The coastlines of different continents fitting together
  - b. Fossils of the same species were found on different continents
  - c. Similar rock formations discovered in different continents
  - d. All of the above
6. Who discovered the theory of continental drift?
  - a. Charles Darwin
  - b. Alfred Wegener
  - c. Max Planck
  - d. Rosalind Franklin
7. Which Earthquake waves are the fastest?
  - a. S waves
  - b. P waves
  - c. Love waves
  - d. Rayleigh waves
8. What energy can be harvested from volcanic activity?
  - a. Wind energy
  - b. Geothermal energy
  - c. Hydroelectric energy
  - d. None of the above is possible
9. What causes Aurora Borealis?

- a. Certain spots in the sky get hotter and give out different colors due to varying heat
  - b. Charged particles from the sun interact with the Earth's magnetic field
  - c. Different galaxies move closer to Earth, creating varying colors
  - d. The clouds on Earth reflect the sun's light which creates the different colors
10. What is the significance of the Kármán line?
- a. It marks the boundary of which direction rivers flow
  - b. It marks the boundary between fault lines
  - c. It marks the boundary between sky and space
  - d. It marks the boundary where airplanes can safely fly
11. What is the primary cause of a supernova?
- a. Formation of a new galaxy
  - b. Collision of two stars
  - c. The explosion of a star
  - d. An asteroid striking a star
12. Approximately how many stars are in the milky way galaxy?
- a. 10 million to 40 million
  - b. 100 million to 400 million
  - c. 100 billion to 400 billion
  - d. 100 trillion to 400 trillion
13. Which of the following is the most common in the Milky Way Galaxy?
- a. Hydrogen
  - b. Helium
  - c. Neon
  - d. Oxygen
14. Which of the following is the most common on Earth?
- a. Hydrogen
  - b. Oxygen
  - c. Silicon
  - d. Iron
15. What is the cause of the increasing acidity of oceans?
- a. Carbon dioxide dissolving in seawater
  - b. Runoff from farmland into streams flowing towards the oceans
  - c. Increasing temperatures causing glaciers to melt
  - d. Increasing amounts of acid rain
16. What is the cause of airplanes being limited to certain altitudes?
- a. Increasing friction with increasing altitude
  - b. Insufficient oxygen
  - c. Limited UV protection
  - d. High pressures
17. What is a cause of Antarctica's low precipitation?
- a. Low air moisture
  - b. Cold air temperature
  - c. Both A and B
  - d. None of the above

18. What is the closest galaxy to the Milky Way?
  - a. Andromeda Galaxy
  - b. Peekaboo Galaxy
  - c. Sagittarius Dwarf Galaxy
  - d. Canis Major Dwarf Galaxy
19. What is the difference between weathering and erosion?
  - a. Weathering is rocks breaking down, while erosion is also rocks moving around
  - b. They are the same but take place at different rates
  - c. Weathering is rocks breaking from wind, while erosion is rocks breaking from water
  - d. Weathering is rocks moving around, while erosion is only rocks breaking down
20. What is a black hole?
  - a. A star that emits black light
  - b. A cluster of galaxies
  - c. A spacecraft designed for deep space exploration
  - d. A region in space with extremely high gravity that nothing can escape from
21. What is the usage of the ISS (International Space Station)?
  - a. Study the atmospheres of other planets
  - b. Provide a platform for space tourism
  - c. Conduct scientific research and experiments in microgravity
  - d. Monitor and predict weather patterns on Earth
22. What makes the sky blue?
  - a. Absorption of blue light
  - b. Reflection of blue light
  - c. Magnetic field of Earth
  - d. UV light
23. What term describes when a planet in orbit is the furthest from the sun?
  - a. Equinox
  - b. Solstice
  - c. Perihelion
  - d. Aphelion
24. What was the first American spacecraft to land on the moon?
  - a. Apollo 11
  - b. Voyager 1
  - c. Gemini 7
  - d. Skylab 1
25. How do stars generate energy?
  - a. Nuclear fusion
  - b. Nuclear fission
  - c. Solar wind
  - d. Hydrogen combustion
26. How is atmospheric nitrogen converted into usable nitrogen?
  - a. Nitrogen fixation
  - b. Nitrogen assimilation
  - c. Nitrification

- d. Electrolysis
27. What is the term for heat transfer through moving particles?
- a. Condensation
  - b. Convection
  - c. Conduction
  - d. Radiation
28. What is the difference between weather and climate?
- a. Weather varies daily. Climate does not
  - b. Weather and climate are the same thing
  - c. Weather is short term conditions. Climate is a long term pattern.
  - d. Weather always changes quickly. Climate always changes slowly.
29. What caused the Canadian wildfires in early June 2023?
- a. Lightning strikes
  - b. Human activity
  - c. Both A and B
  - d. None of the above
30. The majority of mountains are formed by:
- a. Tectonic activity
  - b. Volcanic eruptions
  - c. Weathering and erosion
  - d. Glacial movement