

***Essentials of Oceanography, 10e (Trujillo/Keller)***

**Chapter 1 Introduction to Planet "Earth"**

Match the term or person with the appropriate phrase. You may use each answer once, more than once or not at all.

- A) first determination of Earth's circumference
- B) mapped world with Roman knowledge showing latitude and longitude
- C) made important observations about drift of sea ice
- D) first European explorer to Pacific Ocean
- E) led voyage that first used the marine chronometer
- F) mapped the Mediterranean Sea for the Greeks
- G) led voyage that first circumnavigated the globe
- H) incorrectly concluded that no life exists in deep ocean
- I) used ecological approach to solve fisheries problem
- J) established temporary settlement in North America

1) Balboa

Diff: 1

Skill: knowledge

2) Eratosthenes

Diff: 1

Skill: knowledge

3) Magellan

Diff: 1

Skill: knowledge

4) Ptolemy

Diff: 1

Skill: knowledge

5) Vikings

Diff: 1

Skill: knowledge

Answers: 1) D 2) A 3) G 4) B 5) J

Match the term with the appropriate phrase. You may use each answer once, more than once or not at all.

- A) gaseous and dusty space cloud
- B) rich in ferromagnesian minerals, between crust and core
- C) composed of iron and nickel, liquid outer
- D) Big Bang
- E) outermost portion of the Earth, basalt and granite
- F) Milky Way
- G) solar winds

6) core

Diff: 1

Skill: knowledge

7) crust

Diff: 1

Skill: knowledge

8) galaxy layer and solid inner layer

Diff: 1

Skill: knowledge

9) mantle

Diff: 1

Skill: knowledge

10) nebula

Diff: 1

Skill: knowledge

Answers: 6) C 7) E 8) F 9) B 10) A

Match the term with the appropriate phrase. You may use each answer once, more than once or not at all.

- A) innermost liquid layer of the Earth
- B) oceanic crust
- C) plastic portion of mantle
- D) continental crust
- E) lower portion of mantle
- F) composed of iron, nickel, and sulfur
- G) crust and upper mantle

11) aesthenosphere  
Diff: 1  
Skill: knowledge

12) basalt  
Diff: 1  
Skill: knowledge

13) granite  
Diff: 1  
Skill: knowledge

14) lithosphere  
Diff: 1  
Skill: knowledge

15) mesosphere  
Diff: 1  
Skill: knowledge

Answers: 11) C 12) B 13) D 14) G 15) E

16) Early Polynesians only traveled within sight of land.  
Answer: FALSE  
Diff: 1  
Skill: knowledge

17) Vikings led by Thor Heyerdahl established temporary colonies in North America.  
Answer: FALSE  
Diff: 1  
Skill: knowledge

18) Significant oceanographic knowledge was acquired during the Middle Ages.  
Answer: FALSE  
Diff: 1  
Skill: knowledge

19) The Ming Dynasty ships used magnetic compasses similar to those used today.

Answer: TRUE

Diff: 1

Skill: knowledge

20) Christopher Columbus established trade routes from Europe around Africa to India.

Answer: FALSE

Diff: 1

Skill: knowledge

21) The Earth's crust solidified around 4.5 billion years ago.

Answer: TRUE

Diff: 1

Skill: knowledge

22) When the Earth cooled, the layers of the earth separated based on density differences.

Answer: TRUE

Diff: 1

Skill: knowledge

23) Earth developed the first ocean by about 4 million years ago.

Answer: TRUE

Diff: 1

Skill: knowledge

24) In general, the chemical composition of ocean water has remained constant through geologic time.

Answer: TRUE

Diff: 1

Skill: knowledge

25) The mantle could not have produced enough water to fill the oceans.

Answer: FALSE

Diff: 1

Skill: knowledge

26) The salinity of the oceans has been steadily increasing.

Answer: FALSE

Diff: 1

Skill: knowledge

27) Free oxygen was present in the Earth's primordial atmosphere.

Answer: FALSE

Diff: 1

Skill: knowledge

28) Production of the first free oxygen in the atmosphere caused organisms living at that time to flourish.

Answer: FALSE

Diff: 1

Skill: knowledge

29) Carbon dating is used to determine the absolute age of a rock or fossil.

Answer: TRUE

Diff: 1

Skill: knowledge

30) Heterotrophic organisms can make their own food from inorganic carbon sources.

Answer: FALSE

Diff: 1

Skill: knowledge

31) Oceanic crust is less dense than continental crust because it is made of silica and manganese.

Answer: FALSE

Diff: 1

Skill: knowledge

32) Anaerobic organisms require oxygen to survive.

Answer: FALSE

Diff: 1

Skill: knowledge

33) Heterotrophic organisms manufacture their own food using sunlight energy.

Answer: FALSE

Diff: 1

Skill: knowledge

34) The Earth formed 4.6 billion years ago.

Answer: TRUE

Diff: 1

Skill: knowledge

35) Radiometric age dating is used to determine the age of most rock layers.

Answer: TRUE

Diff: 1

Skill: knowledge

- 36) The four principle oceans of the Earth are the:
- A) Atlantic, Arctic, Mediterranean, and Pacific Oceans.
  - B) Atlantic, Arctic, Indian, and Pacific Oceans.
  - C) Atlantic, Antarctic, Mediterranean, and Pacific Oceans.
  - D) Antarctic, Caspian, Indian, and Pacific Oceans.
  - E) Antarctic, Arctic, Indian, and Pacific Oceans.

Answer: B

Diff: 1

Skill: knowledge

- 37) One distinction between an "ocean" and a "sea" is that a sea:
- A) contains more shallow water.
  - B) is composed of salt water.
  - C) is smaller than an ocean.
  - D) may be enclosed by either land or ocean currents.
  - E) All of the above are correct.

Answer: E

Diff: 2

Skill: comprehension

- 38) All of the following are **TRUE** concerning the deepest part of the ocean *except*:
- A) the bottom of the trench was visited by Piccard and Walsh in the *Trieste* in 1960.
  - B) the deepest part of the ocean is located in a trench off the coast of Japan.
  - C) the depth of the trench exceeds the height of Mount Everest.
  - D) the depth of the trench is estimated at 12,500 meters.
  - E) the trench is called the Mariana Trench.

Answer: D

Diff: 1

Skill: knowledge

- 39) The correct arrangement of astronomical bodies from **oldest** to **youngest** is:
- A) galaxy, solar system, planet.
  - B) planet, galaxy, solar system.
  - C) planet, solar system, galaxy.
  - D) solar system, galaxy, planet.
  - E) solar system, planet, galaxy.

Answer: A

Diff: 3

Skill: application

40) The **nebular hypothesis** suggests that:

- A) all bodies in the solar system formed from an enormous gas cloud.
- B) Earth's moon is an asteroid captured by the Earth's gravity.
- C) galaxies such as the Milky Way form independent of one another.
- D) the Earth was formed by a cosmic explosion, a "big bang".
- E) the moon is derived from a protoplanet.

Answer: A

Diff: 1

Skill: knowledge

41) The separation of the Earth into layers was the result of the:

- A) decrease in temperature downward toward the core.
- B) differing densities of the rock and mineral materials.
- C) gravitational force created by the rotating Earth.
- D) initial collection of materials and their position in Earth.
- E) presence of water at Earth's surface.

Answer: B

Diff: 1

Skill: knowledge

42) Oceanic crust is primarily:

- A) basalt.
- B) carbonate sedimentary rocks.
- C) clay minerals.
- D) granite.
- E) siltstone.

Answer: A

Diff: 1

Skill: knowledge

43) Which of the following statements regarding continental and oceanic crust is **TRUE**?

- A) Continental crust and oceanic crust have equivalent densities.
- B) Continental crust is thicker and denser than oceanic crust.
- C) Continental crust is thinner and denser than oceanic crust.
- D) Continental crust is thicker and less dense than oceanic crust.
- E) Continental crust is thinner and less dense than oceanic crust.

Answer: D

Diff: 2

Skill: comprehension

44) Earth's primordial atmosphere most likely included:

- A) ammonia, carbon dioxide, and water vapor.
- B) carbon dioxide, water vapor, sulfur dioxide, and methane.
- C) hydrogen, helium, and oxygen.
- D) nitrogen, ozone, and sulfur dioxide.
- E) all of the above.

Answer: B

Diff: 1

Skill: knowledge

45) Free oxygen in our atmosphere is important to the development and maintenance of life on Earth because oxygen:

- A) combines with iron in volcanic rocks.
- B) can form ozone and block some UV radiation.
- C) is necessary for photosynthesis to occur.
- D) reduces atmospheric temperature.
- E) was very abundant in our early atmosphere.

Answer: C

Diff: 2

Skill: comprehension

46) Organisms that break down organic molecules and release energy are called:

- A) autotrophic organisms.
- B) bacteria.
- C) biotic organisms.
- D) fungi.
- E) heterotrophic organisms.

Answer: E

Diff: 1

Skill: knowledge

47) Radioactive isotopes can sometimes be used to determine the:

- A) absolute age of the rock.
- B) chemical composition of the rock.
- C) formation method.
- D) metamorphism.
- E) relative age of the rock.

Answer: A

Diff: 2

Skill: comprehension



- 48) The "Age of Discovery" began with:
- A) Christopher Columbus' discovery of the "New World."
  - B) Ferdinand Magellan's circumnavigation of the globe.
  - C) Phoenician exploration of the Mediterranean.
  - D) Polynesian colonization of Pacific Islands.
  - E) Viking voyages to North America.

Answer: A

Diff: 1

Skill: knowledge

- 49) Fish first appeared:
- A) after the "Age of the Dinosaurs" during the Mesozoic Era.
  - B) during the Ordovician Period of the Paleozoic Era.
  - C) in the Cretaceous Period of the Mesozoic Era.
  - D) when amphibians dominated the oceans.
  - E) when land plants evolved during the Carboniferous Period.

Answer: B

Diff: 1

Skill: knowledge

- 50) The scientific method includes all of the following *except*:
- A) data collection.
  - B) evaluation of data.
  - C) hypothesis formation.
  - D) hypothesis testing.
  - E) validation of theory.

Answer: E

Diff: 2

Skill: comprehension

Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

51) A. Baltic  
B. Black  
C. Caspian  
D. Indian  
E. Mediterranean  
Answer: D  
Diff: 4  
Skill: analysis

52) A. Erastosthenes  
B. Herodotus  
C. Ptolemy  
D. Pytheas  
E. Strabo  
Answer: E  
Diff: 4  
Skill: analysis

53) A. Cook  
B. Cosmas  
C. Darwin  
D. Herodotus  
E. Mercator  
Answer: C  
Diff: 4  
Skill: analysis

54) A. autotrophic  
B. chemosynthesizers  
C. cyanobacteria  
D. heterotrophs  
E. sulfur bacteria  
Answer: D  
Diff: 4  
Skill: analysis

55) A. Devonian  
B. Jurassic  
C. Ordovician  
D. Permian  
E. Silurian  
Answer: B  
Diff: 4  
Skill: analysis

- 56) A. calcium carbonate
- B. carbon dioxide
- C. chlorophyll
- D. oxygen
- E. water

Answer: A

Diff: 4

Skill: analysis

- 57) Distinguish between an **ocean** and a **sea**.

Answer: The ocean is the large body of salt water that covers the majority of the earth's surface (roughly 71%). We divide the global ocean into smaller oceans that are bordered by continents or latitude lines. One example is the Atlantic Ocean which is bordered on the west by North and South America, to the east by Europe and Africa, to the north by the Arctic Circle (60°N), and to the south by the Antarctic Circle (60°S). In contrast, a sea is a smaller subdivision of the ocean surrounded by land such as the Black Sea in Eastern Europe.

Diff: 2

Skill: analysis

- 58) Differentiate between a **hypothesis** and a **theory**.

Answer: A hypothesis is a stated relationship between observed phenomena that can be tested. A theory is a relationship between observed phenomena (variables) that has withstood repeated independent testing over time.

Diff: 2

Skill: comprehension

- 59) Contrast oceanic and continental crust.

Answer: Oceanic crust is thinner, denser, and darker in color than continental crust and is composed of the igneous rock, basalt. Continental crust is thicker, less dense, and lighter in color than continental crust and is made of the igneous rock granite.

Diff: 2

Skill: comprehension

- 60) Discuss advances in oceanographic navigation occurring over the course of human history.

Diff: 1

Skill: knowledge

- 61) Describe Stanley Miller's landmark experiment. How did the results of this experiment change theories regarding the evolution of life on Earth?

Diff: 3

Skill: application

- 62) Explain why the presence of free oxygen in our atmosphere marks an important step in the evolution of life on Earth.

Diff: 2

Skill: comprehension