The Origin and Evolution of the Earth

Standard difficulty · 20 questions · 40 marks · Time: 39 minutes

Name: _____ Date: _____ Score: ____ / 40

Write full answers in Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer 8 × 1 = 8 marks

1. The Big Bang is generally accepted to have taken place about:
   (a) 3.8 billion years ago **(b)** 137 million years ago
   (c) 4.6 billion years ago **(d)** 13.7 billion years ago

2. Who is linked with the revised nebular hypothesis of 1950?
   (a) Otto Schmidt and Carl Weizsäcker **(b)** Harry Hess
   (c) Arthur Holmes **(d)** Alfred Wegener

3. What is meant by “differentiation”?
   (a) a vast group of a large number of stars
   (b) small bodies gathering into larger ones
   (c) small bodies that stick together to build planets
   (d) separation of earth materials into layers by density

4. Life began to evolve about 3,800 million years ago; the Big Bang took place about 13,700 million years ago. How many million years apart were these?
   (a) 9,900 million years **(b)** 17,500 million years
   (c) 10,000 million years **(d)** 9,800 million years

5. Light travels at about 300,000 km per second. How far does it travel in 15 seconds?
   (a) 4,500,000 km **(b)** 4,800,000 km **(c)** 450,000 km **(d)** 45,000,000 km

6. Within 300,000 years of the Big Bang the temperature fell to 4,500 K. Suppose a gas cloud is at 2,500 K. What is that in °C? (°C = K − 273)
   (a) 2,773 °C **(b)** 2,227 °C **(c)** 2,263 °C **(d)** 2,327 °C

7. Which of these was part of the early atmosphere formed by degassing?
   (a) factory smoke **(b)** plenty of free oxygen
   (c) carbon dioxide **(d)** chlorofluorocarbons

8. In the evolution of the present atmosphere, what happened in the first stage?
   (a) photosynthesis added oxygen
   (b) the oceans froze completely
   (c) the primordial atmosphere was lost to solar winds
   (d) the moon pulled the air away

Section B — Short answer — 8 × 2 = 16 marks

9. What is meant by differentiation?

10. What is meant by each? (a) accretion (b) photosynthesis

11. Who put forward each idea: (a) the Nebular Hypothesis (b) the revised nebular hypothesis of 1950

12. Which came first, and by how many million years? (a) oxygen began to flood the atmosphere (about 2,000 million years ago) (b) life began to evolve (about 3,800 million years ago)

13. Light travels about 300,000 km per second. How far does it travel in one minute, and in 14 minutes?

14. Convert to °C (°C = K − 273): (a) 4,500 K (b) 2,500 K

15. Put these stages in the formation of planets in order: (a) planetesimals accrete into a few large planets; (b) these stick together into planetesimals; (c) matter condenses into small rounded objects; (d) gas lumps form a core with a rotating disc of gas and dust.

16. Explain each term: (a) differentiation (b) degassing

Section C — Longer answers — 4 × 4 = 16 marks

17. Describe the stages of the Big Bang Theory.

18. (a) Put these in order, earliest first: the Big Bang took place (about 13,700 million years ago); oxygen began to flood the atmosphere (about 2,000 million years ago); the oceans formed (about 4,000 million years ago). (b) How many million years from the first to the last? (c) Explain one of these events.

19. Suppose a space probe 200,100,000 km away sends a signal at the speed of light (300,000 km per second). (a) How many seconds does it take to arrive? (b) How many minutes and seconds is that? (c) Why is a light year a measure of distance, not of time?

20. Life began to evolve about 3,800 million years ago and oxygen began to flood the atmosphere about 2,000 million years ago. (a) How many million years apart were they? (b) Name the three stages in the evolution of the present atmosphere. (c) What is degassing?

Want another sheet on this chapter? In the Ambiful Worksheets app every sheet is new, with its answer key, and your child never gets the same question twice.
Scan the code to get the free app, or open **worksheets.ambiful.com/get**

Answer key

The Origin and Evolution of the Earth · AW-11SS-GOE-2026-V1 · For parents — fold back or tear off before handing the sheet to your child.

Q	Answer	Working
1	**(d) 13.7 billion years ago**	—
2	**(a) Otto Schmidt and Carl Weizsäcker**	—
3	**(d) separation of earth materials into layers by density**	—
4	**(a) 9,900 million years**	13,700 − 3,800 = 9,900
5	**(a) 4,500,000 km**	300,000 × 15
6	**(b) 2,227 °C**	2,500 − 273
7	**(c) carbon dioxide**	—
8	**(c) the primordial atmosphere was lost to solar winds**	—
9	**The separation of earth material into layers by density: heavier iron sank to the centre and lighter material rose.**	—
10	**(a) small bodies gathering into larger ones (b) plants making food and releasing oxygen**	—
11	**(a) Immanuel Kant, revised by Laplace (b) Otto Schmidt and Carl Weizsäcker**	—
12	**Life began to evolve, by 1,800 million years**	3,800 − 2,000
13	**18,000,000 km; 252,000,000 km**	300,000 × 60; × 14
14	**(a) 4,227 °C (b) 2,227 °C**	4,500 − 273; 2,500 − 273
15	**(d), (c), (b), (a)**	—
16	**(a) separation of earth materials into layers by density (b) the outpouring of gases from the earth's interior**	—
17	**All matter was in a tiny ball of infinite density; it exploded about 13.7 billion years ago and expanded; atoms began to form within minutes; within 300,000 years the temperature fell to 4,500 K and atomic matter formed.**	—
18	**(a) the Big Bang took place; the oceans formed; oxygen began to flood the atmosphere (b) 11,700 million years (c) Answers will vary; see the chapter.**	13,700 − 2,000

Q	Answer	Working
19	**(a) 667 seconds (b) 11 min 7 s (c) It is the distance light travels in a year, about 9.461 × 10^{12} km.**	200,100,000 ÷ 300,000; ÷ 60
20	**(a) 1,800 million years (b) loss of the primordial atmosphere, degassing from the interior, and change by photosynthesis (c) the outpouring of gases from the earth’s interior**	3,800 − 2,000