

Fancy a fun way to find out about the history of the natural world? Reckon you're a whizz at knowing What on Earth Happened?

Then why not try this amazing 100-question quiz to test out your knowledge of natural history from the beginning of time to the present day? All the answers, arranged in rough chronological order, can be found or deduced from the timeline overleaf. Good luck!

SECTION 1: HADEAN

1. About how much of the world's water arrived on a giant bombardment of comets?

a) 20%
b) 40%
c) 70%
d) 90%



2. Which of the following gases did not feature in the Earth's early atmosphere?

a) Oxygen
b) Nitrogen
c) Methane
d) Carbon dioxide



SECTION 2: ARCHAEN

3. What does LUCA stand for?

a) Largest Underwater Cretaceous Animal
b) Lower Urinary Causeway and Anterior
c) Least Uniform Cryogenic Annelid
d) Last Universal Common Ancestor

4. What process leads to the formation of complex cells?

a) Photosynthesis
b) Respiration
c) Sexual reproduction
d) Endosymbiosis

5. Chloroplasts are structures in plant cells that turn sunlight and carbon dioxide into food and oxygen – a process called photosynthesis. From which life forms are they thought to have been originally descended?

a) Purple bacteria
b) Spirochetes
c) Cyanobacteria
d) Algae

SECTION 3: PROTEROZOIC

6. Oceanic crust is:

a) More dense and thicker than continental crust
b) Less dense and thicker than continental crust
c) More dense but thinner than continental crust
d) Less dense but thinner than continental crust

SECTION 4: CAMBRIAN

7. What eel-like sea creature may have been the ancestor to all vertebrate animals?

a) Pikaia
b) Opabinia
c) Hallucigenia
d) Cloudinia

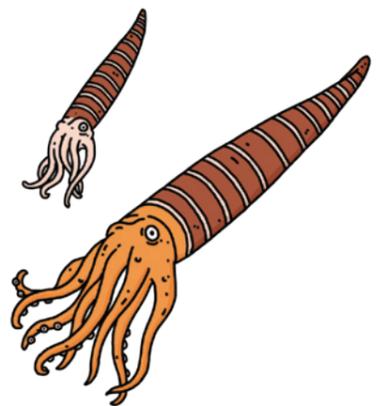


8. How many eyes did the curious arthropod-like sea creature Opabinia have?

a) One
b) Three
c) Five
d) Seven

9. What bodily features indicate the beginnings of an arms race between creatures in the Cambrian seas?

a) Eyes and shells
b) Jaws and teeth
c) Segmented bodies
d) Stinging tentacles



10. *Vauxia* is an ancient type of:

a) Branching sponge
b) Stinging jellyfish
c) Segmented trilobite
d) Eel-like fish

SECTION 5: ORDOVICIAN

11. *Megalograptus* was a:

a) Gigantic dinosaur
b) Huge sea scorpion
c) Towering tree
d) Terrifying raptor

12. Which of the following landmasses formed first?

a) Laurasia
b) Gondwana
c) Australia
d) Pangaea

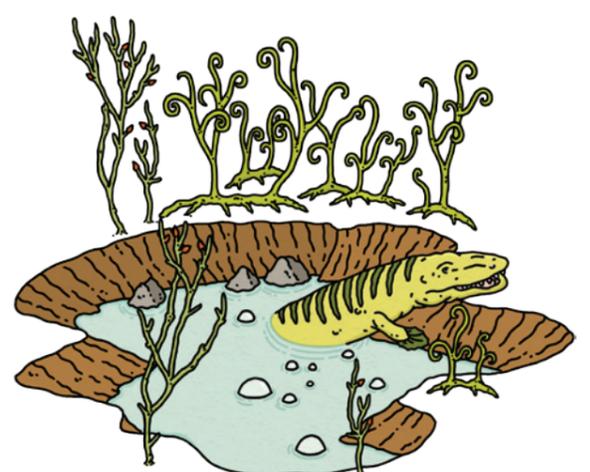
SECTION 6: SILURIAN

13. What is thought to have provoked the first mass extinction of life in the seas?

a) A massive meteorite impact
b) Glaciation over the South Pole
c) Melting methane from the sea floor
d) Bubonic plague

14. Possibly the first arthropods to explore life on land resembled:

a) Beetles
b) Scorpions
c) Lungfish
d) Worms

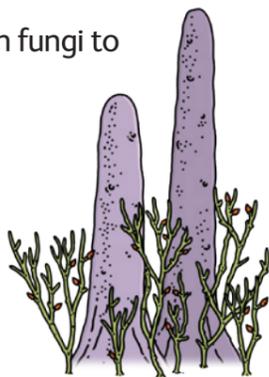


15. Which of the following features did primitive flowers NOT lack?
- Stems
 - Leaves
 - Roots
 - Flowers

SECTION 7: DEVONIAN

16. Which of the following plant families did NOT form part of the early terrestrial landscape, 400 million years ago?
- Mosses
 - Orchids
 - Liverworts
 - Cooksonia
17. Phloem and Xylem are:
- Vascular tissues for transporting nutrients and water around plants
 - Different shaped teeth in the jaws of prehistoric sharks
 - Ancient types of lichens that first colonised the land
 - The male and female sex organs of a giant squid

18. Which of the following families teamed up with fungi to mutual benefit on land?
- Amphibians
 - Plants
 - Worms
 - Reptiles

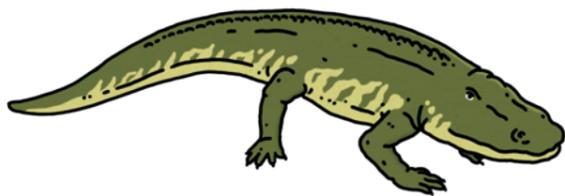


19. Why did levels of atmospheric oxygen rise rapidly in the late Devonian Period?
- Spread of plant life on land
 - Increase in volcanic activity
 - The emergence of massive coral reefs
 - Abnormal levels of solar radiation

SECTION 8: CARBONIFEROUS

20. About when did some terrestrial creatures start laying hard-shelled eggs so they could reproduce inland?
- 500 million years ago
 - 400 million years ago
 - 300 million years ago
 - 200 million years ago

21. *Eryops* was a powerful 2m long amphibious carnivore that had rudimentary:
- Canines
 - Nostrils
 - Ears
 - Eyebrows



22. Why did some insects, such as dragonflies, grow exceptionally large in the Carboniferous era?
- An oversupply of body-building food
 - Rising levels of oxygen in the air
 - Increasing competition for survival between different living things
 - A courtship strategy in the bid for males to mate with females

23. When limestone is crushed by the collision of tectonic plates it turns into:
- Chalk
 - Alabaster
 - Slate
 - Marble

24. Which of the following tree families did NOT form part of the Carboniferous coal-making flora?
- Lepidodendron
 - Calimites
 - Oak
 - Glassopteris



25. There are no coal deposits to be found on Earth dating back to the period:
- 350–340 million years ago
 - 290–280 million years ago
 - 250–240 million years ago
 - 180–170 million years ago

26. *Diplocaulus* was a Carboniferous-era amphibian that had the following curious anatomical features:
- An arrow-shaped head
 - A heart-shaped tongue
 - Dr Spock-like ears
 - Square-shaped feet

SECTION 9: PERMIAN

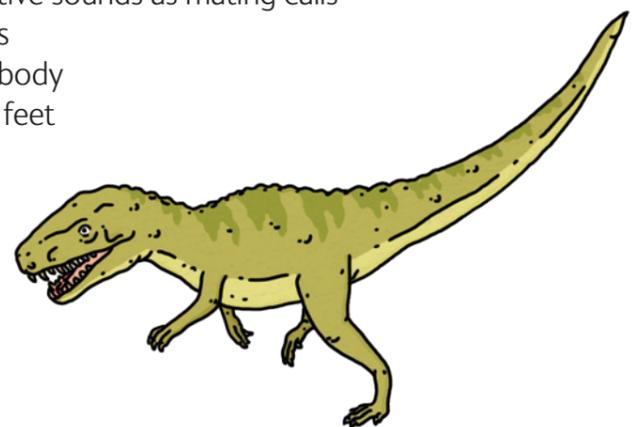
27. Which of the following events is NOT thought to have contributed to the Permian mass extinction, 252 million years ago?
- The melting of frozen methane substrates on the sea floor
 - An increase in volcanic activity
 - A giant meteorite strike
 - A severe glaciation over the South Pole

SECTION 10: TRIASSIC

28. Deciduous trees lose their leaves for part of the year as a way of:
- Protecting against the cold
 - Conserving water
 - Saving food
 - Fertilising the soil

29. *Lystrosaurus* was a mammal-like reptile that survived the Permian mass extinction because it was able to:
- Tolerate low oxygen environments
 - Reproduce asexually
 - See in the dark
 - Live off a diet of worms

30. *Euparkeria* is one of the first terrestrial animals to:
- Make distinctive sounds as mating calls
 - Lay blue eggs
 - Have a furry body
 - Walk on two feet



31. Which of the attributes below helped archosaurs, the ancestors of dinosaurs, to dominate life on land following the Permian mass extinction?
- Strong jaw muscles
 - A venomous bite
 - Molar teeth for chewing
 - Warm bloodedness

32. The word 'dinosaur' means:
- Terrible-lizard
 - Hungry-biter
 - Dangerous-reptile
 - Noisy-tooter

33. Birds are directly descended from which animal family?
- Saurichian dinosaurs
 - Ornithischian dinosaurs
 - Pteradactyls
 - Bats

SECTION 11: JURASSIC

34. Jet is a black mineral that is formed from the fossilised remains of?
- Carboniferous beetles
 - Triassic termites
 - Permian palm trees
 - Jurassic monkey-puzzles

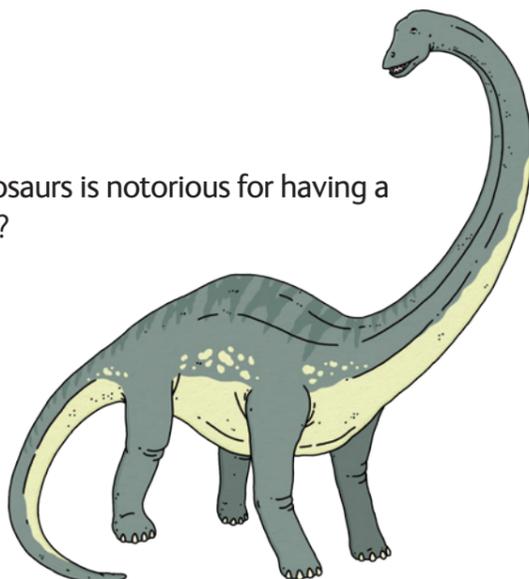


35. Where do most mammals keep their eggs?
- In the ground
 - In a nest
 - In their bodies
 - In water

36. Which of the following helped protect primitive mammals and their offspring against dinosaur attack?
- Sharp teeth
 - Pointy fingernails
 - Breast milk
 - Hairy nostrils

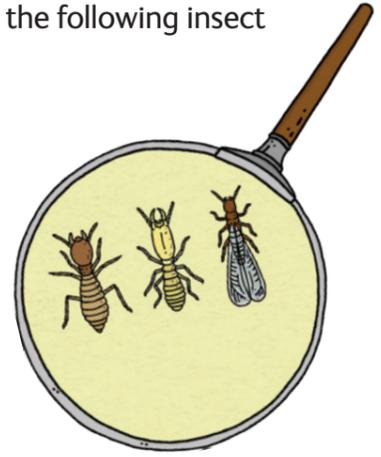
37. Which of the following ancient sea creatures had a coiled shell and can often be found as fossils?
- Trilobites
 - Troglodytes
 - Astomites
 - Ammonites

38. *Diplodocus*, the herbivorous dinosaur giant, belonged to which of the following reptile families?
- Theropod
 - Sauropod
 - Pterosaur
 - Plesiosaur



39. Which of the following dinosaurs is notorious for having a walnut-sized 80 gram brain?
- Tyrannosaurus rex*
 - Triceratops*
 - Stegosaurus*
 - Kentosaurus*

40. Termites are close relatives of which of the following insect families?
- Ants
 - Wasps
 - Maggots
 - Cockroaches

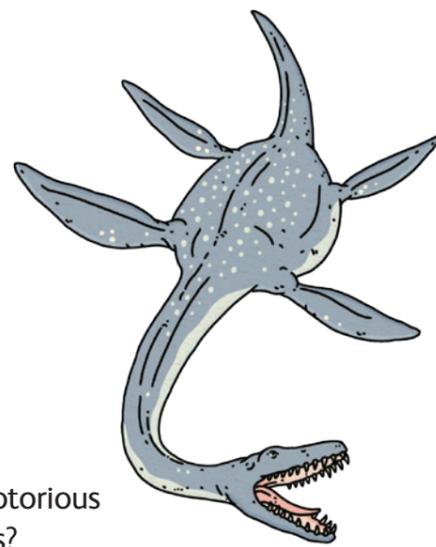


41. Diatoms are types of microscopic:
- Bacteria
 - Algae
 - Amoeba
 - Fungi

42. Snakes are directly descended from which of the following animal families?
- Worms
 - Eels
 - Toads
 - Lizards

43. Which of the following features were common in ancient birds such as *Archaeopteryx* but are absent from modern birds?
- Teeth
 - Gizzard
 - Hollow bones
 - Feathers

44. Which of the following was NOT a marine reptile?
- Plesiosaur
 - Pliosaur
 - Pterosaur
 - Steneosaurus



45. Which family of marine reptiles is notorious for having extraordinarily long necks?
- Pliosaur
 - Plesiosaur
 - Mossasaur
 - Susisuchus

SECTION 12: CRETACEOUS

46. About 90 million years ago India was attached to which continent?
- Africa
 - Europe
 - Australia
 - Asia

47. Which of the following is a particular feature of all 'monocot' flowering plants?
- They are all shrubs and flowers, not trees
 - They grow outwards from the tips of the shoots and leaves
 - They grow outwards from a central bud
 - They are all deciduous

48. Which of the following statements about male mosquitoes is TRUE?
- Unlike females, they don't suck blood
 - Unlike females, they suck blood
 - They carry more diseases than females
 - They are about twice the size of females

49. Songbirds are thought to have originated in which part of the world?
- Africa
 - North America
 - South America
 - New Zealand



50. Which of the following statements about flowering plants is NOT true?
- Their ovaries swell up to form fruits
 - They contain a sugary drink for insects to feast on
 - They diverged into two big families – monocots and dicots
 - The first evolved approximately 200 million years ago

51. Over millions of years the remains of microscopic marine organisms called coccolithophores fall on to the sea floor and gradually turn into:
- Limestone
 - Chalk
 - Sand
 - Marble

52. The fossilised remains of what organisms have been found in clays beneath the city of London?
- Palaeocene palm trees
 - Jurassic theropods
 - Triassic tulips
 - Cretaceous kangaroos

53. A mososaur is a type of ancient:
- Therapod
 - Tetrapod
 - Pterodactyl
 - Marine lizard

54. Which of the following attributes of flowering plants are NOT designed to attract insects, birds or mammals?
- Sugary nectar
 - Bright flowers
 - Juicy fruit
 - Nutritious tubers

SECTION 13: PALAEOCENE

55. Today's oil deposits in the Middle East are the remains of marine life deposited in which ancient sea?
- Tethys
 - Iapetus
 - Gondwanan
 - Baltic

56. How are oak trees pollinated?
- Wind
 - Squirrels
 - Moths
 - Birds



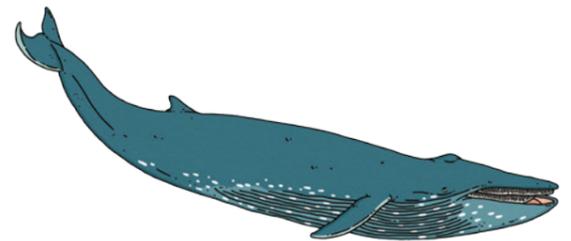
57. Pigs, goats, sheep, camels and deer all belong to which mammal family?
- Ungulates
 - Marsupials
 - Carnivora
 - Condylarths

SECTION 14: EOCENE

58. What occurred about 49 million years ago that is thought to have dramatically changed the Earth's climate?
- A massive meteorite strike
 - A wobble in the Earth's orbit
 - A surge in solar activity
 - The growth of a giant marsh in the north sea

59. Fig trees are pollinated by which type of insects?
- Beetles
 - Mosquitoes
 - Wasps
 - Moths

60. Whales evolved from animals that looked like:
- Deer
 - Sharks
 - Ray-finned fish
 - Sea cows



61. Which of the following types of birds do NOT belong to the Galliform family?
- Turkeys
 - Chickens
 - Ducks
 - Pheasants

62. The Antarctic ice sheet began to form in which geological era?
- Eocene
 - Palaeocene
 - Oligocene
 - Jurassic

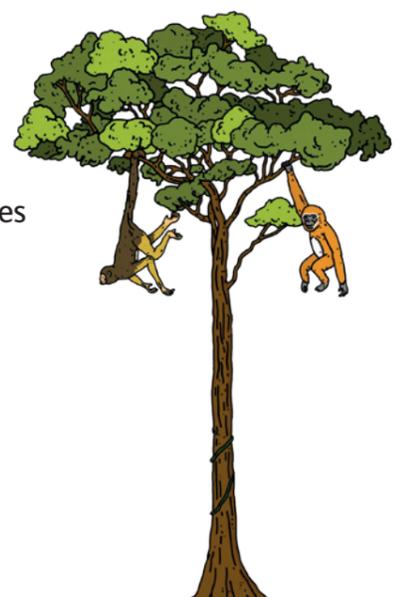
63. Flowering plants originated in which type of climate?
- Tropical
 - Alpine
 - Desert
 - Tundra

64. Why do pine trees sometimes secrete sticky resin?
- To prevent intrusion by infectious micro-organisms
 - To capture insects
 - To regulate internal fluid levels
 - To help glue on newly established branches

SECTION 15: OLIGOCENE

65. Which of the following is NOT a member of the Rosaceae family of flowering plants?
- Apples
 - Apricots
 - Lemons
 - Roses

66. Which of the following features makes New World monkeys distinctive?
- Black fur
 - Flat noses
 - Hand gestures
 - Brightly-coloured bottoms



67. Bears first emerged in which part of the world?

- a) North Africa
- b) North America
- c) Southern Asia
- d) Siberia



68. Why did horses legs gradually get longer?

- a) To jump further
- b) To run faster
- c) To reach higher
- d) None of the above

69. Which of the following is hunted by a sperm whale?

- a) Krill
- b) Squid
- c) Prawns
- d) Flounder

SECTION 16: MIOCENE

70. Why do sperm whales have such big heads?

- a) To protect their bulging brains
- b) To use as a battering ram in courtship contests
- c) To help them stay buoyant in deep water
- d) To accommodate a giant ego

71. What's the big advantage of the C4 mode of photosynthesis that emerged in certain families of grass around 15 million years ago?

- a) It uses less carbon dioxide
- b) It requires less sunlight
- c) It produces more food
- d) It forms stronger stems

SECTION 17: PLIOCENE

72. The Mediterranean is all that remain of which ancient sea?

- a) Panthalassa
- b) Tethys
- c) Iapetus
- d) Indus

73. Which of the following is NOT thought to have been one of the reasons that some ape-like creatures got up and walked on two feet around 4 million years ago?

- a) Because they had big brains
- b) Because they wanted to see further into the distance
- c) For wading across rivers
- d) For carrying food into storage

74. The Gulf Stream is responsible for:

- a) Warming Europe
- b) Covering the South Pole with an ice cap
- c) Triggering tsunamis in the Pacific
- d) Spreading smallpox across the Atlantic

75. Bamboo trees belong to which of the following plant families:

- a) Grass
- b) Palm
- c) Fern
- d) Conifer



76. Camels originally evolved from creatures that once lived in:

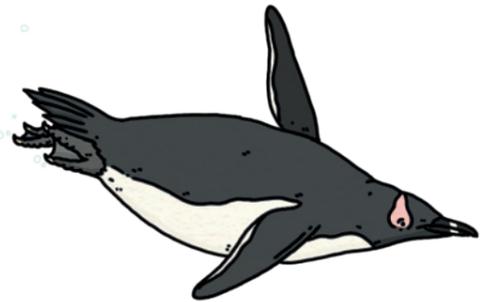
- a) Asia
- b) Europe
- c) Africa
- d) The Americas

77. Why did so many mammals grow to gigantic sizes during the ice ages?

- a) To reach higher into the trees
- b) As a way of keeping warm with extra body fat
- c) Because there was more food available to eat
- d) Because of growth hormone stimulated by climate change

78. Penguins belong to which of the following animal families?

- a) Birds
- b) Mammals
- c) Amphibians
- d) Fish



SECTION 18: PLEISTOCENE

79. Charles Darwin discovered the bones of which mammal species on his voyage around the world on HMS *Beagle*?

- a) *Megatherium*
- b) *Toxodon*
- c) *Camelops*
- d) *Elasmotherium*

80. Roughly how regularly have extreme glaciations occurred in the current ice ages?

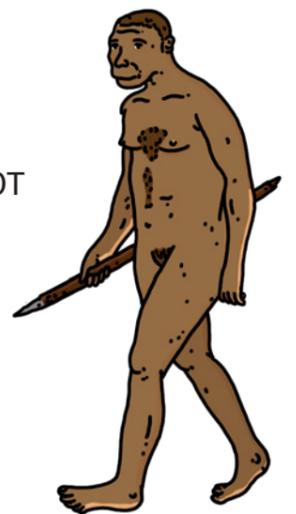
- a) 10,000 years
- b) 100,000 years
- c) 500,000 years
- d) 800,000 years

81. What may have led to a dramatic crash in human populations in Africa about 70,000 years ago?

- a) A drought
- b) A super-volcano
- c) An ice age
- d) Disease

82. Which of the following continents was NOT visited by our ancestor *Homo erectus*?

- a) Africa
- b) Europe
- c) Asia
- d) America



83. Which of the following phenomena is NOT thought to have an effect on global temperatures?

- a) Variations on the Earth's orbit around the Sun
- b) Variations in the rotation of the Earth around its vertical axis
- c) Variations in the rotation of the Earth around its horizontal axis
- d) Thinning of the globe's ozone layer

SECTION 19: HOLOCENE

84. A climatic episode known as the Younger Dryas event may have been triggered by the development of which human activity?
- Agriculture
 - Mining
 - Music
 - Monogamy

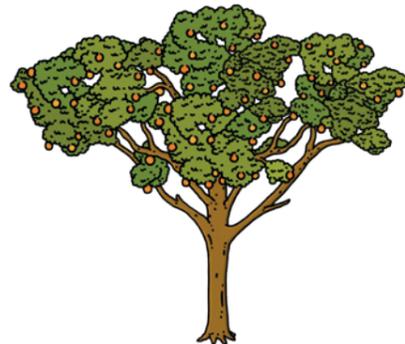
85. The domestic dog is a sub-species of which wild animal?
- Jackal
 - Wolf
 - Fox
 - Boar



86. A mule is a cross between a:
- Horse and zebra
 - Donkey and ass
 - Ass and horse
 - Horse and donkey

87. Coffee berries were first crushed and turned into a beverage in which country?
- Ethiopia
 - Brazil
 - Kenya
 - Costa Rica

88. Oranges originated in which part of the world?
- Florida
 - Spain
 - Canada
 - China



89. Sugar was first cultivated in:
- West Africa
 - North America
 - India
 - Polynesia
90. *Bombyx mori* is a species of:
- Caterpillar
 - Worm
 - Butterfly
 - Earwig

91. Which of the following did NOT aid farmers in medieval Europe?
- Collar harness
 - Iron plough
 - Warming climate
 - A gold rush

92. What made it possible for ancient Egyptian farmers to leave their land and work as labourers building pyramids for three months a year?
- Slave labour
 - The Aswan Dam
 - Honeybees
 - Earthworms



93. Which age is the most recent?
- Iron Age
 - Bronze Age
 - Stone Age
 - Copper Age



94. The Great Barrier Reef covers an area approximately how large?
- 3,000 square miles
 - 23,000 square miles
 - 53,000 square miles
 - 133,000 square miles

95. Alum is a mineral mined from medieval quarries that was used for:
- Mixing into toothpaste
 - Fixing colour dyes to cloth
 - Making tools for locks
 - Smelting into aluminium

96. Which of the following crops was NOT cultivated by Native American farmers?
- Maize
 - Coffee
 - Tomatoes
 - Potatoes

SECTION 20: ANTHROPOCENE

97. Cities such as London require, on average, an area how many times bigger than the land they occupy to feed their tightly-knit populations?
- 2 times
 - 45 times
 - 125 times
 - 254 times

98. Which two countries were saved from famine in the 20th century thanks to the so-called 'Green revolution'?
- Ethiopia and Bengal
 - India and Mexico
 - Namibia and Armenia
 - Bangladesh and Cambodia

99. Concentrations of carbon dioxide in the atmosphere today are roughly how many parts per million?
- 200
 - 300
 - 400
 - 500

100. Which of the following factors does not increase human population levels?
- Improvements in agricultural techniques
 - Artificial fertilisers
 - Genetic modification
 - The contraceptive pill



For the correct answers, please email quizanswers@whatonearthbooks.com