

EARTH AND SPACE

1. EARTH AND SPACE

Writer: American Heritage

Toss Up: Short Answer

Sapphires are made by refining which mineral?

Bonus Answer: Corundum

Bonus: Multiple Choice

Which of the following statements about corundum is not true?

- W) It is an aluminum oxide
- X) It is 8.0 on the Moh's hardness scale
- Y) It is naturally transparent
- Z) It is the source material for rubies

Bonus Answer: X

2. EARTH AND SPACE

Writer: American Heritage

Toss Up: Short Answer

What 16th century astronomer first observed Saturn's ring system, which now has its largest gap named after him?

Bonus Answer: Cassini

Bonus: Multiple Choice

Which of the following is true about Titan?

- W) Its surface has never been explored
- X) One side always faces Saturn
- Y) It is the largest moon in the solar system
- Z) It has lakes of water on its surface

Bonus Answer: X

3. EARTH AND SPACE

Writer: American Heritage

Toss Up: Short Answer

The proton-proton chain reaction occurs in most stars with mass equal to or less than our sun. Name 3 of the products (assuming consumption of 4 protons).

Bonus Answer: Helium nucleus, gamma ray, neutrino, positron. (Accept energy for gamma ray)

Bonus: Multiple Choice

If a star does not undergo nuclear fusion through the proton-proton chain, what other mechanism is it most likely using?

- W) CNO
- X) FNT
- Y) FPL
- Z) CNT

Bonus Answer: W

4. EARTH AND SPACE

Writer: Stuyvesant

Toss Up: Multiple Choice

Which of the following rocks is responsible for the formation of black sand?

- W) Quartzite
- X) Schist
- Y) Slate
- Z) Basalt

Toss Up Answer: Z

Bonus: Short Answer

What is the scale used to measure the hardness of minerals?

Bonus Answer: Moh Scale (accept: Moh)

5. EARTH AND SPACE

Writer: Stuyvesant

Toss Up: Short Answer

Which type of star will live for the longest period of time?

Bonus Answer: Red Dwarfs (they can live for 1 trillion years or so)

Bonus: Multiple Choice

What resonance does Pluto have with Neptune which ensures that the celestial objects will never impact each other?

- W) 2:1
- X) 3:2
- Y) 5:2
- Z) 5:4

Bonus Answer: X

6. EARTH AND SPACE

Writer: Stuyvesant

Toss Up: Short Answer

By name or number, list the following classes of stars from hottest to coolest:

1. Class K
2. Class O
3. Class A
4. Class B

Bonus Answer: 2,4,3,1

Bonus: Short Answer

What are the brightest events in the universe?

Bonus Answer: Gamma Ray Bursts

7. EARTH AND SPACE

Writer: Centennial

Toss Up: Multiple Choice

Which of the following was eventually proposed to explain the Pioneer anomaly?

- W) Radiation pressure
- X) Outgassing from spacecraft parts
- Y) Solar wind
- Z) Previously undiscovered planets

Toss Up Answer: W

Bonus: Short Answer

What phenomenon was used to measure the speed of the Pioneer spacecraft?

Bonus Answer: Doppler Effect

8. EARTH AND SPACE

Writer: Centennial

Toss Up: Multiple Choice

Which of the following compounds made up most of Mt. St. Helens' ash?

W) Magnesium oxide

X) Aluminum oxide

Y) Silicon dioxide

Z) Sodium oxide

Toss Up Answer: Y

Bonus: Short Answer

What mineral forms the dome of Mt. St. Helens?

Bonus Answer: Dacite

9. EARTH AND SPACE

Writer: Centennial

Toss Up: Multiple Choice

Which of the giant planets has the least massive moon system?

W) Jupiter

X) Saturn

Y) Uranus

Z) Neptune

Toss Up Answer: Y

Bonus: Short Answer

Which moon is the only one in the Solar System to have a retrograde orbit?

Bonus Answer: Triton

10. EARTH AND SPACE

Writer: Granada Hills

Toss Up: Short Answer

Tahiti, an archipelago in the South Pacific, is an example of what type of island?

Bonus Answer: Oceanic

Bonus: Short Answer

CuFeS₂, one of the most common ores for mining copper, is the chemical formula for what mineral?

Bonus Answer: Chalcopyrite

11. EARTH AND SPACE

Writer: Granada Hills

Toss Up: Multiple Choice

Which of the following elements exist in the highest concentration on the surface of the moon?

- W) Aluminum
- X) Nickel
- Y) Silicon
- Z) Iron

Toss Up Answer: Y

Bonus: Short Answer

A sun-like star has an apparent magnitude of 8, and an absolute magnitude of 3. Approximately how far away is the star in kiloparsecs?

Bonus Answer: 0.1

12. EARTH AND SPACE

Writer: Granada Hills

Toss Up: Short Answer

What two isotopes of hydrogen are used to produce helium in nuclear fusion?

Bonus Answer: Deuterium and Tritium

Bonus: Multiple Choice

Which of the following types of Martian Meteorites are the most commonly found on Earth?

- W) Nakhla
- X) Shergottite
- Y) Zagami
- Z) Chassignite

Bonus Answer: X

13. EARTH AND SPACE

Writer: Granada Hills

Toss Up: Short Answer

Which scientist is noted with identifying the relationship between a galaxy's distance from a body and its speed?

Bonus Answer: Edwin Hubble

Bonus: Multiple Choice

Which of the following is close to the value of the average temperature of Venus's atmosphere?

- W) 270 C
- X) 390 C
- Y) 470 C
- Z) 590 C

Bonus Answer: Y

14. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

Which atmosphere do meteors burn up?

W) stratosphere

X) mesosphere

Y) troposphere

Z) thermosphere

Toss Up Answer: X

Bonus: Multiple Choice

Which planet has the longest year?

W) Venus

X) Jupiter

Y) Uranus

Z) Neptune

Bonus Answer: Z

15. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Short Answer

What is the name of the constellation that lies within the Summer Triangle?

Bonus Answer: Vulpecula

Bonus: Short Answer

Due to the ionized oxygen creating a green color, is another name for the Dumbbell Nebula?

Bonus Answer: Apple Core Nebula

16. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Short Answer

What is the black hole region furthest from the event horizon?

Bonus Answer: The ergosphere

Bonus: Short Answer

What type of black hole has an ergosphere?

Bonus Answer: A rotating black hole

17. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

What do we call a protostar that evolves to a point where it begins steady state hydrogen fusion in its core and first achieves hydrostatic equilibrium?

W) First Born Main Sequence Star

X) Zero Age Main Sequence Star

Y) T-Tauri Star

Z) Proplyd

Toss Up Answer: X

Bonus: Multiple Choice

The term **reddening** explains what phenomenon?

W) redshifting of distant galaxies from the expansion of the universe

X) the absorption of higher wavelength light by gas and dust that block distant galaxies from Earth's view

Y) the decreasing amount of red wavelengths observed emitting from distant Type Ia supernovae

Z) the process by which dust grains absorb and scatter shorter wavelength light more efficiently

Bonus Answer: X

18. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Short Answer

What atmospheric gas does O.C.O monitor?

Bonus Answer: Carbon dioxide.

Bonus: Short Answer

What geometric distortion does across-track scanners generally experience from the rotation of the Earth?

Bonus Answer: Skew distortion.

19. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

What direction does a comet's tail face?

W) away from the sun

X) towards the sun

Y) away from the moon

Z) towards the moon

Toss Up Answer: W

Bonus: Short Answer

What was the first man made satellite in space called?

Bonus Answer: Sputnik 1

20. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Short Answer

What are the three types of rock?

Bonus Answer: Igneous, Sedentary, and Metamorphic rocks.

Bonus: Multiple Choice

Which of the following is not a igneous rock.

W) Diorite

X) Gabbro

Y) Limestone

Z) Granite

Bonus Answer: Y

21. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

How old is universe

W) 15 b

X) 14b

Y) 1 year

Z) 0

Toss Up Answer: X

Bonus: Multiple Choice

D

W) D

X) D

Y) D

Z) D

Bonus Answer: W

22. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

How old is universe

W) 15 b

X) 14b

Y) 1 year

Z) 0

Toss Up Answer: X

Bonus: Multiple Choice

D

W) D

X) D

Y) D

Z) D

Bonus Answer: W

23. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Multiple Choice

What sphere do meteors burn up fastest?

W) Mesosphere

X) Stratosphere

Y) Exosphere

Z) Thermosphere

Toss Up Answer: W

Bonus: Multiple Choice

Which planet has the smallest maximum eastern elongation?

- W) Neptune
- X) Mercury
- Y) Venus
- Z) Mars

Bonus Answer: X

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24. EARTH AND SPACE

Writer: Lakeside

Toss Up: Short Answer

The Age of Reptiles followed which mass extinction event?

Bonus Answer: PERMIAN-TRIASSIC (Accept: PERMIAN)

Bonus: Multiple Choice

The most abundant deposits of coal date from what period?

- W) Permian
- X) Hadean
- Y) Devonian
- Z) Carboniferous

Bonus Answer: Z

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25. EARTH AND SPACE

Writer: Lakeside

Toss Up: Short Answer

Which glacial structures, similar to roche moutonnees but opposite in orientation, are formed when glaciers retreat over an area that contains a particularly hard rock core?

Bonus Answer: DRUMLINS

Bonus: Multiple Choice

Which of the following glacial landforms is created by a braided stream flowing from the front end of a glacier?

- W) eskers
- X) kames
- Y) moraines
- Z) outwash fans

Bonus Answer: Z

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26. EARTH AND SPACE

Writer: Lakeside

Toss Up: Short Answer

Order the following four substances from least to greatest in terms of hardness: fluorite, topaz, corundum, and tooth enamel.

Bonus Answer: FLUORITE, TOOTH ENAMEL, TOPAZ, CORUNDUM

Bonus: Short Answer

Evidence supporting which hypothesized process, whose name was coined by Robert Dietz, includes an observed

upper age limit of 200 million years for the associated material? This process produces zebra-stripe lineations in combination with reversals of the Earth's magnetic field reversals.

Bonus Answer: SEAFLOOR SPREADING

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27. EARTH AND SPACE

Writer: Brooklyn Tech

Toss Up: Short Answer

Who, despite being against it as the beginnings of our universe, gave the Big Bang its name?

Bonus Answer: Fred Hoyle

Bonus: Short Answer

Who was the first person to determine starlight took time and had to travel to reach our eyes?

Bonus Answer: Edgar Allan Poe

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28. EARTH AND SPACE

Writer: Venice

Toss Up: Multiple Choice

What percentage of Earth's surface area do the seven major lithospheric plates make up?

W) 84%

X) 90%

Y) 94%

Z) 97%

Toss Up Answer: Y

Bonus: Short Answer

Which of Earth's intermediate-sized plates is surrounded by five major plates?

Bonus Answer: NAZCA PLATE

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29. EARTH AND SPACE

Writer: Venice

Toss Up: Multiple Choice

Which planet's existence was first predicted mathematically before being directly observed?

W) Mercury

X) Uranus

Y) Venus

Z) Neptune

Toss Up Answer: Z

Bonus: Multiple Choice

What is the force exerted by a neutron star that keeps it from collapsing further?

W) Electron degeneracy pressure

X) Gravity

Y) Neutron degeneracy pressure

Z) Strong force

Bonus Answer: Y

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30. EARTH AND SPACE

Writer: Venice

Toss Up: Short Answer

After which period of the geologic time scale did dinosaurs become extinct?

Bonus Answer: CRETACEOUS

Bonus: Short Answer

Which of the following mountain ranges are younger than 100 million years? 1) Himalayas; 2) Alps; 3) Andes

Bonus Answer: ALL OF THEM (ACCEPT: 1, 2, AND 3 OR HIMALAYAS, ALPS, AND ANDES)
