

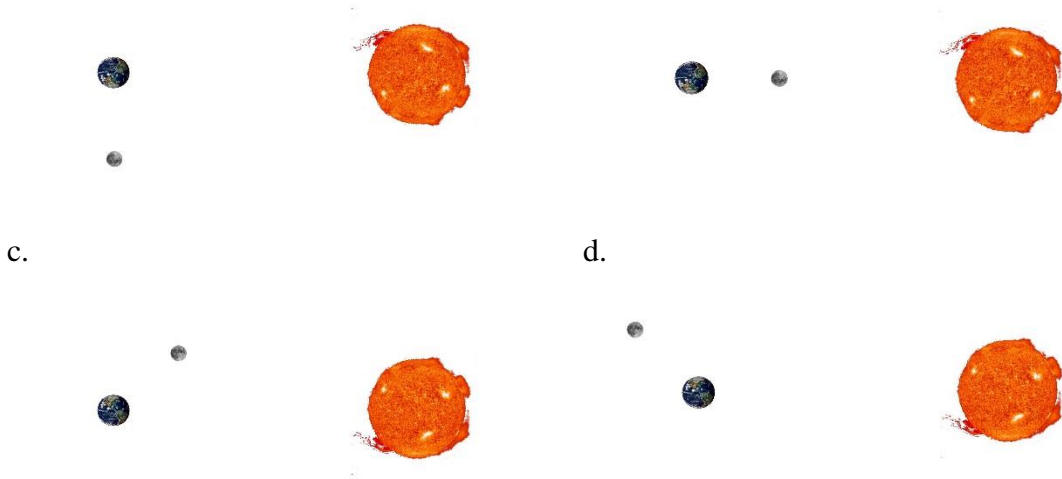


PHSC 1000 – Interdisciplinary Physical Science
Final Exam
Professor David Black
One 8 ½" x 11" Paper of Notes Allowed

Name:

- 1) Which of the following diagrams could represent a solar eclipse?
- a.  b. 



- 2) Below, I show a basic picture of the periodic table with the box for Carbon highlighted. How many protons does Carbon have?

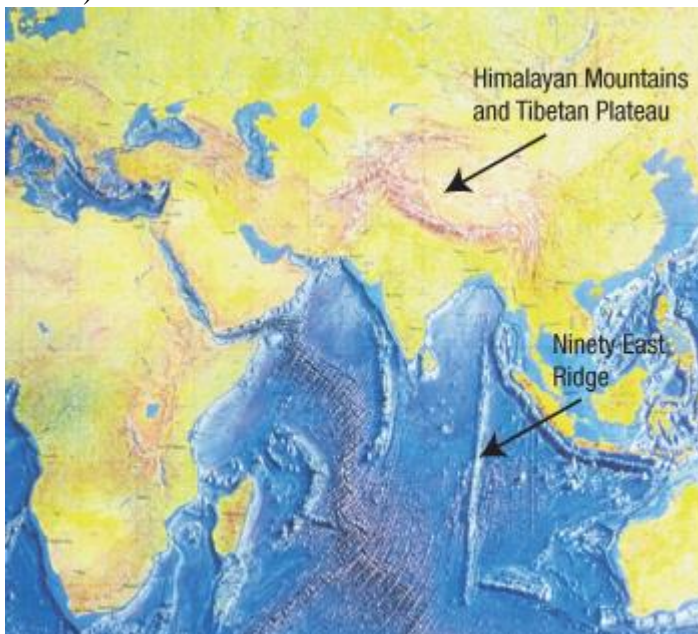
The diagram consists of two main grid sections. The top section is a large grid with a red square highlighting a specific cell. The bottom section is a smaller grid.

The top grid is composed of several rows and columns. The red square is located in the top row, specifically in the column that is the 10th from the left. The grid is divided into three main horizontal sections: a top section with a red square, a middle section, and a bottom section.

The bottom grid is a smaller grid, consisting of 2 rows and 12 columns.

- 3) How many **valence** electrons does Carbon have?
- a. 12 b. 8 c. 21 d. 4

- 4) Which is on the x-axis for the Hertzsprung-Russell Diagram?
a. Luminosity b. Size c. Number of planets d. Temperature
- 5) Which is on the y-axis for the Hertzsprung-Russell Diagram?
a. Luminosity b. Size c. Number of planets d. Temperature
- 6) Which of the following is an evidence of plate tectonics?
a. Similar fossils on either side of the Atlantic Ocean
b. A guy buried under 100 m of ice
c. The tilt of the Earth
d. The tides
- 7) There are two atoms of phosphorous (this isn't a joke.) One has a mass that is almost exactly 31 times the mass of a proton. The other has a mass that's almost exactly 32 times the mass of a proton. What are these two called?
a. Isotopes b. Polymers c. Mixtures d. Sub-shells
- 8) According to plate-tectonic theory, the Himalayan mountains of Asia (see the picture below) formed when



- a. Asia and Australia separated
b. Africa ran into the Middle East
c. Southern-central Asia was hit by a large meteorite
d. India ran into southern-central Asia
- 9) If a sample of rock we are dating has a radioactive parent-daughter system and there are 20 parents and 60 daughters, how many half-lives have gone by since the formation of the rock?
a. 1 b. 2 c. 3 d. 4 e. 5

10) Clayton, this one's for you.

Which planet has more rings than LeBron (James?)

- a. Saturn b. Mercury c. Mars d. Earth

11) There are two forces which must be in balance in a star. One is a repulsive force (a force which pushes things apart) which comes when the nuclei of atoms smash together and join to form bigger atomic nuclei. What is the other force called?

- a. Gravity b. The Electromagnetic Force c. Kinetic Energy d. Light

12) To save on gas, Professor Black gets up to a high speed and then turns his engine off, letting the car coast. Which physics principle is he using?

- a. Conservation of momentum b. Heat c. Quantum mechanics
- d. Action/reaction pair (Newton's third law) e. Inertia

13) Which is the biggest?

- a. Galaxy b. Planet c. Big Mac d. Star

14) Which of the following is not testable?

- a. Metal can be levitated by putting it in a magnetic field
- b. All matter inside a black hole becomes purple
- c. The Earth is round
- d. $F = ma$

15) Professor Black lighting the balloons on fire so you could *see* what happens is an example of which step in the scientific method?

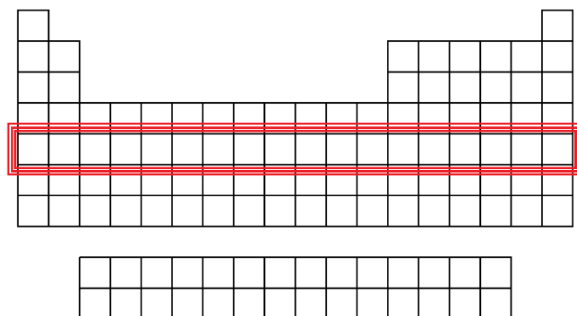
- a. Observe b. Question c. Predict d. Test predictions
- e. Draw a conclusion

16) Astronomy is

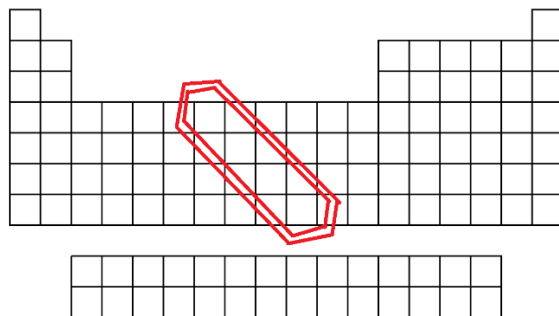
- a. The study of planets, stars, galaxy, and the large-scale universe
- b. The study of how atoms interact
- c. The study of rocks and minerals as well as how our planet is shaped
- d. The study of energy, motion, and the mathematical principles that govern events

17) Elements in the periodic table which are in the same _____ often have similar properties. (An example of what each word represents is highlighted, so the elements inside the “highlighted thing” should be similar.)

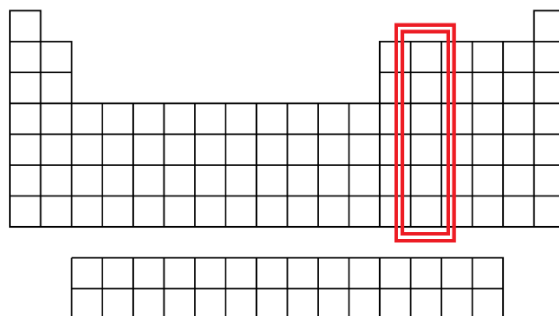
a. Row



b. Diagonal



c. Column



d. Spiral pattern



18) A rocket being propelled forward because of hot gas escaping out the back is an example of which of the following:

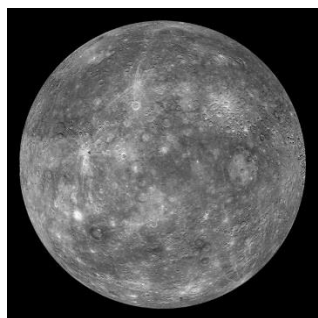
- a. Newton's 1st Law
- b. Newton's 2nd Law
- c. Newton's 3rd Law
- d. Newton's Law of Cooling

19) Protons are

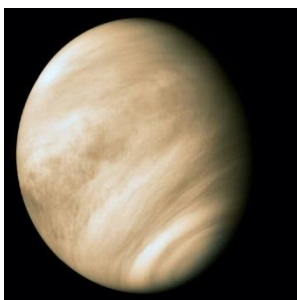
- a. Positive
- b. Negative
- c. Neutral
- d. Yellow

20) Which of the following planets is Jupiter?

a.



c.



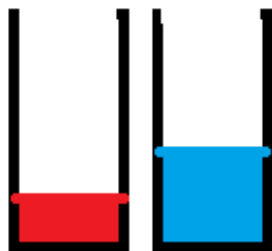
b.



d.



21) Which of the following molecules could NOT be separated into its elements and give the following result?



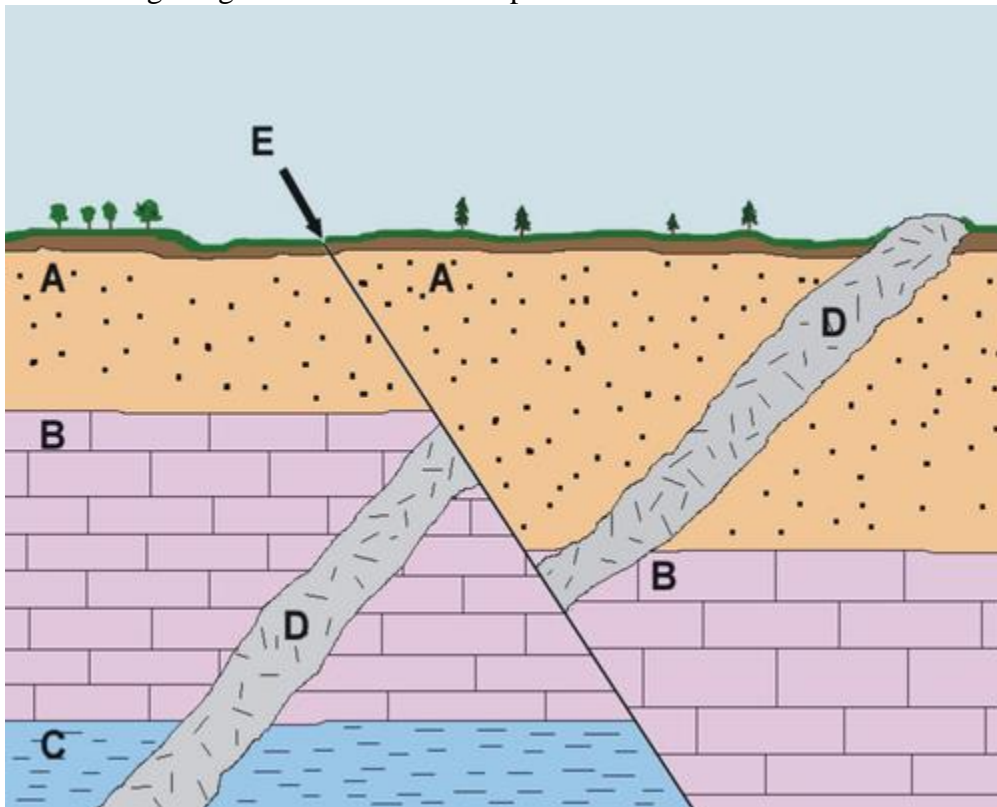
- a. H_2O
- b. CO_2
- c. NO_2
- d. CH_2
- e. $\text{C}_6\text{H}_{12}\text{O}_8$

22) The main (biggest) object pictured here is a(n)



- a. Star b. Planet c. Volcano d. Galaxy e. Ion

23) The oldest geological formation in this picture is



- a. A b. B c. C d. D e. E

24) The lake pictured below consists of a ring of water about 60 miles across, and it's about 200 million years old. Scientists would tell us that it was probably formed by



- a. Aliens b. A meteorite c. Canadian nuclear tests d. A volcano
- 25) What is the name of this class?
- a. Advanced General Relativity b. Organic Chemistry
c. Interdisciplinary Physical Science d. Intro to Painting
- 26) Briefly tell me the difference between a covalent bond and an ionic bond.

27) Give me an example of each of the following (and explain)

a. Something that is testable and that is accepted as true.

b. Something that is testable but that is accepted as false.

c. Something that is not testable.

28) Name the planets. I'll give you the correct mnemonic this time: My Very Educated Mother Just Served Us Nachos.

29) Draw the basic positions of the Earth, moon, and sun for the following phases of the moon.

a. Waxing gibbous

b. Last Quarter

c. New Moon

30) For the next few pictures, give a possible explanation for how these geological features might have formed. You won't be graded on whether or not you give the scientifically-accepted reason, but you will be graded on whether or not your answer shows a knowledge of things that shape the Earth's surface.

a.



b.



c.



d.



31) Tell me a few things about the class:

- a. Two or three things about this class which were the most surprising.
- b. Something you learned in this class that you had always wanted to know.
- c. Two or three questions that you still have.

HAVE A GREAT HOLIDAY BREAK!