

Science Tips and Tricks:

35 minutes

40 questions

7 passages(5-7q)

Sep 20-7:18 AM

- The seven passages are about science. You do not have to know the atomic number of cadmium or the mating habits of the butterfly.

- Fields: Biology, Chemistry, Physics, Geology, astronomy, and meteorology.

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- Usually 6 passages present scientific data and the other is two opposing opinions of scientists.
- Some passages have one very difficult question but the other 4-6 are super easy.

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The Directions:



Each of the following seven passages is followed by several questions. After reading each passage, decide on the best answer to each question and fill in the corresponding oval on your answer sheet. You are allowed to refer to the passages while answering the questions.

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Analyzing Data:



- A third of the questions require you to read data from graphs or tables.
- You may need to report the information or draw inferences or patterns from the data.

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Conducting Experiments:



- Its a good idea to understand the scientific process for experiments. Including how they are designed and how to find what they prove.

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The Principle:



- Some questions require you either to logically apply a principle or to identify ways of defending or attacking a principle. Some give the theory/principle in the description.

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Workout 1: Look for Patterns

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Five Step Process:

1. Pre read the Passage
2. Consider the question stem
3. Refer to the passage.
4. Answer the question in your own words
5. Match your answer with one of the choices.

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1. Preread the Passage:

- Do not get bogged down in the details.
- Skim the passage to get an understanding. Make sure you read the descriptions of the graphs and passages.
- Ask yourself: How is the information presented? Graphs? Diagrams? Are there experiments? What seems to be important? Size? Shape? Temperature? Speed? Chemical composition?
- Read actively... always asking questions and finding the answers.
- Take notes, mark up the passage, circle important items.
- Your goal is to answer a question, not learn new material.

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2. Consider the Question Stem:

- Its essential that you understand what the questions are asking. So when you go back to the passage you know what you are looking for.
- Data Analysis Questions: look for patterns in the data on the graphs and tables. Try to get an idea of what the answer should be before looking at the choices.
- Experiment Questions: Understand the purpose of the experiment. Find the control group and the variable.
- Principle Questions: You will need to know how to apply principles or how to defend or attack a principle. This includes making prediction on theories or how a hypothesis might be stronger or weaker.

ex. The dinosaur studied by scientists, compsognathus, was:

- a. Definitely a reptile
- b. Definitely a bird
- c. about the size of a turkey
- d. larger than archaeopteryx or teleosaurus



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3. Refer to the Passage:

- Your prereading should give you a good idea of the location of important information. Sometimes the questions will point to the location.
- BE CAREFUL WITH UNITS
- Understand the difference in decrease and increase. This could be the difference in the correct answer and the wrong answer.

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4. Answer the question in your own words.



- The answers are in the passages.
- Instead of trying to rely on your own knowledge, think of paraphrasing the information in the passage.

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5: Match your answer with one of the choices:



- Once you have paraphrased the information, make sure that you have answered the question.
- Many of the questions are reversed. Watch out for words like NOT and EXCEPT.

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Reading Tables and Graphs

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- Most of the information is presented in a table or graph.
- Being able to read data from them is critical for the science section.
- Remember these four things.
 1. Determine what is being represented
 2. Determine what the axes represent.
 3. Take note of units of measurement
 4. Look for trends in the data.

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1. Determine what is being represented.



- Read the titles and the descriptions.

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2. Determine what the axes represent.



- Check out the x-axis and the y-axis.
Think also how these two things relate.

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3. Take note of units of measurement.



- Looking at what each axes is labeled, also take note of the units.
- reading the description can also tell you.
- Watch out for reduced units(in millions)

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4. Look for trends in the data:



- The pattern is usually clear to see. Make sure that you understand what it means.
- Often they will ask about the slope on graphs and change on tables.

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Passage 1

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Which of the following best describes how the 2 scientists explain how craters are removed from Europa's surface?

Scientist 1

Scientist 2

A. Sublimation

Filled in by water

B. Filled in by water

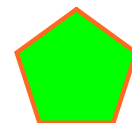
Sublimation

C. Worn smooth by wind

Sublimation

D. Worn smooth by wind

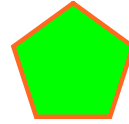
Filled in by water



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According to the information provided, which of the following descriptions of Europa would be accepted by both scientists?

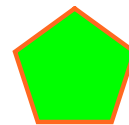
- F. Europa has a larger diameter than does Jupiter.
- G. Europa has a surface made of rocky material.
- H. Europa has a surface temperature of 20°C.
- J. Europa is completely covered by a layer of ice.



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With which of the following statements about the conditions on Europa or the evolution of Europa's surface would both Scientist 1 and Scientist 2 most likely agree?
The surface of Europa:

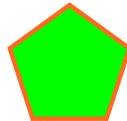
- A. is being shaped by the movement of ice.
- B. is covered with millions of meteorite craters.
- C. is the same temperature as the surface of the Arctic Ocean on Earth.
- D. has remained unchanged for millions of years.



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Which of the following statements about meteorite craters on Europa would be most consistent with both scientists' views?

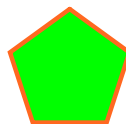
- F. No meteorites have struck Europa for millions of years.
- G. Meteorite craters, once formed, are then smoothed or removed by Europa's surface processes.
- H. Meteorite craters, once formed on Europa, remain unchanged for billions of years.
- J. Meteorites frequently strike Europa's surface but do not leave any craters.



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Scientist 2 explains that ice sublimates to water vapor and enters Europa's atmosphere. If ultraviolet light then broke those water vapor molecules apart, which of the following gases would one most likely expect to find in Europa's atmosphere as a result of this process?

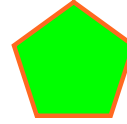
- A. Nitrogen
- B. Methane
- C. Chlorine
- D. Oxygen



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Based on the information in Scientist 1's view, which of the following materials must be present on Europa if a magnetic field is to be generated on Europa?

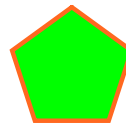
- F. Frozen nitrogen
- G. Water ice
- H. Dissolved salts
- J. Molten magma



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Assume Scientist 2's view about the similarities between Europa's surface features and flowing glaciers on Earth is correct. Based on this assumption and the information provided, Earth's glaciers would be least likely to exhibit which of the following features?

- A. Pressure ridges
- B. Cracks
- C. Meteorite craters
- D. Dark bands



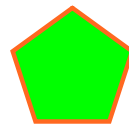
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Passage 2

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Based on Figure 1, Material A's temperature increased the fastest during which of the following time intervals?

- A. 0– 2 sec
- B. 2–12 sec
- C. 12–22 sec
- D. 22–24 sec



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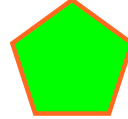
Based on the passage and Table 1, what was the density of liquid Material A ?

F. 0.5 g/cm³

G. 1 g/cm³

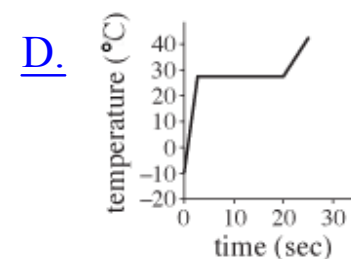
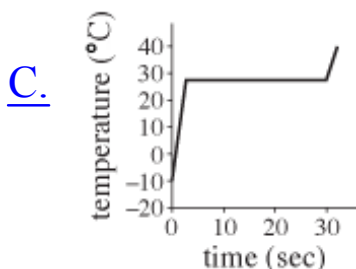
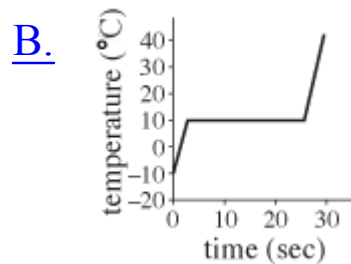
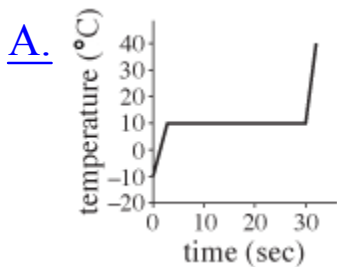
H. 5 g/cm³

J. 10 g/cm³



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Suppose 1 g of Material D at -10°C is heated at the rate of 10 cal/sec and kept at 1 atm until all of the liquid is vaporized. Based on Figure 1 and Table 2, a plot of Material D's temperature versus time would be best represented by which of the following graphs?



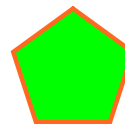
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Table 1 and Figure 1 best support which of the following hypotheses about the temperature and volume of Material A ?

(Note: Pressure is assumed to stay constant.)

F. If liquid Material A is in contact with gaseous Material A and the volume of the gas increases, the gas's temperature will increase.

G. If liquid Material A is in contact with gaseous Material A and the volume of the gas increases, the gas's temperature will decrease.



H. When the temperature of gaseous Material A increases, its volume will increase.

J. When the temperature of liquid Material A increases, its volume will increase.

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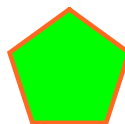
Suppose 1 g samples of liquid Materials A–D are just beginning to boil. If each of the liquids absorbs heat at the rate of 10 cal/sec while kept at 1 atm, which of the liquids will be the first to be completely turned into a gas?

A. Material A

B. Material B

C. Material C

D. Material D



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