

reactant
products

31. (C) The passage argues that virtually all of the phenomena traditionally associated with ghosts and hauntings are scientifically explainable.
32. (J) This paragraph explains why humans would have evolved a fear response to certain vibrations (because those vibrations are usually made by dangerous things).
33. (A) The concert experiment proves that humans will exhibit fear responses to infrasound even when they are not expecting to be scared (as someone who knowingly enters a reputedly haunted house might).
34. (G) The passage never addresses accounts of people who supposedly received information from ghosts.
35. (A) The passage implies that many of the people who have reported seeing ghosts were probably confused by infrasound and making an honest mistake.
36. (J) The passage explains that the phenomenon of "smeared" vision, causing visual hallucinations, occurs only at the top of the infrasound "panic range," around 18 Hz.
37. (B) *Havoc* most nearly means "chaos." To "wreak havoc" on something is to throw it into chaos or extreme disarray.
38. (H) When the passage says that evolution taught us that these sounds represent "bad news," it means that they are frequently made by things that pose real dangers, like wild animals or storms.
39. (C) Gavreau's initial motivation was to figure out why his assistant's ear was suddenly bleeding. He didn't know at first that he was going to discover infrasound or that this would explain hauntings.
40. (J) For a good haunted house, you would need both vibrations in the infrasound "panic range" and a properly shaped room for them to bounce around in. It doesn't matter what is making the vibrations, as long as they are in the right range.

Answer Explanations: Science Test

1. (B) The fourth column in Table 3 lists the amount of time the reactant was passed over the catalyst. The fifth column lists the amount of propane collected for each trial. As the numbers in the fourth column get smaller, the numbers in the fifth column get smaller also.
2. (J) As stated in the first paragraph of text, a catalyst is a substance that speeds up a reaction. Since no propane was collected in Trial 4, we can assume the hydrogen and propene did not have enough time to interact with the catalyst and no reaction occurred.
3. (C) Paragraph 1 of the text states that a heterogeneous catalyst is when the catalyst is in a different phase from the reactants. In the description of Experiment 1, it is stated that the catalyst is made up of alumina beads and that the propanol is in a vapor phase when it reacts with the catalyst. Vapor and solid are two different phases, so it is a heterogeneous catalyst.
4. (H) Table 1 clearly states that Stage 3 is when the reaction occurs. The description of Experiment 2 states that the reaction occurs after the hydrogen-propene mixture passed over the catalyst, and then the propane was collected. Table 1 describes the four stages of catalysis.
5. (A) The volume of propanol was the same for each trial, whereas the volume of alumina beads was different. Look at Table 2. We know from reading the description of Experiment 1 that the catalyst is the alumina beads. The third column in Table 2 lists the volume of the catalyst used for each trial. The amounts would have to be different, while the volume of propanol used as reactant would have to be the same, to test the effect that varying the amount of catalyst has on the outcome.
6. (J) There was no reason for the plunger to move until the propene entered the syringe.
7. (B) When there are two recessive L alleles in the genotype, the leaf texture is wrinkled, so it can be determined that the L gene affects leaf texture.
8. (H) The last row in Table 2 lists the phenotypes for this genotype.
9. (A) The genotype would contain two recessive P alleles. Table 3 contains the data for the four different crosses performed. It can be determined from Table 2 that if a plant has 3 pods, the genotype is made up of two recessive P alleles.
10. (J) It can be determined from Table 2 that the genotype pp results in 3 pods. Table 3 shows that 100% of the offspring for Cross 3 had 3 pods, so 100% of the offspring must have the genotype pp.

11. (D) Table 2 displays all the possible genotypes and the associated phenotypes. There are only two rows where the phenotypes are 3 pods and normal leaves, and the associated genotypes listed are ppLL and ppLl. All other answers can be eliminated.
12. (G) Find Table 1. Look at the column labeled *Amount of Chlorophyll per Experiment*. The bottom two rows are the data for Experiment 3. The sample exposed to UVR is labeled 3-UVR. Follow that row until you come to the column with the heading 4, for day 4. The amount of chlorophyll measured was 1.3.
13. (A) We compare the amounts of chlorophyll measured in Experiment 1 for the sample exposed to UVR and the sample not exposed to UVR, labeled PAR. For each measurement, the amount of chlorophyll found in the sample exposed to UVR is either the same as, or lower than, the PAR sample. The same is true if you compare the data from Experiments 2 and 3. Therefore, it can be concluded that UVR exposure inhibits chlorophyll production.
14. (G) Look at Figure 3. The diatoms exposed to UVR are labeled UVR. The bars on the graph for UVR are gray. If you compare the two bars for diatoms, you will see that the UVR bar is much lower than the PAR bar. In fact, the UVR bar for diatoms is the lowest bar on the graph, making this the correct answer.
15. (D) The only experiment that continued for eight days was Experiment 3. If you look at the data from Experiment 3, you will see that the sample not exposed to UVR, labeled 3-PAR, measured more than twice the amount of chlorophyll on day 8 than on day 6. Assume Experiment 1 would produce similar results. On day 6 the sample 1-PAR measured 17 for chlorophyll. Day 8 would be more than double that amount, so 36 is the best answer.
16. (J) Look at Figure 2. According to the legend, the bars that show the number of dead cells found in the samples exposed to UVR are white. The white bars are higher for both diatoms and flagellates.
17. (C) Look at the section under the heading Researcher 1. The third paragraph lists the demographic parameters that can be monitored in seabirds. Mortality rates are not listed.
18. (J) Look at the section under the heading Researcher 1. The second paragraph makes this point.
19. (C) Look at the section under the heading Researcher 2. The second paragraph addresses this issue and mentions that placing bands on penguins has been shown to reduce both breeding success and survival rates.
20. (F) Look at the section under the heading Researcher 1. The last sentence of paragraph 1 supports this answer.
21. (C) The first paragraph of the passage discusses indicators, and there is a 4-point list of important criteria for an effective indicator. Researcher 2's views state that seabirds do not fit the first three criteria and do not address the fourth item in the list. Look at the section under the heading Researcher 2 to understand how his or her views are related to each point. Point 1—the last sentence of paragraph 1 explains why seabirds don't meet this criterion. Point 2—the first sentence of paragraph 2 explains why seabirds don't meet this criterion. Point 3—the first sentence of paragraph 3 explains why seabirds don't meet this criterion.
22. (F) When the amount of prey is low, so is the number of seabirds. Look at the section under the heading Researcher 1. The last sentence of paragraph 1 makes it clear that as there is less prey available, the seabird population will decline. This is a direct relationship and the graph to reflect that will be a diagonal line.
23. (C) Researcher 2 doesn't mention the cost associated with using seabirds as indicators. The last paragraph of Researcher 1's point of view states that "seabirds are...cost-effective."
24. (F) Look at Figure 2. The first set of columns is for liquid fuel, as the label shows. The white column represents leaded fuel, as the legend states. Follow the top of the white column over to the left, and you will see that it is at about the 200 mark on the y-axis.
25. (C) Look at Figure 2. The highest column represents the type of fuel found to have the highest average concentration of benzene. The third column is the highest. Looking down we see that it is labeled as a vapor, and the legend tells us that the white columns represent leaded fuel, so we can determine the highest average concentration of benzene was found in leaded vapor fuel.
26. (J) Look at Figure 1. Follow the line on the graph. After 5 minutes, the line steadily climbs up as time passes. It can be deduced that after 20 minutes the line would have continued to climb, meaning that the temperature would have continued to increase. Choice D is the only answer that reflects this outcome.
27. (C) Brand C is the only brand that had a higher concentration of benzene in the leaded fuel. Look at the data in Table 1. The second column lists the concentration of benzene found in the liquid form of the fuels. Compare the amounts found in each brand for leaded versus unleaded. Brand C is the only brand that had a higher concentration of benzene in the leaded fuel.

28. (G) Look at Figure 3. The first set of columns represents the gasohol fuels, according to the x-axis labels. The legend tells us that the white column represents the liquid form of the fuel, and the gray column represents the vapor form of the fuel. By looking at the relative heights of the columns, it can be determined that the white column is about half the size of the gray column.
29. (B) Look at Table 1. The second row displays the data for the bob with a mass of 100 g. The last column displays the average period. Follow the second row over to the last column to find the number 1.83.
30. (F) Look at Table 2. The longer the length of the string, the longer the average period; 1 m was the longest length of string tested, and the average period was 1.84 s. We can deduce that if the string was 1.4 m, then the average period would be greater than 1.84 s.
31. (B) Look at Table 1. The first column shows the mass of the bob tested. As the column for each trial shows, as well as the average period, the larger the mass of the bob, the longer the period.
32. (H) Figure 2 displays the affect that changing the amplitude of the pendulum has on the average period. Each column in the figure is roughly the same size, meaning that regardless of the amplitude, the average period is about the same. We can deduce that pendulums A and B would have about the same average period.
33. (B) Look at Table 2. The third column displays the results for Trial 2. Look at the second row down that displays the results for the string with a length of 0.6 m. The table shows 1.44 s as the period recorded.
34. (H) Based on the information in the text preceding the explanation of the experiments, and the descriptions of the experiments and results displayed, it can be determined that the mass of the bob, the length of the string, and the swing amplitude were all varied.
35. (A) Look at Table 1 and find the largest number, which is 26. Follow the column up to find that the location is Iquique.
36. (G) Look at the middle column in Figure 2, which is labeled Coquimbo. Trace your finger to the left from the top of the bar to find that the average egg size is between 0.15 and 0.2 mm.
37. (C) Look at Figure 3. Find the tallest bar, which represents the average SMR. The bar on the left is the tallest and it is a solid black bar. The legend tells you this represents the TC1 thermal category. Now look down to find the label on the x-axis, which is Iquique.
38. (J) *Several things must be consulted to answer this question.* Table 1 contains the temperatures that the crabs were exposed to at each location. The text in paragraph 2 defines TC2 as the average maximum temperature, so you know you need to pay attention to the numbers in that row of the table. In addition, Figure 1 must be consulted because it contains information about the size of the crabs. Table 1 shows that crabs at Iquique were exposed to the highest average temperatures at 22, then Coquimbo at 20, and Concepcion at 17. Figure 1 shows that the average size of the crabs was smallest at Iquique, slightly larger at Coquimbo, and then largest at Concepcion.
39. (C) The information in Table 1 and Figure 2 needs to be analyzed to answer this question. Table 1 shows that the temperatures were highest at Iquique, then Coquimbo, and lowest at Concepcion. The control temperature was only 1° lower than the average maximum temperature at Concepcion. Using this information, and looking at Figure 2, it can be determined that at lower temperatures, the egg volume is greater. So, if scientists had measured the egg volume of crabs in the control groups, they would have most likely found larger sizes than at any of the sites measured.
40. (J) Look at the information in Table 1 and Figure 3 to answer this question. For both Iquique and Concepcion the black column in Figure 3 is the highest, but for Coquimbo the white column is the highest. So there is no clear relationship between temperature exposure and SMR.

Writing Sample

Recently, some people have suggested that students at this school should be required to maintain a certain minimum GPA in order to be allowed to participate in extracurricular activities. As a good student, you might assume I would be in favor of this plan. But in my opinion, this is one of those ideas that sounds great at first, but turns out to be built on many fallacies and false assumptions, as I will demonstrate in the ensuing paragraphs. First of all, extracurricular activities can foster a sense of school or team spirit, which has actually been shown to raise grades. Secondly, it's not actually the case that colleges will care more about GPA than extracurriculars in the case of every student. And finally, let's remember that extracurriculars are not just about fun—they can teach and hone skills just as important to a student's future as the classes do.

The reasoning that the people in favor of this rule are using seems logical enough. If a student is getting bad grades, then more time to study would help, and no extracurricular activities means more time to study, right? But I'm afraid it's not