

GED Science Test Prep

Section: GED Science Exams • Total Questions: 10 • Format: Verified Q&A

1. Scientists are interested in whether certain greenhouse gases have helped cause recent temperature increases. The graph presents data on carbon dioxide and methane gas levels in the atmosphere for the past several centuries. Human activities began producing large quantities of both gases in the 1700s. This graph, combined with information from-----, supports -----.

Scientists agree that our planet is getting warmer. But is there a human cause for global warming, or is it a natural fluctuation in a long-term cycle? Warming cycles throughout Earth's history have caused glacial melting, animal and plant habitat shifts, and earlier flowering seasons for trees. These climate changes often correlate with changes in Earth's orbit known as Milankovitch cycles. For example, Earth's angle of axial tilt varies over the course of 41,000 years from 22.1° to 24.5°. At greater angles, Earth's poles receive more direct solar radiation, or insolation.

Increased insolation results in higher mean temperatures. The Milankovitch theory proposes that cycles in climate arise from these cyclical changes in Earth's orbit. According to one viewpoint, the current warming of our planet is just evidence of a Milankovitch cycle. However, current climate changes are occurring at a faster rate than those in the past. To explain the different rates, many scientists point to human use of fossil fuels. Fossil fuels release carbon dioxide (CO₂) when burned. CO₂ traps thermal radiation in Earth's atmosphere, a phenomenon known as the greenhouse effect. Recent increased levels of CO₂ correlate very strongly with increased mean temperatures. Furthermore, the rate of increase in CO₂ levels is also rising.

For this reason, many scientists conclude that climate change is anthropogenic (caused by humans). Data that support Milankovitch cycles do not necessarily contradict this conclusion. Supporters of the anthropogenic climate change model only need to demonstrate that the current warming deviates from Milankovitch cycles and that human activities provide a better explanation. Both the anthropogenic climate change model and the Milankovitch theory are consistent with some of the observed climate changes. However, only one offers the best explanation for the current warming of Earth.

- (A) The Milankovitch climate change model
- (B) paragraph 3
- (C) The anthropogenic climate change model
- (D) Paragraph 2

2. which sentence describes a difference between artificial selection and natural selection?

- (A) In natural selection, variation is heritable; in artificial selection, variation is not heritable.
 - (B) In natural selection, there is differential reproduction; in artificial selection, there is not differential reproduction.
 - (C) In natural selection, there is variation within the population of organisms; in artificial selection, there is no variation within the population or organisms.
 - (D) In natural selection, reproductive success is driven by naturally occurring processes; in artificial selection, reproductive success is driven by human-imposed processes.
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3. best explains the ammonia deposits found in ice core samples from the time of the Tunguska Event. The evidence that best supports the validity of this hypothesis is the-

In 1908, a huge explosion known as the Tunguska Event flattened trees for miles across a remote area of Russia. Scientists now think an asteroid or a comet entered Earth's atmosphere, causing the explosion. Ice core samples from an ice sheet in Greenland reveal signs of this enormous explosion: deposits of ammonia equal to 5 micrograms per square meter. But how exactly did these telltale molecules form?

- *Hypothesis 1: The Tunguska explosion started forest fires, known to produce ammonia. Data indicates that such fires would have deposited an amount of ammonia over the Northern Hemisphere equaling 0.1 micrograms per square meter.*
- *Hypothesis 2: Up to 1% of the object's mass might have been ammonia, and this ammonia might have spread over the Northern Hemisphere. Approximately 0.00005 micrograms of ammonia per square meter are predicted by this hypothesis.*
- *Hypothesis 3: Since many compounds form in the presence of high heat, the ammonia could have been produced as the falling object heated the atmosphere. However, heat alone is not sufficient to cause the formation of ammonia.*
- *Hypothesis 4: As it passed through the atmosphere, the object pushed air in front of it at high pressure. Nitrogen and hydrogen combine to form ammonia under similar pressure. Considering the amount of hydrogen expected in a comet and the available nitrogen in Earth's atmosphere, approximately 5 micrograms of ammonia per square meter would have been deposited under this hypothesis.*

- (A) Hypothesis 2
 - (B) heat produced by fast-moving objects in the atmosphere
 - (C) Hypothesis 1
 - (D) match between measured and predicted amounts of ammonia
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4. Which hypothesis is suitable for this investigation?

A researcher measured the heart rates of 20 male athletes and 20 female athletes before and immediately after 30 minutes of continuous strenuous exercise. The strenuous exercise included running for 15 minutes and bicycling for 15 minutes. The researcher recorded the data in the table.

- (A) Body temperature, breathing rate, and heart rate depend on the health of the subject.
 - (B) Many of the body's systems respond to exercise.
 - (C) Body temperature, breathing rate, and heart rate increase with exercise.
 - (D) Subjects at rest have better health than subjects that exercise.
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5. Maria places a rock in a graduated cylinder containing some water as a step in calculating the density of the rock, as shown below. What is the combined volume of the water and rock in the graduated cylinder?

- (A) 9 mL
 - (B) 26 mL
 - (C) 30 mL
 - (D) 15 mL
-

6. How do the results of Bateson's experiment affect the interpretation of Mendel's experimental results?

Gregor Mendel determined that the offspring in crosses between plants with two heterozygous traits resulted in a 9:3:3:1 ratio, as shown in the table. The largest number of offspring expressed both dominant traits, while the fewest number of offspring expressed both recessive traits. Mendel concluded that different traits are inherited independently from each other.

William Bateson and his colleagues designed a similar experiment using heterozygous pea plants. Bateson crossed plants that were heterozygous for flower color and pollen shape. These experiments resulted in numbers of offspring that did not match Mendel's 9:3:3:1 ratio. The number and appearance of the offspring are shown in the table. Bateson concluded that some traits are not inherited independently.

- (A) Bateson's experimental results show that Mendel's conclusions were incorrect.
 - (B) Bateson's experimental results show that Mendel's conclusions were incomplete.
 - (C) Bateson's experiments resulted in different ratios of traits in the offspring, confirming Mendel's conclusion.
 - (D) Bateson's experiments studied different traits than Mendel's so Bateson's results could not challenge or support Mendel's conclusions.
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7. Which hypothesis was Dilger testing in his experiment?

*Various species of birds from the genus *Agaporis* possess differing behaviors. These behaviors differ in a way that can be used to infer how the species are related and how they have evolved over time.*

For example, the three lovebird species considered to be the most primitive all build simple nests in preexisting cavities. The three middle species all build elaborate nests with tops, and one even digs out a cavity for the nest. The four modern species build cuplike nests: These nests are more complex than those built by the primitive species but less complex than those built by the middle species.

William Dilger conducted an investigation to show that the nest-building behaviors of these birds were genetic rather than learned behaviors. In his investigation, Dilger used two different species of lovebird that readily mate with each other-Fischer's lovebird and the peach-faced lovebird.

Fischer's lovebird is a species of moder lovebird while the peach-faced lovebird is a slightly more primitive species.

Fischer's lovebird carries small pieces of nesting material in its beak. The small size of the nesting material is the reason for the simpler cuplike nests of Fischer's lovebird. The peach-faced lovebird cuts long strips of nesting material, which is then tucked into the feathers on the back of the bird. These long strips of nesting material will often fall out of the bird's feathers. However, the long strips of material allow the peach-faced lovebird to build an elaborate nest.

The hybrid offspring of these two species has difficulty building nests. The hybrid offspring will cut long strips of material like its peach-faced parent. However, the hybrid offspring will attempt to carry the material in its beak and have difficulty flying. If it does attempt to place the material in the feathers of its back, the material falls out because the bird does not properly secure the material in its feathers.

- (A) If hybrid offspring have a mixture of behaviors, then the species are within the same genus.
- (B) If a hybrid offspring carries nesting material in its beak, then it is more closely related to modern lovebirds.
- (C) If behavior in lovebirds is genetic, then a hybrid offspring will display a mixture of behaviors.
- (D) If lovebird species can interbreed, then a hybrid offspring will have a mixture of behaviors.

8. Which statement describes a weakness of the investigation in the passage?

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- (A) None of the hypotheses are directly related to the ice core data.
- (B) The Greenland ice sheet is far away from the site of the explosion in Russia.
- (C) Several of the hypotheses rely on unproven processes or estimated values.
- (D) A few micrograms of ammonia is insufficient evidence for a conclusion.

9. What is the relationship between the kinetic energy of the feather and of the hammer just before they hit the surface of the Moon?

While exploring the Moon during the Apollo 15 mission, astronaut David Scott held a 1.32-kg geological hammer in one hand and a 0.03-kg falcon feather in the other, releasing them from the same height. The Moon has no air resistance and the acceleration due to gravity is only 1.6 m/s². The two objects landed on the surface of the Moon at the same time.

- (A) The hammer has more kinetic energy than the feather because it has a greater mass.
- (B) Both objects have the same kinetic energy because they fell with the same velocity.
- (C) The hammer has more kinetic energy than the feather because it will accelerate faster than the feather.
- (D) Both objects have the same kinetic energy because gravity pulls on both objects equally.

10. Based on these results and assuming that whenever two materials are present their remaining energy is averaged, what would the scientist best conclude to be the composition of Saturn's rings?

Saturn's rings contain enormous numbers of particles. These particles sometimes experience collisions with each other. Scientists need to know how those collisions transfer energy in order to model the overall structure and composition of the rings. Images of particles in Saturn's rings reveal that only 50-60% of the particles' energy remains after a collision. To identify which types of particles could explain the observations, a scientist tests substances in a laboratory and measures the energy remaining after a collision, To Particles of those substances. The table shows the scientist's results.

- (A) equal amounts of loose rocks and loose snow
- (B) equal amounts of ice and bedrock
- (C) a small amount of bedrock and a large amount of carbon rock
- (D) large amounts of ice and smaller amounts of carbon rock