Not for student use.

Minnesota Comprehensive Assessments-Series III

Science Item Sampler Script
Grade HS

ITEM SAMPLERS ARE NOT SECURE TEST MATERIALS. THIS ITEM SAMPLER SCRIPT MAY BE COPIED OR DUPLICATED.

DEPARTMENT OF EDUCATION

MINNESOTA COMPREHENSIVE ASSESSMENTS
ITEM SAMPLER
GRADE HS SCIENCE SCRIPT

INSTRUCTIONS CONTAINED IN THE ITEM SAMPLER REFLECT THE CONTENT OF THE ACTUAL TEST AND MAY NOT APPLY TO THE ADMINISTRATION OF THE ITEM SAMPLER.

This script is for Test Monitor use only. Students take the test online or in a large print or braille test book while the Test Monitor reads from the script.

PRIOR TO ONLINE TEST ADMINISTRATION:

- ATTENTION: Prior to administering the script in conjunction with an online test, verify with your District or School Assessment Coordinator that the correct test for the science script has been assigned. **If not set up correctly, the student's test will not match the script.**

GENERAL INSTRUCTIONS FOR TEST MONITORS:

- Prior to test administration, review the *Directions for Online Administrations* or *Directions for Paper Administrations* for detailed policy and procedure information for test administration (e.g., stopping testing for the day).
- Read scripted test instructions to students, as directed, and refer to the applicable *Directions for Administrations* throughout the test administration.
    - Refer to the *Directions for Online Administrations* if using the script in conjunction with the online test.
    - Refer to the *Directions for Paper Administrations* if using the script in conjunction with the large print or braille test.
- For braille, Test Monitors should also refer to the *Test Monitor Notes for Braille* included with the braille test book.
- This script contains two sets of instructions: the first set is used for administering the script with the online test and the second set is used for administering the script in conjunction with a large print or braille test book. Use tabs on the pages to confirm you are using the correct script.
    - Refer to pages 6-24 when using the script in conjunction with an online test.
    - Refer to pages 25-35 when using the script in conjunction with a large print or braille test.
    - In these sections, read aloud to students ONLY what is in BOLD TYPE.
- Do not discuss test content with the student during or after the test.
- Do not discuss any portion of the test or the student's performance with others.
- Read the applicable guidelines on the following pages for reading the script aloud or signing the script (if the student requires the script to be signed).

GUIDELINES FOR READING THE SCRIPT ALOUD

Read Aloud ONLY what is in BOLD TYPE

- Read test content exactly as written, as steadily and clearly as possible without changing, emphasizing, or adding information.
- Do not paraphrase, clarify, define, or translate any part of the questions, answer options, or instructions in the script.
- This script is the only source you may use to read the test to the student. Reading any test content from the test book or screen is not allowed and may require the test to be invalidated.
- Respond to student questions using only scripted directions from the *Directions for Online Administrations* or *Directions for Paper Administrations*.

Respond to the Student's Needs

- Adjust your reading speed and volume if requested by the student.
- After a question has been read, allow the student time to respond. If the pause has been lengthy, you may ask, "Do you want me to repeat the question or any part of it again?" before continuing.

Maintain Neutrality

- Communicate in a neutral tone and maintain a neutral facial expression and posture.
- Do not attempt to solve questions, or determine the correct answer to a question while reading, as this may result in pauses or changes in inflection which may mislead the student.
- Be careful to give equal emphasis to each answer option. If the student chooses an answer before all the answer options have been read, ask, "Do you want the other answer options read?" before continuing.

GUIDELINES FOR SIGNED INTERPRETATION OF SCRIPT

Sign ONLY what is in BOLD TYPE

- Sign test content exactly as written, as steadily and clearly as possible without changing, emphasizing, or adding information.
- Do not clarify or define any part of the questions, answer options, or instructions in the script.
- This script is the only source you may use to sign the test to the student. Signing any test content from the test book or screen is not allowed and may require the test to be invalidated.
- Respond to student questions using only scripted directions from the *Directions for Online Administrations* or *Directions for Paper Administrations*.

Use Professional Judgment when Signing

- Do your best to use the same signs if the student requests a portion to be repeated.
- Use signs that are conceptually accurate, with or without simultaneous voicing.
- When using an ASL sign that can represent more than one concept or English word, you must adequately contextualize the word to reduce any ambiguity. You may also spell the word after signing it to remove any doubt about which word is intended.
- If you are unsure how to sign and/or pronounce an unfamiliar word, advise the student of the uncertainty and spell the word.
- In cases where signs give clues to the answer, finger spelling must be used.

Respond to the Student's Needs

- Adjust your signing speed if requested by the student.
- Spell any words requested by the student during the test administration.
- After a question has been signed, allow the student time to respond. If the pause has been lengthy, you may ask, "Do you want me to sign the question or any part of it again?" before continuing.

Use Appropriate Physical/Facial Expressions

- Use facial expressions consistent with sign-language delivery; do not use expressions which may be interpreted by the student as approval or disapproval of the student's responses.
- Do not attempt to solve questions, or determine the correct answer to a question while signing, as this may result in pauses or changes in inflection which may mislead the student.
- Be careful to give equal emphasis to each answer option. If the student chooses an answer before all the answer options have been signed, ask, "Do you want the other answer options signed?" before continuing.

SCRIPT FOR USE WITH THE ONLINE ITEM SAMPLER

After reading the applicable scripted instructions in the *Directions for Online Administrations*, say the following before you begin reading the questions on page 7.

After I read each question, I will pause for as much time as you need to answer the question. Then I will read the next question. You may ask me to repeat any question as many times as you need.

HIGH SCHOOL SCIENCE ITEM SAMPLER SCRIPT
FOR USE WITH ONLINE ITEM SAMPLER

Title Page:

Cyanobacteria

Select the Blue arrow at the top to go on.

Scene:

Cyanobacteria are aquatic bacteria with many unique characteristics. Cyanobacteria are single-celled, but sometimes they live in multicellular colonies or chains. The diagram shows cyanobacteria chains.

The diagram is labeled: Cyanobacteria.

Question number one (1)**:**

Genetic material in bacteria is organized differently than genetic material in plant and animal cells. Identify the correct genetic material for each cell.

Drag the correct genetic material to each type of cell.

The boxes on the left are labeled, from top to bottom: Bacterial cell, Plant cell, Animal cell. The answer options are labeled, from top to bottom: One (1) **circular chromosome, Chromosomes inside a nucleus.**

Select the Blue arrow at the top to go on.

Question number two (2)**:**

Cyanobacteria cell membrane are selectively permeable. Cells use many methods of transport to move materials into and out of the cells. Label each method of material transport in the diagram.

Drag a label into each box.

The top box is labeled, from top to bottom: Cell membrane, Material moves against the concentration gradient; requires energy. The bottom box is labeled, from top to bottom: Cell membrane, Material moves with the concentration gradient; requires proteins. The answer options are titled: Labels. The answer options are labeled, from top to bottom: osmosis, active transport, facilitated transport.

Select the Blue arrow at the top to go on.

Scene:

Unlike most kinds of bacteria, cyanobacteria contain chlorophyll and perform photosynthesis. Because they contain chlorophyll, most cyanobacteria are green.

The diagram is labeled: Cyanobacteria.

Question number three (3)**:**

Identify three (3) **objects involved in photosynthesis.**

Drag the objects into the diagram.

The diagram is labeled, from left to right: Energy Source, Stored Energy, Waste Product. The answer options are titled: Objects. The top row is labeled, from left to right: Water, Carbon dioxide, Oxygen. The bottom row is labeled, from left to right: Glucose, Sunlight, Heat.

Select the Blue arrow at the top to go on.

Scene:

Some cyanobacteria change nitrogen gas in the air to a usable form. These cyanobacteria are nitrogen fixers and important components of the nitrogen cycle. The diagram shows part of the nitrogen cycle in an aquatic environment.

The diagram is titled: Nitrogen Cycle. Beginning at the top and continuing clockwise, the diagram is labeled: Nitrogen gas, Denitrifying bacteria make and release nitrogen gas, Plants use nitrates for growth, Other bacteria make nitrite and nitrate, Dead plants and animals release ammonium, Animals eat plants, Cyanobacteria fix nitrogen to make ammonium.

Question number four (4)**:**

How are cyanobacteria important to aquatic plants in the nitrogen cycle?

Choose one of the following answers. (Read answers aloud.)

A. Aquatic plants use cyanobacteria for food.
B. Aquatic plants absorb cyanobacteria for nitrogen.
C. Aquatic plants depend on cyanobacteria to fix nitrogen gas.
D. Aquatic plants use the form of nitrogen made by cyanobacteria.

Select the Blue arrow at the top to go on.

Title Page:

Fruit Fly Genetics

Select the Blue arrow at the top to go on.

Scene:

Biology students can use fruit flies in experiments. Fruit flies have short life cycles and easily observable traits. Genetics studies involving wing length and eye color are common.

Question number five (5)**:**

Students observe fruit flies with different eye colors and wing lengths. Which type of molecule carries the instructions for characteristics in fruit flies?

Choose one of the following answers. (Read answers aloud.)

A. ATP
B. Glucose
C. Fatty acids
D. Nucleic acids

Select the Blue arrow at the top to go on.

Scene:

Each somatic cell, or body cell, in a fruit fly has chromosomes that contain the genetic information needed for life.

Question number six (6)**:**

Which statement best describes the composition of genetic material in fruit flies and other animals?

Choose one of the following answers. (Read answers aloud.)

A. Genes and chromosomes are composed of DNA.
B. Genes and chromosomes are composed of RNA.
C. Genes are composed of DNA; chromosomes are composed of RNA.
D. Genes are composed of RNA; chromosomes are composed of DNA.

Select the Blue arrow at the top to go on.

Scene:

Biology students examine wing length inheritance in fruit flies by doing a cross and observing the offspring. In biology, a cross is defined as two (2) **organisms bred to produce offspring.**

The diagram is titled: Results of a Fruit Fly Cross. The column on the left is labeled, from top to bottom: Cross, Long-winged fly crossed with (X) **Long-winged fly. The column on the right is labeled, from top to bottom: Offspring, Seventy-five percent** (75%) **long wings, Twenty-five percent** (25%) **short wings.**

Question number seven (7)**:**

The students count the offspring from the cross and show the results in a circle graph. Which graph best represents the results of the cross?

Choose answer A, B, C, or D.

Each graph in answer options A, B, C, and D is titled: Offspring. Each graph is labeled, from left to right: Long wings, Short wings.

Select the Blue arrow at the top to go on.

Question number eight (8)**:**

The students perform three (3) **trials of the cross. In the first trial, the students count eight** (8) **offspring. In the second trial, the students count sixteen** (16) **offspring. In the third trial, the students count twenty-four** (24) **offspring.**

Calculate the number of long-winged fruit flies counted in each of the three (3) **trials. Make a graph of this data.**

You can use the calculator to help you answer this question.

Drag the top of each bar to the correct height.

The graph is titled: Fruit Fly Offspring Data. The horizontal axis is labeled: Trials.
The vertical axis is labeled: Number of Long-Winged Fruit Flies.
The horizontal axis reads, from left to right: First Trial, Second Trial, Third Trial.

Select the Blue arrow at the top to go on.

Title Page:

Altitude Training

Select the Blue arrow at the top to go on.

Scene:

When athletes train and compete, their cells require large amounts of energy. For cells to get the energy they need, many organ systems must work together.

Question number nine (9)**:**

Put the activities into the diagram to show how organ systems work together to help the cells transform energy.

Drag the activities into the diagram.

The right side of the diagram is labeled: Cells produce usable energy. The answer options are titled: Activities. The row is labeled, from left to right: Cells get raw materials, Circulatory system transports, Digestive system breaks down food, Respiratory system gets oxygen.

Select the Blue arrow at the top to go on.

Scene:

Some athletes train in locations that have high altitudes. Training in these locations may result in the body being able to get more oxygen to the muscles during exercise. More oxygen available to the muscles can help athletes perform better during competition.

Question number ten (10)**:**

What is one (1) **way more oxygen helps athletes' muscle cells when they exercise? Athletes muscle cells**

Choose one of the following answers. (Read answers aloud.)

A. require less food.
B. produce less waste.
C. use more carbon dioxide.
D. convert more glucose to energy.

Select the Blue arrow at the top to go on.

Scene:

To determine if athletes are benefitting from training in high altitudes, scientists measure the volume of oxygen that athletes use during exercise. This measurement is called VO_2 max. Athletes benefit when they increase their VO_2 max.

The graph shows the VO_2 max for three (3) **athletes who trained in high altitudes for four** (4) **weeks.**

The graph is titled: VO_2 Max Measurements. The horizontal axis is labeled: Week. The vertical axis is labeled: VO_2 Max (milliliters per kilograms per minute (mL/kg/min.)**). The key to the right of the graph is labeled, from top to bottom: athlete one** (1)**, athlete two** (2)**, athlete three** (3)**.**

Question number eleven (11)**:**

Identify the time period during which each athlete showed the greatest increase in VO_2 measurements.

Drag the time period into each box.

The boxes are titled: Greatest Increase in VO_2 Measurements. The boxes are labeled, from left to right: Athlete one (1)**, Athlete two** (2)**, Athlete three** (3)**. The answer option columns below the boxes are each labeled, from top to bottom: Week zero to one** (0-1)**, Week one to two** (1-2)**, Week two to three** (2-3)**, Week three to four** (3-4)**.**

Select the Blue arrow at the top to go on.

Scene:

Athletes who increase their VO_2 max may also improve their performance during competition.

The table shows the race times for the three (3) **athletes before and after they trained in high altitudes.**

The table is titled: Athletes' Race Times. The table has two columns and four rows. The columns are labeled, from left to right: Before Training (minutes, seconds (min.:sec.)**), After Training (minutes, seconds** (min.:sec.)**). The rows are labeled, from top to bottom: Athlete one** (1)**, Athlete two** (2)**, Athlete three** (3)**, Average.**

Question number twelve (12)**:**

The graph shows the improvement in race times (minutes, seconds (min.:sec.)**) for each of the three** (3) **athletes. Complete the graph by putting labels on the x-axis.**

Drag the labels into the graph.

The graph is titled: Improvement in Race Times. The vertical axis is labeled: Time (minutes, seconds (min.:sec.)**). The answer options are titled: Labels. The row is labeled, from left to right: Athlete one** (1)**, Athlete two** (2)**, Athlete three** (3)**.**

STOP

Stop when the student reaches the end of Segment 1. Refer to the *Directions for Online Administrations* as needed before continuing.

Title Page:

Plant Growth

Select the Blue arrow at the top to go on.

Scene:

Many plants grow from seeds. As a plant grows, it requires energy for cell division. Eventually, the plant produces flowers and seeds.

Question number one (1)**:**

Select the phrase that completes the sentence.

Replication of the (Choose: DNA, RNA, fatty acids, amino acids) in the cell takes place before the bean plant cells divide.

Select the Blue arrow at the top to go on.

Question number two (2)**:**

Identify each plant system response that must occur for the bean plant to maintain homeostasis when it is growing.

Select each system response you want to choose.

The answer options are labeled, from top to bottom: Increased xylem conduction, Increased gas exchange, Decreased root absorption, Decreased phloem conduction.

Select the Blue arrow at the top to go on.

Question number three (3)**:**

Identify which cell part is associated with each cell process that occurs in a bean plant.

Drag the cell part into each diagram.

The diagrams are titled, from left to right: Cellular Respiration, Photosynthesis, Protein Synthesis. The answer options are labeled, from top to bottom: chloroplast, mitochondrion, ribosome.

Select the Blue arrow at the top to go on.

Question number four (4)**:**

From the compounds, identify each reactant of cellular respiration in the cells of this growing bean plant.

Select each reactant you want to choose.

The answer options are titled: Compounds of Cellular Respiration. The options are labeled, from left to right: ATP, Carbon dioxide, Glucose, Oxygen, Water.

Select the Blue arrow at the top to go on.

Question number five (5)**:**

What role does a bean plant play in the food web of an ecosystem?

Choose one of the following answers. (Read answers aloud.)

A. Producer
B. Decomposer
C. Primary consumer
D. Secondary consumer

Select the Blue arrow at the top to go on.

Scene:

This laboratory investigates bean plant growth. Select the type of soil, amount of light, and concentration of fertilizer for the trial. Select "Run" to view the resulting height of the plants.

The column on the left is titled: Soil. The choices are labeled, from top to bottom: Soil A, Soil B, Soil C. The column in the middle is titled: Light. The choices are labeled, from top to bottom: Five (5) **hours, Ten** (10) **hours, Fifteen** (15) **hours. The column on the right is titled: Fertilizer. The choices are labeled, from top to bottom: Zero milliliters per liter** (0 mL/L)**, Two milliliters per liter** (2 mL/L)**, Four milliliters per liter** (4 mL/L)**. The button on the right is labeled: RUN. The table has seven columns and four rows. The columns are labeled, from left to right: Soil Type, Amount of Light, Fertilizer Amount, Plant Height (centimeters** (cm)**), Mean Height (centimeters** (cm)**). The Plant Height (centimeters** (cm)**) column reads, from left to right: One** (1)**, Two** (2)**, Three** (3)**. The button on the bottom right is labeled: Clear All.**

Question number six (6)**:**

Which statement can be defended because of the results of the investigation?

Choose one of the following answers. (Read answers aloud.)

A. The type of soil affects plant height.
B. The amount of light has no effect on plant height.
C. The amount of water affects the heights of the plants.
D. The plants grow the tallest after receiving eight milliliters per liter (8 mL/L) **of fertilizer.**

Select the Blue arrow at the top to go on.

Question number seven (7)**:**

Proper safety precautions should be followed when conducting scientific investigations. Identify two (2) **safety procedures to use in this plant growth investigation in a laboratory.**

Select the two (2) **safety precautions you want to choose.**

The answer options are labeled, from top to bottom: Use protective eyewear when handling chemical fertilizer. Use caution when calculating mean plant heights. Use gloves when applying fertilizer to the plants. Use caution to avoid mixing different soil types.

Select the Blue arrow at the top to go on.

Question number eight (8)**:**

An investigation is designed to test the effect of the amount of light on bean plant growth. Which part of this design would add a source of error to the investigation?

Choose one of the following answers. (Read answers aloud.)

A. Growing all plants in different types of soil
B. Giving all plants the same amount of water
C. Providing all plants with different amounts of light
D. Supplying all plants with the same amount of fertilizer

Select the Blue arrow at the top to go on.

Question number nine (9)**:**

Bean plants are grown in soil C and receive five (5) **hours of light. Calculate the expected mean height of the plants if they receive fertilizer at a concentration of one milliliter per liter** (1 mL/L)**.**

You can use the calculator to help you answer this question.

Enter your answer in the box. The box is labeled: centimeters (cm)**.**

Select the Blue arrow at the top to go on.

Question number ten (10)**:**

Use soil B and a fertilizer concentration of four milliliters per liter (4 mL/L) **to run the simulation for five** (5)**, ten** (10)**, and fifteen** (15) **hours of light. Predict the mean plant height if plants were given twenty** (20) **hours of light. Graph the data for five** (5)**, ten** (10)**, fifteen** (15)**, and twenty** (20) **hours of light.**

Select the location on the graph to plot each point.

The graph is titled: Effect of the Amount of Light on Mean Plant Height. The horizontal axis is labeled: Amount of Light (hours). The vertical axis is labeled: Mean Plant Height (centimeters (cm)**).**

Select the Blue arrow at the top to go on.

Question number eleven (11)**:**

Conduct an investigation to test the hypothesis that bean plant growth is affected by the amount of light.

After you conduct the investigation, go on to the next question.

STOP

Refer to the *Directions for Online Administrations* for information on collecting test materials from the student.

After reading the applicable scripted instructions in the *Directions for Paper Administrations*, say the following before you begin reading the questions on page 26.

After I read each question, I will pause for as much time as you need to answer the question. Then I will read the next question. You may ask me to repeat any question as many times as you need.

We will now begin Segment One (1)**.**

Title Page:

Cyanobacteria

Scene:

Cyanobacteria are aquatic bacteria with many unique characteristics. Cyanobacteria are single-celled, but sometimes they live in multicellular colonies or chains. The diagram shows cyanobacteria chains.

The diagram is labeled: Cyanobacteria.

Question number one (1)**:**

Genetic material in bacteria is organized differently than genetic material in plant and animal cells. Identify the correct genetic material for each cell.

Each genetic material is labeled A or B. Write the letter of the correct genetic material in each empty box. You may use each letter more than once.

The boxes on the left are labeled, from top to bottom: Bacterial cell, Plant cell, Animal cell. The answer options are labeled, from top to bottom: A. One (1) **circular chromosome, B. Chromosomes inside a nucleus.**

Question number two (2)**:**

Cyanobacteria cell membrane are selectively permeable. Cells use many methods of transport to move materials into and out of the cells. Label each method of material transport in the diagram.

Each method of material transport is labeled A, B, or C. Write the letter of the correct method of material transport in each empty box.

The top box is labeled, from top to bottom: Cell membrane, Material moves against the concentration gradient; requires energy. The bottom box is labeled, from top to bottom: Cell membrane, Material moves with the concentration gradient; requires proteins. The answer options are titled: Labels. The answer options are labeled, from top to bottom: A. osmosis, B. facilitated transport, C. active transport.

Scene:

Unlike most kinds of bacteria, cyanobacteria contain chlorophyll and perform photosynthesis. Because they contain chlorophyll, most cyanobacteria are green.

The diagram is labeled: Cyanobacteria.

Question number three (3)**:**

Identify three (3) **objects involved in photosynthesis.**

Each object is labeled A, B, C, D, E, or F. Write the letter of the correct object in each empty box in the diagram. Three of the objects will be used.

The diagram is labeled, from left to right: Energy Source, Stored Energy, Waste Product. The answer options are titled: Objects. The top row is labeled, from left to right: A. Water (H_2O), B. Carbon dioxide (CO_2), C. Oxygen (O_2). The bottom row is labeled, from left to right: D. Glucose ($C_6H_{12}O_6$), E. Sunlight, F. Heat.

Scene:

Some cyanobacteria change nitrogen gas in the air to a usable form. These cyanobacteria are nitrogen fixers and important components of the nitrogen cycle. The diagram shows part of the nitrogen cycle in an aquatic environment.

The diagram is titled: Nitrogen Cycle. Beginning at the top and continuing clockwise, the diagram is labeled: Nitrogen gas, Denitrifying bacteria make and release nitrogen gas, Plants use nitrates for growth, Other bacteria make nitrite and nitrate, Dead plants and animals release ammonium, Animals eat plants, Cyanobacteria fix nitrogen to make ammonium.

Question number four (4)**:**

How are cyanobacteria important to aquatic plants in the nitrogen cycle?

Choose one of the following answers. (Read answers aloud.)

A. Aquatic plants use cyanobacteria for food.
B. Aquatic plants absorb cyanobacteria for nitrogen.
C. Aquatic plants depend on cyanobacteria to fix nitrogen gas.
D. Aquatic plants use the form of nitrogen made by cyanobacteria.

Title Page:

Fruit Fly Genetics

Scene:

Biology students can use fruit flies in experiments. Fruit flies have short life cycles and easily observable traits. Genetics studies involving wing length and eye color are common.

The top row of the diagram is labeled, from left to right: Long-winged Fly, Short-winged Fly. The bottom row is labeled, from left to right: White-eyed Fly, Red-eyed Fly.

Question number five (5)**:**

Students observe fruit flies with different eye colors and wing lengths. Which type of molecule carries the instructions for characteristics in fruit flies?

Choose one of the following answers. (Read answers aloud.)

A. ATP
B. Glucose
C. Fatty acids
D. Nucleic acids

Scene:

Each somatic cell, or body cell, in a fruit fly has chromosomes that contain the genetic information needed for life.

The top diagram is titled: Fruit Fly Cell. Beginning at the top right and continuing clockwise, the diagram is labeled: Cytoplasm, Endoplasmic reticulum, Ribosomes, Golgi apparatus, Mitochondrion, Nucleus, Lysosome, Cell membrane. The bottom diagram is titled: Fruit Fly Genetic Material.

Question number six (6)**:**

Which statement best describes the composition of genetic material in fruit flies and other animals?

Choose one of the following answers. (Read answers aloud.)

A. Genes and chromosomes are composed of DNA.
B. Genes and chromosomes are composed of RNA.
C. Genes are composed of DNA; chromosomes are composed of RNA.
D. Genes are composed of RNA; chromosomes are composed of DNA.

Scene:

Biology students examine wing length inheritance in fruit flies by doing a cross and observing the offspring. In biology, a cross is defined as two (2) **organisms bred to produce offspring.**

The diagram is titled: Results of a Fruit Fly Cross. The column on the left is labeled, from top to bottom: Cross, Long-winged fly crossed with (X) **Long-winged fly. The column on the right is labeled, from top to bottom: Offspring, Seventy-five percent** (75%) **long wings, Twenty-five percent** (25%) **short wings.**

Question number seven (7)**:**

The students count the offspring from the cross and show the results in a circle graph. Which graph best represents the results of the cross?

Choose answer A, B, C, or D.

Each graph in answer options A, B, C, and D is titled: Offspring. Each graph is labeled, from left to right: Long wings, Short wings.

Question number eight (8)**:**

The students perform three (3) **trials of the cross. In the first trial, the students count eight** (8) **offspring. In the second trial, the students count sixteen** (16) **offspring. In the third trial, the students count twenty-four** (24) **offspring.**

Calculate the number of long-winged fruit flies counted in each of the three (3) **trials. Make a graph of this data.**

You can use the calculator to help you answer this question.

Write a plus sign (+) **above each bar where the top of the bar should be.**

The graph is titled: Fruit Fly Offspring Data. The horizontal axis is labeled: Trials. The horizontal axis reads, from left to right: First Trial, Second Trial, Third Trial. The vertical axis is labeled: Number of Long-Winged Fruit Flies.

STOP

Stop when the student reaches the end of Segment 1. Refer to the *Directions for Online Administrations* as needed before continuing.

We will now begin Segment Two (2)**.**

Title Page:

Altitude Training

Scene:

When athletes train and compete, their cells require large amounts of energy. For cells to get the energy they need, many organ systems must work together.

Question number nine (9)**:**

Write the letter of each activity in the diagram to show how organ systems work together to help the cells transform energy. The activities are labeled A, B, C, or D. You may use each letter one (1) **time.**

The right side of the diagram is labeled: Cells produce usable energy. The answer options are titled: Activities. The row is labeled, from left to right: A. Cells get raw materials, B. Circulatory system transports, C. Digestive system breaks down food, D. Respiratory system gets oxygen.

Scene:

Some athletes train in locations that have high altitudes. Training in these locations may result in the body being able to get more oxygen to the muscles during exercise. More oxygen available to the muscles can help athletes perform better during competition.

Question number ten (10)**:**

What is one (1) **way more oxygen helps athletes' muscle cells when they exercise? Athletes muscle cells**

Choose one of the following answers. (Read answers aloud.)

A. require less food.
B. produce less waste.
C. use more carbon dioxide.
D. convert more glucose to energy.

Scene:

To determine if athletes are benefitting from training in high altitudes, scientists measure the volume of oxygen that athletes use during exercise. This measurement is called VO_2 max. Athletes benefit when they increase their VO_2 max.

The graph shows the VO_2 max for three (3) **athletes who trained in high altitudes for four** (4) **weeks.**

The graph is titled: VO_2 Max Measurements. The horizontal axis is labeled: Week. The vertical axis is labeled: VO_2 Max (milliliters per kilograms per minute (mL/kg/min.)**). The key to the right of the graph is labeled, from top to bottom: athlete one** (1)**, athlete two** (2)**, athlete three** (3)**.**

Question number eleven (11)**:**

Identify the time period during which each athlete showed the greatest increase in VO_2 measurements.

The time periods for Athlete one (1) **are labeled A, B, C, or D. The time periods for Athlete two** (2) **are labeled A, B, C, or D. The time periods for Athlete three** (3) **are labeled A, B, C, or D. Write the letter of the correct time period in each empty box.**

The boxes are titled: Greatest Increase in VO_2 Measurements. The boxes are labeled, from left to right: Athlete one (1)**, Athlete two** (2)**, Athlete three** (3)**. The answer option columns below the boxes are each labeled, from top to bottom: A. Week zero to one** (0-1)**, B. Week one to two** (1-2)**, C. Week two to three** (2-3)**, D. Week three to four** (3-4)**.**

Scene:

Athletes who increase their VO_2 max may also improve their performance during competition.

The table shows the race times for the three (3) **athletes before and after they trained in high altitudes.**

The table is titled: Athletes' Race Times. The table has two columns and four rows. The columns are labeled, from left to right: Before Training (minutes, seconds (min.:sec.)**), After Training (minutes, seconds** (min.:sec.)**). The rows are labeled, from top to bottom: Athlete one** (1)**, Athlete two** (2)**, Athlete three** (3)**, Average.**

Question number twelve (12)**:**

The graph shows the improvement in race times (minutes, seconds (min.:sec.)**) for each of the three** (3) **athletes. Complete the graph by putting labels on the x-axis.**

Each label is marked A, B, or C. Write the letter of the correct label in each empty box. You may use each letter one (1) **time.**

The graph is titled: Improvement in Race Times. The vertical axis is labeled: Time (minutes, seconds (min.:sec.)**). The answer options are titled: Labels. The row is labeled, from left to right: A. Athlete one** (1)**, B. Athlete two** (2)**, C. Athlete three** (3)**.**

STOP

Refer to the *Directions for Online Administrations* for information on collection and return of test materials.