NAEP
FLORIDA
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Grade 8 Science
Sample Questions

This booklet contains sample Grade 8 Science items from the National Assessment of Educational Progress (NAEP). Additional NAEP items can be accessed at www.nces.ed.gov/nationsreportcard/itmrls.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (NCES), National Assessment of Educational Progress (NAEP).

This Grade 8 Science Sample Questions Booklet and the corresponding answer booklet are posted at http://www.fldoe.org/asp/naep/naep-pt.asp.

NAEP GRADE 8 SCIENCE
CONTENTS

Introduction 3

NAEP GRADE 8 EARTH AND SPACE SCIENCE 4

Question 1 - Predict a geological consequence of tectonic plate movement 4

Question 2 - Identify how some lunar surface features formed 5

Question 3 - Relate oxygen level to atmospheric conditions at higher elevations 5

Question 4 - Identify a source of energy for Earth's water cycle 5

Question 5 - Identify a characteristic of Earth's structure 6

Question 6 - Order soils in terms of permeability 6

Question 7 - Explain why seismic activity occurs near the fault 7

Question 8 - Predict the Sun's position in the sky 8

Question 9 - Identify and explain the most recent rock formation 9

Question 10 - Explain why rainwater is not salty 9

Question 11 - Explain and critique two plans to prevent erosion 10

NAEP GRADE 8 PHYSICAL SCIENCE 11

Question 1 - Explain what causes an object to change its motion 11

Question 2 - Identify energy transfers in an application 11

Question 3 - Identify the atomic components of the molecule 11

Question 4 - Identify chemically similar elements in the Periodic Table 12

Question 5 - Recognize the direction of force of friction 13

Question 6 - Critique and improve investigation about forces 14

Question 7 - Critique a conclusion about chemical change in observations 14

NAEP GRADE 8 LIFE SCIENCE 15

Question 1 - Recognize the role of decomposers 15

Question 2 - Identify relationships in a food web 16

Question 3 - Identify the primary consumers in a food web 16

Question 4 - Identify path of blood flow in human heart 17

Question 5 - Organ needed for survival 18

Question 6 - Example of genetic engineering 18

Question 7 - Identify location of cell's genetic material 18

Question 8 - Compare heart rates before, during, and after running 19

Question 9 - Recognize ecological role of organism 20

INTRODUCTION

The sample items included in this document are taken from previously administered, publicly released Grade 8 National Assessment of Educational Progress (NAEP) Science assessments. The answers to the sample items are included in a companion document. For the multiple-choice questions, the correct answers (indicated by an asterisk) and the distracters; the percentage of the Florida's or the Nation's responses to each of the possible answers; and the Description, Difficulty, and Science Practice of each item are provided. Score descriptors are shown for short- and extended-constructed response items. All released NAEP items and sample responses can be found in the NAEP Questions Tool (NQT) at http://nces.ed.gov/nationsreportcard/itmrlsx/default.aspx.

The NQT is an interactive tool containing over 2000 released questions from NAEP assessments in all NAEP subject areas. The questions are an example of what NAEP asks students on the assessments and can be used as a supplement to classroom instruction. Also available are the scoring rubrics; sample student responses; and scoring results by subject, grade, item type, difficulty, content area, science practices, framework, year, and key words.

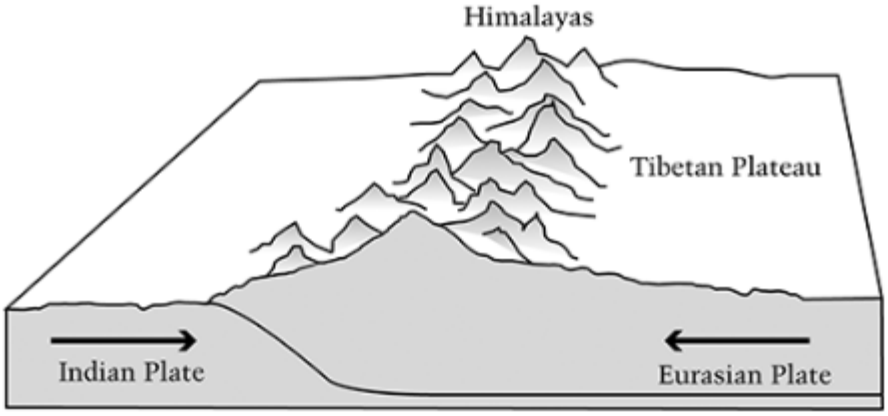
For more information about NAEP results, go to the NAEP Data Explorer (NDE) at http://nces.ed.gov/nationsreportcard/naepdata/. The NDE is an interactive tool that provides access to a wide variety of data about what students know and can do, as well as demographic and contextual factors that may affect their performance. The NDE produces charts, customized tables, and graphics based on NAEP results by year and jurisdiction; significance between jurisdictions, within variables, and across years; and gap analyses between jurisdictions or across years and between groups, between years, and between groups and years.

Additional information about the knowledge and skills the science assessment is designed to measure can be found in the 2011 Science Framework, http://www.nagb.org/content/nagb/assets/documents/publications/frameworks/science-2011.pdf . The current NAEP Science Framework was the basis of the NAEP 2009 and 2011 science assessments. The previous framework was the basis of the NAEP science assessments administered in 1996, 2000, and 2005.

NAEP GRADE 8 EARTH AND SPACE SCIENCE

Question 1, Predict a geological consequence of tectonic plate movement

The diagram below shows the collision of two tectonic plates in Asia.



What is a result of this collision?

a. Volcanoes erupt periodically
b. The Tibetan Plateau slowly sinks
c. The Himalayas increase in height each year
d. Glaciers on the Tibetan Plateau melt

Question 2, Identify how some lunar surface features formed

The surface of the Moon is covered with craters, as shown below.

CRATERS ON THE MOON

How were most of these craters formed?

a. By eruptions of active volcanoes
b. By impacts of many meteoroids
c. By shifting rock on the Moon's surface (moonquakes)
d. By tidal forces caused by the Earth and the Sun

Question 3, Relate oxygen level to atmospheric conditions at higher elevations

Why do mountain climbers at high elevations use oxygen tanks to help them breathe?

a. At high elevations the ozone layer draws oxygen out of the atmosphere
b. The atmosphere is less dense at higher elevations so there is less oxygen available
c. Oxygen is heavier than the other gases in the atmosphere and sinks to lower elevations
d. Radiation from the Sun splits oxygen molecules into atoms making oxygen unbreathable

Question 4, Identify a source of energy for Earth's water cycle

Water evaporates and falls back to Earth as rain or snow. What is the primary energy source that drives this cycle?

a. The wind
b. The Sun
c. Air pressure
d. Ocean currents

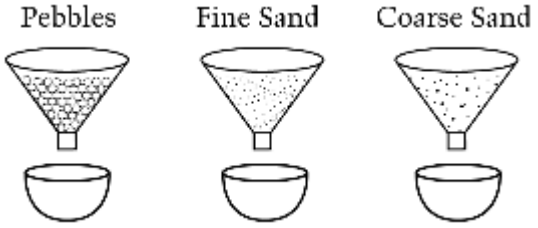
Question 5, Identify a characteristic of Earth's structure

Which layer of Earth is divided into plates?

a. Mantle
b. Crust
c. Inner core
d. Outer core

Question 6, Order soils in terms of permeability

Three funnels were filled with equal volumes of pebbles, fine sand, and coarse sand, as shown in the diagram below. The same amount of water was poured into each funnel.



Which correctly lists the order in which the water passed through the funnels, from fastest to slowest?

a. Pebbles, fine sand, coarse sand
b. Pebbles, coarse sand, fine sand
c. Fine sand, coarse sand, pebbles
d. Coarse sand, pebbles, fine sand

Question 7, Explain why seismic activity occurs near the fault

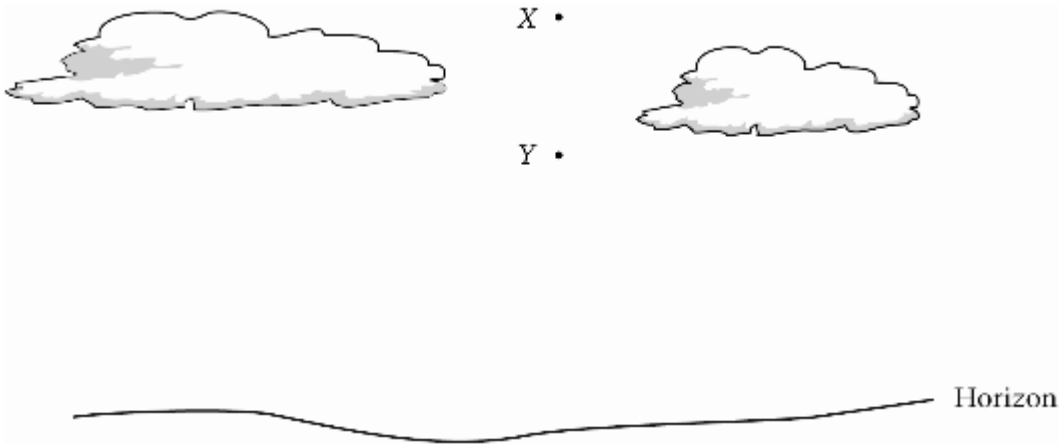
The diagram below shows the movement of the Pacific and North American plates along the San Andreas fault located in California.

Why do earthquakes occur near the San Andreas fault?

a. One plate slowly pushes the other plate up
b. A trench is created as one plate slides under the other plate
c. Portions of the plates get stuck and then suddenly loosen and move
d. One plate pushes hard enough to reverse the motion of the other plate

Question 8, Predict the Sun's position in the sky

Point X in the diagram below shows the highest point above the horizon that the Sun reaches in the spring at noon

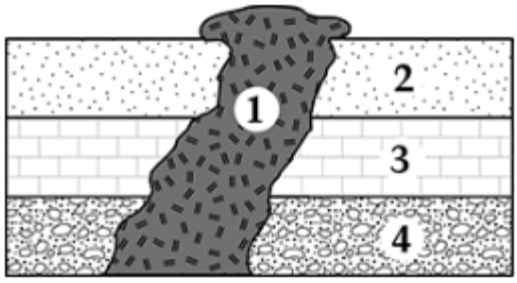


When is the Sun's position most likely to be at point Y?

a. In the afternoon on a winter day
b. In the afternoon on a summer day
c. At noon on a winter day
d. At noon on a summer day

Question 9, Identify and explain the most recent rock formation

The diagram below shows a cross section of rock formations.



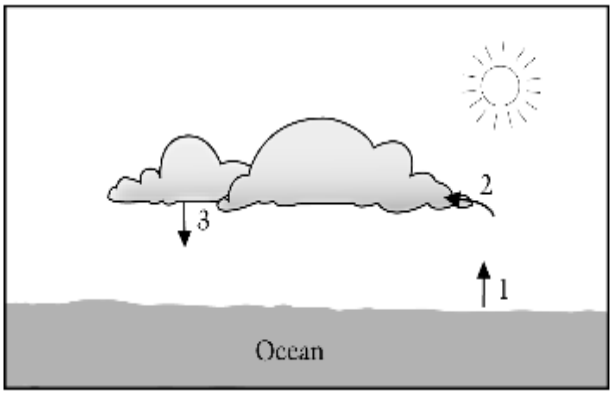
Which rock formation was formed most recently?

a. 1
b. 2
c. 3
d. 4

Explain why you chose your answer and not the others.

Question 10, Explain why rainwater is not salty

Using your knowledge of the water cycle, explain why rainwater is **NOT** salty, even though ocean water is.



Question 11, Explain and critique two plans to prevent erosion

Some homes were built near the shoreline of the ocean. Sand dunes lie between the homes and the water. Each year a portion of the sand dunes is eroded by the ocean. To prevent erosion, some citizens suggest planting grasses on the sand dunes, and others suggest building a seawall, a solid barrier along the shoreline.

Explain how each plan would prevent erosion of the dunes.

Give an environmental advantage and disadvantage of each plan.

Environmental advantage of planting grasses:

Environmental disadvantage of planting grasses:

Environmental advantage of building a seawall:

Environmental disadvantage of building a seawall:

NAEP GRADE 8 PHYSICAL SCIENCE

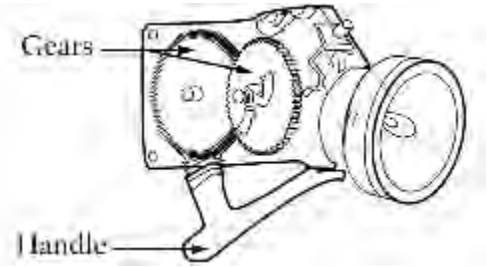
Question 1, Explain what causes an object to change its motion

Kelly slides a flat rock across the smooth ice of a frozen pond. The rock slows down after several seconds. What causes the rock to slow down?

a. The thickness of the ice
b. The temperature of the air above the ice
c. The force of friction between the ice and the rock
d. The gravitational force between the ice and the rock

Question 2, Identify energy transfers in an application

The flashlight shown below has no batteries. It is operated by squeezing and letting go of the handle. Inside the body of the flashlight are gears, which are shown below.



Which sequence best identifies the energy transfers that take place within the flashlight to produce light?

a. Kinetic → electrical → light
b. Kinetic → chemical → light
c. Chemical → kinetic → light
d. Chemical → electrical → light

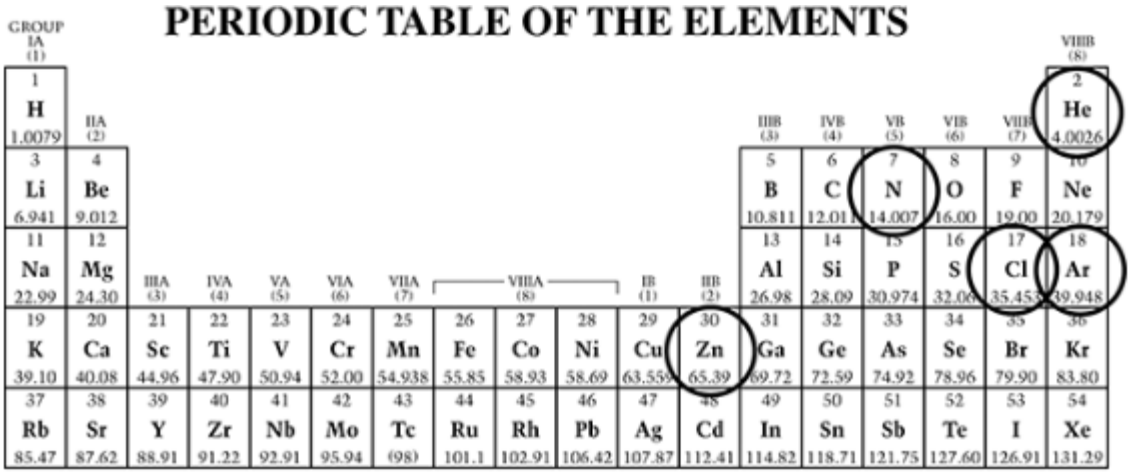
Question 3, Identify the atomic components of the molecule

What atoms combine to make up a molecule of water?

a. 1 hydrogen, 1 oxygen
b. 1 hydrogen, 2 oxygen
c. 2 hydrogen, 1 oxygen
d. 2 hydrogen, 2 oxygen

Question 4, Identify chemically similar elements in the Periodic Table

Based on its location on the partial periodic table shown below, which element would you predict has chemical properties that are most similar to argon (Ar)?



Element	Symbol
Argon	Ar
Chlorine	Cl
Helium	He
Nitrogen	N
Zinc	Zn

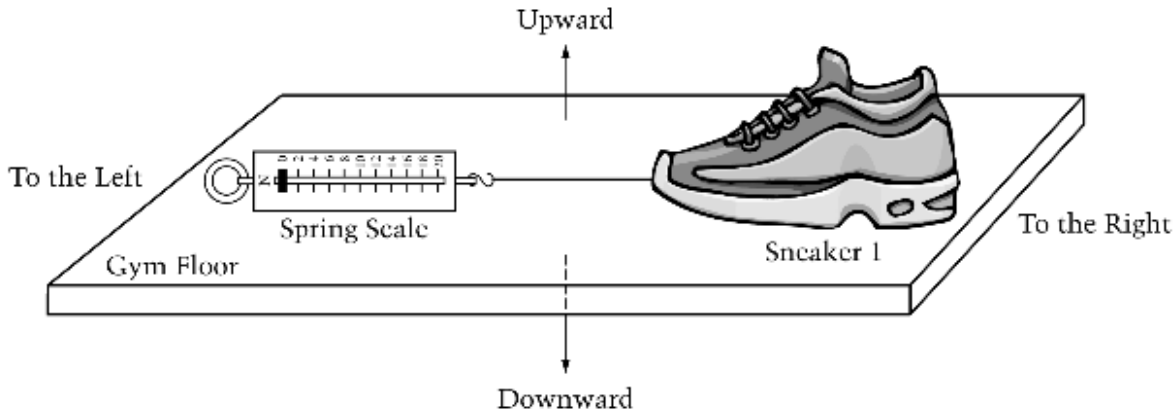
a. Chlorine (CI)
b. Helium (He)
c. Nitrogen (N)
d. Zinc (Zn)

Question 5, Recognize the direction of force of friction

Cesar designs an experiment to see which types of sneakers provides the most friction. He uses the equipment listed below.

a. Sneaker 1
b. Sneaker 2
c. Sneaker 3
d. Spring scale

He uses the setup illustrated below and pulls the spring scale to the Left.



In what direction does the force of friction act?

a. To the left
b. To the right
c. Upward
d. Downward

Question 6, Critique and improve investigation about forces

Refer back to the experiment discussed in Question 5.

Cesar tests one type of sneaker on a gym floor, a second on a grass field, and a third on a cement sidewalk. His teacher is not satisfied with the way Cesar designed his experiment. Decribe one error in Cesar's experiment.

Describe how Cesar could improve the experiment to find out which of the three types of sneakers provides the most friction.

Question 7, Critique a conclusion about chemical change in observations

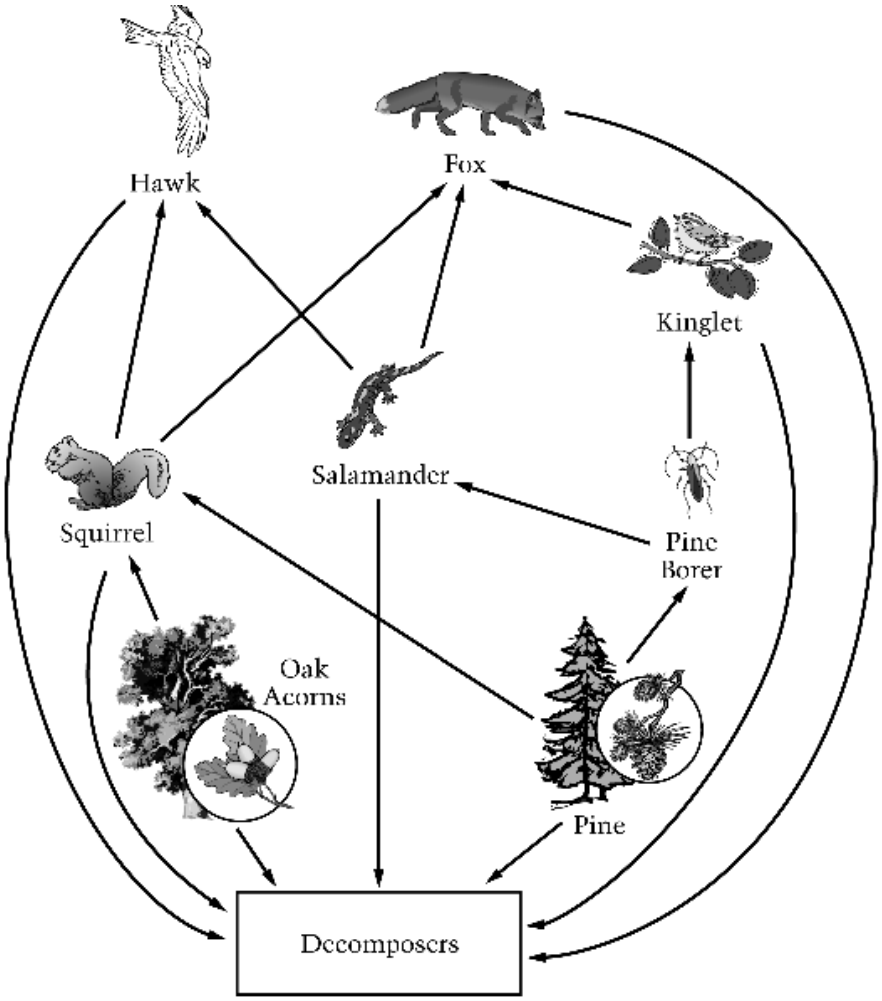
A class observes two demonstrations: water changing into steam and a piece of wood burning and producing smoke. A student concludes that both demonstrations must be examples of a chemical change because gas is produced in each.

Is the student's conclusion accurate? Explain your answer, referring to both demonstrations.

NAEP GRADE 8 LIFE SCIENCE

Question 1, Recognize the role of decomposers

The arrows in the food web diagram below show the direction of energy flow. Each arrow points from the organism that is consumed to the organism that consumes it. Use the information in the food web to answer the question that follows.



Which statement best explains why decomposers are an important part of this food web?

a. They use sunlight to make their own food.
b. They give off oxygen for animals to breathe.
c. They provide camouflage for small animals.
d. They make nutrients available to plants.

Question 2, Identify relationships in a food web

Refer to the diagram in Question 1 showing a food web. The arrows show the direction of energy flow. Each arrow points from the organism that is consumed to the organism that consumes it. Use the information in the food web to answer the questions that follow.

a. Give one example of an organism from this food web that makes its own food using energy from sunlight.

Organism: _____

b. Give one example of an organism from this food web that eats only plants.

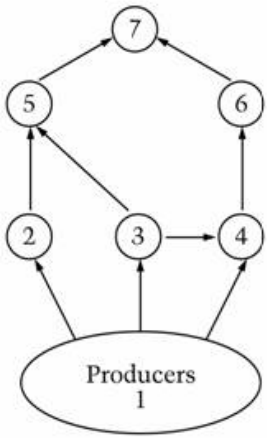
Organism: _____

c. Give one example of an organism from this food web that eats only animals.

Organism: _____

Question 3, Identify the primary consumers in a food web

The diagram below shows a food web in a large park. Each circle represents a different species in the food web. Which of the organisms in the food web could be referred to as primary consumers?

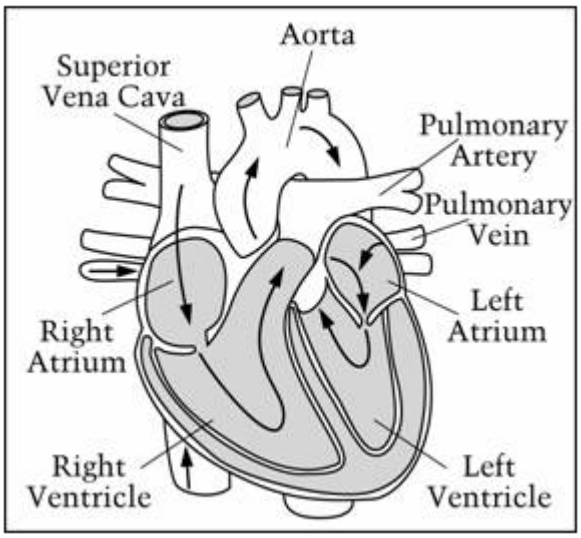


a. 7 only
b. 5 and 6 only
c. 2, 3, and 4 only
d. 2, 5, and 7 only

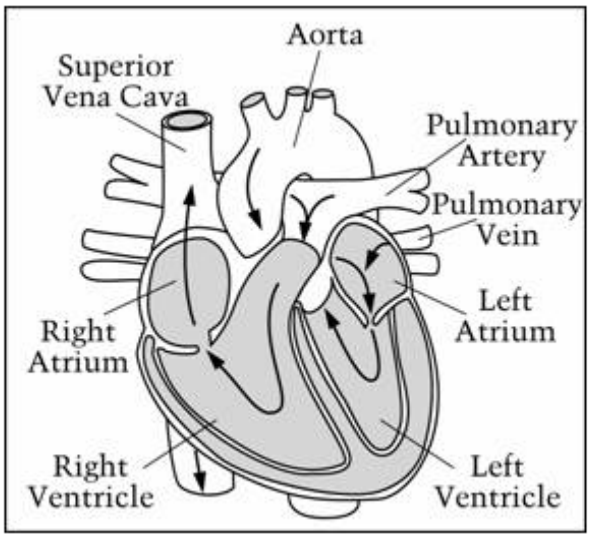
Question 4, Identify path of blood flow in human heart

Each diagram below shows the same front view of a human heart. Which diagram has arrows that correctly show the path of blood flow through the heart and the blood vessels leading to and from the heart?

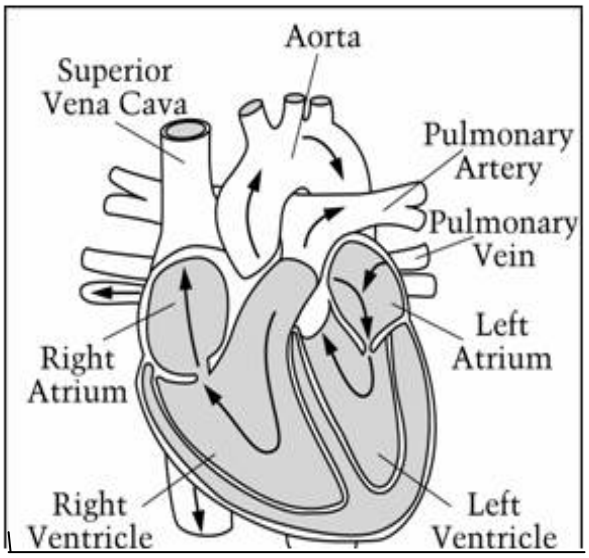
A.



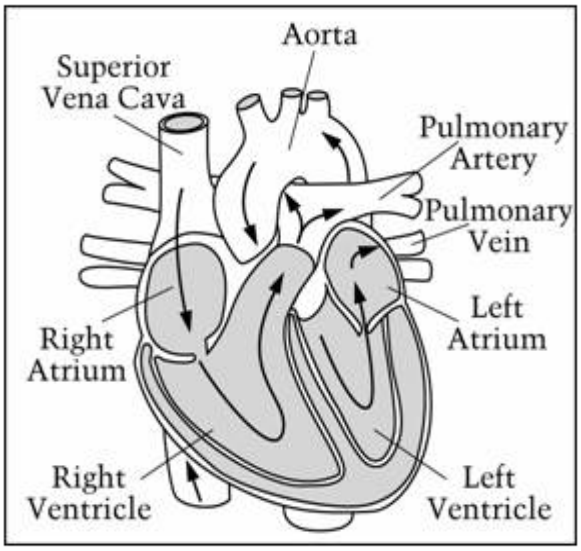
B.



C.



D.



Question 5, Organ needed for survival

A human CANNOT survive the loss of which of the following?

a. The appendix
b. The liver
c. A lung
d. A kidney

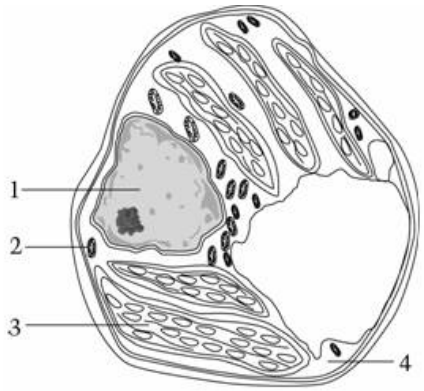
Question 6, Example of genetic engineering

Which of the following is an example of genetic engineering?

a. Growing a whole plant from a single cell
b. Finding the sequences of bases in plant DNA
c. Inserting a gene into plants that makes them resistant to insects
d. Attaching the root of one type of plant to the stem of another type of plant

Question 7, Identify location of cell's genetic material

In the picture of a cell below, which label indicates the part of the cell that contains most of the cell's genetic material?

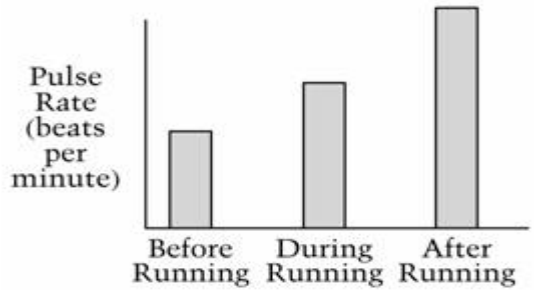


a. 1
b. 2
c. 3
d. 4

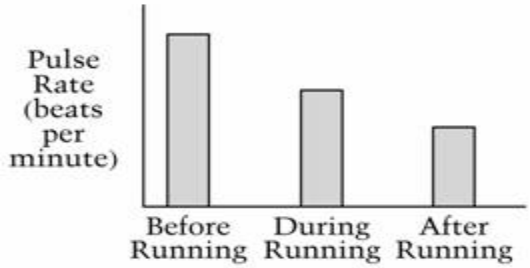
Question 8, Compare heart rates before, during, and after running

Julio wanted to know how his pulse rate changed when he ran very fast. He measured his pulse rate before he started running, while he was running, and two minutes after he stopped running. Which graph best shows how Julio's pulse rate changed?

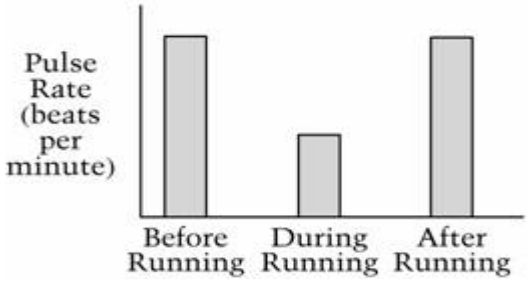
a.



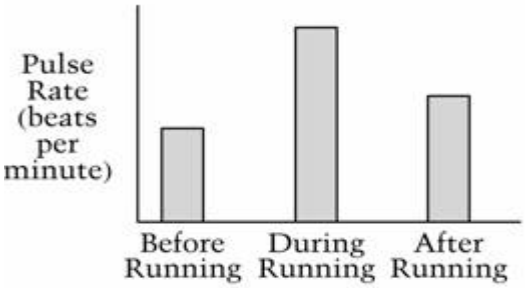
b.



c.



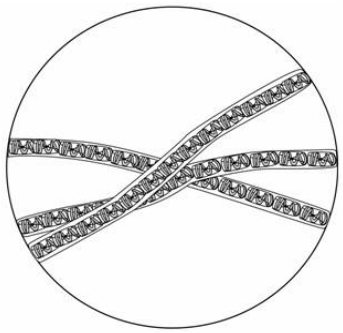
d.



a. A
b. B
c. C
d. D

Question 9, Recognize ecological role of organism

Sarah looked at some pond water with a microscope. She used the low-power objective lens to look at some green algae. The picture below shows what Sarah saw through the microscope.



What is the role of the pond organisms that Sarah saw in her field of view?

a. Producer
b. Primary consumer
c. Secondary consumer
d. Decomposer