Tennessee TCAP 2023
Grade 7 Science

Exam Materials
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Answer Key Materials
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Tennessee Comprehensive Assessment Program

TCAP

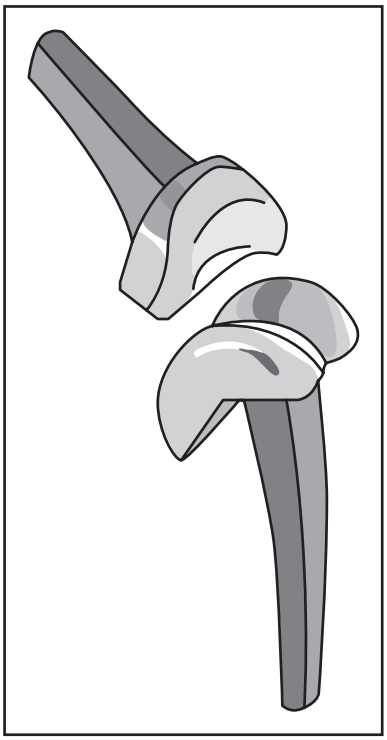
Science
Grade 7 Item Release

TN Department of Education

TS02S2112_4

00. Synthetic finger joints can replace damaged joints in human hands. In the past, these joints were made out of soft plastic. They were flexible but wore down quickly and required replacement. Scientists are now making synthetic finger joints from different materials.

Finger Replacement Joint



When choosing a material to make synthetic finger joints, which of these is the **least** important factor for scientists to consider?

A. the flexibility of the material

B. the durability of the material

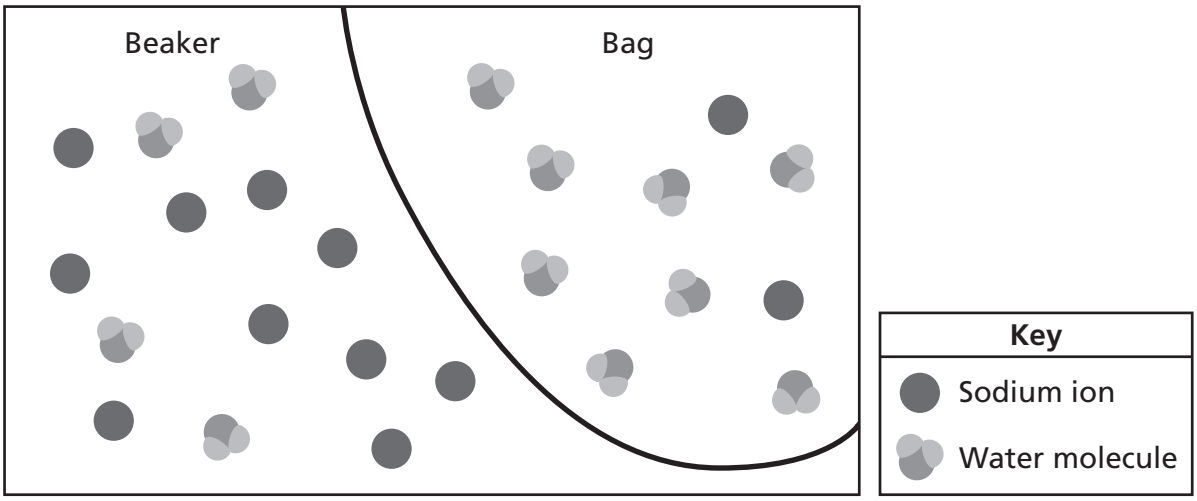
C. the ability of the material to be accepted by body systems

D. the ability of the material to be used in other parts of the body

TS02S2903_2

00. A semipermeable bag contains water with a very low concentration of sodium ions. The bag and its contents are placed in a beaker containing water that has a much higher concentration of sodium ions than the water in the bag. The bag is permeable to water molecules but is not permeable to sodium ions.

Osmosis Demonstration Before Sodium Ions Are Added



Which of these describes what will happen as more sodium ions are added to the water in the beaker?

A. All of the water molecules inside the beaker will move into the bag.

B. Some of the water molecules inside the bag will move outside the bag and into the beaker.

C. Some of the sodium ions inside the beaker will move into the bag.

D. All of the sodium ions inside the bag will move outside the bag and into the beaker.

TS02S2929_3

00. The table describes characteristics of cells from two different organisms that belong to different kingdoms.

Examination of Cells from Two Organisms

	Cell from Organism X	**Cell from Organism Y**
Shape	Round and irregular	Rectangular and fixed
Centrioles	Present	Not present
Chloroplasts	Not present	Present
Cytoplasm	Present	Present
Ribosomes	Present	Present
Mitochondria	Present	Present

Which statement correctly explains a difference between Organism X and Organism Y?

A. Organism X is more likely to have a lower body temperature than Organism Y because the cells of Organism X contain centrioles.

B. Organism X uses more energy to remove waste than Organism Y because Organism X has round and irregularly shaped cells.

C. Organism Y is more likely to make its own food than Organism X because Organism Y contains chloroplasts.

D. Organism Y uses more resources to produce cells than Organism X because Organism X has round and irregularly shaped cells.

TS02S3297_1

00. Creosote bushes are types of plants that grow in deserts. The roots of these plants release a toxic substance that prevents other plants from growing near them.

Which of these describes the **most likely** effect the toxic substance released by a creosote bush has on its chances for survival?

A. The toxic substance helps increase the chances of survival for the creosote bush because the bush will have less competition for water from other plants.

B. The toxic substance decreases the chances of survival for the creosote bush because pollinators will be less likely to spread its pollen.

C. The toxic substance helps increase the chances of survival for the creosote bush because animals will be less likely to nest in its branches.

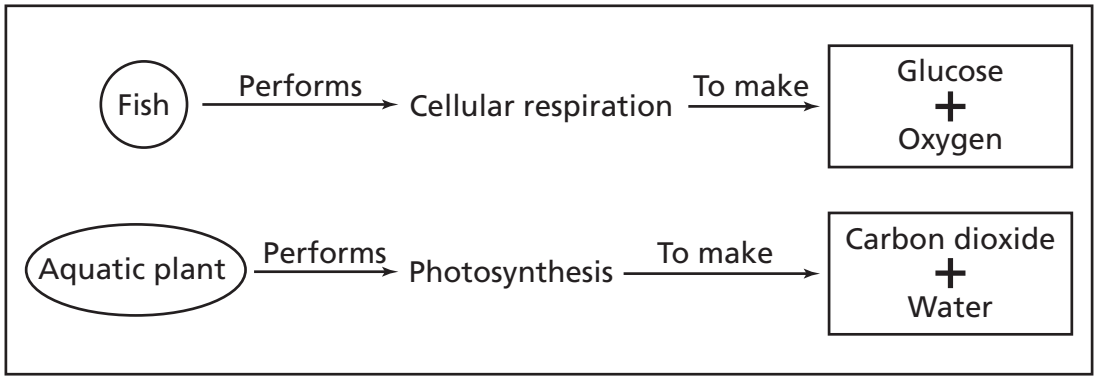
D. The toxic substance decreases the chances of survival for the creosote bush because the toxin will require the bush to need more water than the desert provides.

TS02S3933_4

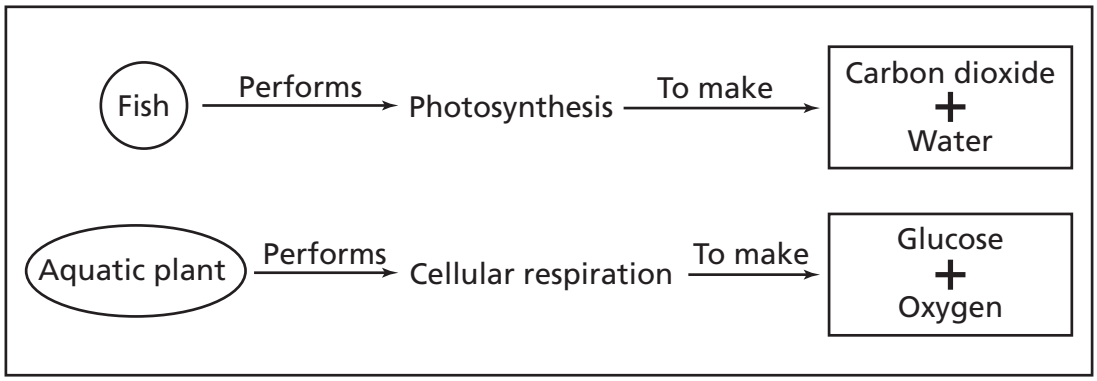
00. A teacher placed an herbivorous fish and a plant in an aquarium with a closed lid next to a classroom window. The teacher leaves the aquarium tank unattended in the classroom every weekend. The teacher is confident that the fish and the plant will remain healthy each weekend.

Which diagram **best** shows how the fish and plant are able to survive in the unattended aquarium?

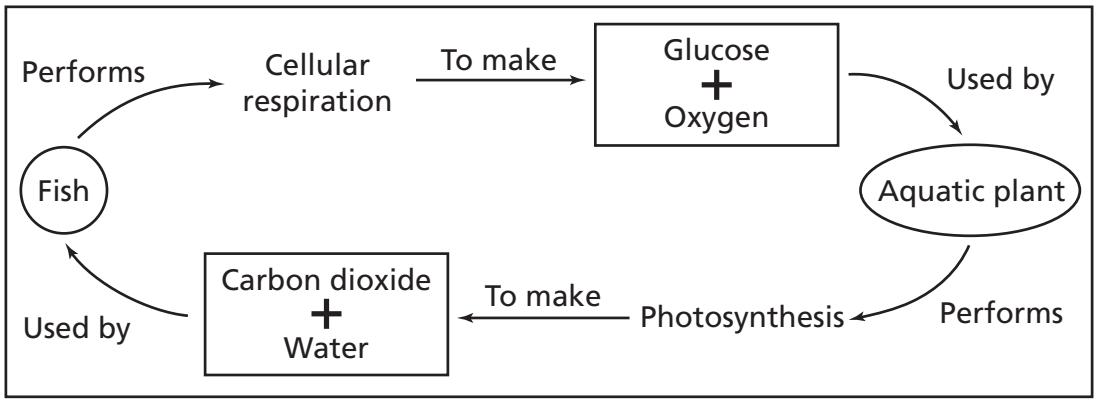
A.



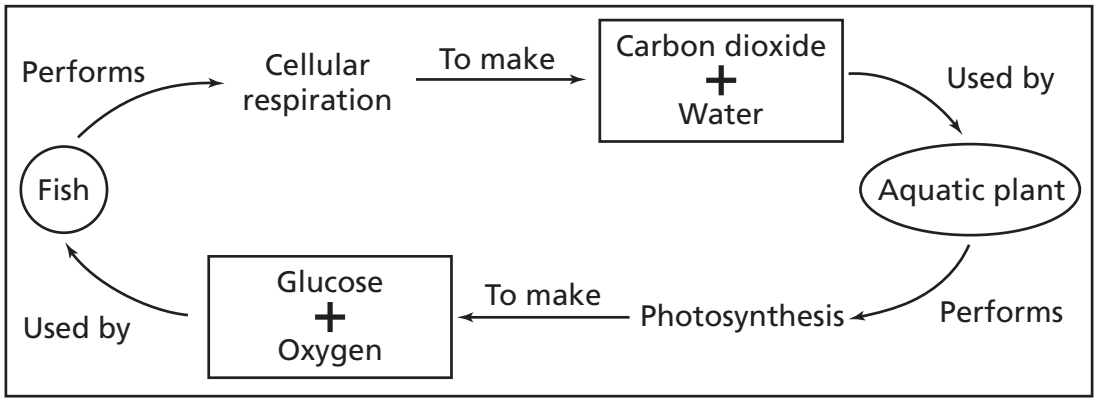
B.



C.

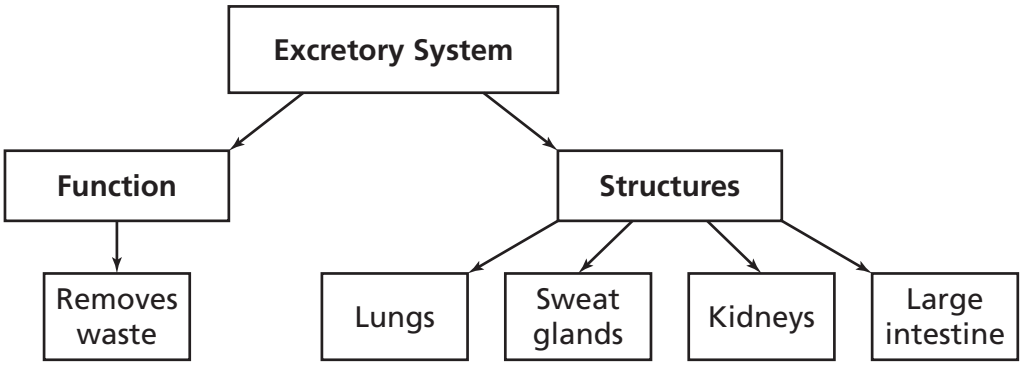


D.


Performs
Cellular respiration
To make
Carbon dioxide + Water
Used by
Fish
Aquatic plant
Used by
Glucose + Oxygen
To make
Photosynthesis
Performs

TS02S4029_1

00. A student created a diagram about the excretory system.



Based on the diagram, which of these organ systems interact with the excretory system?

A. respiratory, integumentary, digestive, and urinary

B. circulatory, skeletal, digestive, and endocrine

C. respiratory, digestive, circulatory, and skeletal

D. circulatory, muscular, digestive, and nervous

TS03S5474_3

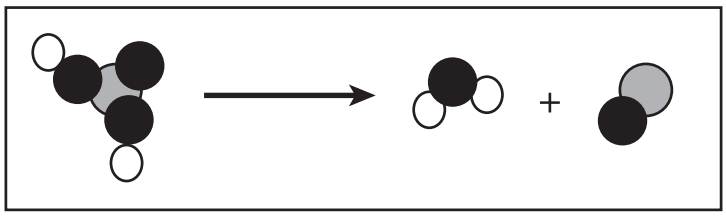
00. Heat causes some substances to decompose or break into smaller substances. Atoms are not created or destroyed during this process; they are only rearranged. These reactions can be written as chemical equations.

$$H_2CO_3 \longrightarrow H_2O + CO_2$$

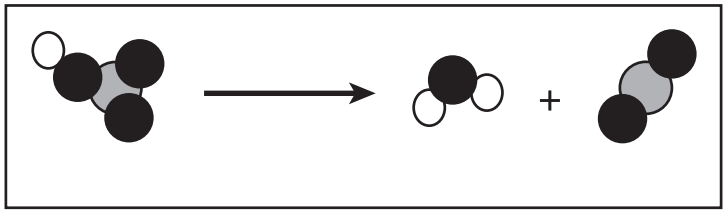
carbonic acid — water — carbon dioxide

Which particle diagram **best** represents the conservation of atoms in this chemical reaction?

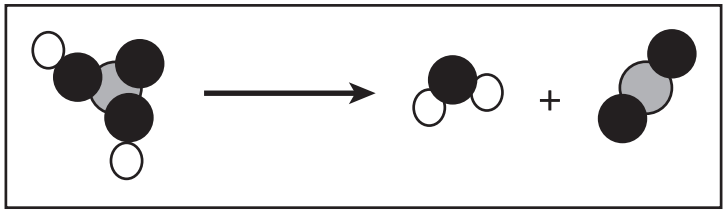
A.



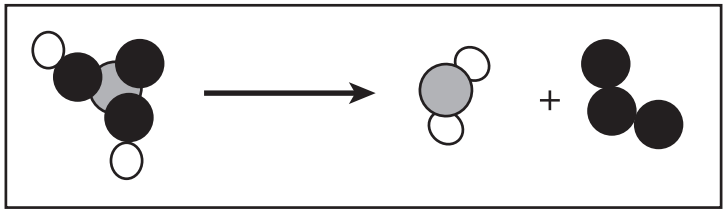
B.



C.



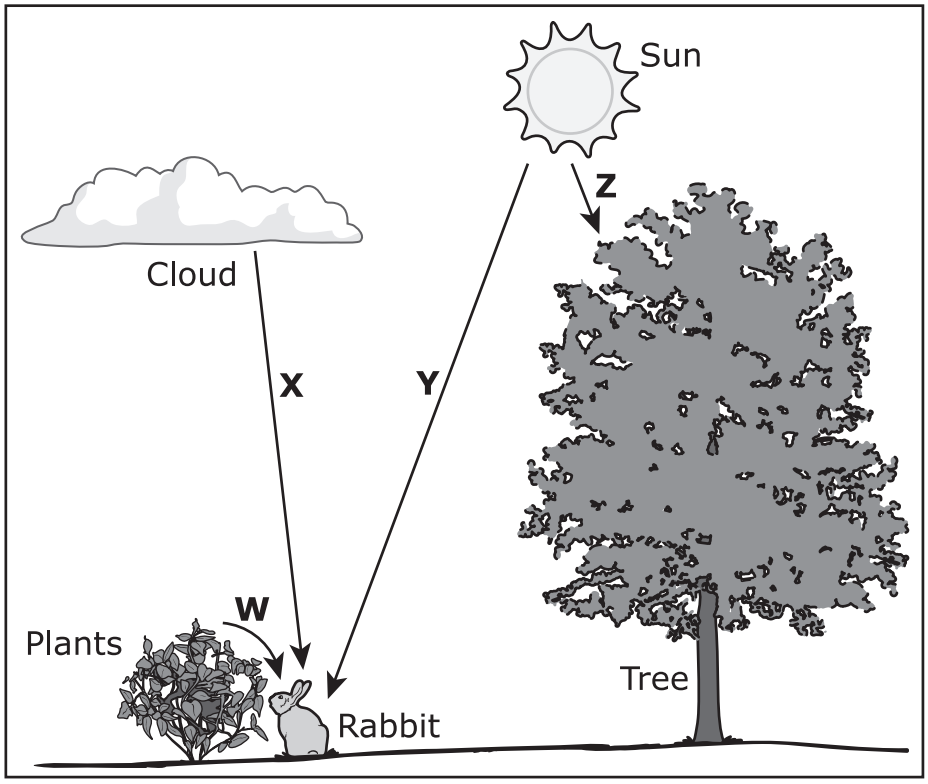
D.



TS03S5943_1

00. A student draws a diagram of some parts of an ecosystem. The arrows represent interactions between the ecosystem's parts.

Some Parts of an Ecosystem



Which arrow represents the movement of both energy and carbon in this ecosystem?

A. arrow W, because the plants provide energy and carbon through food to the rabbit

B. arrow X, because the cloud provides energy and carbon through water to the rabbit

C. arrow Y, because the sun provides energy and carbon in the form of heat to the rabbit

D. arrow Z, because the sun provides energy and carbon in the form of light to the tree

Metadata – Grade 7

Items

Page Number	UIN	Grade	Item Type	Key	DOK	TN Standards	SEP	CCC
1	TS02S2112	7	MC	D	2	7.ETS2.1		SF
2	TS02S2903	7	MC	B	2	7.LS1.2	MOD	SYS
3	TS02S2929	7	MC	C	2	7.LS1.1	DATA	SF
4	TS02S3297	7	MC	A	2	7.LS1.6	CEDS	
5	TS02S3933	7	MC	D	3	7.LS1.9	MOD	EM
7	TS02S4029	7	MC	A	3	7.LS1.5	MOD	
8	TS03S5474	7	MC	C	3	7.PS1.4	MOD	PAT
9	TS03S5943	7	MC	A	2	7.LS2.1	MOD	EM

Metadata Definitions:

UIN	Unique letter/number code used to identify the item.
Grade	Grade level or Course.
Item Type	Indicates the type of item. MC= Multiple Choice
Key	Correct answer.
DOK	Depth of Knowledge (cognitive complexity) is measured on a three-point scale. 1 = Recall or simple reproduction of information; 2 = Skills and concepts: comprehension and processing of text; 3 = Strategic thinking, prediction, elaboration.
TN Standards	Primary educational standard assessed. This includes the science ideas that students need to understand at each grade level.
SEP	Science and Engineering Practices: These are the essential practices of scientists and engineers which help students figure out explanations for phenomena or solutions for design problems.
CCC	Cross Cutting Concepts: These are concepts that permeate all science disciplines and provide a lens through which students can apply their science ideas to phenomena or design problems.