

Tennessee TCAP 2023
Grade 8 Science

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Tennessee Comprehensive Assessment Program

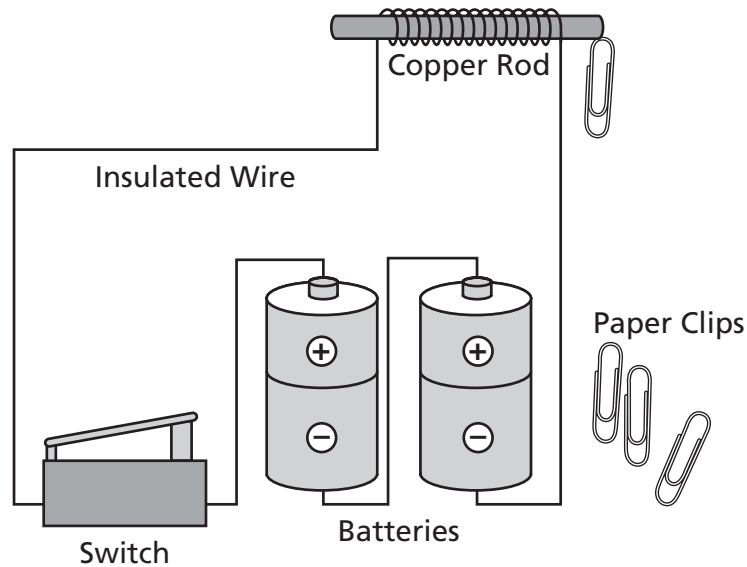
TCAP

Science Grade 8 Item Release



- 00.** A student made an electromagnet out of common objects.

An Assembled Electromagnet



Which change would weaken the electromagnet?

- A.** Replace the copper rod with an iron nail.
- B.** Remove some of the wire loops around the copper rod.
- C.** Connect another battery between the switch and the copper rod.
- D.** Use larger paper clips.

00. A student places a straw in a glass of water. The student observes that the part of the straw that is outside of the water looks different from the part of the straw that is in the water.

Glass of Water with a Straw



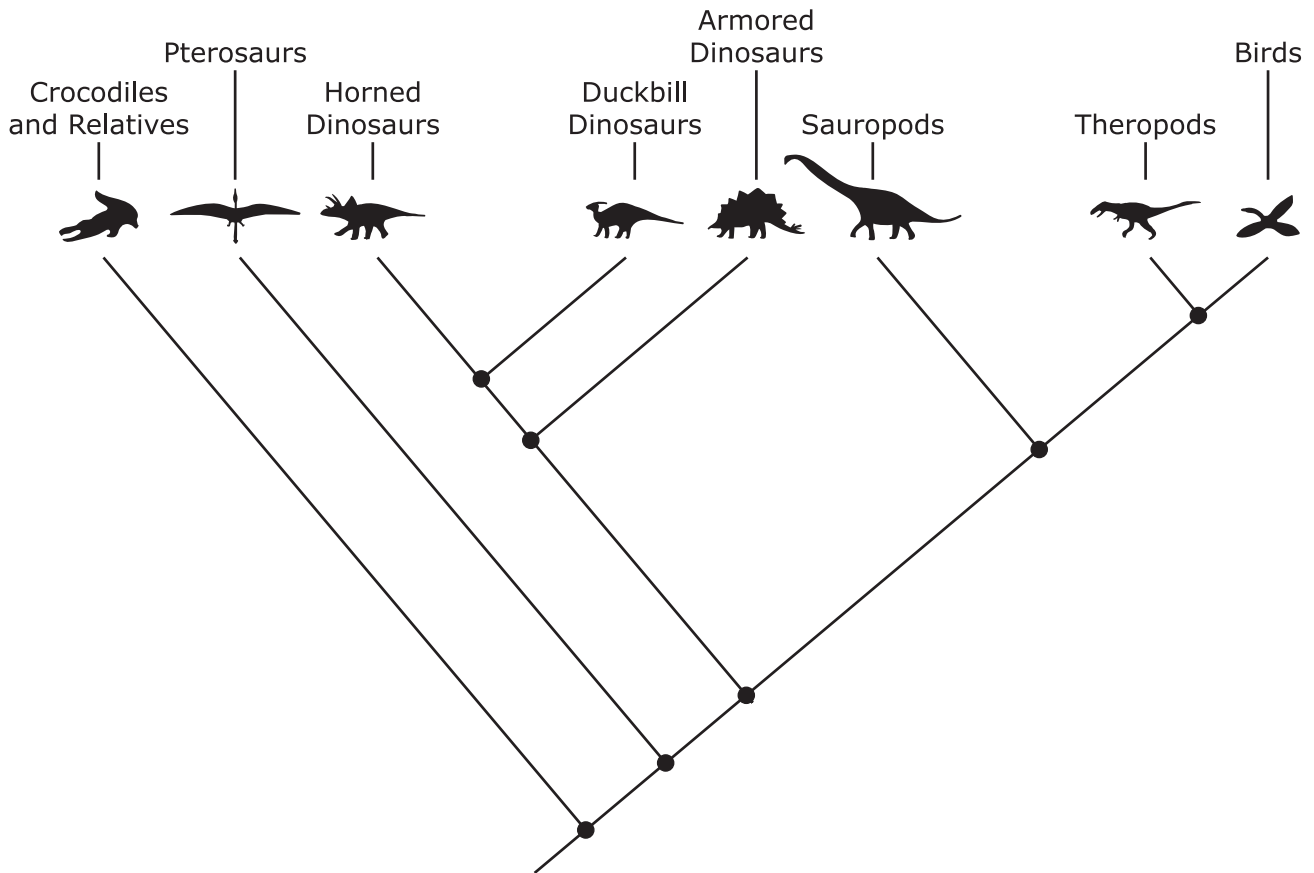
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Which statement **best** explains why the part of the straw that is out of the water appears different from the part of the straw that is in the water?

- A. The water causes visible light to reflect slowly, which causes the straw in the water to appear larger.
- B. Light travels through air and water at different speeds, which causes the straw to appear distorted in water.
- C. The water absorbs visible light, which causes the straw to appear in a different position than it does out of the water.
- D. Light is affected by the temperature difference between the air and water, which causes the straw to appear distorted in water.

00. The cladogram shows some relationships between different types of organisms.

Cladogram of Birds, Crocodiles, and Dinosaurs



Using the cladogram, which **two** of these organisms are the **most** closely related to Duckbill Dinosaurs?

- A. Sauropods
- B. Theropods
- C. Horned Dinosaurs
- D. Armored Dinosaurs
- E. Birds

- 00.** A student investigated how temperature affects the current produced by a motor. The student separated three magnets used within the motor and cooled each magnet to 0°C. The strength of each magnet was tested by counting how many washers each magnet could pick up. Then each magnet was heated to a higher temperature and the testing with the washers was repeated. The student recorded the results in the data table.

**Number of Washers Picked Up by
Magnets at Different Temperatures**

Temperature of Magnet (°C)	Magnet 1	Magnet 2	Magnet 3
0	27	32	29
25	23	27	25
50	19	24	21
75	11	14	13
100	6	9	7

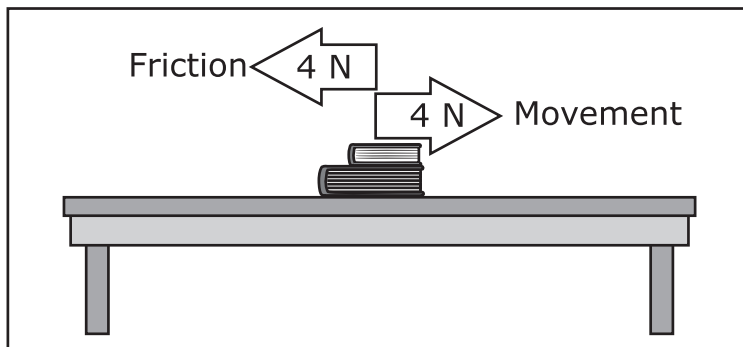
Under which conditions would the motor produce the **greatest** amount of current?

- A.** cooling the motor to keep the internal temperature between 10°C and 20°C
- B.** cooling the motor to keep the internal temperature between 30°C and 40°C
- C.** heating the motor to keep the internal temperature between 60°C and 70°C
- D.** heating the motor to keep the internal temperature between 80°C and 90°C

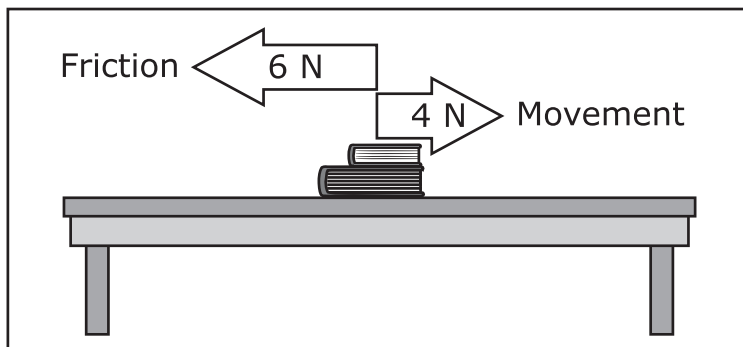
00. Books are on a table. A student pushes the books to the right side of the table.

In which diagram do the arrows show the **most likely** forces acting on the books as they move to the right?

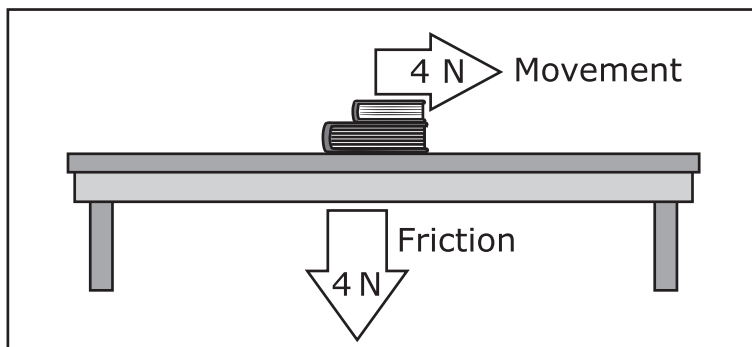
A.



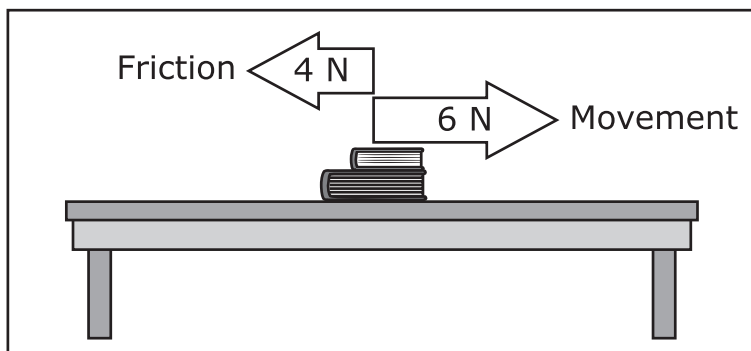
B.



C.



D.

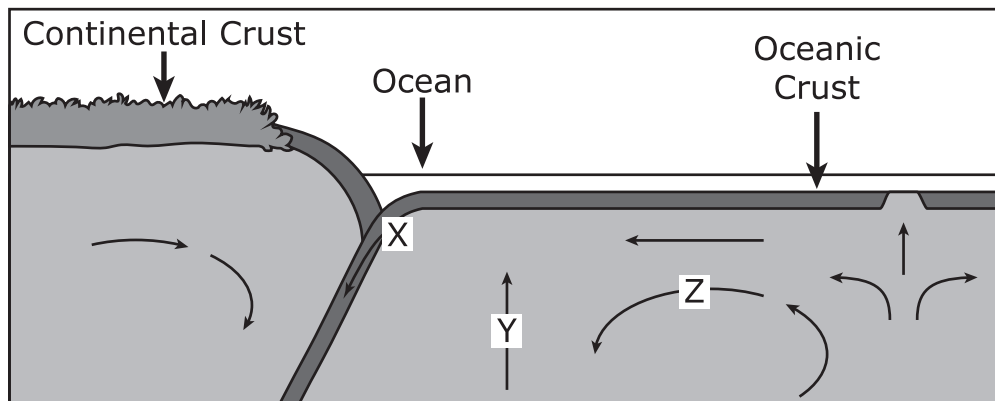


- 00.** Scientists observe that most galaxies are moving away from Earth. The farther away the galaxy is, the faster it is moving away from Earth.

Which **two** arguments are supported by the evidence that most galaxies are moving away from Earth?

- A.** The universe used to be larger in the past.
- B.** The universe used to be smaller in the past.
- C.** The universe has always been the same size.
- D.** The space between galaxies is becoming larger.
- E.** The space between galaxies is becoming smaller.

00. The diagram shows a plate boundary. Each letter near an arrow represents a process that is happening near this boundary.

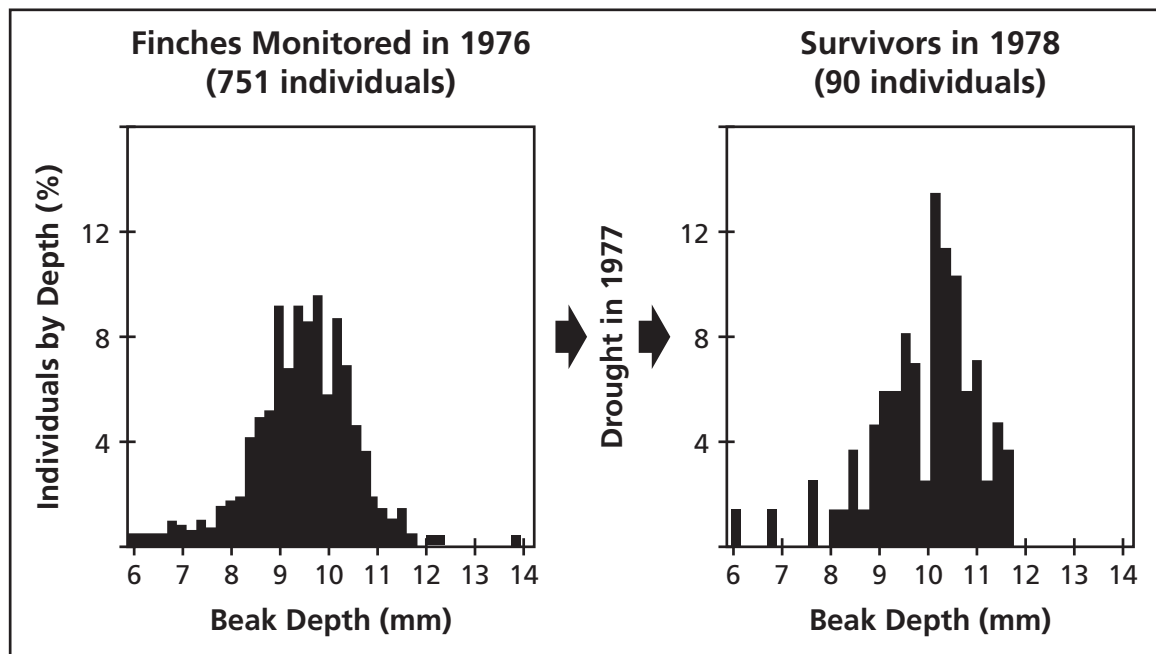


Which of these **best** describes the process that each letter represents?

- A.**
- | | |
|---|--|
| X | One lithospheric plate is subducted under another. |
| Y | Heat rises through the asthenosphere. |
| Z | Convection currents in the asthenosphere drive plate movement. |
- B.**
- | | |
|---|---|
| X | One plate in the asthenosphere collides with another. |
| Y | The lithosphere is heated until it becomes liquid. |
| Z | Heat moves by conduction from the crust to the core. |
- C.**
- | | |
|---|--|
| X | The lithosphere absorbs heat from the ocean. |
| Y | Friction in the asthenosphere drives plate movement. |
| Z | Thermal currents push the magma up toward the crust. |
- D.**
- | | |
|---|--|
| X | One lithospheric plate is moving away from another. |
| Y | The asthenosphere is heated by the sun. |
| Z | Concentrated radiation circulates magma up toward the crust. |

00. Scientists have been researching finch populations on the Galápagos Islands for many years. In 1977, there was a drought in the area. The scientists compared data collected in the years before and after the drought to make a conclusion about the effect the drought had on the finches.

**Comparing Beak Depth of Finches
Before and After the 1977 Drought**

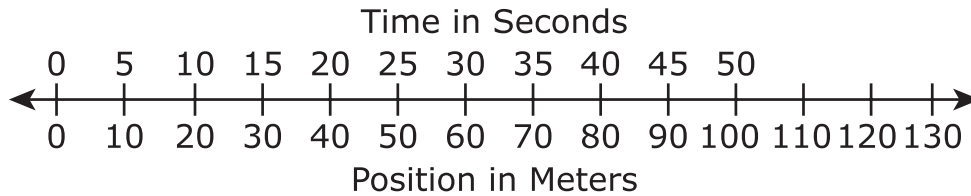


Which of these is the **most** likely conclusion the scientists made after studying the data in the graphs?

- A. Finches that had beaks longer than 10 millimeters did not survive the drought of 1977.
- B. Finches that had beaks longer than 11 millimeters had already become extinct by 1976.
- C. Finches that had beaks between 10 and 11 millimeters long were better adapted to the environment on the islands in 1977 than finches that had different beak sizes.
- D. Finches that had beaks between 10 and 11 millimeters long were less abundant on the islands between 1976 and 1978 than finches that had different beak sizes.

00. The diagram represents the position of a dog at different times while it is running.

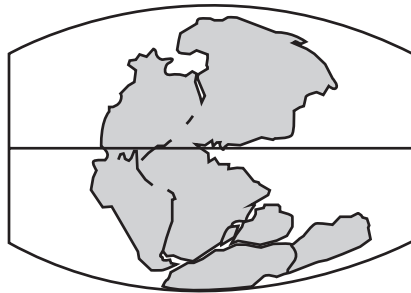
Position-Time Data



Which statement **best** describes the dog's motion?

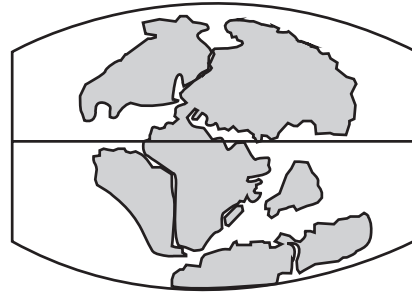
- A. The dog is speeding up.
- B. The dog is moving with a constant speed of 5 meters per second.
- C. If the motion of the dog stays the same, the position will be 120 meters when the time is 60 seconds.
- D. If the motion of the dog stays the same, the position will be 110 meters when the time is 60 seconds.

00. The maps model how Earth's continents have moved over time.



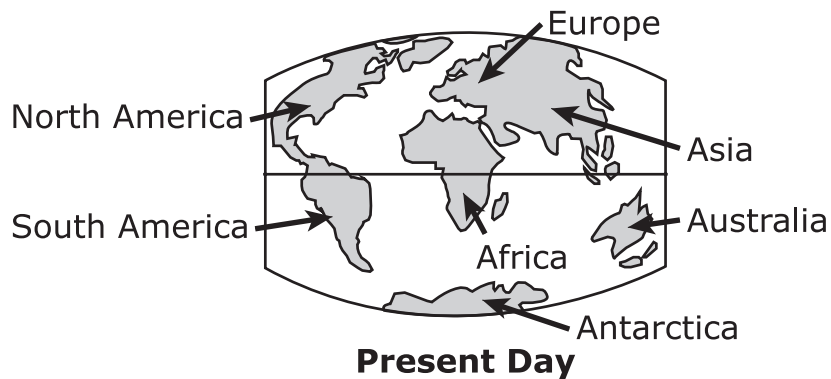
Permian Time Period

225 million years ago



Jurassic Time Period

150 million years ago



Present Day

Using the maps, on which **two** pairs of continents would similar fossils be found?

- A.** South America and Australia
- B.** North America and Australia
- C.** Asia and Australia
- D.** Africa and South America
- E.** Europe and North America

- 00.** The Grand Canyon contains 20,000 different species of brachiopod shell fossils. These fossils can be found throughout the canyon at different depths from the surface. Fossil ages at the Grand Canyon span a time period of over 800 million years. Most of the rock layers in the canyon are made of similar sediment types.

Which statement is a **correct** explanation for the vast differences in the fossil ages in the Grand Canyon rock layers?

- A.** A wide range of fossil sizes can be found throughout the canyon.
- B.** Each rock layer was deposited over a long period of time.
- C.** The nonsedimentary rock layers contain the most fossils.
- D.** A river deposited fossils from other locations over time.

Metadata – Grade 8

Items

Page Number	UIN	Grade	Item Type	Key	DOK	TN Standards	SEP	CCC
1	TS02S2402	8	MC	B	2	8.PS2.1	MOD	SYS
2	TS02S2701	8	MC	B	1	8.PS4.2		CE
3	TS03M5904	8	MS	C,D	2	8.LS4.2	DATA	PAT
4	TS02S2916	8	MC	A	3	8.ETS1.1	DATA	SYS
5	TS02S3801	8	MC	D	1	8.PS2.4	MOD	SC
7	TS03M5791	8	MS	B,D	2	8.ESS1.1	ARGS	SPQ
8	TS02S3855	8	MC	A	2	8.ESS2.4	MOD	SC
9	TS02S3938	8	MC	C	3	8.LS4.3	CEDS	CE
10	TS03S5532	8	MC	C	2	8.PS2.3	MATH	PAT
11	TS03M5820	8	MS	D,E	3	8.ESS2.5	MOD	PAT
12	TS03S5965	8	MC	B	2	8.ESS2.1	CEDS	

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; MS= Multiple Select
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.