



West Virginia Department of Education

## Science Sample Questions



*Students deserve it • The world demands it*

# Changes to the WESTEST 2 Science Section

## Types of Questions on Science Test

- Multiple Choice
- Gridded Response items – 2 per test

## Format of Science Test

- More reading because of the 21<sup>st</sup> century context
- Graphic organizers when appropriate
- Opportunity for multiple strategies to be used
- Student engagement encouraged

## Content of Science Test

- Objectives as per CSOs
- Rigor based on the DOK of the CSO
- Content relevant to the student

## Science Tools

- Periodic Table used with grades 5-11
- Formula Sheet used with grades 7-11
- Calculators are permitted on all sections of the science test for all grade levels

**Grade 3 – Application of Science**

SC.O.3.3.04 **given** a set of events, objects, shapes, designs, or numbers, formulate patterns of constancy or regularity.

*Depth of Knowledge 2*

During a science experiment, you need to record the temperature of a liquid on a regular basis. You fill your chart with the times shown below.

Time (Seconds)	Temperature (°C)
0	10
15	12
30	15
45	20
?	25

At what time should you have recorded the temperature at 25°C, in seconds?

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

## Grade 4 – Nature of Science

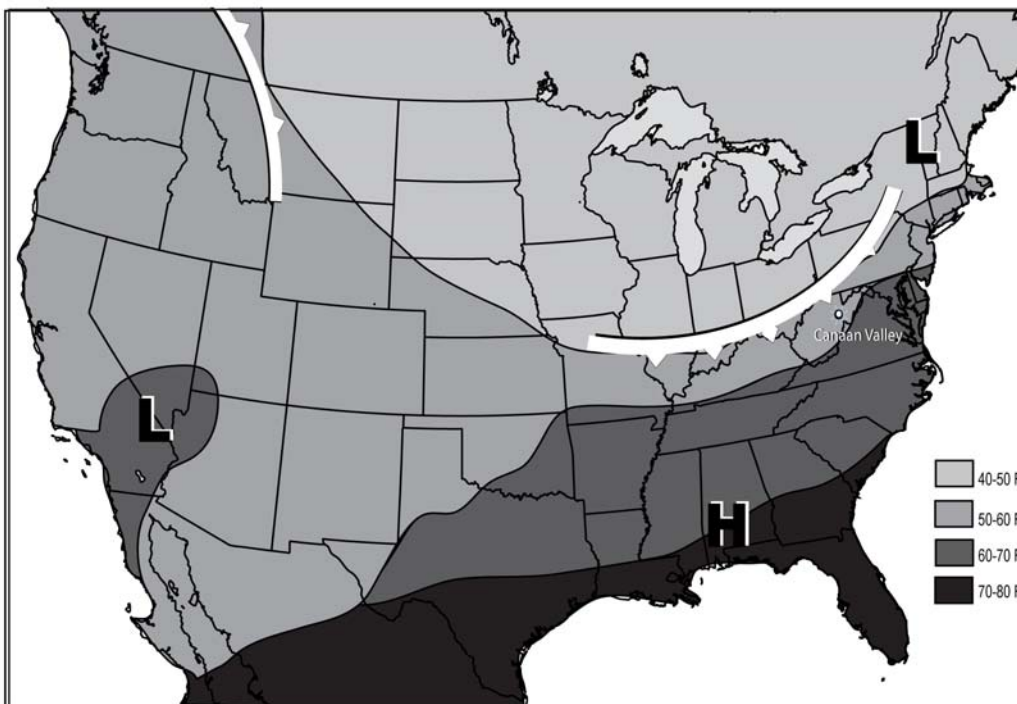
**SC.O.4.1.12** draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, variation of plants, or frequency and pitch of sound).

*Depth of Knowledge 3*

Sara needs to buy a coat for her trip to Canaan Valley. The table below describes the properties of four materials often used in coats and the weather map below shows the predicted weather.

### Properties of Materials Used in Coats

Material	Properties of the Material		
	Waterproof	Warm	Lightweight
A	YES	YES	NO
B	NO	NO	YES
C	YES	NO	YES
D	NO	YES	YES



*Question on following page.*

Her jacket should be made of which material?

- A. Material A
- B. Material B
- C. Material C
- D. Material D

**Grade 5 – Application of Science**

SC.O.5.3.04 **compare** and **contrast** the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, or flight characteristics of different-sized model airplanes).

*Depth of Knowledge 2*

You are given four toy trucks by your teacher. Each truck is the **same size** but with a different mass, as shown in the chart below.

Truck	Mass (g) of truck
1	25
2	50
3	75
4	100



One at a time, you release a truck on the top of the ramp. You record the amount of time it takes for each truck to reach the end of the ramp.

Which truck would most likely reach the bottom of the ramp in the shortest period of time?

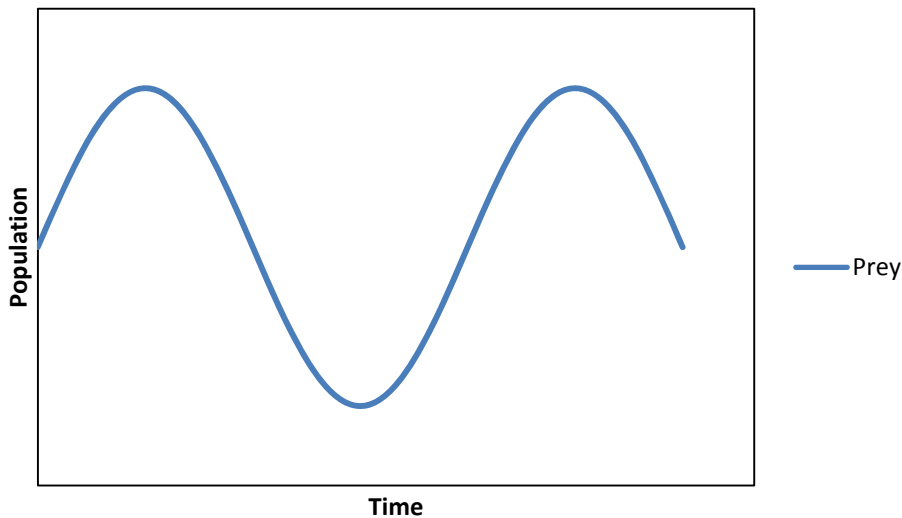
- A. Truck 2
- B. Truck 3
- C. Truck 1
- D. Truck 4

**Grade 6 – Application of Science**

SC.O.6.3.02 **construct** a variety of useful models of an object, event or process.

*Depth of Knowledge 2*

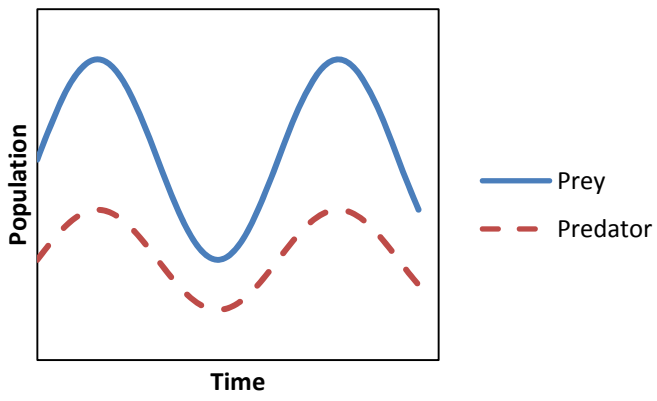
Your teacher gives you 10 years of population data for two animal species in West Virginia. You learn the species have a predator-prey relationship. Your teacher instructs you to develop a model of the population changes. You use your computer to begin creating the graph shown below.



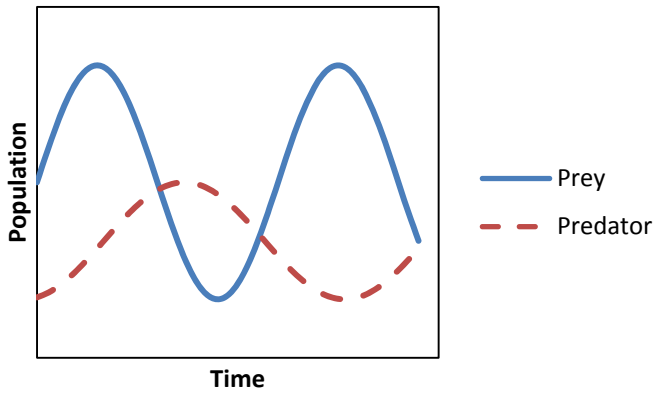
Which graph below correctly adds the predator population?

*(Answers on next page)*

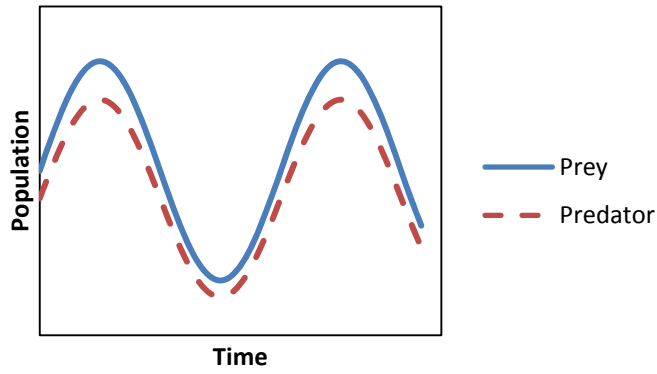
A.



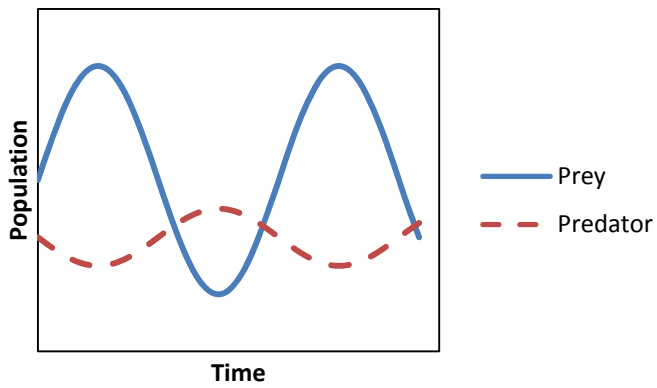
B.



C.



D.

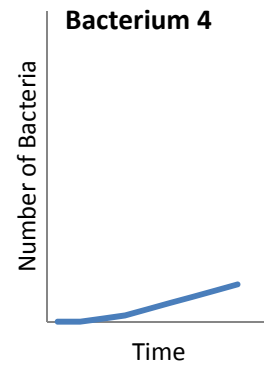
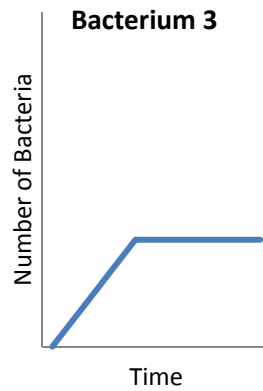
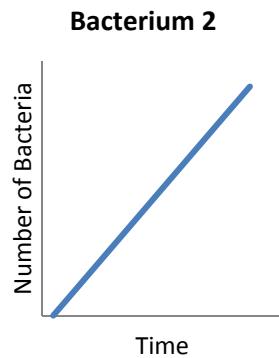
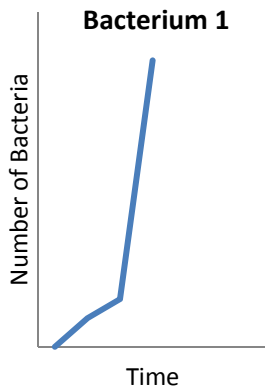


**Grade 7 – Nature of Science**

SC.O.7.1.11 **construct** and **use** charts, graphs and tables to organize, display, interpret, analyze and explain data.

*Depth of Knowledge 2*

You construct the four graphs shown below to show the rate at which four different disease-producing bacteria grow.



Which bacterium would produce a disease in the shortest amount of time?

- A. Bacterium 1
- B. Bacterium 2
- C. Bacterium 3
- D. Bacterium 4

**Grade 8 – Content of Science**

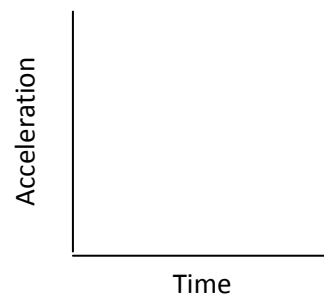
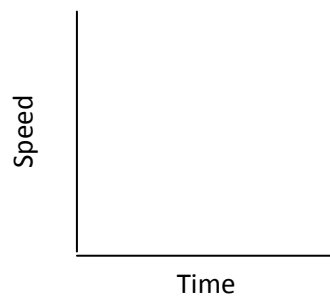
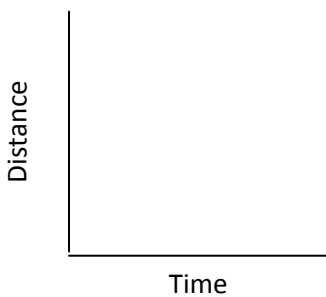
SC.O.8.2.23 **graph** and **interpret** the relationships of distance versus time, speed versus time, and acceleration versus time

*Depth of Knowledge 3*

During your class trip to New York City, you were given permission to drop a tennis ball from the observation deck of the Empire State Building. The ball fell for ten seconds. Its distance and time are recorded below in a table. Using the data collected, sketch the shape of the data, and then answer **the question** by choosing the best answer.

Time (s)	Distance (m)
1.0	4.9
2.0	19.6
3.0	44.1
4.0	78.4
5.0	122.5
6.0	176.4
7.0	240.1
8.0	313.6
9.0	396.9
10.0	490.0

Sketch the data for each graph below.



The acceleration graph indicates the tennis ball's speed

- A. remained constant.
- B. increased randomly.
- C. increased at a constant rate.
- D. is independent of acceleration.

### Grade 9 - Nature of Science

SC.O.PS.3.1 **synthesize concepts across various science disciplines** to better understand the natural world (e.g., form and function, systems, or change over time)

*Depth of Knowledge 2*

While working as a biochemist, you have found that a certain type of bottom-dwelling microorganism thrives under the following environmental conditions:  $1.0$  to  $3.0$   $\text{Fe}^{2+}$ ,  $\text{O}_2 < 1.0$ , and a pH of  $> 6$ . Use the chart shown below to answer the question.

- A depth of 0 centimeters (m) represents the top of the sediment.
- The concentrations are expressed in parts per million (ppm).
- The acidity of a solution is represented on a scale known as pH.

Depth (m)	Temperature (°C)	pH	Concentrations (ppm)					
			$\text{SO}_4^{2-}$	$\text{S}^{2-}$	$\text{CO}_2$	$\text{Fe}^{3+}$	$\text{Fe}^{2+}$	$\text{O}_2$
0	4	7.5	7.0	0.0	1.0	4.0	0.5	2.0
5	5	7.0	5.0	2.0	1.5	3.0	1.5	1.0
10	7	6.5	3.5	3.5	2.0	2.0	2.0	0.7
15	9	5.5	3.3	3.8	3.0	0.8	3.0	0.3
0	10	4.5	3.0	4.0	1.0	0.5	4.0	0.0

*Concentration of ions and dissolved gases in the sediment at the bottom of an ocean*

Based on the information, at which of the following sediment depths would one **most** likely find this microorganism?

- A. 5m
- B. 10m
- C. 15m
- D. 20m

### Answer Key

**Grade 3 -**

**Grade 4 -**

**Grade 5 -**

**Grade 6 -**

**Grade 7 -**

**Grade 8 -**

**Grade 9 -**