

8th Grade, Week 3/16-3/20

*****Last day of the quarter 3/27 all late/missing work due 3/23!!
This is the last week of work that will be in Quarter 3 Gradebook.
Finish strong!**

Monday:

Math- Complete Pi worksheet, include: circumference, diameter, and radius of Friday's pie.

Tuesday: Virtual meeting at 9:00 am. Check your school email and/or google calendar for the link.

Math- Practice Test! Get your questions ready.

Science- CAST practice test, Please write directly on the test. To utilize drop down menus please go to <http://capt.tds.airast.org/student>

History- pg 431 #5 Write one solid paragraph (no less than 6 sentences)

Wednesday:

Math- Chpt 7 Test (you MUST show work to get credit, without work you will lose 50%)

** Elective- if you have yearbook and have items to work on please feel free to work on it.

Thursday: Virtual meeting at 9:00 am. Check your school email and/or google calendar for the link. Bring all your questions.

Math- Lesson 8.1 pg 465 Notes: VOCAB these terms are important! Complete pg 468 1-18 (be sure to use the videos through connected and Khanacademy.org)

Science- Pg 437 Applying Math Practice Problems 1 and 2 (be sure to read through the example thoroughly)

History- Lesson 3.2 Read pg 432-437 Notes: Reading Strategy and main ideas, Assignment: pg 437 1-4

Friday:

Math- Lesson 8.2 pg 472 Complete pg 474 1-17 (be sure to use the videos through connected and Khanacademy.org)

Chapter 7 Test, Form 2B

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

1. Simplify $(m^4)^2$.
 A $6m$ B m^8 C m^6 D $2m^4$ 1. _____

2. Simplify $(-2xy^2)^4(2x^3y^4)^2$.
 F $4x^{24}y^{32}$ G $-8x^9y^6$ H $64x^{10}y^{16}$ J $-4x^{10}y^{16}$ 2. _____

3. Simplify $\frac{6n^{-3}y}{2n^{-1}y^{-3}}$. Assume the denominator is not equal to zero.
 A $\frac{4y^3}{n^2}$ B $\frac{3y^4}{n^2}$ C $\frac{3}{n^4y^2}$ D $\frac{3n^2}{y^4}$ 3. _____

4. Simplify $\frac{(a^{-2}b^4)^{-6}}{(a^4b^{-8})^3}$. Assume the denominator is not equal to zero.
 F ab^3 G 1 H $\frac{a^{24}}{b^{48}}$ J $\frac{b^{48}}{a^{24}}$ 4. _____

5. Which monomial represents the number of square units in the area of a circle with radius $3x^3$ units?
 A $9\pi x^6$ B $6\pi x^6$ C $9\pi x^9$ D $6\pi x^5$ 5. _____

6. Express 8,450,000 in scientific notation.
 F 8.45×10^4 G 8.45×10^7 H 8.45×10^5 J 8.45×10^6 6. _____

7. Evaluate $\frac{4.65 \times 10^{-4}}{5 \times 10^{-6}}$.
 A 9.3×10^{11} B 9.3×10^1 C 9.3×10^2 D 9.3×10^0 7. _____

8. **SOLAR SYSTEM** The average distance Earth is from the Sun is about 9.296×10^7 miles, and the average distance Mars is from the Sun is about 1.4162×10^8 . About how many times as far is Mars from the Sun as Earth is from the Sun?
 F 0.7 G 0.9 H 1.3 J 1.5 8. _____

9. Write $(8x)^{\frac{1}{2}}$ in radical form.
 A $8\sqrt{x}$ B $\sqrt{8x}$ C $8\sqrt{8x}$ D $x\sqrt{8}$ 9. _____

10. Evaluate $125^{\frac{2}{3}}$.
 F 5 G 25 H 625 J 3125 10. _____

11. Solve $6^{x+1} = 1296$.
 A 1 B 2 C 3 D 4 11. _____

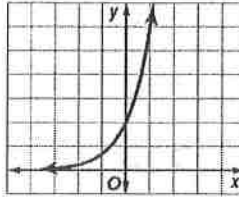
Chapter 7 Test, Form 2B *(continued)*

12. Which is the equation for the n th term of the geometric sequence 6, 12, 24, ... ?
 F $a_n = 6 \cdot 2^n$ G $a_n = 2 \cdot 3^n$ H $a_n = 3 \cdot 2^n$ J $a_n = 3 \cdot 2^{n-1}$ 12. _____

13. Which equation represents exponential decay?
 A $y = 0.5x^3$ B $y = 0.5x^2 - x$ C $y = 0.5(1.07)^x$ D $y = 0.5(0.87)^x$ 13. _____

14. Which equation corresponds to the graph shown?

F $y = 3^x + 2$ H $y = 2(3^x)$
 G $y = 2(3^x + 1)$ J $y = (2 \cdot 3)^x + 1$



14. _____

15. A weight lifter can deadlift 275 pounds. She can increase the weight $W(x)$ that she can lift according to the function $W(x) = 275(1.05)^x$, where x represents the number of training cycles completed. How much will she deadlift after 5 training cycles?
 A 334 lb B 369 lb C 344 lb D 351 lb 15. _____

16. **POPULATION** A city's population is about 763,000 and is increasing at an annual rate of 1.5%. Predict the population of the city in 50 years.
 F 1,335,250 G 826,830,628 H 358,374 J 1,606,300 16. _____

17. **BUSINESS** A printing press valued at \$120,000 depreciates 12% per year. What will be the approximate value of the printing press in 7 years?
 A \$19,200 B \$265,282 C \$49,041 D \$55,728 17. _____

18. Find the third term of the sequence in which $a_1 = -1$ and $a_n = 5a_{n-1} - 3$, if $n \geq 2$.
 F -218 G -43 H -8 J 12 18. _____

19. Find an explicit formula for $a_1 = 10$, $a_n = a_{n-1} - 3$, $n \geq 2$.
 A $a_n = n - 3$ C $a_n = -3n + 10$
 B $a_n = 10n - 3$ D $a_n = -3n + 13$ 19. _____

20. Find a recursive formula for the arithmetic sequence 8, -2, -12, -22, ...
 F $a_1 = 8$, $a_n = -10a_{n-1}$, $n \geq 2$ H $a_1 = 8$, $a_n = -\frac{1}{2}a_{n-1} + 2$, $n \geq 2$
 G $a_1 = 8$, $a_n = a_{n-1} - 10$, $n \geq 2$ J $a_1 = 8$, $a_n = \frac{1}{2}a_{n-1} - 6$, $n \geq 2$ 20. _____

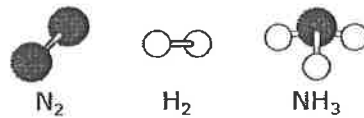
Bonus Simplify $3^{2n-1} \cdot (3^{5n})$. B. _____

Grade Eight Practice Test Items

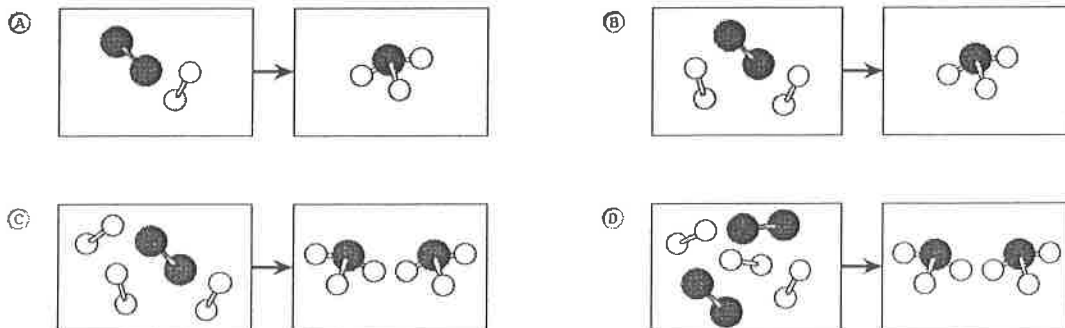
Item	Grade	PE	SEP	DCI	CCC	DOK
2	8	MS-PS1-5	2. Developing and Using Models	PS1.B Chemical Reactions	5. Energy and Matter	2

ILCS: Select the appropriate components to develop a model to illustrate the conservation of atoms/mass.

Nitrogen gas (N_2) reacts with hydrogen gas (H_2) to form ammonia gas (NH_3). Models of the molecules are shown.



Which model correctly shows that the mass is conserved in the reaction?



Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
3	8	MS-LS4-4	6. Constructing Explanations and Designing Solutions	LS4.B Natural Selection	2. Cause and Effect	3

ILCS: Explain why one variation of the trait is more advantageous given the introduction of a predator to the environment.

A species of small fish lives in a shady pond with a dark bottom. Some of these small fish are light colored, and some are dark colored. A new predator is added to the pond, and one of its primary food sources is the small fish. The table shows the percent of each color of fish in this population before and after the predator was added.

Color of Fish	Before New Predator	After New Predator
Light	51%	29%
Dark	49%	71%

Based on the data in the table, select the **best** phrase from the menus to complete each sentence.

After the new predator is added to the pond, the have a better chance of surviving than fish of the other color. This is because the predator .

Item	Grade	PE	SEP	DCI	CCC	DOK
4	8	MS-PS2-4	7. Engaging in Argument from Evidence	PS2.B Types of Interactions	4. Systems and System Models	2

ILCS: Construct a sound argument using evidence from the data, that an increase in an objects mass, increases the magnitude of gravitational force acting on the object.

Students used a computer simulation to determine the variables that affect the gravitational force between two objects. They collected the data shown in the table.

Mass of Object 1 (kilograms)	Mass of Object 2 (kilograms)	Distance Between Objects 1 and 2 (meters)	Gravitational Force of Object 1 on Object 2 (newtons)	Gravitational Force of Object 2 on Object 1 (newtons)
25	25	4	2.6×10^{-9}	2.6×10^{-9}
25	25	8	6.5×10^{-10}	6.5×10^{-10}
100	100	8	1.0×10^{-8}	1.0×10^{-8}
100	1	8	1.0×10^{-10}	1.0×10^{-10}

Part A

Choose the claim statement that **best** agrees with the data.

- Ⓐ Mass does not affect the gravitational force between two objects.
- Ⓑ Mass is the only variable that affects the gravitational force between two objects.
- Ⓒ Distance is the only variable that affects the gravitational force between two objects.
- Ⓓ Both mass and distance are variables that affect the gravitational force between two objects.

Item continues on the next page.

Grade Eight Practice Test Items

Part B

Select the correct words from the menus to complete the following statement to support the claim.

As the masses of both objects increased, the gravitational force between them

, and as the distance between the two objects increased, the gravitational force between them .

Key:

Item	Grade	PE	SEP	DCI	CCC	DOK
5	8	MS-ETS1-2	7. Engaging in Argument from Evidence	ETS1.B Developing Possible Solutions	N/A	2

ILCS: Match each of several designs with a list of the prioritized criteria and constraints or trade-offs in building materials for schools in an area where earthquakes occur.

There are two schools in a town where earthquakes sometimes happen. The town leaders want to make the school buildings stronger and safer to protect students and teachers during an earthquake. The leaders ask three different construction companies to propose a plan for making the schools safer. Each plan should match three important criteria and constraints.

- The schools will be made safe within two years.
- The cost cannot be more than \$0.47 per square meter of building space.
- Both schools will be able to withstand an earthquake of magnitude 8.0.

The table shows important details for three plans submitted by the construction companies.

Criteria and Constraints	Plan 1	Plan 2	Plan 3
Time to complete the plan for both schools	2 years	2 years, 1 month	3 years
Cost per square meter of building space	\$0.52	\$0.46	\$0.45
Maximum magnitude earthquake that the schools will be able to withstand	7.9	8.2	7.7

Select the plan that **best** matches the criteria and constraints made by the town leaders.

Plan 1	Plan 2	Plan 3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

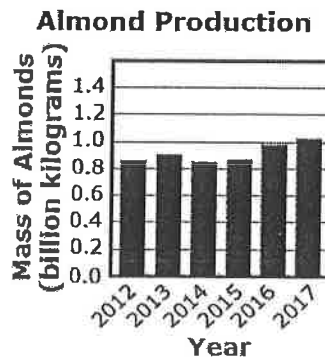
Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
6	8	MS-ESS3-4	7. Engaging in Argument from Evidence	ESS3.C Human Impacts on Earth Systems	2. Cause and Effect	3

ILCS: Evaluate (with reasoning) whether the provided evidence/data are sufficient to defend the claim based on almond production and the effect it has on water supplies in California.

Environmental Principle I: The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.

This graph shows almond production in the United States since 2012. Almost all of the almonds grown in the United States come from California, and about 70% of California’s almonds are sold overseas. About 4% of California’s freshwater supply is used to grow almonds.



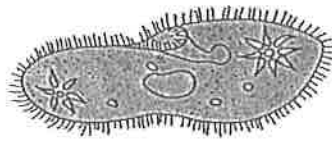
Globally, the quantity of almonds eaten per person has increased in recent years. Scientists claim that this increased demand for almonds will directly cause a decrease in California’s limited freshwater supply. Based on the data, select the words or phrases that **best** complete the statement.

The data the scientists’ claim because, as the demand for almonds increases, almond production in California will most likely

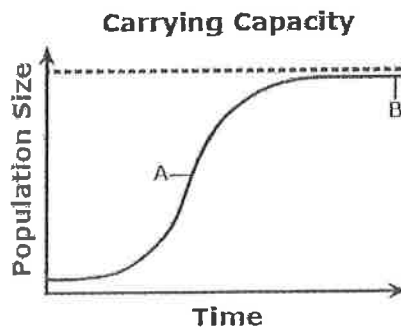
Item	Grade	PE	SEP	DCI	CCC	DOK
7	8	MS-LS2-1	4. Analyzing and Interpreting Data	LS2.A Interdependent Relationships in Ecosystems	2. Cause and Effect	3

ILCS: Explain how resource availability affects population growth and carrying capacities.

A paramecium is a single-celled freshwater organism that can be observed using a microscope. A typical paramecium is shown.



A scientist started a paramecium culture in the laboratory to study population growth. A model of population growth for the paramecium culture is shown in the graph. The carrying capacity is the number of individuals that the environment has enough resources to support.



Explain why the paramecium population growth is rapid at the part labeled A and why the population growth rate is slower at the part labeled B, where the population is at carrying capacity. Enter your answer in the box provided.

B I U T X
☰ ☱ ☲ ☳
✂
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🌐 English
Ω

Rubric follows on the next page.

Item	Grade	PE	SEP	DCI	CCC	DOK
8	8	MS-ESS3-2	4. Analyzing and Interpreting Data	ESS3.B Natural Hazards	1. Patterns	3

ILCS: Evaluate the information provided on earthquakes and identify a pattern between the location and severity of a natural disaster.

A tsunami is a series of waves, and it is usually caused by an earthquake. A tsunami can only be predicted after an earthquake has already occurred. Most tsunamis are caused by earthquakes with magnitudes over 7.0 that occur under the ocean or near coastlines. These earthquakes are also less than 100 kilometers (km) below Earth's surface. This table summarizes the magnitude, location, and depth of four earthquakes.

Earthquake	Magnitude	Location	Depth (below Earth's surface)
A	3.6	Coastline	52 km
B	8.9	Ocean	28 km
C	7.2	Ocean	180 km
D	8.5	Mid-continental	85 km

Based on this information, which earthquake has the **greatest** likelihood of causing a tsunami to develop?

- Ⓐ Earthquake A
- Ⓑ Earthquake B
- Ⓒ Earthquake C
- Ⓓ Earthquake D

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
9	8	MS-PS2-5	3. Planning and Carrying Out Investigations	PS2.B Types of Interactions	2. Cause and Effect	3

ILCS: Evaluate data to determine if there is evidence that fields exert forces on nearby objects without direct contact.

A student wants to show a friend that a magnetic field exists in the region around a permanent magnet.

For each demonstration listed in the table, select a check box to indicate whether the student can use the demonstration to show that a field exists in a region around a magnet.

	Does show a field exists	Does not show a field exists
A magnet touched to a paper clip picks it up from a table.	<input type="checkbox"/>	<input type="checkbox"/>
A magnet held near a small metal ball makes the ball roll across a table.	<input type="checkbox"/>	<input type="checkbox"/>
The north pole of a magnet sticks to the south pole of a second magnet when they touch.	<input type="checkbox"/>	<input type="checkbox"/>
A small magnet held under a piece of paper with iron filings on top makes the filings move into a pattern that covers the whole piece of paper.	<input type="checkbox"/>	<input type="checkbox"/>

Item	Grade	PE	SEP	DCI	CCC	DOK
10	8	MS-LS1-6	6. Constructing Explanations and Designing Solutions	LS1.C Organization for Matter and Energy Flow in Organisms	5. Energy and Matter	3

ILCS: Explain the role of plants (or animals) in the cycling of matter.

The processes of photosynthesis and cellular respiration are involved in the cycling of carbon dioxide (CO₂) and oxygen (O₂) among organisms.

Select at least one check box in each row to indicate the organisms that perform each process that contributes to the carbon cycle.

	Plants	Animals
Produce CO ₂ that is used in photosynthesis	<input type="checkbox"/>	<input type="checkbox"/>
Use CO ₂ in photosynthesis	<input type="checkbox"/>	<input type="checkbox"/>
Produce O ₂ that is used in cellular respiration	<input type="checkbox"/>	<input type="checkbox"/>
Use O ₂ in cellular respiration	<input type="checkbox"/>	<input type="checkbox"/>

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
11	8	MS-PS3-4	3. Planning and Carrying Out Investigations	PS3.B Conservation of Energy and Energy Transfer	3. Scale, Proportion, and Quantity	3

ILCS: Select the suitable equipment necessary to investigate heat transfer.

A student learning about heat transfer makes the claim shown.

Some metals change temperature more rapidly than other metals.

The student proposes to test the claim in the laboratory by using metal rods made of iron (Fe), copper (Cu), and aluminum (Al). In addition to the metal rods, which pieces of equipment would be useful for investigating the claim?

- Ⓐ prism, heat lamp, screen, meterstick
- Ⓑ beaker, digital scale, stopwatch, clamps
- Ⓒ litmus paper, beaker, pan balance, battery
- Ⓓ hot water, pan to hold water, stopwatch, thermometer

Item	Grade	PE	SEP	DCI	CCC	DOK
12	8	MS-ESS2-1	2. Developing and Using Models	ESS2.A Earth's Materials and Systems	7. Stability and Change	2

ILCS: Select the processes that represent the rock cycle and also identify the limitations to using a model.

A student uses wax crayons to model different parts of the rock cycle. The model has several steps as shown.

Part A

Drag the process to the step that most closely models that part of the rock cycle. Each process is used only once.

Step	Process
Crayons are grated into small pieces.	[]
↓	
Grated pieces of crayons are squeezed together with hands.	[]
↓	
Squeezed crayon pieces are wrapped in foil and flattened with a warm iron.	[]
↓	
Flattened crayon pieces are placed in a beaker and heated until liquid.	[]
↓	
Liquid crayon is poured into a Petri dish to cool and solidify.	[]

Processes		
Weathering and erosion of igneous rock	Formation of metamorphic rock	Formation of sedimentary rock
[]	Magma or lava forming igneous rock	Metamorphic rock changing to magma

Item continues on the next page.

Grade Eight Practice Test Items

Part B

The rock cycle is different from the student's model, because in the rock cycle

- Ⓐ processes take a much longer time.
- Ⓑ pressure is involved in some processes.
- Ⓒ there are both liquid and solid materials.
- Ⓓ thermal energy is needed for some processes.

Item	Grade	PE	SEP	DCI	CCC	DOK
13	8	MS-LS3-1	2. Developing and Using Models	LS3.B Variation of Traits	6. Structure and Function	3

ILCS: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

DNA contains a code for synthesizing proteins. Three nucleotides in a row code for a particular amino acid. There are four nucleotides in DNA, which are abbreviated as A, T, C, G. The amino acids are joined to form a protein.

Genetic mutations can occur in the DNA of individuals. Some mutations are harmful, some have no effect, and some might be beneficial to the organism. The table shows the nucleotide sequence of DNA that codes for a protein in one individual and the nucleotide sequence of the same segment of DNA in an individual with a mutation.

Comparison of DNA Sequences of Two Individuals

Original Sequence	TTA	TAG	GTT	ATG	TAT	TT
Mutated Sequence	TTA	TAG	GAT	TAT	GTA	TTT

Which statement describes the **most likely** impact of the mutation in the mutated sequence?

- Ⓐ There will be no effect because the rest of the DNA is normal.
- Ⓑ The extra nucleotide will be deleted before the protein is formed.
- Ⓒ The protein formed will not be the same as that formed from the original DNA sequence.
- Ⓓ The mutated DNA will code for the same number of amino acids as the original sequence.

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
14	8	MS-ESS3-5	1. Asking Questions and Defining Problems	ESS3.D Global Climate Change	7.Stability and Change	3

ILCS: Ask a testable question that could be used to evaluate global impacts from a volcano that has erupted.

In June 1991, Mount Pinatubo in the Philippines erupted. The eruption released large amounts of gases, such as sulfur dioxide, water vapor, and carbon dioxide, into the atmosphere. Sulfur dioxide reacted with water to form aerosol particles, and an aerosol cloud formed that covered a large portion of Earth.

Students want to determine what effect the eruption had on global climate. Which question should the students investigate to **best** determine the effect?

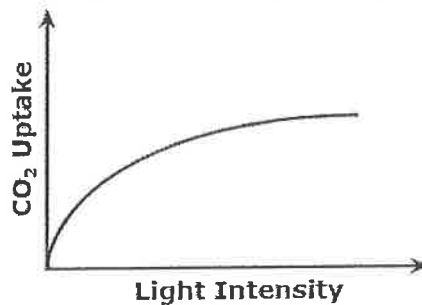
- Ⓐ What was the temperature of the lava that flowed onto Earth’s surface when Mount Pinatubo erupted?
- Ⓑ Was the amount of rain that fell on Mount Pinatubo in the days after the eruption greater or less than average?
- Ⓒ Do aerosol particles of this type cause the amount of solar energy that reaches Earth’s surface to increase or decrease?
- Ⓓ How did the temperature of the gases as they were ejected from Mount Pinatubo compare to the temperature of the gases ejected from other volcanoes?

Item	Grade	PE	SEP	DCI	CCC	DOK
15	8	MS-LS2-4	7. Engaging in Argument from Evidence	LS2.C Ecosystem Dynamics, Functioning, and Resilience	7. Stability and Change	4

ILCS: Link the evidence/data to a claim how the impact of La Niña caused a change in the rate of photosynthesis within a tropical forest ecosystem.

During a La Niña event, the temperature of the Pacific Ocean near Central America becomes cooler than normal. As a result, more clouds form, and this can block sunlight from reaching plants in Central American forests. A researcher studying the effects of La Niña measured the amount of carbon dioxide (CO₂) uptake by tropical plants under different light intensities. The data are shown in the graph.

Effect of Light Intensity on CO₂ Uptake



Predict how a La Niña event affects the rate of photosynthesis by plants in the tropical forests of Central America. Provide evidence from the graph to support your prediction. Enter your answer in the box provided.

B I U I_x [List of icons] English Ω

Item	Grade	PE	SEP	DCI	CCC	DOK
16	8	MS-LS1-4	7. Engaging in Argument from Evidence	LS1.B Growth and Development of Organisms	2. Cause and Effect	3

ILCS: Identify evidence that is irrelevant/invalid and would not support the argument that certain flower colors attract more pollinators.

A biologist wanted to study how certain plant structures, such as colored flowers, might affect how often the plants are pollinated during the day. For one hour on a sunny summer day, the biologist observed bee, butterfly, hummingbird, and beetle pollinators of a population of plants with equal numbers of purple, white, and pink flowers. Based on the data collected and shown in the table, the biologist made the claim that plants with purple flowers in this population attract more pollinators than do plants with flowers of other colors.

Flower Color	Pollinators				
	Bees	Butterflies	Hummingbirds	Beetles	Total Visits
Purple	12	0	5	0	17
White	1	1	0	1	3
Pink	0	1	0	1	2

Which evidence could be used to **challenge** the biologist's claim that purple flowers in the population of plants attract more pollinators than other flower colors do?

- Ⓐ The purple flowers did not have any butterfly or beetle pollinators.
- Ⓑ Bees pollinated the purple flowers 12 times and the white flowers only 1 time.
- Ⓒ Hummingbirds pollinated the purple flowers 5 times and did not pollinate the white or pink flowers.
- Ⓓ The purple flowers were pollinated 17 times, the white flowers were pollinated 3 times, and the pink flowers were pollinated 2 times.

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
17	8	MS-PS4-1	5. Using Mathematics and Computational Thinking	PS4.A Wave Properties	1. Patterns	2

ILCS: Use the model to identify how the energy of the wave changes based on a change in amplitude.

A scientist measures the amplitude and wavelength of waves in the ocean. The scientist also calculates the amount of energy contained in one square meter of water for each wave. The data and calculations for four different waves are shown in the table.

Amplitude (meters)	Wavelength (meters)	Energy (joules)
0.20	8.0	200
0.20	16.0	200
0.40	8.0	800
0.40	16.0	800

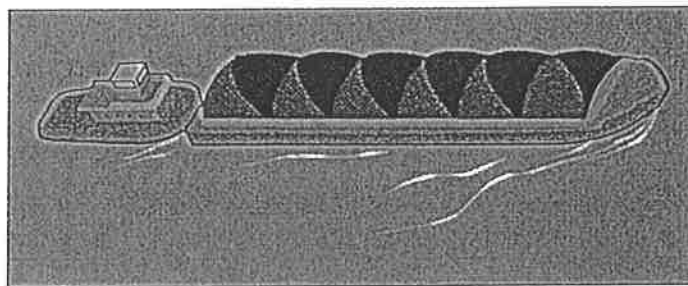
Which wave characteristics, if any, does the energy in the wave depend on?

- Ⓐ the amplitude only
- Ⓑ the wavelength only
- Ⓒ both the amplitude and the wavelength
- Ⓓ neither the amplitude nor the wavelength

Item	Grade	PE	SEP	DCI	CCC	DOK
18	8	MS-PS3-1	4. Analyzing and Interpreting Data	PS3.A Definitions of Energy	3. Scale, Proportion, and Quantity	2

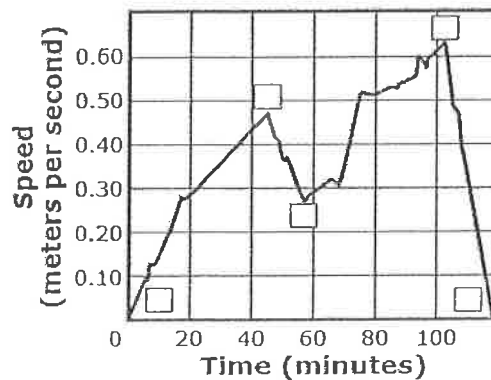
ILCS: State that increasing an object’s speed results in an increase of the object’s kinetic energy proportional to the square of its speed.

The picture shows a tugboat pushing a barge loaded with coal up a river to a power plant.



The tugboat’s computer generates a graph of the boat’s speed during each minute of its journey.

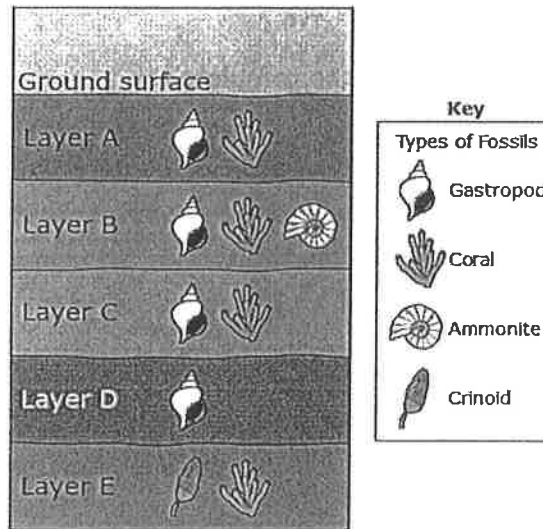
Select the box on the graph that shows the location where the tugboat’s kinetic energy is the greatest.



Item	Grade	PE	SEP	DCI	CCC	DOK
19	8	MS-ESS1-4	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	3. Scale, Proportion, and Quantity	2

ILCS: Use scientific concepts, principles, and theories to explain how the evidence supports a conclusion about Earth's history based on sedimentary rock layers.

The diagram shows a cross section of layers of sedimentary rocks. The types of fossils in each layer are shown.



Based on the information in the cross section, select the **three** statements that are **most likely** correct.

- Layer C is below Layer B, so Layer C is older.
- Layer A is at the top, so it is the youngest layer.
- The ammonite fossil is above the crinoid fossil, so the crinoid is older.
- There is no coral fossil in Layer D, so corals must have become extinct.
- The gastropod fossils are above the crinoid fossil, so gastropods evolved from crinoids.

Grade Eight Practice Test Items

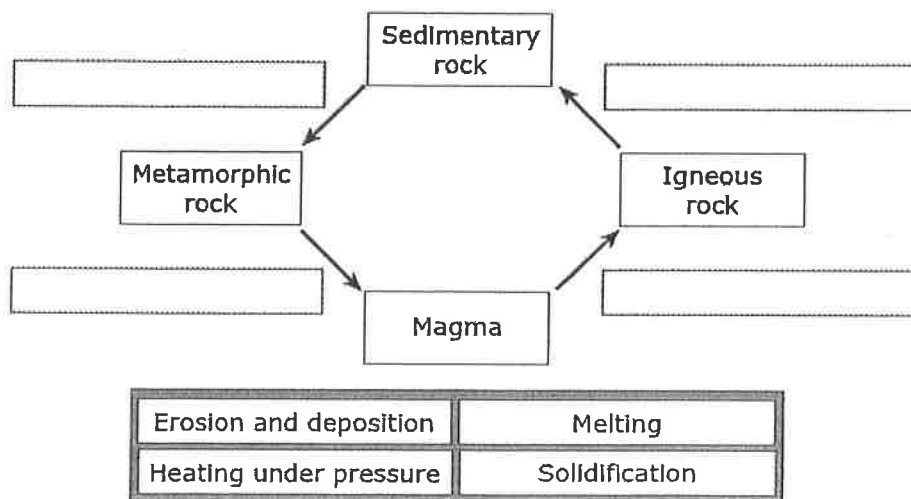
Item	Grade	PE	SEP	DCI	CCC	DOK
20	8	MS-ESS2-1	2. Developing and Using Models	ESS2.A Earth's Materials and Systems	7. Stability and Change	3

ILCS: Select the processes that represent mechanisms and behaviors within the rock cycle.

- This model of the rock cycle shows magma (the molten rock found under the surface of Earth) and the major types of rocks. The arrows represent some processes that rocks go through as they are changed from one type to another.

Part A

Drag the processes to the correct positions to complete the model. Each process is used only once.



Item continues on the next page.

Part B

Based on the model, which is a correct statement about the rock cycle?

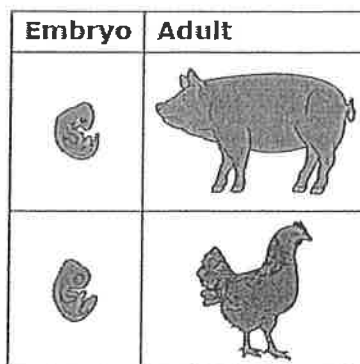
- Ⓐ Rocks and minerals are the same thing.
- Ⓑ All processes in the rock cycle occur at the same rate.
- Ⓒ Rocks are always found in the same locations as where they formed.
- Ⓓ Rocks are changed into different types as a result of Earth processes.

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
21	8	MS-LS4-3	4. Analyzing and Interpreting Data	LS4.A Evidence of Common Ancestry and Diversity	1. Patterns	2

ILCS: Analyze pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

The embryos of two vertebrate animals at the same stage of development are shown in the figure.



Which **best** explains why the embryos are similar in appearance, yet the adults look different?

- Ⓐ Pigs and chickens are in the same genus.
- Ⓑ All vertebrate embryos have the same DNA.
- Ⓒ As the embryos grow, they undergo mutations.
- Ⓓ Some developmental processes are shared by vertebrates.

Item	Grade	PE	SEP	DCI	CCC	DOK
22	8	MS-PS1-3	8. Obtaining, Evaluating and Communicating Information	PS1.B Chemical Reactions	6. Structure and Function	2

ILCS: Evaluate the information given on the energy used to make plastic bottles and the impact manufacturing has on natural resources.

Environmental Principle III: Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.

Plastic A is commonly used to make disposable water bottles. Plastic B can also be used to make these bottles. Information about Plastic A and Plastic B is given in the table.

Plastic	Common Source of Raw Material	Energy Used to Make One Kilogram of Plastic
A	Oil	16.5 megajoules
B	Corn	12.1 megajoules

Based on the information in the table, explain **two** ways how using Plastic B instead of Plastic A to make disposable water bottles can help conserve natural resources. Enter your answer in the box provided.

Rich text editor toolbar with icons for Bold, Italic, Underline, Text Color, Background Color, Bulleted List, Numbered List, Indent, Outdent, Undo, Redo, Language (English), and Spell Check.

Large empty rectangular box for student response.

Item	Grade	PE	SEP	DCI	CCC	DOK
23	8	MS-LS4-4	6. Constructing Explanations and Designing Solutions	LS4.B Natural Selection	2. Cause and Effect	3

ILCS: Explain how the increasing frequency for plant height at a certain elevation of one plant species is advantageous.

A certain species of flowering plant has populations that grow near sea level and populations that grow at high elevations. Scientists collected seeds from the plants growing at different elevations and planted the seeds at a high elevation and near sea level. The heights of the plants grown from the seeds are shown in this table.

Location of Collected Seeds	Location of Planted Seeds	Resulting Height of Plant
High elevation	High elevation	Short
High elevation	Near sea level	Short
Near sea level	High elevation	Tall
Near sea level	Near sea level	Tall

Based on the data, which **two** statements about the height of this species of plant are **most likely** correct?

- The height of the plants is most directly controlled by genetic factors.
- The height of the plants is most directly controlled by environmental conditions.
- Near sea level, the taller plants are better able to survive and reproduce than the shorter plants are.
- At higher elevations, the taller plants are better able to survive and reproduce than the shorter plants are.

Grade Eight Practice Test Items

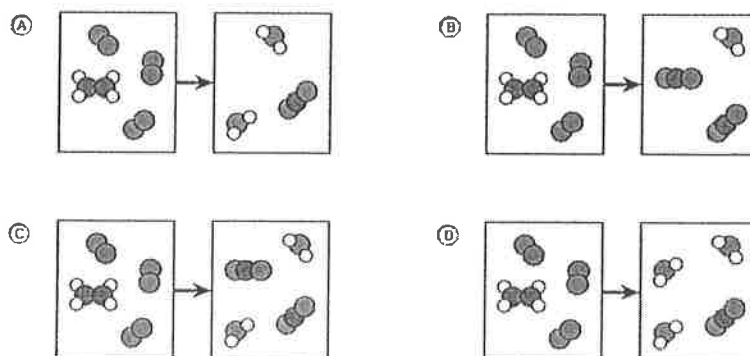
Item	Grade	PE	SEP	DCI	CCC	DOK
24	8	MS-PS1-5	2. Developing and Using Models	PS1.B Chemical Reactions	5. Energy and Matter	2

ILCS: Select the appropriate components to complete the model to illustrate the conservation of atoms/mass.

One ethylene (C_2H_4) and three oxygen (O_2) molecules combine to produce carbon dioxide (CO_2) and water (H_2O) molecules. The molecules are represented by models as shown.



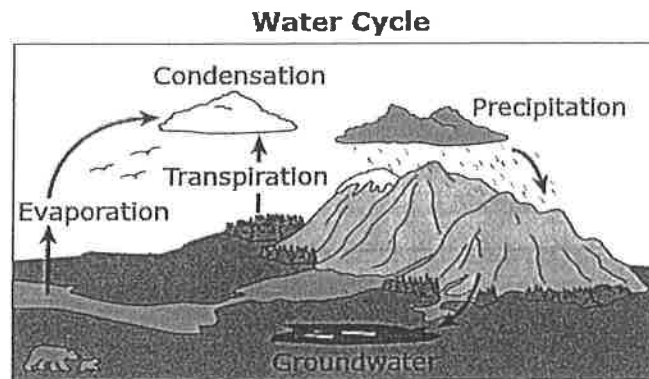
Which model of the chemical reaction correctly represents the correct number of CO_2 and H_2O molecules produced if mass is conserved?



Item	Grade	PE	SEP	DCI	CCC	DOK
25	8	MS-ESS2-4	2. Developing and Using Models	ESS2.C The Roles of Water in Earth's Surface Processes	5. Energy and Matter	2

ILCS: Identify the processes operating within the water cycle and the role living organisms have on the water cycle.

A student creates the model shown of the water cycle for a class presentation. The student's main goal is to help the class understand how living organisms assist in the movement of water through the system.



Based on the model, what should the student say about the role of living organisms in the water cycle?

- Ⓐ Plants help move water from the soil to the atmosphere.
- Ⓑ Animals generate heat that helps evaporate water from the land.
- Ⓒ Plant movements create wind that helps draw water into the atmosphere.
- Ⓓ Animals create pathways in the mountains that allow water to flow downhill.

Grade Eight Practice Test Items

Item	Grade	PE	SEP	DCI	CCC	DOK
26	8	MS-LS2-5	7. Engaging in Argument from Evidence	LS2.C Ecosystem Dynamics, Functioning, and Resilience	7. Stability and Change	3

ILCS: Identify possible unanticipated effects of a design solution that includes native and nonnative species within a lake ecosystem.

A biologist studying a lake is concerned that an invasive aquatic plant species is outcompeting several native aquatic plant species. The native plants are the primary food source for many animals in the lake. The biologist proposes addressing the problem by introducing a nonnative, herbivorous species of fish into the lake to eat the invasive plants.

Select the phrases from the menus that **best** complete the sentences.

Some biologists argue that introducing the fish could be a bigger problem than the invasive plant species because the fish might

. One way to help prevent this problem is to to the lake.

Chapter 7 Test, Form 2A

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

1. Simplify $(x^3)^8$.
 A x^{24} B x^{11} C $8x^{24}$ D $8x^{11}$ 1. _____

2. Simplify $(-2hk)^4(4h^3k^5)^2$.
 F $2h^{24}k^{40}$ G $-64h^9k^{11}$ H $-256h^{10}k^{14}$ J $256h^{10}k^{14}$ 2. _____

3. Simplify $\frac{36b^4c^2}{9b^{-1}c^5}$. Assume the denominator is not equal to zero.
 A $\frac{27b^4}{c^3}$ B $\frac{4b^4}{c^3}$ C $\frac{27b^3}{c^3}$ D $\frac{4b^5}{c^3}$ 3. _____

4. Simplify $\frac{(3y^4n^6)^2}{(y^2n^{-3})^4}$. Assume the denominator is not equal to zero.
 F $\frac{9}{y^{16}}$ G $\frac{9}{n^{24}}$ H $9y^{16}$ J $9n^{24}$ 4. _____

5. Which monomial represents the number of square units in the area of a circle with radius $4x^3$ units?
 A $16\pi x^6$ B $8\pi x^6$ C $16\pi x^9$ D $8\pi x^5$ 5. _____

6. Express 46,100,000 in scientific notation.
 F 4.61×10^7 G 4.61×10^6 H 4.61×10^5 J 4.61×10^8 6. _____

7. Evaluate $\frac{7 \times 10^4}{1.4 \times 10^{-5}}$.
 A 5×10^9 B 5×10^{-20} C 5×10^{-1} D 5×10^1 7. _____

8. **ATTENDANCE** The total attendance for a professional baseball team this season was 3.24×10^6 and two years ago was 2.43×10^6 . About how many times as large was this season's attendance as attendance two years ago?
 F 0.8 G 0.9 H 1.1 J 1.3 8. _____

9. Write $10y^{\frac{1}{2}}$ in radical form.
 A $\sqrt{10y}$ B $10\sqrt{y}$ C $10\sqrt{10y}$ D $y\sqrt{10}$ 9. _____

10. Evaluate $81^{\frac{3}{4}}$.
 F 3 G 9 H 27 J 243 10. _____

11. Solve $5^{x-2} = 125$.
 A 2 B 3 C 4 D 5 11. _____

Chapter 7 Test, Form 2A *(continued)*

12. Which is the equation for the n th term of the geometric sequence $-4, 8, -16, \dots$?

F $a_n = -4 \cdot 2^{n-1}$

H $a_n = -4 \cdot (-2)^{n-1}$

G $a_n = -2 \cdot (-4)^{n-1}$

J $a_n = -2 \cdot 4^n$

12. _____

13. Which equation represents exponential growth?

A $y = 5(0.84)^x$

B $y = 5x$

C $y = 0.3x^3$

D $y = 5(1.06)^x$

13. _____

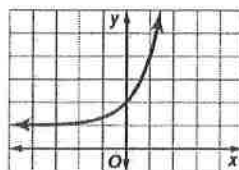
14. Which equation corresponds to the graph shown?

F $y = (3)^x + 1$

H $y = 2(3^x)$

G $y = 2(3^x + 1)$

J $y = (2 \cdot 3)^x + 1$



14. _____

15. A weightlifter can increase the weight $W(x)$ that she can lift according to $W(x) = 315(1.05)^x$, where x represents the number of training cycles completed. How much will she lift after 4 training cycles?

A 365 lb

B 383 lb

C 378 lb

D 402 lb

15. _____

16. **BIOLOGY** A certain fast-growing bacteria increases 6% per minute. If there are 100 bacteria now, about how many will there be 12 minutes later?

F 172

G 201

H 48

J 190

16. _____

17. **POPULATION** A city's population is about 954,000 and is decreasing at an annual rate of 0.1%. Predict the population in 50 years.

A 577,176

B 906,300

C 1,002,888

D 907,450

17. _____

18. Find the third term of the sequence in which $a_1 = 7$ and $a_n = -2a_{n-1} + 11$, if $n \geq 2$.

F -23

G -3

H 5

J 17

18. _____

19. Find an explicit formula for $a_1 = -4$, $a_n = a_{n-1} + 9$, $n \geq 2$.

A $a_n = 9n - 13$

C $a_n = 9n - 4$

B $a_n = n + 9$

D $a_n = -4n + 9$

19. _____

20. Find a recursive formula for the arithmetic sequence 24, 32, 40, 48, ...

F $a_1 = 24, a_n = 8a_{n-1}, n \geq 2$

H $a_1 = 24, a_n = \frac{4}{3}a_{n-1}, n \geq 2$

G $a_1 = 24, a_n = \frac{1}{2}a_{n-1} + 20, n \geq 2$

J $a_1 = 24, a_n = a_{n-1} + 8, n \geq 2$

20. _____

Bonus Simplify $\frac{7^{x-3}}{7^{3x-1}}$

B. _____