STAAR Review – Most Commonly Missed Concepts

NAME: _____

SCIENCE TEACHER: _____

PERIOD: _____

6.5C – Difference between Elements & Compounds

1

$$CaCO_3 \xrightarrow{heat} CaO + CO_2$$

In the chemical reaction shown above, the products are best classified as —

A two elements

B one element and one compound

C two compounds

D two compounds and one element

2 (6.5C) Which of these data tables correctly classifies the given substances?

A.

Substance	Classification
NaCl	compound
Si	element
H_2O	compound

B.

Substance	Classification
NaCl	element
Si	element
H_2O	element

C.

Substance	Classification
NaCl	element
Si	element
H_2O	compound

D.

Substance	Classification
NaCl	compound
Si	compound
H_2O	compound

3 (6.5C) The chemical equation shown below represents a reaction that produces fuel for certain cars.

$$CO + H_2O \rightarrow CO_2 + H_2$$

Which substance represented in this equation is classified as an element?

A. CO

B. H_2O

C. CO_2

D. H_2

6.8C - Calculating average speed

4 (6.8C) A toy car rolls 8 meters in 2 seconds. What is the average speed of the toy car?

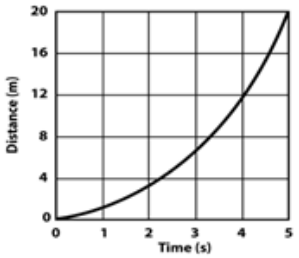
A. 16 m/s

B. 10 m/s

C. 6 m/s

D. 4 m/s

5 (6.8C) Students begin to measure the speed of a ball rolling down a ramp. The graph below shows their results.



What is the average speed of the ball?

A. 4 m/s
B. 5 m/s
C. 14 m/s
D. 20 m/s

$$\text{Average speed} = \frac{\text{total distance}}{\text{total time}} \qquad s = \frac{d}{t}$$

6 Some students were investigating the speed of a toy car they built. They performed two trials and recorded their data in the table below.

Toy-Car Trials

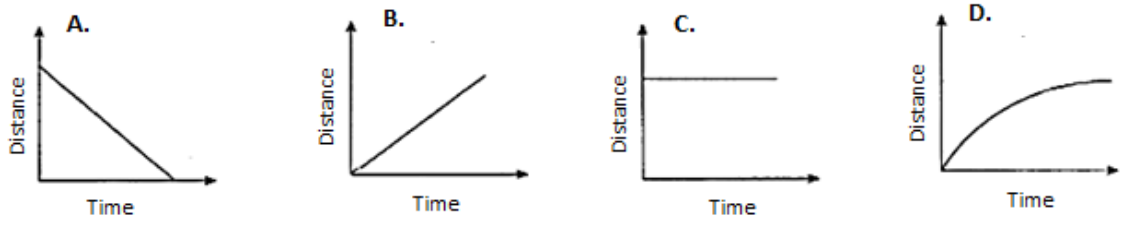
Trial 1		Trial 2	
Time (s)	Distance (m)	Time (s)	Distance (m)
4.0	5.6	5.0	7.0

What was the average speed of the toy car during the two trials to the nearest tenth of a m/s?

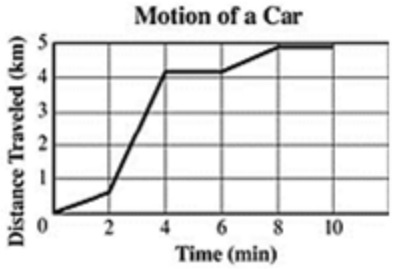
Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

6.8D – Graphing Changes in Motion

7 (6.8D) Which graph shows an object moving forward at a constant speed?



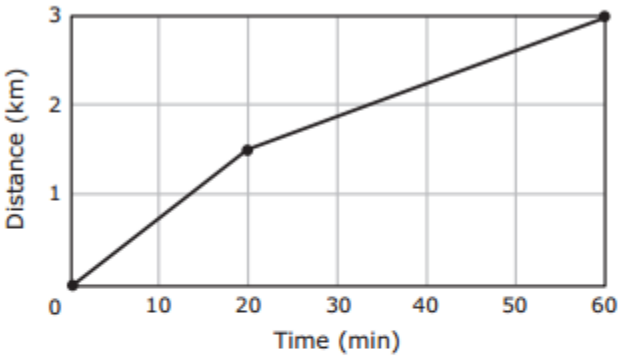
8 (6.8D) The graph below represents the motion of a car.



During what time was the car moving the fastest?

A. From 0 to 2 minutes
B. From 2 to 4 minutes
C. From 4 to 6 minutes
D. From 6 to 8 minutes

9 The graph below shows distance over time.



Which of these situations could be represented by this graph?

A A student walks 1.5 km to a friend's house in 40 minutes. The two students then walk another 1.5 km to school in 20 minutes.

B A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 40 minutes.

C A student walks 1.5 km to a friend's house in 30 minutes. The two students then walk another 1.5 km to school in 30 minutes.

D A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 60 minutes.

7.6A – Identifying Organic Compounds

10 Based on its chemical formula, which of the following substances is an organic compound?

A Urea, CH_4N_2O

B Ammonium sulfide, $(NH_4)_2S$

C Silane, SiH_4

D Sodium chloride, NaCl

11 (7.6A) Scientists are always trying to create new medicines. Which of the following would be the best combination of materials to make an organic molecule?

A. carbon, hydrogen, oxygen, phosphorus, nitrogen, sulfur
B. chlorine, hydrogen, oxygen, potassium, neon, sulfur
C. chlorine, helium, oxygen, phosphorus, neon, sodium
D. carbon, helium, oxygen, phosphorus, nitrogen, sodium

12 (7.6A) The table below shows the elemental composition of three different types of organisms.

Elemental Composition of Selected Organisms (percent by weight)			
Element	**Human**	**Alfalfa**	***E.coli* Bacterium**
O	65.0	77.9	73.7
C	18.5	11.3	12.1
H	9.5	8.7	9.9
X	3.3	0.8	3.0
P	1.0	0.7	0.6
S	0.3	0.1	0.3
Total	97.6%	99.5%	99.6%

The **X** in the table represents which of the following elements?

A. Calcium (Ca)
B. Iron (Fe)
C. Nitrogen (N)
D. Sodium (Na)

7.12B – Identify Organ Systems and their function

13 When people run long distances, their muscles require increased amounts of oxygen. Which system is responsible for carrying this oxygen to the muscles?

A Nervous
B Respiratory
C Digestive
D Circulatory

14 (7.12B) Based on the functions in the table below, which system is the skeletal system?

System W	System X	System Y	System Z
Moves nutrients to cells	Absorbs nutrients	Protects vital organs and tissues	Produces chemicals that regulate bone growth
Distributes oxygen to all parts of the body	Mechanically and chemically breaks down food	Provides framework for mobility	Stabilizes blood sugar levels
Aids in the removal of wastes from cells	Converts food to energy	Produces new red blood cells	Aids in the regulation of mood

A. System W
B. System X
C. System Y
D. System Z

15 (7.12B) Devon has cystic fibrosis or CF. It is an inherited condition that causes his body to produce excess mucus and lower than normal levels of digestive enzymes. A person with CF often experiences the following symptoms:

- frequent lung infections
- poor energy level
- low appetite

Although all of Devon's body systems are affected by cystic fibrosis, it is mainly a disorder of which two body systems?

A. Circulatory and Digestive
B. Digestive and Skeletal
C. Digestive and Respiratory
D. Circulatory and Respiratory

7.12F – Cell Theory

16 In 1838 botanist Matthias Schleiden determined that all plants are composed of cells. In 1839 anatomist Theodor Schwann proposed that all animals are composed of cells. In 1855 biologist Rudolph Virchow added to Schleiden's and Schwann's observations and proposed that all living things are composed of cells. Which statement is also part of Virchow's cell theory?

F All cells have a cell wall.
G All cells arise from pre-existing cells.
H All cells are capable of photosynthesis.
J All cells can develop into any other type of cell.

17 (7.12F) Which of the following characteristics are shared by all organisms?

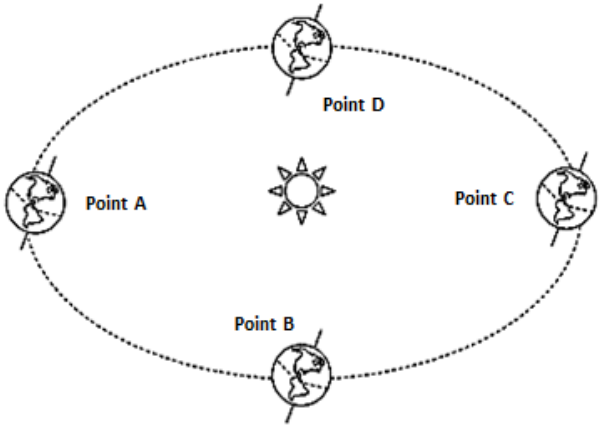
A. All organisms contain tissues.
B. All organisms have organ systems.
C. All organisms have nuclei and chloroplasts
D. All organisms are composed of at least one cell.

18 (7.12F) Which microscopic structure carries out the major life functions in all organisms?

A. Chloroplasts
B. Cells
C. Wings
D. Antennae

8.7A – Results of Earth's Rotation & Revolution

19 (8.7A) At which point on the diagram below is the number of hours of daylight shortest in North America?



NOTE: DIAGRAM IS NOT TO SCALE

A. Point A
B. Point B
C. Point C
D. Point D

20 A student draws the model shown below.

Which of these best compares the conditions at Location X and Location Y?

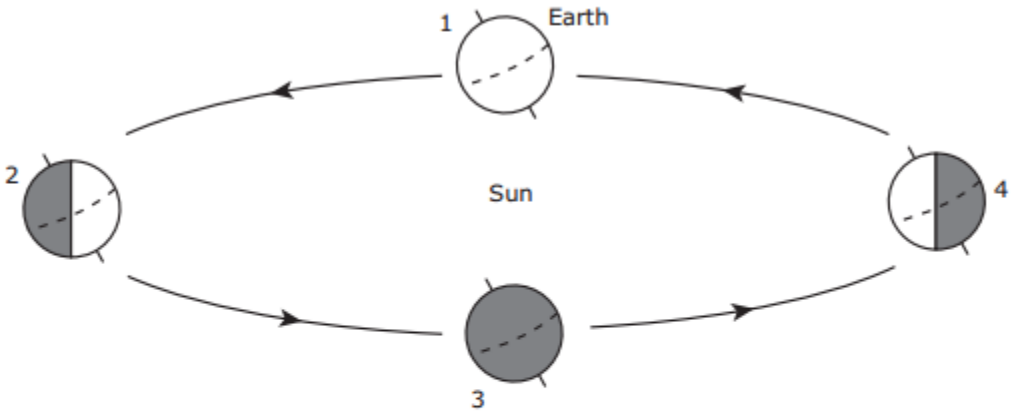
F It is day at Location X and night at Location Y.

G It is winter at Location X and summer at Location Y.

H There are more hours of daylight at Location X than at Location Y.

J The moon is brighter when viewed from Location X than when viewed from Location Y.

21 The diagram below shows four positions in Earth's orbit around the sun.



The Northern Hemisphere experiences the beginning of spring when Earth is in —

F Position 1

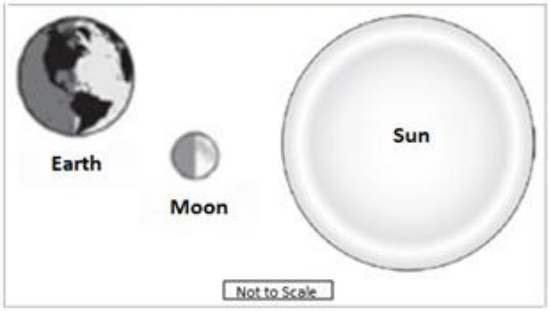
G Position 2

H Position 3

J Position 4

8.7B – Predict Sequence of Lunar Cycle

22 (8.7B) According to the diagram below, which lunar phase would an observer on Earth see?



A. New Moon

B. Waning Crescent

C. Waxing Gibbous

D. First Quarter

23 Some students used records from the U.S. Naval Observatory to make the table below of the percent of the moon that was visible on each night in January 2011.

Percent of Moon Visible in January 2011

Date	Moon Visible (%)	Date	Moon Visible (%)	Date	Moon Visible (%)
1	11	11	38	21	97
2	5	12	48	22	92
3	1	13	57	23	85
4	0	14	67	24	76
5	1	15	76	25	65
6	3	16	84	26	54
7	8	17	91	27	43
8	14	18	96	28	32
9	21	19	99	29	23
10	29	20	100	30	15
				31	8

Source: U.S. Naval Observatory

Based on these data, what part of the lunar cycle occurred between January 5 and January 7?

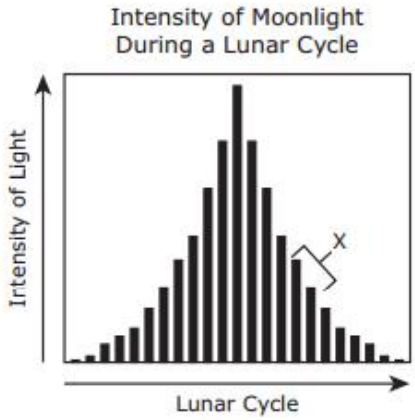
F Waxing crescent moon

G Waning crescent moon

H Full moon

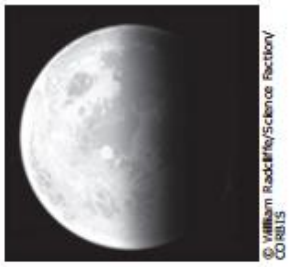
J New moon

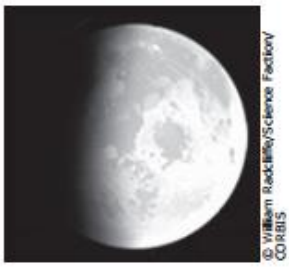
24 The moon reflects different amounts of sunlight onto Earth at different times. This reflected sunlight is commonly called moonlight. The graph below shows the intensity of moonlight at different times in a lunar cycle.



Which moon phase most likely occurs at the time in the cycle represented by an X on the graph?

A 

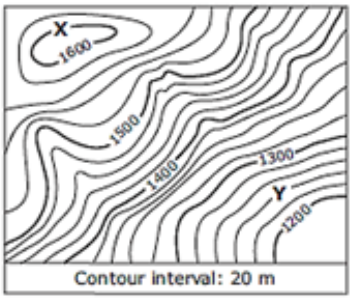
C 

B 

D 

8.9C – Topographic Maps & Weathering on Satellite Views

25 (8.9C) A section of a topographic map is shown below.



What is the difference in elevation in meters between Point X and Point Y on the map?
Record you answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

26 The satellite image below shows a ship channel between South Padre Island and Boca Chica beach in South Texas.

Sand is sometimes removed from the ship channel through a process called dredging to make it easier for ships to travel through. Recently sand from the bottom of the channel was moved to area beaches. Without this transfer of sand, what would most likely occur in this area in the future?

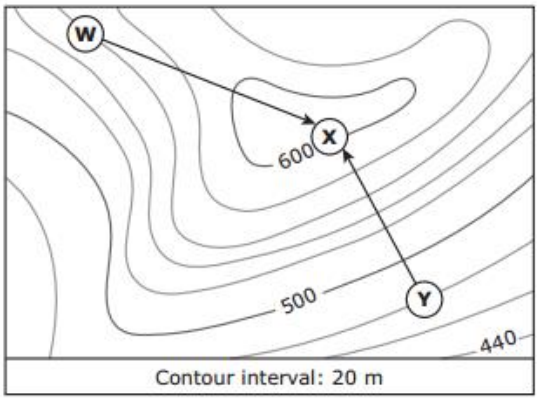
A The ship channel would become deeper, and the island would move west toward the mainland.

B The ship channel would become shallower, and the beach would become narrower.

C The ship channel would become narrower, and the island would become completely covered with water.

D The ship channel would become wider, and the island would sink into the Gulf of Mexico.

27 The points labeled W and Y on the topographic map below show the campsites of two families. Each family hiked to the elevation on the map marked X. The arrows show the paths taken by both families.

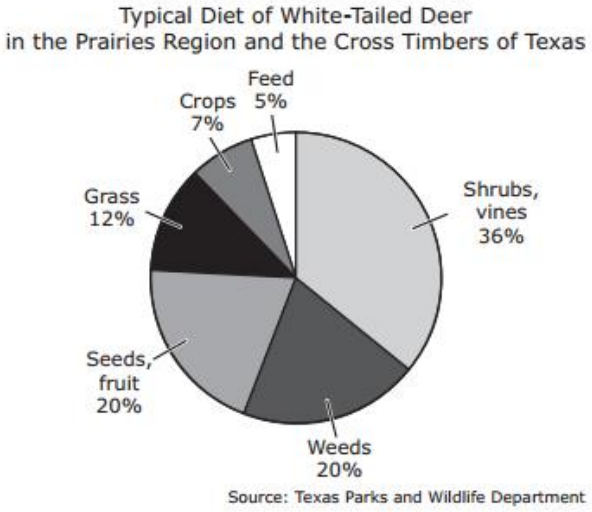


What was the change in elevation, to the nearest ten meters, for the family that took the steepest path to Point X?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

8.2E – Analyze DATA

28 The Prairies Region and the Cross Timbers are located in north-central Texas. The graph below shows information about eating habits of white-tailed deer in these regions.



A Cross Timbers rancher is concerned about competition between the ranch animals and the deer. Based on the graph, which ranch animals compete for the most food with white-tailed deer?

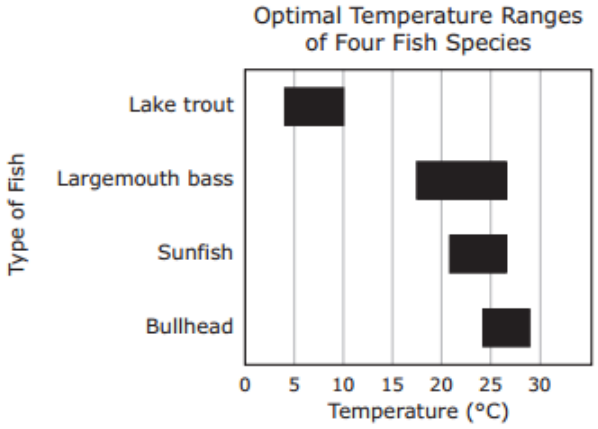
A Cattle that eat grass and feed

B Goats that eat weeds and shrubs

C Turkeys that eat seeds and fruit

D Hogs that eat fruit, seeds, and feed

29 Fish in a lake have to compete for space. Different fish have different optimal temperature ranges. The graph below shows the temperature ranges of four fish species.



At which temperature range will there be the most competition for space among these fish species?

F 5°C to 10°C

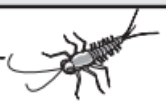
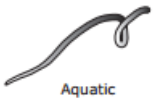
G 10°C to 15°C

H 15°C to 20°C

J 25°C to 30°C

30 The types of small organisms that live on the bottom of streams can be good indicators of water pollution. The table below groups some organisms by their tolerance of pollution.

Stream Organisms

Organisms	Tolerance of Water Pollution
 Riffle beetles  Stone flies  Mayflies	Cannot tolerate pollution
 Dragonflies  Sow bugs  Crayfish  Midges  Pouch snails  Aquatic worms	Can tolerate pollution

A certain stream that was historically clear and clean has become increasingly polluted with fertilizer waste over the years. Which of these describes a likely result of this pollution?

F Mayflies that were previously abundant are no longer present in the stream.

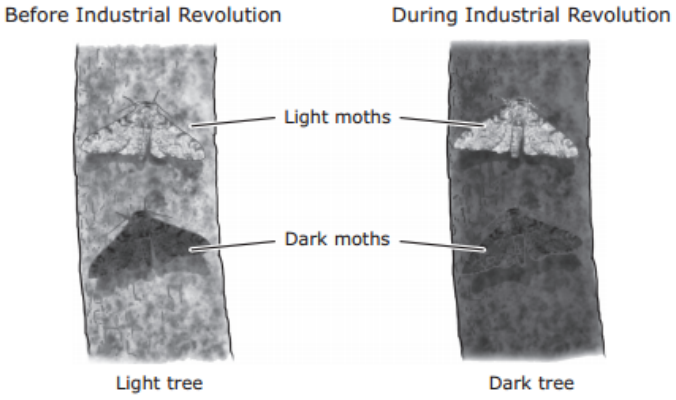
G Stone flies and midges thrive and compete for the same food source.

H Large numbers of crayfish have suddenly died.

J Riffle beetles have become more abundant in the stream.

8.3B – Use Models

31 Before the Industrial Revolution in England, the peppered moth was commonly found on tree trunks that had light-colored lichen on the bark. Most of the peppered moths were a light gray-brown color similar to that of the lichen. A few of the moths had a mutation that made them a dark gray-brown color.



During the Industrial Revolution, coal-burning factories produced black soot that covered the trees and killed the lichen in and near cities. In these areas the number of dark peppered moths increased, while the number of light peppered moths decreased. What contributed to this change?

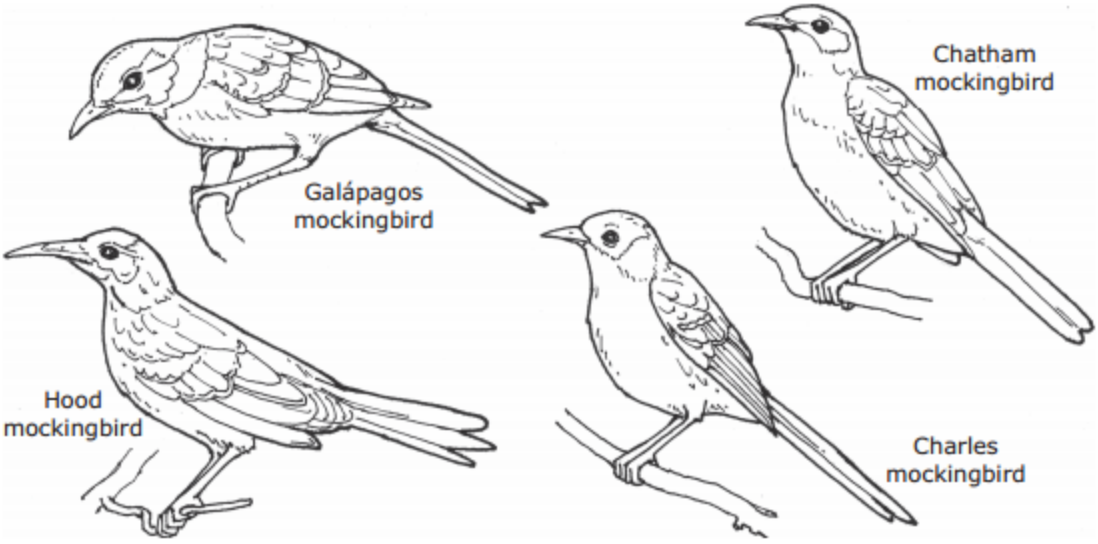
A The soot-covered trees camouflaged the dark moths.

B The dark moths preyed on the light moths.

C Bird populations increased in the areas near the factories.

D The dark moths laid fewer eggs than the light moths.

32 When Charles Darwin visited the Galápagos Islands in the 1800s, he observed many types of organisms that were similar but lived on different islands. The four species of mockingbirds found on the Galápagos Islands are shown below. Each species lives on a different island.



These species are very similar, but the Hood mockingbird has a longer beak than the other three species. Which of the following best explains this difference?

A The Hood mockingbird needs a longer beak for defense against predators.

B The Hood mockingbird originated from a different type of bird than the other species.

C The Hood mockingbird's longer beak is an adaptation to the food available in the bird's habitat.

D The Hood mockingbird's beak stretched to reach its food, and the longer beak was passed down to its offspring.

33 The diagram below shows a sled moving along a smooth, frictionless track.

In which sections of the track will the sled experience an unbalanced force?

A Sections 1 and 3

B Sections 2 and 3

C Sections 2 and 4

D Sections 3 and 4

8.6A – Calculating Unbalanced Forces

34 When a space shuttle was launched, the astronauts onboard experienced an acceleration of 29.0 m/s^2. If one of the astronauts had a mass of 60.0 kg, what net force in newtons did the astronaut experience?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

35 A student uses a magnet to move a 0.025 kg metal ball. The magnet exerts a force of 5 N, which causes the ball to begin moving. What is the acceleration of the ball when it begins to move?

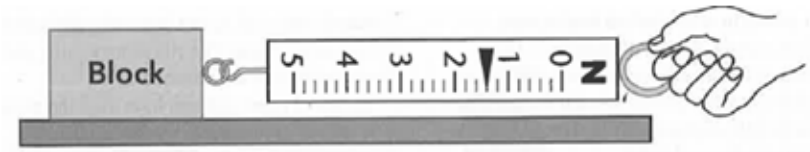
A 200 m/s^2

B 0.125 m/s^2

C 5 m/s^2

D 5.025 m/s^2

36 (8.6C) A spring scale is used to pull a block across the surface of an ice rink.



If the block has a mass of 7.0 kg, what is the acceleration of the block in meters per second squared?

Record your answer and fill in the bubbles on your answer document.

STAAR TEST OUTLINE & VOCABULARY

Category	# of Questions	Will be TESTED	Could Be tested
# of Questions	54 (4 Grid)	32-35	19-23
Category 1 (Chemistry) Matter & Energy	14	8.5A – Atomic Structure (Triple Bubble) 8.5B – Valence Electrons (Reactivity) 8.5C – Periodic Table (groups/periods & Big Box) 8.5D – Chemical Formulas (subscripts/elements) 8.5E – Chemical Reactions (PECSB)	8.5F – Chemical Equation 7.5C – Food webs/chains 7.6A – Organic Compound (C) 7.6B – Phys./Chem. In Digestion 6.5C – Element or Compound 6.6A – Phys. Prop. Metals/Non 6.6B – Calculate Density
Category 2 (Physics) Force, Motion, & Energy	12	8.6A – Calculating Unbalanced Forces 8.6C – Newton's Laws of Motion (Law Triangle)	8.6B – Speed/Velocity/Accel. 7.7A – Work w/force & ramp 6.8A – Potential/Kinetic Energy 6.8C – Calculate Average Speed 6.8D – Graphing Motion 6.9C – Energy transformations
Category 3 (Astronomy) Earth & Space	14	8.7A – Earth's Revolution/Rotation 8.7B – Predict Lunar Cycle (SNEF) 8.8A – Universe (Stars & Galaxy) 8.9B – Plate Tectonics & Crustal Features 8.9C – Topographic Maps/Satellite Weathering	8.7C - Tides 8.8B – Sun size & location 8.8C – EM Waves 8.8D – Lights Years 8.8E – Universe Origin Theory 8.9A – Plate Tectonic Theory 8.10A – Convection/Winds 8.10B – Weather Maps 8.10C - Hurricanes 7.8C – Groundwater/watershed 6.11B – Gravity & solar system
Category 4 (Ecology) Organism & Environment	14	8.11A – Relationships in ecosystem 8.11B – Competition in ecosystems 8.11C – Effect of Environ. changes on organisms	8.11D – Dependence on Ocean 7.10B – Biodiversity & environ. 7.10C – Ecological Succession 7.11A – Dichotomous Key 7.11C – Natural Selection/Traits 7.12B – Organ Systems 7.12D – Plant/Animal Cell 7.12F – Cell Theory 7.14B – Offspring/Reproduction 7.14C – Inherited Traits 6.12D – Classifying Organisms
Process Standards Investigation & Reasoning	≥40% of Test	8.2E – Analyzing Data & Charts/Graphs 8.3B – Using Models or Pictures	
		60%	40%

Category	OBJECTIVES Vocab. (Classroom)				STAAR Vocab. (Prior tests)		
Category 1 (Chemistry) Matter & Energy	Atom	Mass	Proton	Neutron	Particle	Cloud	Charge
	Nucleus	Electron	Structure	Model	Positive Charge	Negative Charge	Neutral Charge
	Electron Cloud	Electrical Charge	Chemical Property	Valence Electron	React	Reactive	Atom
	Reactivity	Group	Period	Property	Element	Nucleus	Property
	Periodic Table	Chemical Formula	Chemical Reactions	Subscript	Mass Number	Chemical Reactivity	Atomic Mass
					Molecule	Mixture	Solid
					Liquid	Dissolve	
Category 2 (Physics) Force, Motion, & Energy	Law of Inertia	Law of Force acceleration	Law of action reaction		Acceleration	Mass	Newton
	Speed	Direction	Motion		Frictionless	Friction	Speed
	Force	Newton	Tectonic		Unbalanced Force	Applied Force	Ramp
	Inertia	Acceleration	Unbalanced		Net Force	Tension	Velocity
					Constant Speed	Exert	Increase
Category 3 (Astronomy) Earth & Space	Rotate	Axis	Day		Orbit	Tilt	Equator
	Night	Revolve	Seasons		Northern Hemisphere	Daylight Hours	New Moon
	Lunar Cycle	Universe	Star		Waning Gibbous	Waxing Crescent	Waning Crescent
	Satellite View	Erosional Features	Hertzsprung-Russell Diagram		First Quarter Moon	Third Quarter Moon	Waxing Gibbous
	Plate Tectonics	Crustal Features	Topographic Map		Full moon	Phase	Revolve
	Nebula	Galaxy	Weathering		Nuclear Reaction	Milky Way Galaxy	Celestial Body
					Elevation	Erode	Crater
					Continental Crust	Oceanic Crust	Tectonic Plates
					Subduction Zone	Mountain Range	Volcanic Island
					Converging Plates	Transform Fault Boundary	Folded Mountains
					Divergent Boundary	Subduction Boundary	Convergent Boundary
					Mid-Ocean Ridge	Collide	Geological Form
Category 4 (Ecology) Organism & Environment	Producer	Consumer	Predator		Carnivore	Herbivore	Photosynthetic
	Prey	Parasite	Host		Relationship	Nutrients	Aquatic
	Food Webs	Marine Ecosystem	Freshwater Ecosystem		Organism	Competition	Species
	Terrestrial Ecosystem	Soil Composition	Short-Term Enviro. Effect		Resources	Food Web	Environment
	Organisms	Populations	Ecosystem		Adapt	Space	Scarce
	Compete	Biotic factors	Abiotic factor		Camouflage	Abundant	Adaptation
	Long-Term Eviro. Effect	Subsequent Populations	Traits		Population	Mutation	Tolerance