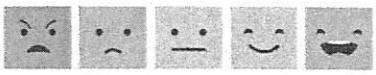
FLASH BACK

Energy Matter

Day 1

CATEGORY 1

7.5B SS diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids



7.6A SS distinguish between physical and chemical changes in matter

6.6A SS compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability

6.6B SS calculate density to identify an unknown substance

What Category 1 Flashbacks on STAAR Look Like

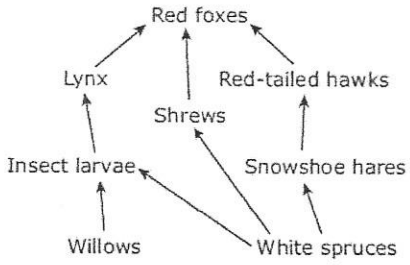
A student researching a northern forest ecosystem learns the following information about feeding relationships in the ecosystem.

Northern Forest Ecosystem

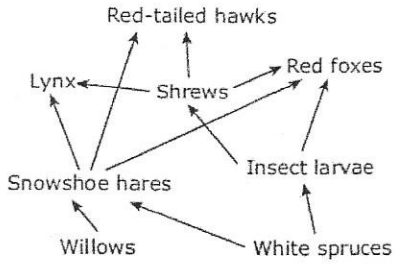
- Insect larvae feed on white spruces.
- Shrews and snowshoe hares are prey for lynx, red-tailed hawks, and red foxes.
- Snowshoe hares eat both willows and white spruces.
- Shrews eat insect larvae.
- Red foxes sometimes eat insect larvae.

Which food web best represents the flow of energy in these feeding relationships?

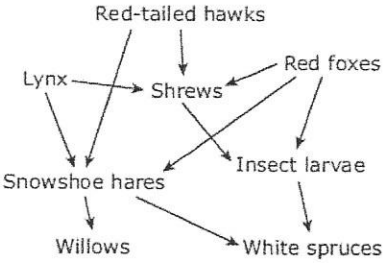
A



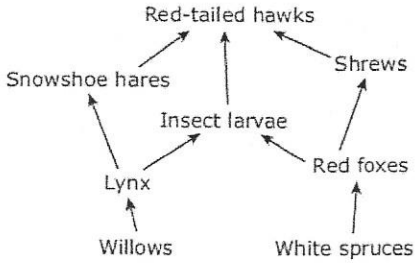
C



B



D



Four students were given a list of compounds and asked to identify which ones are organic.

Formula	Student K	Student L	Student M	Student N
CaO	Organic			Organic
$C_2H_4(OH)_2$	Organic	Organic	Organic	
$Ca(OH)_2$	Organic		Organic	Organic
CH_4		Organic	Organic	
NaCl				Organic
C_3H_8		Organic		

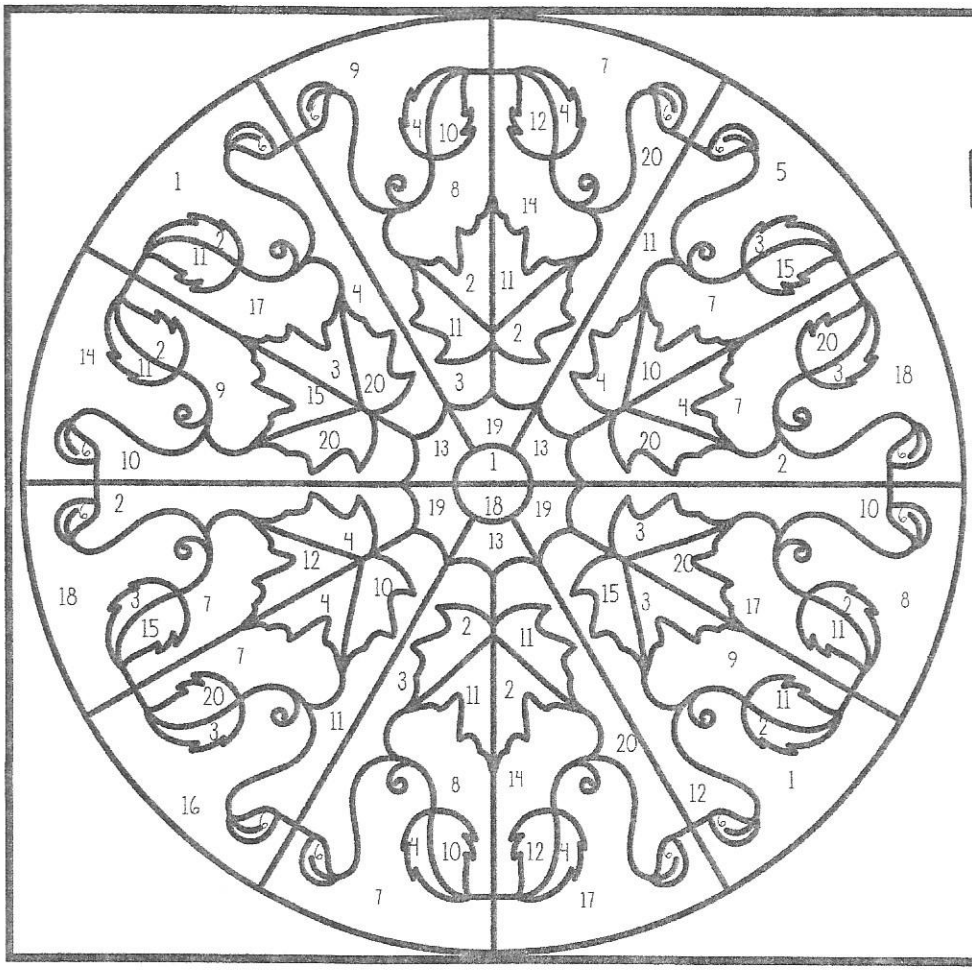
Which student correctly identified the organic compounds in the list?

F Student K

G Student L

H Student M

J Student N



METALS & NON-METALS

Choose the correct answer for each question on the following page. Use the color in the answer to complete the picture.

Choose the correct answer for each question. Use the color in the answer to complete the picture.

1	Non - metals are good conductors of heat.	True Pink	False Light Green
2	... have high melting and boiling points.	Metals Orange	Non – metals Dark Blue
3	How many elements are non-metals?	More than 100 Purple	About 20 Yellow
4	Graphite is a non-metal that conducts electricity.	True Red	False Dark Green
5	Metals can be hammered into shape. We say that they are ...	Dense Yellow	Malleable Dark Green
6	Which of these is a metal?	Calcium Dark Blue	Argon Red
7	Which non-metal is a liquid at room temperature?	Fluorine Orange	Bromine Light Blue
8	All non-metals are gases at room temperature.	True Dark Blue	False Pink
9	Non-metals have ... boiling points.	Low Purple	High Red
10	Which metal is less dense than water?	Iron Pink	Sodium Red
11	Which of these is a non-metal?	Hydrogen Orange	Magnesium Pink
12	Metals can be drawn into wires. They are said to be ...	Sonorous Light Blue	Ductile Red
13	Graphite and diamond are both forms of carbon.	True Dark Blue	False Dark Green
14	Which of these will be a good conductor of electricity?	Copper Pink	Sulphur Orange
15	All metals are solids at room temperature.	True Light Green	False Yellow
16	When metals are mixed together they form ...	Alloys Dark Green	Crystals Pink
17	All metals are magnetic.	True Yellow	False Purple
18	Which of these is a non-metal?	Iodine Light Green	Mercury Red
19	Non-metals tend to be ...	Brittle Light Blue	Malleable Orange
20	Metals generally have a low density.	True Purple	False Yellow

ELEMENTS

Two principal ways of _____ matter are according to its physical state (_____, _____, or _____) and its (_____, _____, or _____).

- Contain only _____ type of atom.
- by either _____ be broken down into simpler substances or _____ means.
- Can exist as either _____ or _____ (O_2).

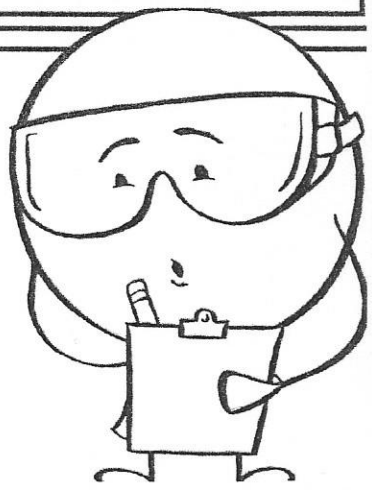
COMPOUNDS

- Contain _____ of _____ or more DIFFERENT elements _____ together in a specific _____.
- by _____ be broken down into simpler substances (elements) means but NOT by _____!
- Has _____ properties than its component _____.

MIXTURES

- Contains _____ or _____ substances (elements or compounds) that are NOT _____ together.
- Can be separated _____.
- Retains many of the same _____ of its components.

you try: How do you know that water is not simply a mixture of hydrogen and oxygen?



Day 2

For an investigation a student records data about four unknown substances.

Data for Unknown Substances

Substance	Mass (g)	Volume (cm^3)	Density (g/cm^3)
1	6.95	4.0	
2	4.54	2.0	
3	5.40	3.0	
4	10.35	5.0	

The student then calculates the densities of the unknown substances and compares them with the table of densities of known substances shown below.

Densities of Some Known Substances

Substance	Density (g/cm^3)
Calcium	1.54
Carbon	2.27
Magnesium	1.74
Phosphorus	1.82
Platinum	21.46
Sulfur	2.07

Which unknown substance is most likely carbon?

A Substance 1

B Substance 2

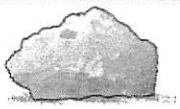
C Substance 3

D Substance 4

Category 1

Some students conducted a laboratory investigation to learn more about the physical properties of different elements. They observed four samples and recorded their observations in the table below.

Properties of Four Elements

Sample	Appearance	Physical Properties
1		• Dull • Yellow • Powdery solid • Smells like eggs • Broken by hammer
2		• Silvery-gray • Solid • Shaped into a bar • Dented by hammer
3		• Reddish-brown • Shiny solid • Shaped into a wire • Can be stretched • Dented by hammer
4		• Silvery-gray • Solid • Small round pellets • Flattened by hammer

Based on these observations, which sample is most likely a nonmetal?

F Sample 1

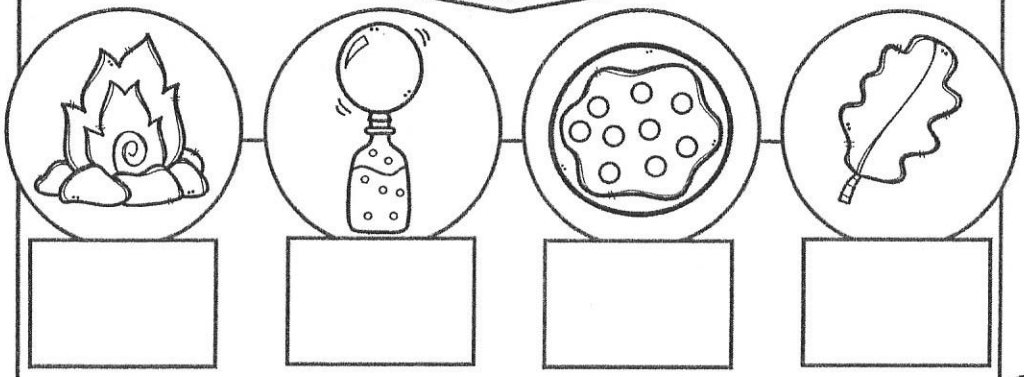
G Sample 2

H Sample 3

J Sample 4

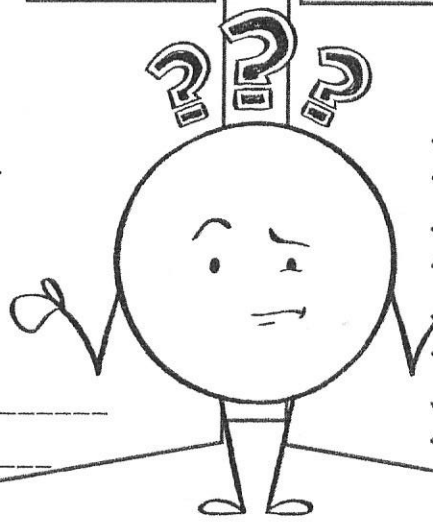
CHEMICAL

CHANGES are



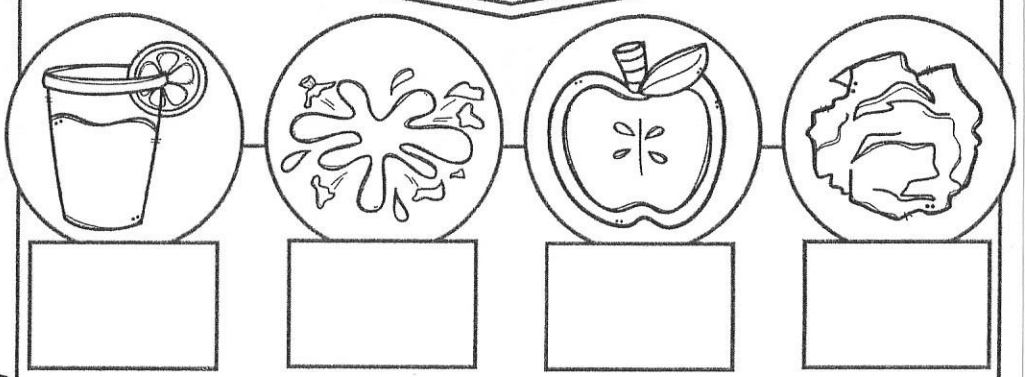
How can you tell?

- They _____ cause color change.
- NOT easily _____ .
- _____ products are formed.
- Formation of _____, heat, _____ _____, or a _____



PHYSICAL

CHANGES are



How can you tell?

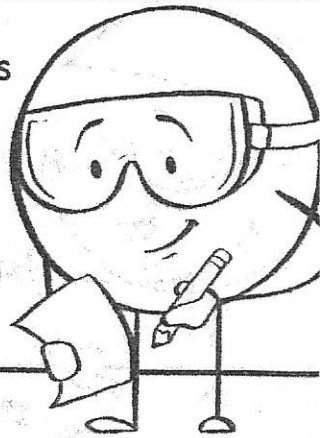
- They are often just a _____ change.
- They can be easily _____ .
- No _____ products are formed.
- They _____ cause color change.

You try:

Mark each of the following with a "C" for a chemical change or a "P" for a physical change.

_____ melting wax
_____ water boiling
_____ baking bread
_____ tearing paper
_____ wire is bent
_____ wood burning
_____ ice melting
_____ breaking glass
_____ metal rusting
_____ silver tarnishing
_____ breaking an egg
_____ frying an egg

A substance that cannot be _____ _____ into simpler substances by _____ means. An element is composed of _____ that have the same number of _____ in their _____.

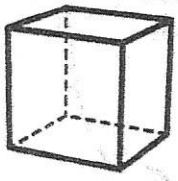


ELEMENTS

Every element has a unique _____ _____. It indicates the total number of _____ in the _____ of the atom. Normal atoms are electrically _____, same number of _____ as _____. So it is also the number of _____.

ATOMIC NUMBER

12



Mg

Magnesium

24.305

Every elements is _____ using a unique _____ of one or _____ letters. The first letter is always _____ and if there is a second letter, it is _____ _____.

Some are based on other languages, for example the symbol ____ is _____ from the Latin "ferrium."

SYMBOL

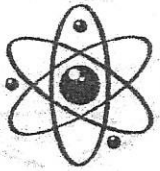
ELEMENT NAME

Every element has a unique name. Many element names are very _____ and are based on other _____. _____ is named after "khloros," the Greek work for " _____ _____ " Newly discovered _____ are named by the discoverer, but must be _____ by an international committee.

ATOMIC MASS

Atomic mass is the mass of the _____ and the _____ in an atom. Every proton and neutron has a _____ of _____ AMU. Electrons do _____ count towards the _____ because they are _____. The mass can be shown with a _____ because it is an average mass of the _____ of that element.

You try:



What element's neutral atom has 17 electrons?

How many neutrons are in a lithium atom?

What do you think the cube symbol in the upper right means?

Flashback

Category 2

Day 1

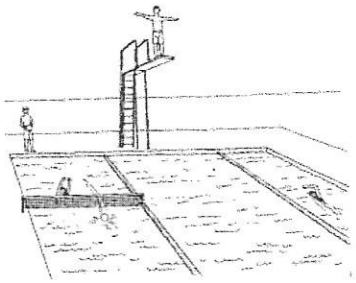
6.8A SS compare and contrast potential and kinetic energy

6.8C SS calculate average speed using distance and time measurements

6.8D SS measure and graph changes in motion

6.9C SS demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy

Four students were asked to classify the activities of the people in the picture below as examples of either potential or kinetic energy.



Which student correctly classified the activities?

F

Student 1

Activity Observed	Classification of Activity
Girl swimming laps	Potential energy
Boy on diving board	Kinetic energy
Girl hitting volleyball	Potential energy
Boy holding volleyball	Kinetic energy

G

Student 2

Activity Observed	Classification of Activity
Girl swimming laps	Potential energy
Boy on diving board	Potential energy
Girl hitting volleyball	Kinetic energy
Boy holding volleyball	Kinetic energy

H

Student 3

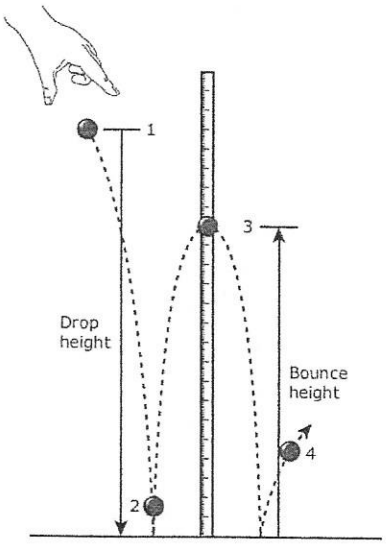
Activity Observed	Classification of Activity
Girl swimming laps	Kinetic energy
Boy on diving board	Kinetic energy
Girl hitting volleyball	Potential energy
Boy holding volleyball	Potential energy

J

Student 4

Activity Observed	Classification of Activity
Girl swimming laps	Kinetic energy
Boy on diving board	Potential energy
Girl hitting volleyball	Kinetic energy
Boy holding volleyball	Potential energy

In the classroom demonstration shown below, a rubber ball is dropped from Position 1. The ball bounces as shown.



At which of these positions does the ball have both the greatest kinetic energy and the least potential energy?

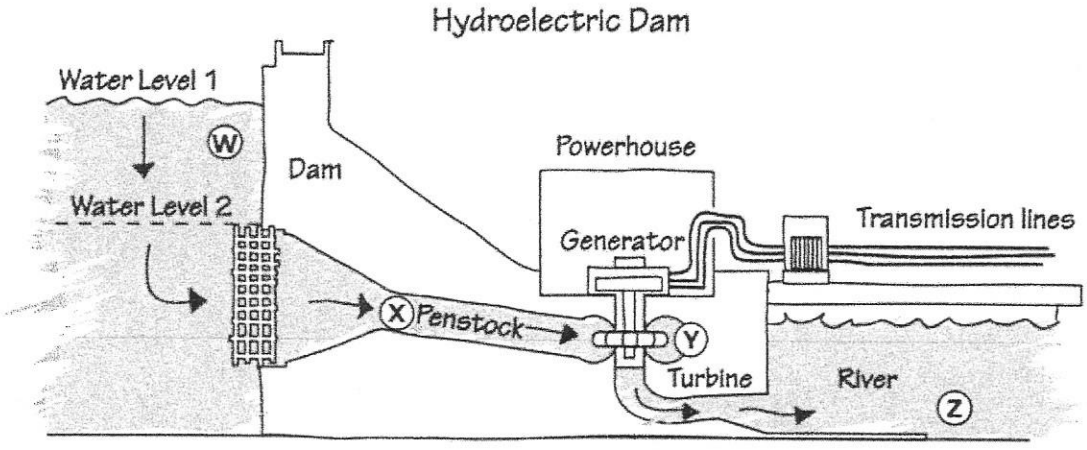
A Position 1

B Position 2

C Position 3

D Position 4

A student drew the diagram below to show the movement of water through a hydroelectric dam.



The student used the diagram to describe changes in the potential and kinetic energy of the water. At which location is the gravitational potential energy of the water the greatest?

A Location W

B Location X

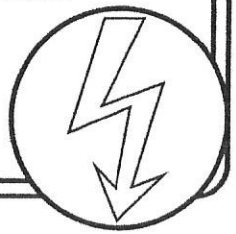
C Location Y

D Location Z

TYPES OF ENERGY

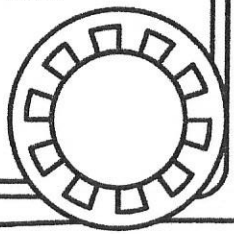
ELECTRICAL

Energy made available through the flow of electric _____ through a _____.



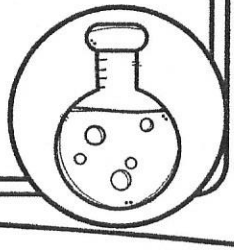
RADIANT

Energy carried by _____ and other types of _____ _____.



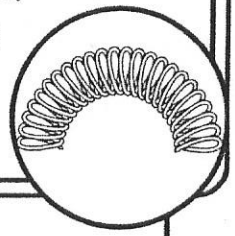
CHEMICAL

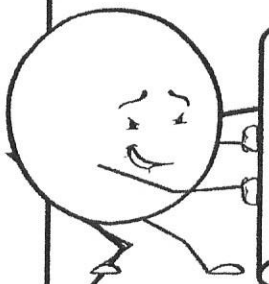
Energy stored in the bonds of chemical _____ that is released during certain _____.



ELASTIC

Energy stored in an object when it is _____ or _____, like in a spring or rubber band.



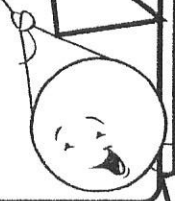


MECHANICAL

The sum of energy associated with the _____ & _____ of an object.

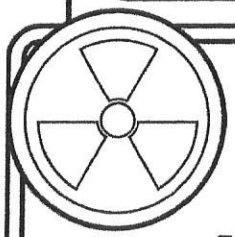
KINETIC

Energy of an object or a _____ due to its _____.



POTENTIAL

Energy an object has due to its _____ or its _____ energy.



NUCLEAR

Energy released when _____ split (_____) or join together (_____)

THERMAL

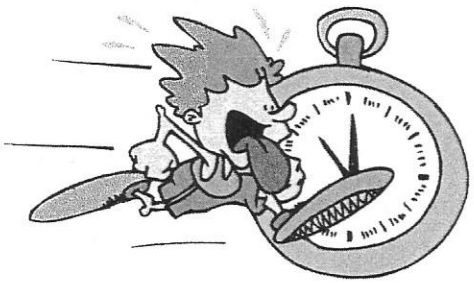
Energy of an object due to the _____ energy of its _____.

SOUND

Energy transferred through a _____ by a _____ wave.

GRAVITATIONAL

Energy of an object due to its _____ position compared to a _____ one.

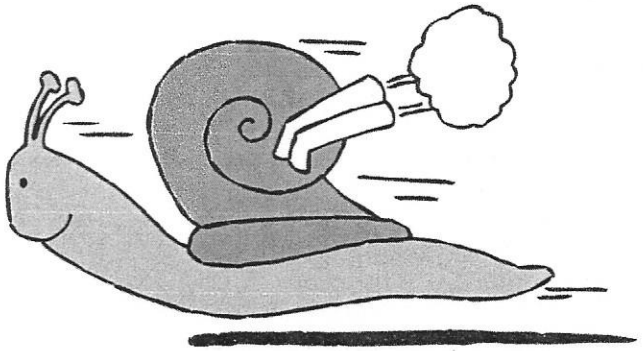


Average Speed Puzzle

Joey, Isabella, Marcus, Natasha, Jerome, and Angela all start walking at the same time, but all six walk a different distance in a different amount of time. Use the clues below to find their distance traveled and total time. Then, calculate each student's average speed.

Distances traveled: 40 m, 85 m, 25 m, 10 m, 30 m, 60 m
Total time taken: 60 s, 12 s, 15 s, 120 s, 10 s, 30 s

1. Marcus did not travel the greatest distance
2. Joey traveled a greater distance than Jerome
3. Angela finished before Natasha
4. Isabella took twice as long as Natasha
5. Joey had exactly four times the average speed of Isabella
6. Natasha had a greater average speed than Angela
7. Marcus went 1/4th as far as Angela
8. Marcus finished before Joey
9. Angela's average speed was greater than 1.0 m/s
10. Angela finished before Natasha but after Marcus
11. Marcus' time was 1/10th that of Isabella's
12. Natasha traveled a greater distance than Joey
13. Jerome's average speed was greater than Joey's



	distance						total time						average speed
Joey													
Isabella													
Marcus													
Natasha													
Jerome													
Angela													

Category 2 Day 2

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

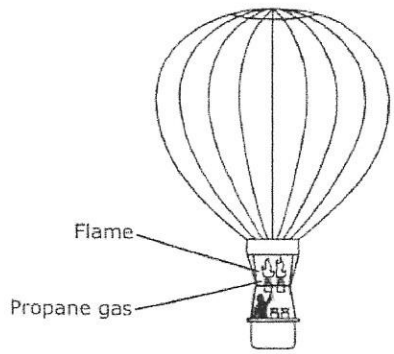
Toy-Car Trials

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.

The diagram below shows a hot air balloon rising. Propane gas tanks are seen at the bottom of the balloon.



What energy transformations occur when propane gas is used to lift the balloon?

A Mechanical → light → chemical

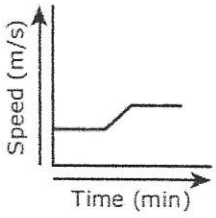
B Chemical → mechanical → thermal

C Thermal → chemical → light

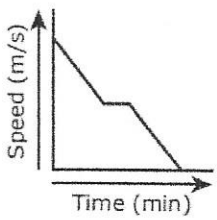
D Chemical → thermal → mechanical

A car travels at a constant speed of 15 m/s for 2 minutes. The car increases its speed from 15 to 25 m/s during the next minute and then travels at a constant speed of 25 m/s for 2 more minutes. Which of the following graphs best represents the car's motion during this 5-minute period?

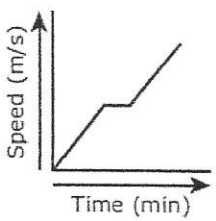
F



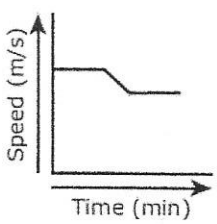
H

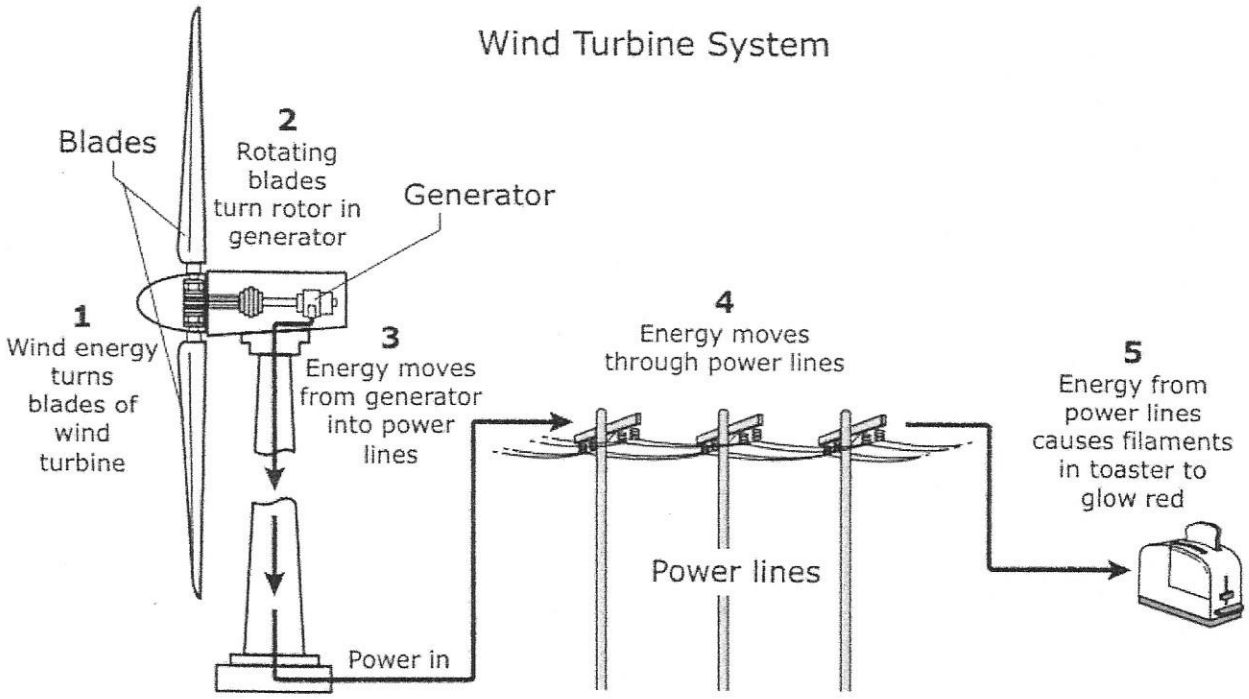


G



J





In the diagram above, a wind turbine is transforming energy from the wind. Between which two steps in the diagram is mechanical energy being converted into electrical energy?

A 1 and 2

B 2 and 3

C 3 and 4

D 4 and 5

When a lion eats a zebra and then uses the energy from the zebra to run, the lion's body converts —

A chemical energy to mechanical energy

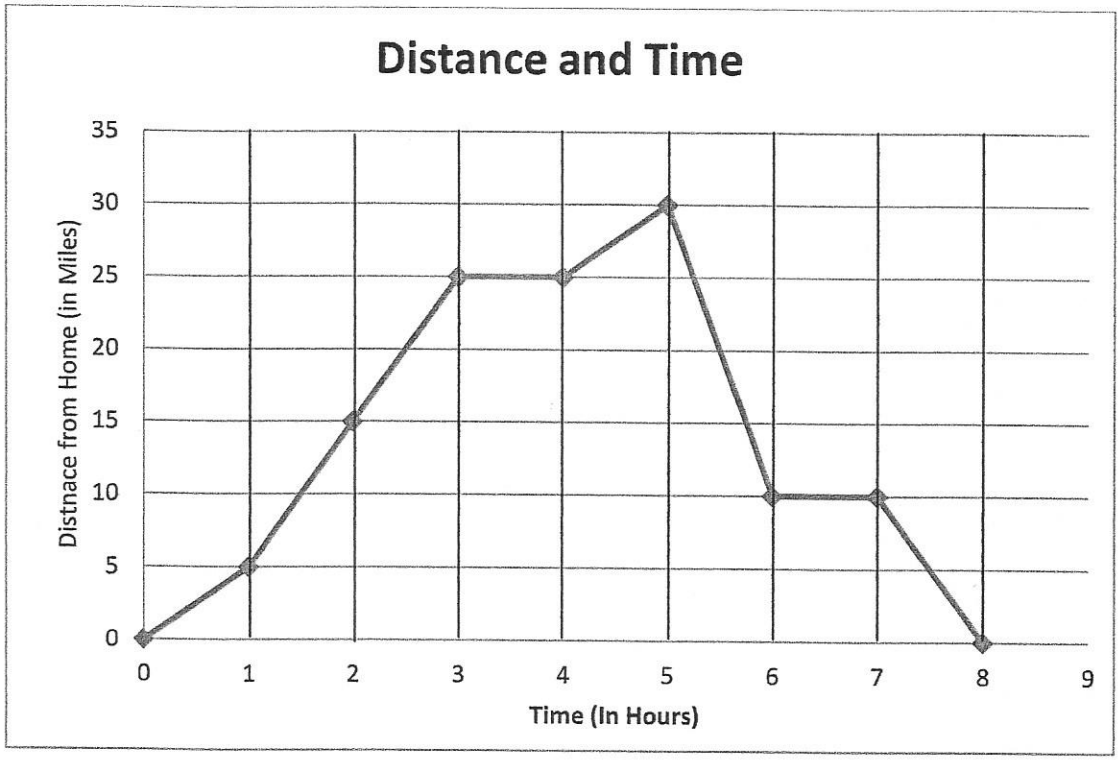
B electrical energy to chemical energy

C chemical energy to light energy

D mechanical energy to chemical energy

Name_____ Date_____

Distance and Time



You are driving to deliver a packages to two friends , one of whom lives 25 miles away and the other of whom lives 10 miles away. The above graph shows your distance and time during the journey.

1) How far are you from home at the following times?

Times (Hours)	Distance (Miles)
1	
2	
3	
4	
5	
6	
7	
8	

2) Highlight the section of the graph between zero and one hour.
   a. How far did you travel?_____
   b. How long did it take?_____

3) Use a different color to highlight the section of the graph between one hour and 3 hours.
   a. How far did you travel?_____ (25-5)

b. How long did it take?_____ (3-1)

4) Use the same color highlighter you used for question 2. Highlight the section of the graph between 3 and 4 hours.
   a. Does your distance change?_____
   b. What does that mean?_____

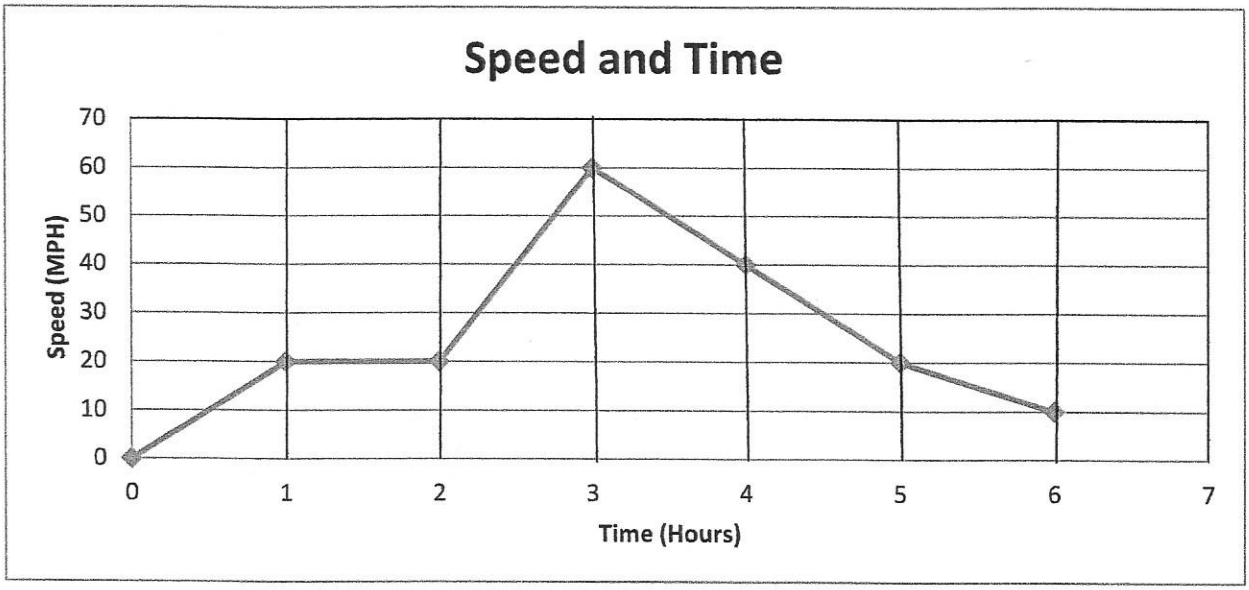
5) Use the same color highlighter you used for question 3. Highlight the section of the graph between 4 and 5 hours.
   a. How far did you travel?_____
   b. How long did it take?_____

6) Use the same color highlighter you used for question 2. Highlight the section of the graph between 5 and 6 hours.
   a. How far did you travel?_____
   b. How long did it take?_____

7) Use the same color highlighter you used for question 3. Highlight the section of the graph between 6 and 7 hours.
   a. Does your distance change?_____
   b. What does that mean?_____

8) Use the same color highlighter you used for question 2. Highlight the section of the graph between 7 and 8 hours.
   a. How far did you travel?_____
   b. How long did it take?_____

Speed and Time



You spend 6 hours practicing for your upcoming road test to get your drivers' license. The graph above shows the speeds you traveled at various points throughout your drive.

9) How fast are you going at the following times?

Times (Hours)	Speed (MPH)
1	
2	
3	
4	
5	
6	

10) Highlight the section of the graph between zero and one hour.
   a. Did you accelerate, decelerate, or drive at a constant speed?_____
   b. How do you know?_____

11) Use a different color to highlight the section of the graph between one hour and 2 hours.
   a. Did you accelerate, decelerate, or drive at a constant speed?_____
   b. How do you know?_____

12) Use the same highlighter you used for question 10. Highlight the section of the graph between 2 and 3 hours.
   a. Did you accelerate, decelerate, or drive at a constant speed?_____
   b. How do you know?_____

13) Use the same highlighter you used for question 11. Highlight the section of the graph between 3 and 6 hours.
   a. Did you accelerate, decelerate, or drive at a constant speed?_____
   b. How do you know?_____

April 9th

Expectations:

Respect the materials- the games are a TEST grade for the students who made them. They have to present them at a show.

Stay in assigned area

Classroom level voices

Constructive criticism only

FLASH BACK!!!!

Category 3

Day 1

7.8C SS model the effects of human activity on groundwater and surface water in a watershed

6.11B SS understand that gravity is the force that governs the motion of our solar system

An object will continue moving in a straight line unless it is acted on by an unbalanced force. Which of the following best explains Earth's motion?

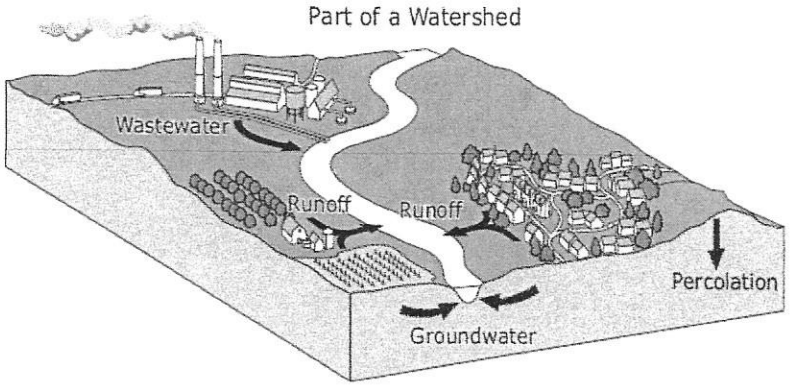
F There is no unbalanced force acting on Earth because space is empty and nothing touches Earth.

G The gravitational force pulling Earth toward the sun is equal and opposite to the force pulling the sun toward Earth, so there is no unbalanced force acting on Earth.

H The sun moves in an elliptical orbit around Earth, and the sun's gravity pulls Earth along.

J Earth moves in an elliptical orbit around the sun because the gravitational force of the sun attracts Earth.

A student drew the model below to represent a part of a watershed and some human activities that affect the watershed.



How do the industrial, agricultural, and residential activities of humans most likely affect the groundwater in the area?

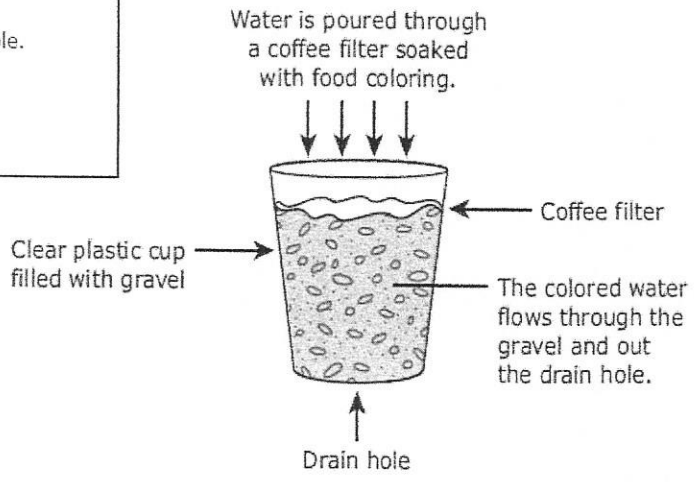
F The activities prevent most of the water from evaporating into the atmosphere.

G Pollutants from the activities percolate through the soil and enter the water table.

H The activities replace the groundwater used.

J All of the above

nvestigation shown below.



The movement of colored water through the gravel best models —

F condensation of water vapor

G surface runoff of precipitation

H conservation of water

J pollution of groundwater

Watershed 7.8 C

Video Notes: https://www.youtube.com/watch?v=z2v07Vnd5GI

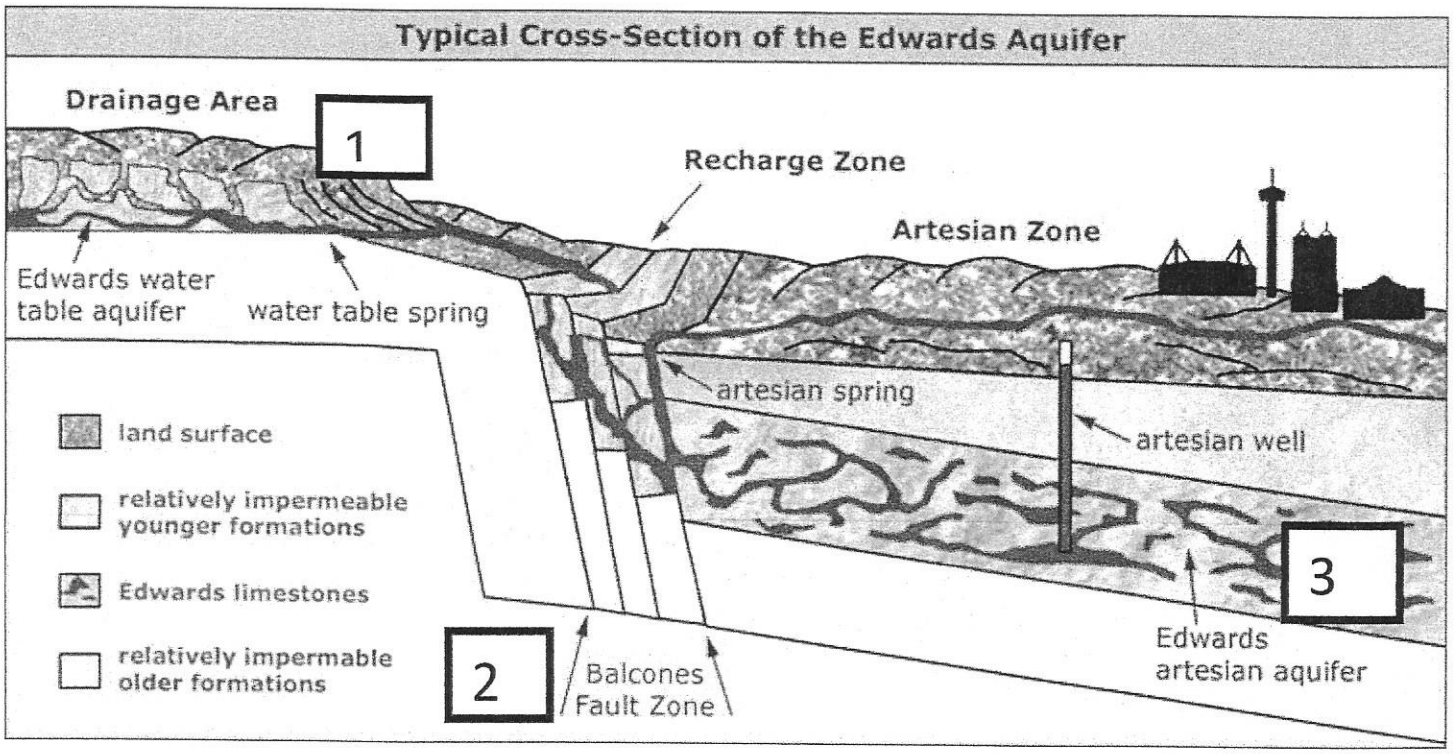
Watershed:

Ex:

*

Aquifer:

Ex:



1: Drainage area:

2. Recharge zone:

3. Aquifer:

* Pollution in _____ and _____would pollute _____. This matters because:

How does human activity affect the watershed?

Pollution:

*fertilizers-

*waterparks-

-

-

*oil and gasoline pollution

-parking lots/highways

Water conservation-

Not in video: DEAD ZONES (draw the diagram and explain)

FLASHBACK

CATEGORY 4 DAY 1

7.10B describe how biodiversity contributes to the sustainability of an ecosystem;

7.10C observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.

7.11A examine organisms or their structures such as insects or leaves and use dichotomous keys for identification;

7.11C identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (Geospiza fortis) or domestic animals and hybrid plants.

7.12B identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems;

7.11D differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;

(F) recognize the components of cell theory.

7.14B compare the results of uniform or diverse offspring from asexual or sexual reproduction; and

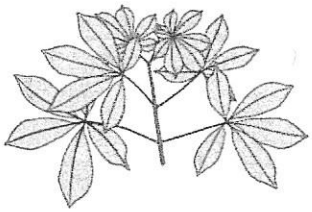
7.14C recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.

6.12 identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized kingdoms.

Some students collected leaf samples. The students used the leaf identification key shown below to identify a leaf sample.

Leaf Identification Key

Step	Characteristic	Species
1a	Simple leaf (single leaf)	Go to 2
1b	Compound leaf (leaves grouped on a stem)	Go to 5
2a	Leaves directly opposite on twig	Go to 3
2b	Leaves not directly opposite on twig	Go to 4
3a	Leaves with 5 lobes	Sugar maple
3b	Leaves with 3 lobes	Black maple
4a	Leaves that are fan-shaped	Ginkgo
4b	Leaves that are star-shaped	Sweet gum
5a	Leaves arranged like a fan	Horse chestnut
5b	Leaves directly opposite on stem	Honey locust



Based on the identification key, which type of tree is this sample from?

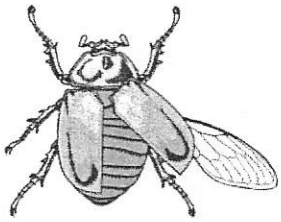
F Ginkgo

G Honey locust

H Horse chestnut

J Black maple

A student examines the winged insect shown below.



Dichotomous Key

Step	Characteristics	Order
1a	Insect has an extremely long prothorax (neck)	Go to 2
1b	Insect has a short or no prothorax	Go to 3
2a	Forelegs come together in a "praying" position	Mantodea
2b	Forelegs do not come together in a "praying" position	Raphidioptera
3a	Wings are armor-like with membranous hind wings underneath	Coleoptera
3b	Wings are not armor-like	Go to 4
4a	Wings are triangular in shape	Go to 5
4b	Wings are not triangular in shape and head is elongated	Mecoptera
5a	Insect lacks a proboscis (long, slender snout) and has long filaments at abdominal tip	Ephemeroptera
5b	Insect has a proboscis and lacks long filaments at abdominal tip	Lepidoptera

Based on the dichotomous key, in what order should this insect be classified?

F Mantodea

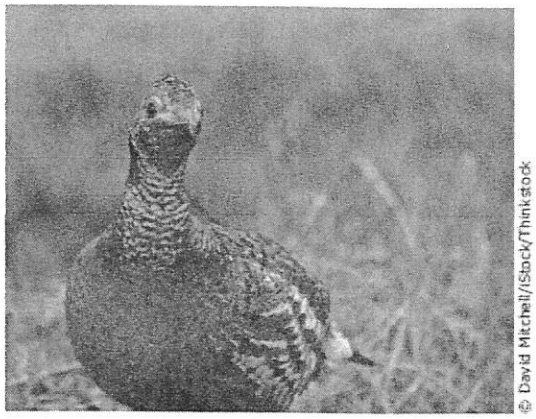
G Raphidioptera

H Coleoptera

J Lepidoptera

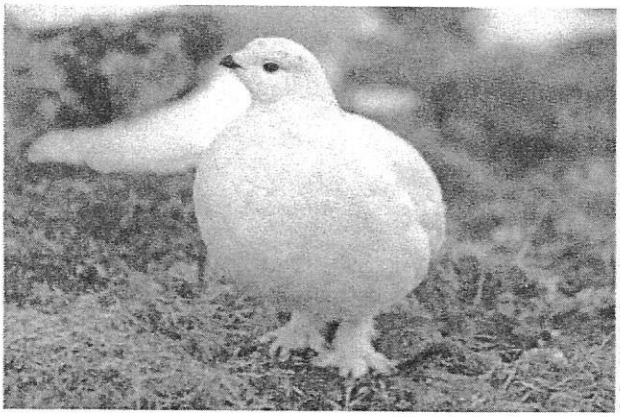
8 The white-tailed ptarmigan lives at high elevations on mountains that receive a lot of snow in the winter. During the summer, the ptarmigans' feathers are mottled brown. The birds lose the brown feathers and grow a new set of white feathers during the winter. Scientists are concerned that rising global temperatures will affect the white-tailed ptarmigan.

White-Tailed Ptarmigan in Summer



© David Mitchell/iStock/Thinkstock

White-Tailed Ptarmigan in Winter



© BradWolfe/iStock/Thinkstock

If global climate change leads to the elimination of snow in the habitat of white-tailed ptarmigans, which adaptation is most likely to occur over many generations?

F Birds with white feathers in areas without winter snow will be easier for predators to find. Over time this could lead to white-tailed ptarmigans that have brown feathers throughout the year.

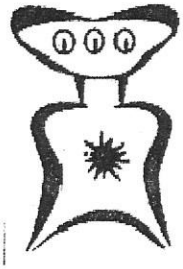
G Birds with brown feathers in areas without winter snow will be easier for predators to find. Over time this could lead to white-tailed ptarmigans that have white feathers throughout the year.

H Birds with white feathers will be easier to see on the ground in the summer. Over time this could lead to white-tailed ptarmigans that have white feathers throughout the year.

J Birds with brown feathers will be easier to see on the ground in the winter. Over time this could lead to white-tailed ptarmigans that have brown feathers throughout the year.

Flashback Dichotomous Keys 7.11A

Help! Scientists have discovered quite a few new creatures on planet Pamishan. They need your help to identify and classify them. Use the dichotomous key on the next page to identify these creatures.

1. 
2. 
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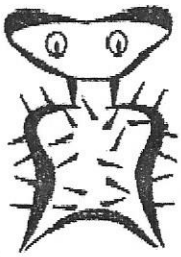
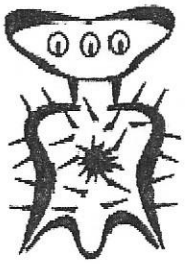
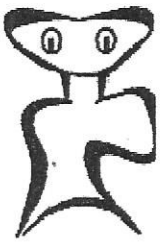
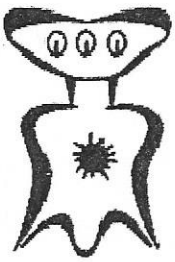
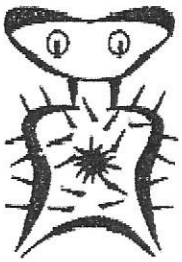
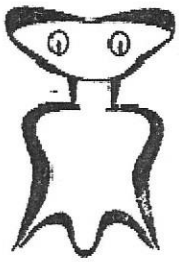
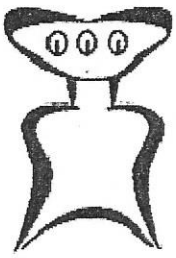
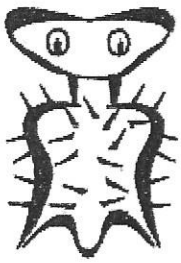
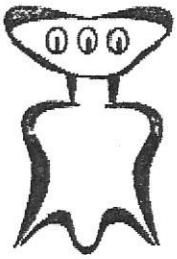
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20. 

A Key to New Pamishan

1. a. The creature has a large wide head.....go to 2
   b. The creature has a small narrow head.....go to 11
2. a. It has 3 eyes .....go to 3
   b. It has 2 eyes .....go to 7
3. a. There is a star in the middle of its chest.....go to 4
   b. There is no star in the middle of its chest .....go to 6
4. a. The creature has hair spikes .....*Broadus hairus*
   b. The creature has no hair spikes.....go to 5
5. a. The bottom of the creature is arch-shaped .....*Broadus archus*
   b. The bottom of the creature is M-shaped .....*Broadus emmus*
6. a. The creature has an arch-shaped bottom .....*Broadus plainus*
   b. The creature has an M-shaped bottom.....*Broadus tritops*
7. a. The creature has hairy spikes .....go to 8
   b. The creature has no spikes.....go to 10
8. a. There is a star in the middle of its body .....*Broadus hairystarus*
   b. The is no star in the middle of its body .....go to 9
9. a. The creature has an arch shaped bottom .....*Broadus hairyemmus*
   b. The creature has an M shaped bottum .....*Broadus kiferus*
10. a. The body is symmetrical .....*Broadus walter*
    b. The body is not symmetrical.....*Broadus anderson*
11. a. The creatrue has no antennae .....go to 12
    b. The creature has antennae .....go to 14
12. a. There are spikes on the face .....*Narrowus wolfus*
    b. There are no spikes on the face .....go to 13
13. a. The creature has no spike anywhere .....*Narrowus blankus*
    b. There are spikes on the right leg .....*Narrowus starboardus*
14. a. The creature has 2 eyes.....go to 15
    b. The creature has 1 eye.....*Narrowus cyclops*
15. a. The creature has a mouth.....go to 16
    b. The creature has no mouth.....go to 17
16. a. There are spikes on the left leg .....*Narrowus portus*
    b. There are no spikes at all .....*Narrowus plainus*
17. a. The creature has spikes .....go to 18
    b. The creature has no spikes .....*Narrowus georginia*
18. a. There are spikes on the head .....go to 19
    b. There are spikes on the right leg.....*Narrowus montanian*
19. a. There are spikes covering the face .....*Narrowus beardus*
    b. There are spikes only on the outside edge of head .....*Narrowus fuzzus*

CATEGORY 4 DAY 2

Both primary and secondary succession begin with pioneer species that —

A change the area and make it safer from predatory organisms

B invade the area so that new organisms cannot be established

C modify the area and allow larger and more complex organisms to appear

D use up all the existing resources and prevent establishment of non-native organisms

Tropical rain forests have the greatest biodiversity of any type of land ecosystem. How does biodiversity contribute to the sustainability of an ecosystem?

F The presence of more species with different adaptations makes it more likely that some organisms will survive an ecological disaster.

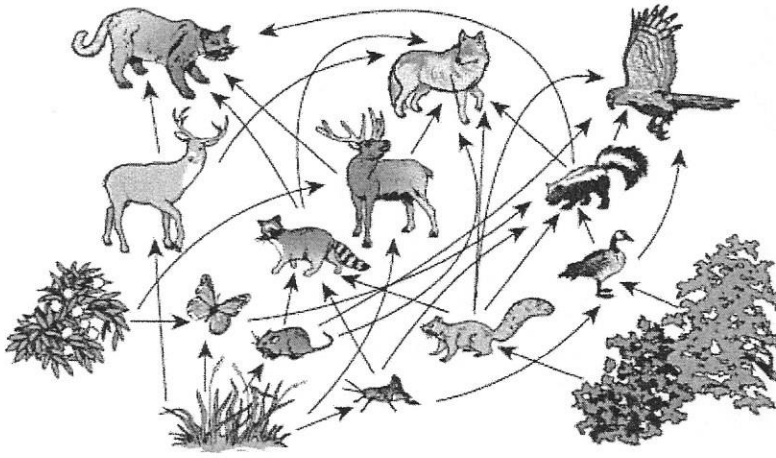
G Greater genetic variation within species makes it more likely that some individuals will survive a disease outbreak.

H The presence of a variety of herbivore species that can feed on a large number of different producer species helps ensure abundant prey for predators in the ecosystem.

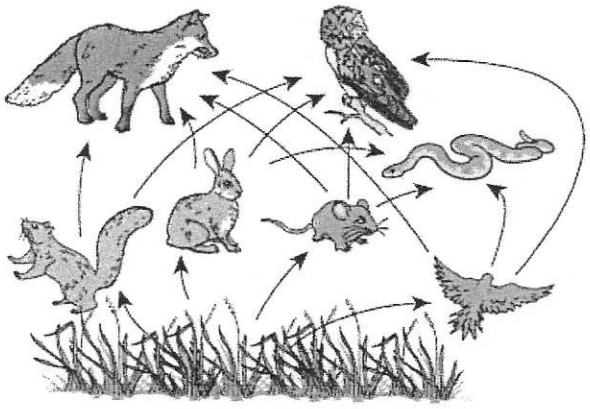
J All of the above

The food webs below model relationships among the organisms in two ecosystems.

Forest Food Web



Grassland Food Web



Which ecosystem would be more likely to survive if a disease killed the grasses?

A The forest ecosystem, because most of the animals can eat other organisms

B The grassland ecosystem, because several predators compete for food

C The forest ecosystem, because it has three top predators

D The grassland ecosystem, because it has many herbivores

Ecological Succession 7.10C

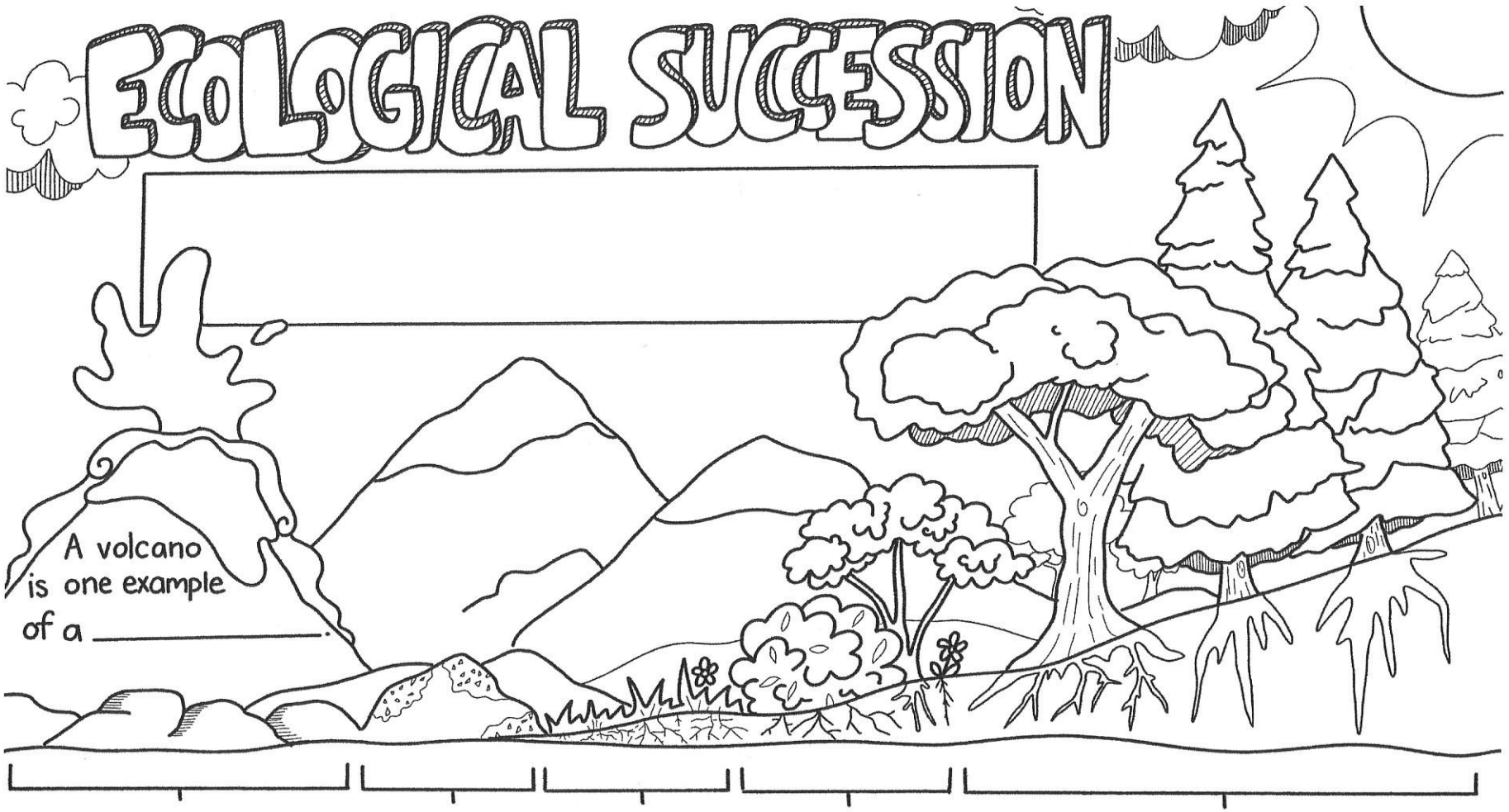
Video: https://www.youtube.com/watch?v=uqEUzgVAF6g

https://www.youtube.com/watch?v=555EG8Vzs_I

Primary:

Secondary:

ECOLOGICAL SUCCESSION

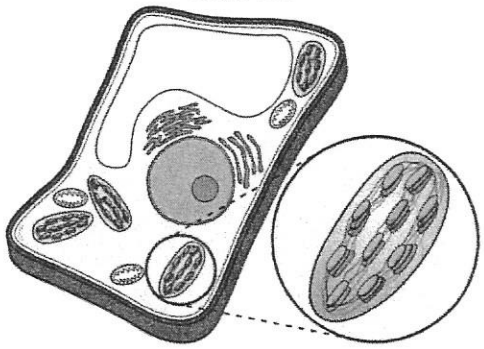


?? What is the difference between primary and secondary succession? ??

CATEGORY 4 DAY 3

A diagram of a plant cell is shown below.

Plant Cell



The function of the plant cell structure shown in the enlargement is to —

A provide support for the cell

B direct all the cell's activities

C use energy from sunlight to make sugar

D regulate substances that enter and exit the cell

Which table correctly describes the functions of the cell structures listed?

F

Cell Structure	Function
Vacuole	Stores water
Chloroplast	Removes waste
Mitochondrion	Produces sugar
Cell membrane	Regulates cell contents

H

Cell Structure	Function
Vacuole	Stores water
Chloroplast	Produces sugar
Mitochondrion	Converts energy
Cell membrane	Regulates cell contents

G

Cell Structure	Function
Vacuole	Regulates cell contents
Chloroplast	Produces sugar
Mitochondrion	Stores water
Cell membrane	Converts energy

J

Cell Structure	Function
Vacuole	Removes waste
Chloroplast	Converts energy
Mitochondrion	Produces sugar
Cell membrane	Regulates cell contents

In the 1800s two scientists, Theodor Schwann and Matthias Schleiden, studied different types of organisms. After many years of studying a great variety of organisms, they drew similar but independent conclusions about their observations.

Schwann studied animals and concluded that all animals are made of cells.

Schleiden studied plants and concluded that all plants are made of cells.

What statement was developed most directly from these conclusions and is part of the modern cell theory?

A The functions of living things occur in cells.

B Cells exist only in multicellular organisms.

C Living things are composed of cells.

D Cells contain hereditary information.

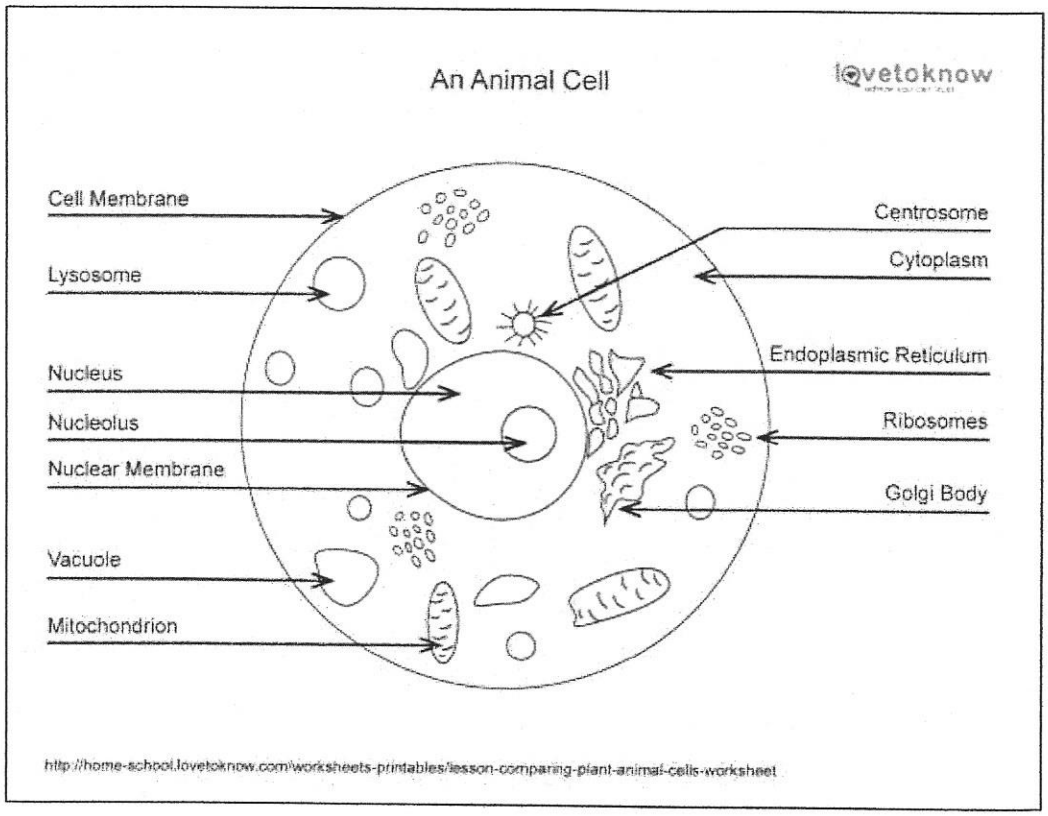
Which list of characteristics describes organisms classified as animals?

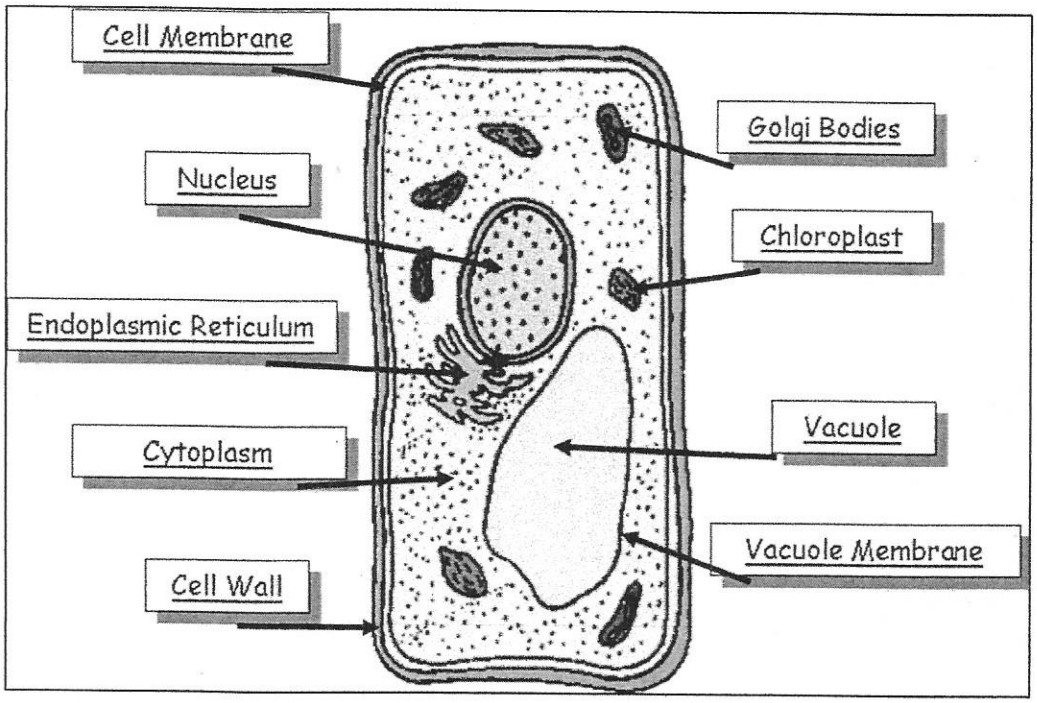
F Unicellular, prokaryotic, autotrophic

G Multicellular, eukaryotic, heterotrophic

H Unicellular, eukaryotic, heterotrophic

J Multicellular, eukaryotic, autotrophic


An Animal Cell
lovetoknow
Cell Membrane
Lysosome
Nucleus
Nucleolus
Nuclear Membrane
Vacuole
Mitochondrion
Centrosome
Cytoplasm
Endoplasmic Reticulum
Ribosomes
Golgi Body
http://home-school.lovetoknow.com/worksheets-printables/lesson-comparing-plant-animal-cells-worksheet


Cell Membrane
Nucleus
Endoplasmic Reticulum
Cytoplasm
Cell Wall
Golgi Bodies
Chloroplast
Vacuole
Vacuole Membrane

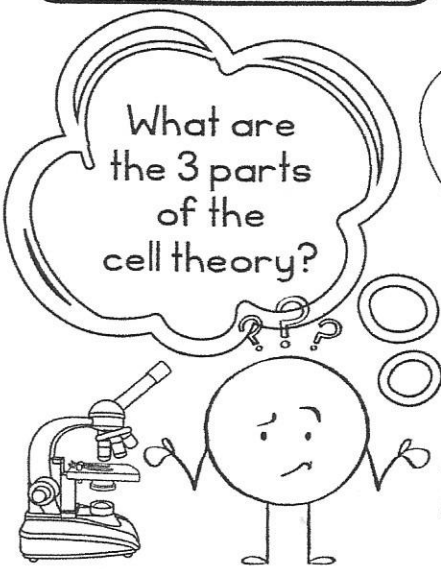
CELL THEORY

TIMELINE

1590 — Hans & Zacharias Jannssen

1665 — Robert Hooke

1680s — Anton van Leeuwenhoek



1838 — Matthias Schleiden

1839 — Theodor Schwann

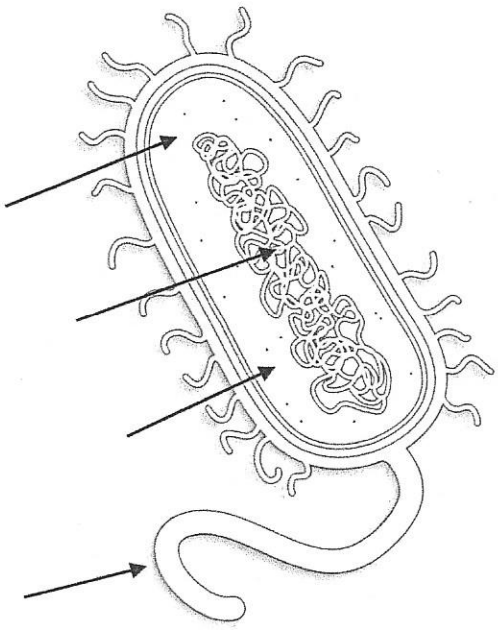
1855 — Rudolph Virchow

1

2

3

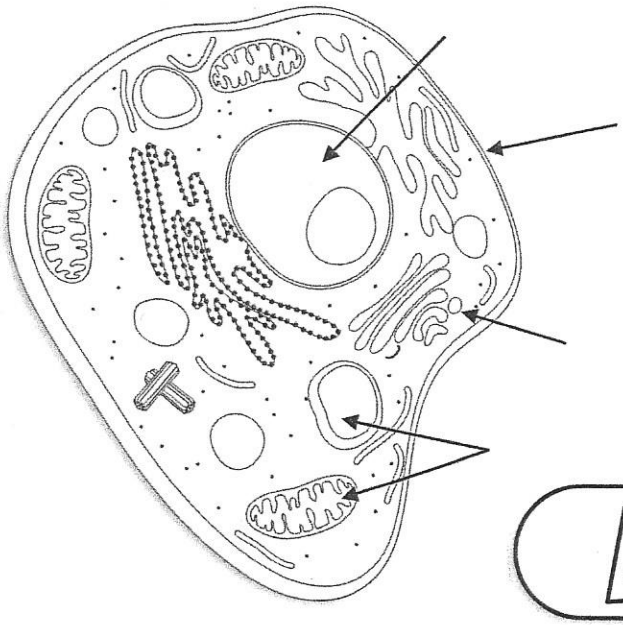
PROKARYOTIC CELLS

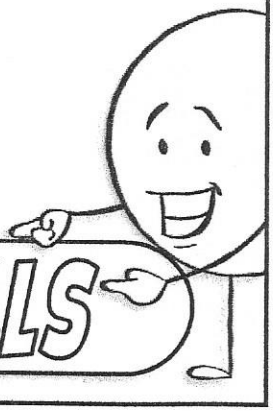


Cell Type	
Size of Cells	
Nucleus	
DNA Structure	
DNA Location	
Reproduction	

VS.

	Cell Type
	Size of Cells
	Nucleus
	DNA Structure
	DNA Location
	Reproduction





EUKARYOTIC CELLS

CATEGORY

4 DAY 4

A group of students prepared a table listing the types of reproduction that occur in several organisms.

Organism	Type of Reproduction
Amoebas	Asexual reproduction
Yeasts	Both sexual and asexual reproduction
Cats	Sexual reproduction
Hydras	Both sexual and asexual reproduction
Frogs	Sexual reproduction
Ferns	Both sexual and asexual reproduction

Based on this information, which of the organisms can produce offspring that are genetically identical to the parent organism?

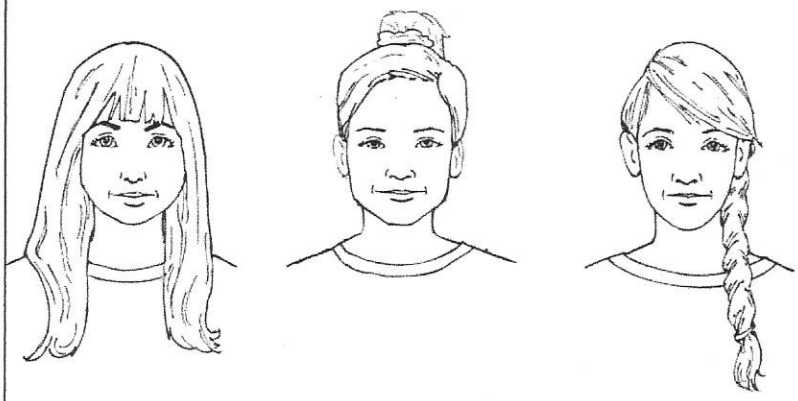
F Ferns only

G Amoebas and yeasts only

H Cats, hydras, frogs, and ferns only

J Amoebas, yeasts, hydras, and ferns only

Three cousins have a similar appearance but different face shapes.



Which of these cell components are most involved in determining the basic shape of each girl's face?

A Genes, chromosomes, and nucleus

B Cytoplasm, chloroplasts, and genes

C Vacuoles, nucleus, and chromosomes

D Chromosomes, chloroplasts, and vacuoles

Certain species of whiptail lizards have only female individuals and no males. These lizards reproduce asexually. What is one disadvantage of asexual reproduction for these lizards?

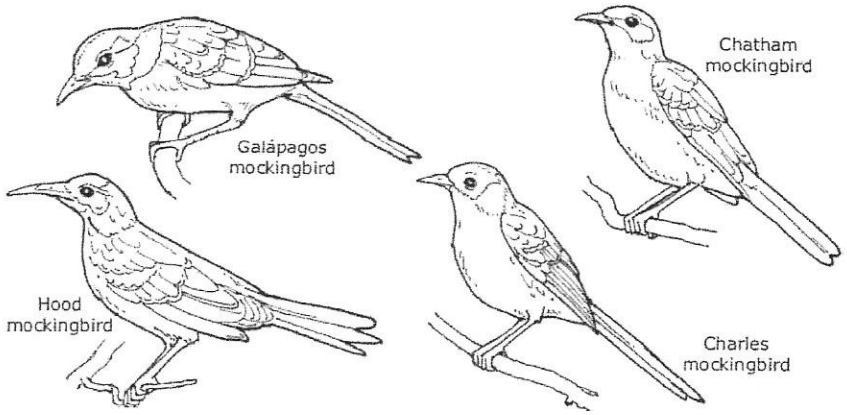
A A new population can be established by a single individual in a relatively short period of time.

B All the members of a population are genetically very similar and less able to survive environmental changes.

C They are smaller than lizards that reproduce sexually.

D They are more likely to develop a variety of tail lengths.

7 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.

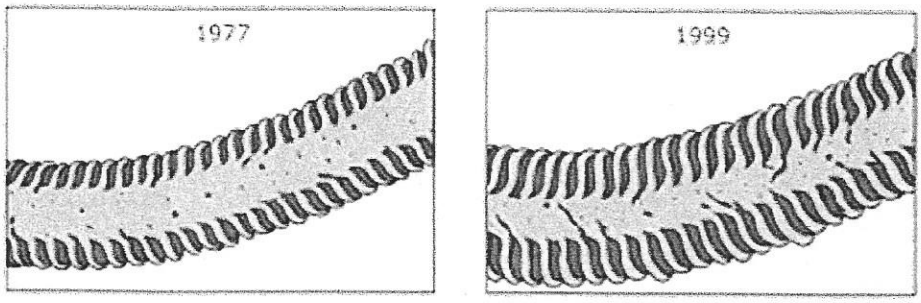
B The Hood mockingbird originated from a different type of bird than the other species.

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.

Lake Victoria in East Africa is home to many species of fish called cichlids. In 1954 the predatory Nile perch was introduced to Lake Victoria. The Nile perch became the dominant fish species in the lake by the mid-1980s. The number of cichlid species in the lake decreased as the Nile perch population increased. The perch preyed heavily on cichlid species that fed on algae and debris on the bottom of the lake. Algae in the lake increased, and oxygen levels decreased. The surface area of the gills of some cichlid species has increased in just over 20 years.

Increase in Gill Surface Area in Some Lake Victoria Cichlids



Which statement explains the increase in gill surface area seen in some of Lake Victoria's cichlids?

A Increased gill surface area has allowed the cichlids to change their diet and avoid competing with the Nile perch.

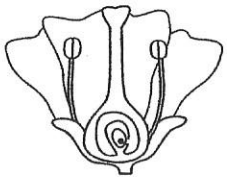
B Increased gill surface area has allowed the cichlids to be camouflaged and avoid being eaten by the Nile perch.

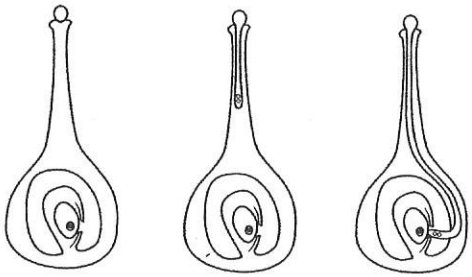
C Increased gill surface area has allowed the cichlids to leave Lake Victoria and establish populations in nearby bodies of water.

D Increased gill surface area has allowed the cichlids to better absorb the limited oxygen in the water.

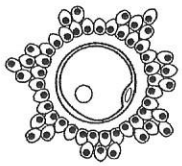
SEXUAL REPRODUCTION

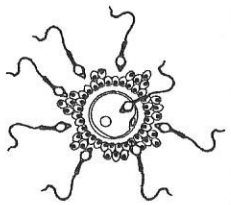
Plants





Animals



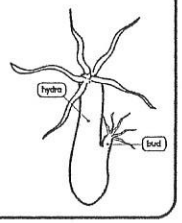


Advantages!

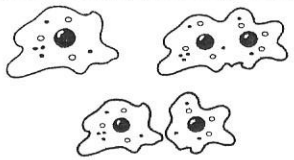
Disadvantages!

ASEXUAL REPRODUCTION

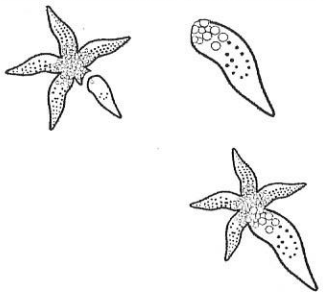
Budding



Fission

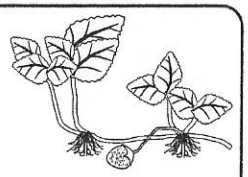


Fragmentation

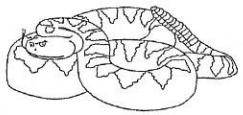


Spores

Vegetative Propogation



Parthenogenesis

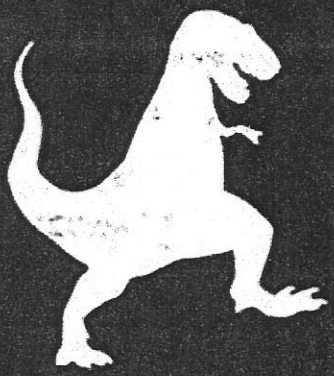


Advantages!

Disadvantages!

PHYSICS FLASHBACK

VELOCIRAPTOR =



$$\frac{\text{DISTANCERAPTOR}}{\text{TIMERAPTOR}}$$

it's not the

$$V_f = V_i + at$$

that kills you, it's the

$$F = m\frac{\Delta V}{\Delta T}$$

GRAVITY IS SUCH A DOWNER

MAY THE MASS TIMES ACCELERATION BE WITH YOU

FORCE

WHAT IS A FORCE?

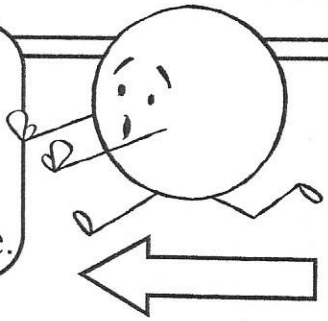
Force is a _____ or a _____ that causes an object to change _____, change _____, or to change _____ or _____. It is measured in _____.

CHANGE IN SPEED

CHANGE IN DIRECTION

CHANGE IN SHAPE OR SIZE

If the forces acting on an _____ are in the same _____, they _____ together to form the net force.



NET FORCE

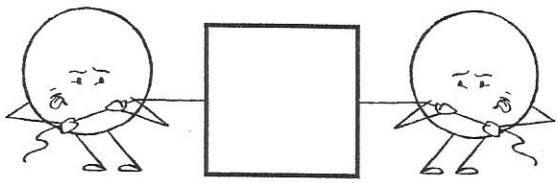
Net force is the _____ of all of the forces _____ on an object

If forces are in _____ directions, the net force is the _____ between the two forces.

VERSUS

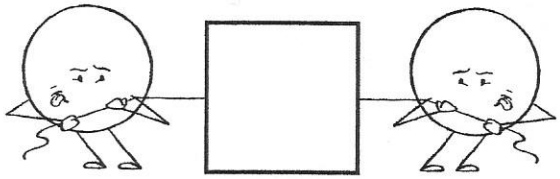
BALANCED FORCES

Forces are said to be "_____" if their effects _____ each other and there is no _____ in the objects speed or _____.



UNBALANCED FORCES

Forces are said to be "_____" if their effects do not _____ each other and there is a _____ in the objects speed or _____.

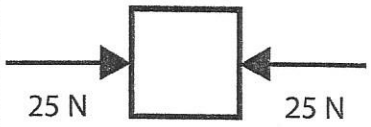


SHOW what you KNOW

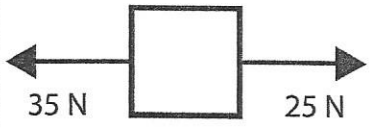
WHAT IS FORCE?

Name: Date:

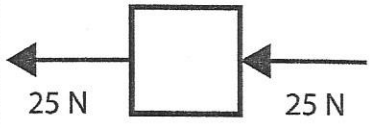
1. Label each diagram as balanced or unbalanced.



A:



B:



C:

2. A book sits on a table. Which of the following is true?

   a. The forces acting on the book are balanced.
   b. The forces acting on the book are unbalanced.
   c. Gravity is the only force acting on the book.
   d. The net force acting on the book is 3N.

3. The standard unit for force is

   a. grams
   b. Newtons
   c. watts
   d. m/s^2

4. Which of the following changes when an unbalanced force acts on an object?

   a. mass
   b. motion
   c. inertia
   d. weight

4. An object that experiences a push or a pull has a(n) _____ exerted on it.

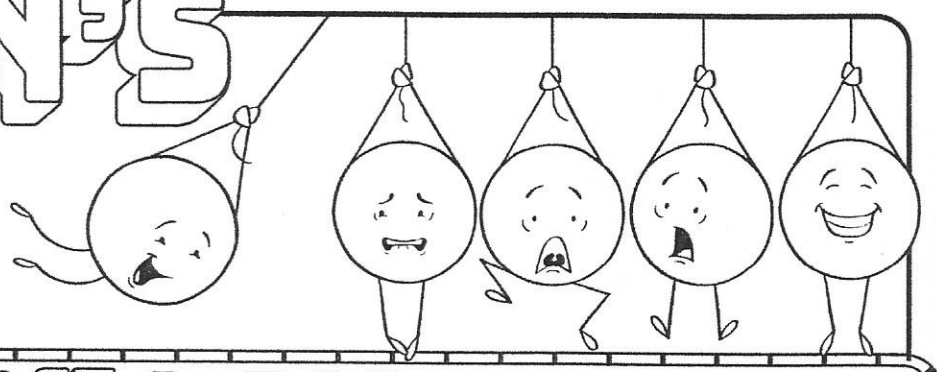
5. Forces may cause an object to change _____ if it is unable to move.

6. _____ is the force that pulls everything down towards the earth.

7. If two 4-Newton forces act on an object in the same direction, what is the net force on the object?

8. What is the net force and in which direction for the diagram in question 1B?

NEWTON'S 3 LAWS

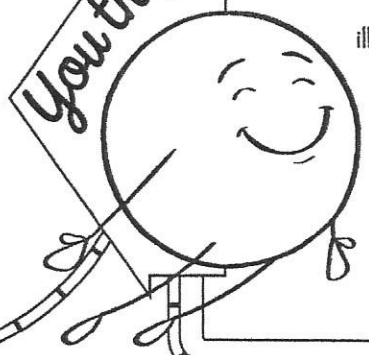


1ST LAW

An object at _____ stays at _____ and an object in _____ stays in _____ with the same _____ and in the same _____ unless acted upon by an _____ force.
The Law of _____.

How does this jump illustrate the 1st Law?

You try!

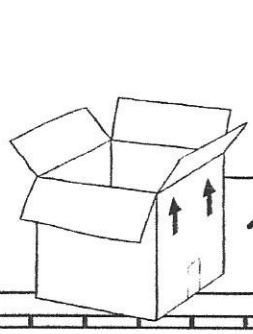


Describe and illustrate your own example!

2ND LAW

The _____ of an object _____ with increased _____, decreases with increased _____, and is in the same _____ as the force. F = M x A

How does pulling an empy box versus a full box illustrate the 2nd Law?



You try!

Describe and illustrate your own example!

3RD LAW

When one object exerts a _____ on another object, the second object exerts an _____ and _____ force on the first object.
Action - _____ forces.

How does pushing against a wall illustrate the 3rd Law?

You try!

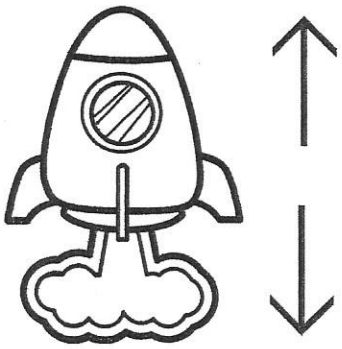
Describe and illustrate your own example!

SHOW what you KNOW

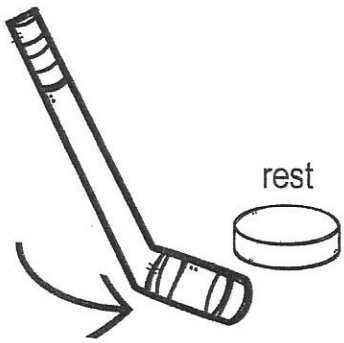
NEWTON'S 3 LAWS

Name: Date:

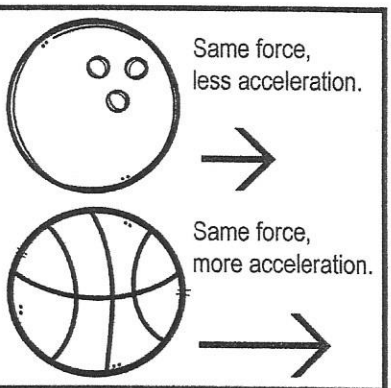
1. Identify the Law from the given illustration.



A:



B:



C:

2. Which of the following would change when an unbalanced force acts upon an object at rest?
   a. the object's mass
   b. the object's weight
   c. the object's motion
   d. the object's density

3. How quickly an object accelerates would depend upon what two things?
   a. weight and mass
   b. force and mass
   c. motion and mass
   d. none of these

4. Forces that do NOT cancel each other out are known as _____ forces.

5. Newton's 3rd Law deals with Action - _____ forces.

6. Magician's often use the trick of pulling a table cloth out from under a table full of dishes without moving the dishes. Which law would this be an illustration of and why?

7. When you are standing on a bridge, you are pushing down on the bridge but you don't fall through (hopefully!). Which law would this be an illustration of and why?

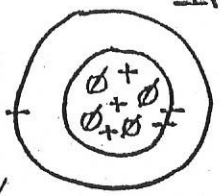
8. When shopping, it is much easier to push the empty shopping cart than when it begins to fill up. Which law would this be an illustration of and why?

Group # = similar properties

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

of Valence Electrons = Reactivity

Inert



1 / 1A / 3 Li

Protons	+	1amu	Nucleus
Neutrons	ø	1amu	Nucleus
Electrons	−	ø amu	electron cloud

Mass

PERIODIC TABLE OF THE ELEMENTS

of protons = Identify element

Periods = energy levels (rings)

Group

Period

Atomic number — 14
Symbol — Si
Atomic mass — 28.085
Silicon — Name

Atomic # = Protons = Electrons

mass # − Atomic # = Neutrons

Noble gases: stable/Non-reactive

	1 1A	2 2A	3 3B	4 4B	5 5B	6 6B	7 7B	8	9 8B	10	11 1B	12 2B	13 3A	14 4A	15 5A	16 6A	17 7A	18 8A
1	1 H 1.008 Hydrogen																	2 He 4.0026 Helium
2	3 Li 6.94 Lithium	4 Be 9.0122 Beryllium											5 B 10.81 Boron	6 C 12.011 Carbon	7 N 14.007 Nitrogen	8 O 15.999 Oxygen	9 F 18.998 Fluorine	10 Ne 20.180 Neon
3	11 Na 22.990 Sodium	12 Mg 24.305 Magnesium											13 Al 26.982 Aluminum	14 Si 28.085 Silicon	15 P 30.974 Phosphorus	16 S 32.06 Sulfur	17 Cl 35.45 Chlorine	18 Ar 39.948 Argon
4	19 K 39.098 Potassium	20 Ca 40.078 Calcium	21 Sc 44.956 Scandium	22 Ti 47.867 Titanium	23 V 50.942 Vanadium	24 Cr 51.996 Chromium	25 Mn 54.938 Manganese	26 Fe 55.845 Iron	27 Co 58.933 Cobalt	28 Ni 58.693 Nickel	29 Cu 63.546 Copper	30 Zn 65.38 Zinc	31 Ga 69.723 Gallium	32 Ge 72.630 Germanium	33 As 74.922 Arsenic	34 Se 78.971 Selenium	35 Br 79.904 Bromine	36 Kr 83.798 Krypton
5	37 Rb 85.468 Rubidium	38 Sr 87.62 Strontium	39 Y 88.906 Yttrium	40 Zr 91.224 Zirconium	41 Nb 92.906 Niobium	42 Mo 95.95 Molybdenum	43 Tc Technetium	44 Ru 101.07 Ruthenium	45 Rh 102.91 Rhodium	46 Pd 106.42 Palladium	47 Ag 107.87 Silver	48 Cd 112.41 Cadmium	49 In 114.82 Indium	50 Sn 118.71 Tin	51 Sb 121.76 Antimony	52 Te 127.60 Tellurium	53 I 126.90 Iodine	54 Xe 131.29 Xenon
6	55 Cs 132.91 Cesium	56 Ba 137.33 Barium	71 Lu 174.97 Lutetium	72 Hf 178.49 Hafnium	73 Ta 180.95 Tantalum	74 W 183.84 Tungsten	75 Re 186.21 Rhenium	76 Os 190.23 Osmium	77 Ir 192.22 Iridium	78 Pt 195.08 Platinum	79 Au 196.97 Gold	80 Hg 200.59 Mercury	81 Tl 204.38 Thallium	82 Pb 207.2 Lead	83 Bi 208.98 Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
7	87 Fr Francium	88 Ra Radium	103 Lr Lawrencium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson

Atomic masses are not listed for elements with no stable or common isotopes.

57 La 138.91 Lanthanum	58 Ce 140.12 Cerium	59 Pr 140.91 Praseodymium	60 Nd 144.24 Neodymium	61 Pm Promethium	62 Sm 150.36 Samarium	63 Eu 151.96 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.93 Terbium	66 Dy 162.50 Dysprosium	67 Ho 164.93 Holmium	68 Er 167.26 Erbium	69 Tm 168.93 Thulium	70 Yb 173.05 Ytterbium
89 Ac Actinium	90 Th 232.04 Thorium	91 Pa 231.04 Protactinium	92 U 238.03 Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium

= metalloid
X = non-metal
□ = metal

LCM

Reactants ⟹ Products

$H_2 + O = H_2O$

E	a	M	E	a
H	2	E	H	2
O	1	A	O	1

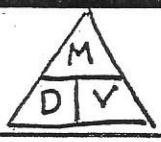
Chemical Reaction { Bubbles = Precipitate = Light = Temp. = Color = Smell = (Gas)

Updated 2017

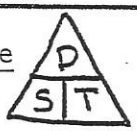
AFM

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

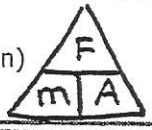
FORMULAS

Density = $\frac{\text{mass}}{\text{volume}}$ 

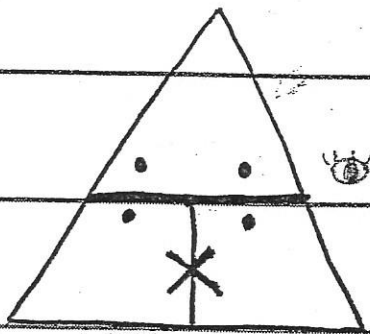
$D = \frac{m}{V}$

Average speed = $\frac{\text{total distance}}{\text{total time}}$ 

$s = \frac{d}{t}$

Net force = (mass)(acceleration) 

$F = ma$



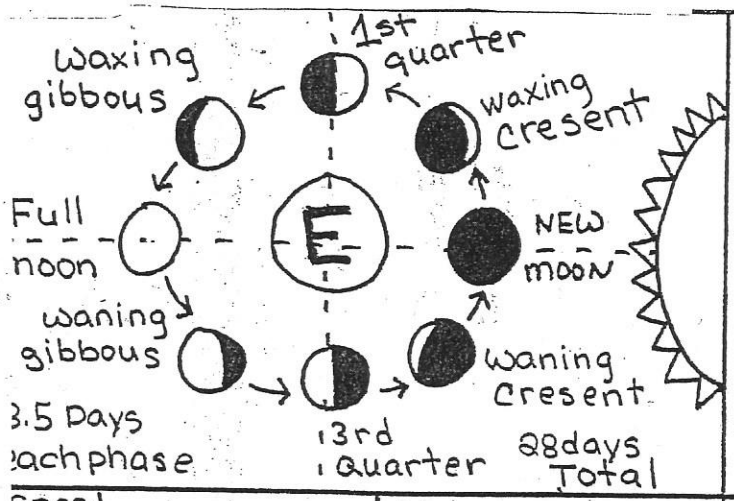
for conversions

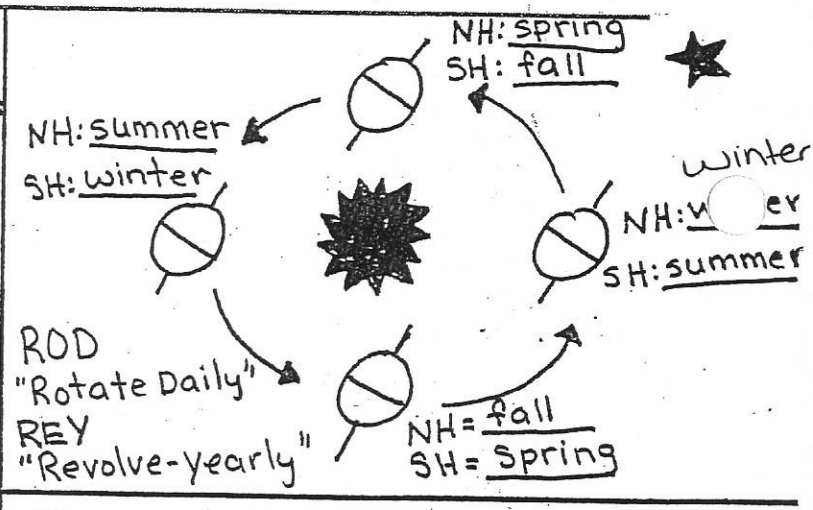
Balanced Force — NO change — CONSTANT

UNBALANCED Force : Changes

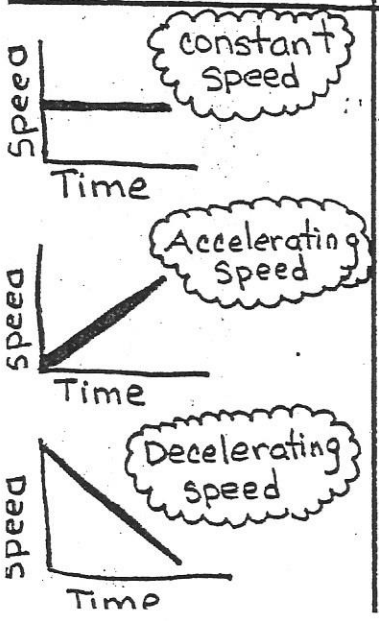
Speed = $\frac{D}{T}$ Velocity = Speed ($\frac{D}{T}$) with direction

Acceleration = change for conversions

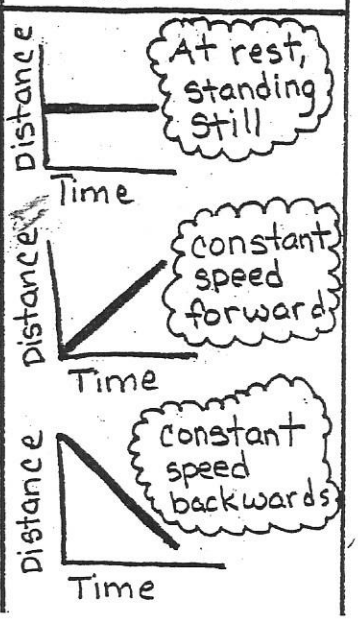




Speed vs. Time



Distance vs. Time



Convergent

- oceanic/oceanic = Island arc, trench
- oceanic/continental = Volcanoes, trench
- continental/continental = mountains

Trenches form at subduction zones

Divergent

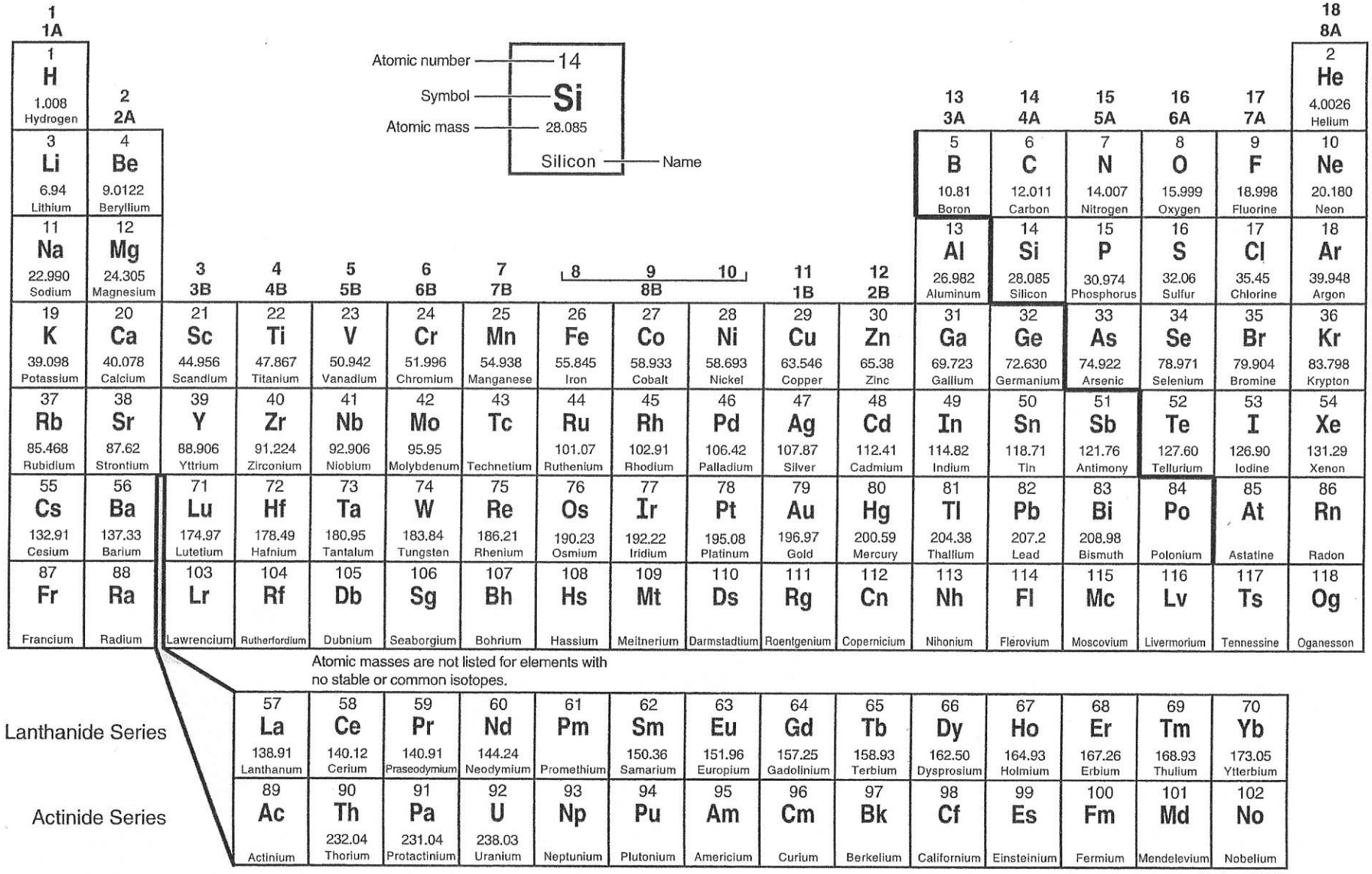
- In oceans = Mid-Ocean Ridges
- In continents = Rift Valley

Transform

Earthquakes

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

PERIODIC TABLE OF THE ELEMENTS



Updated 2017

Source: International Union of Pure and Applied Chemistry

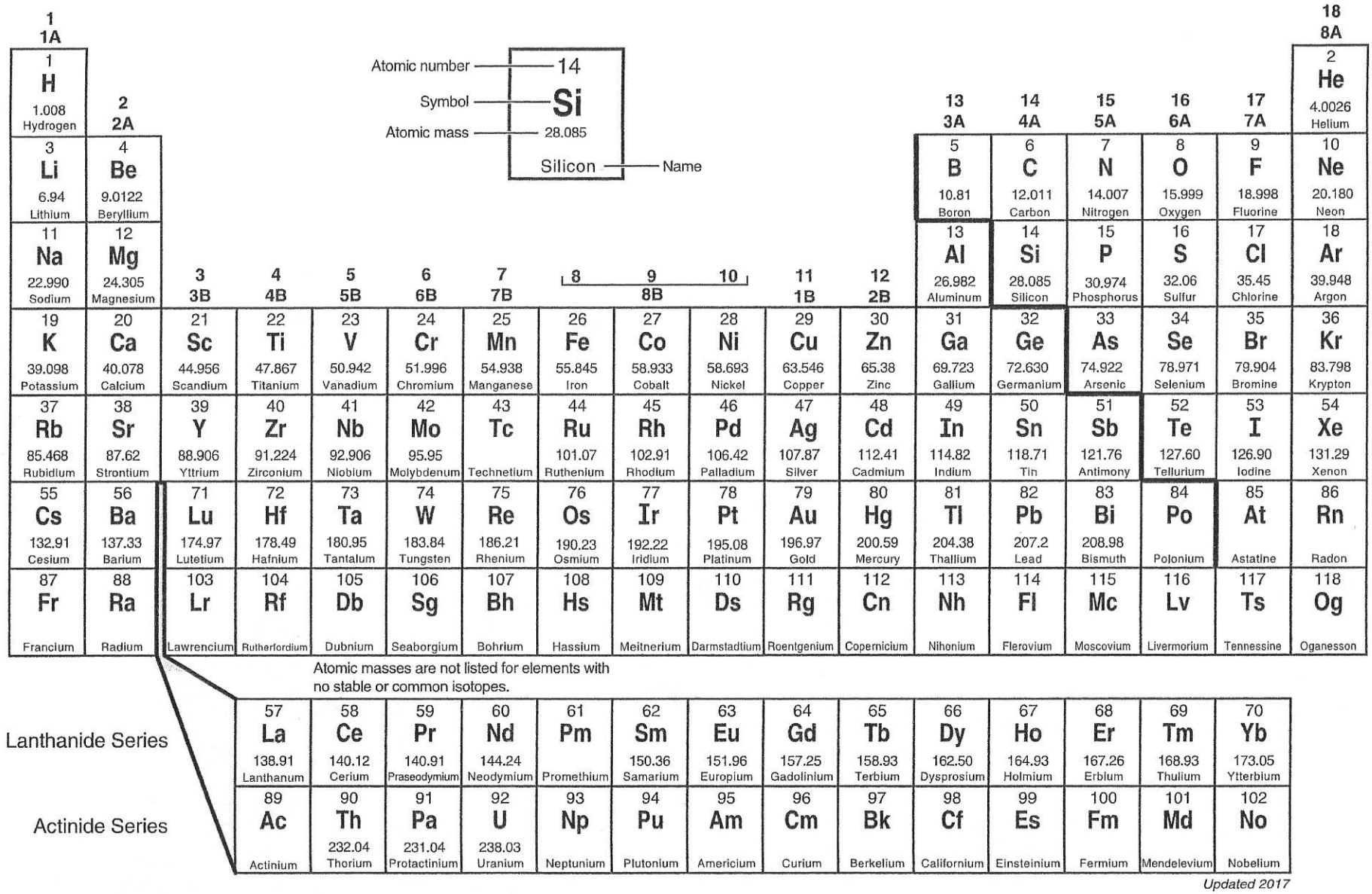
STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

FORMULAS

Density $= \frac{\text{mass}}{\text{volume}}$	$D = \frac{m}{V}$
Average speed $= \frac{\text{total distance}}{\text{total time}}$	$s = \frac{d}{t}$
Net force = (mass)(acceleration)	$F = ma$

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

PERIODIC TABLE OF THE ELEMENTS



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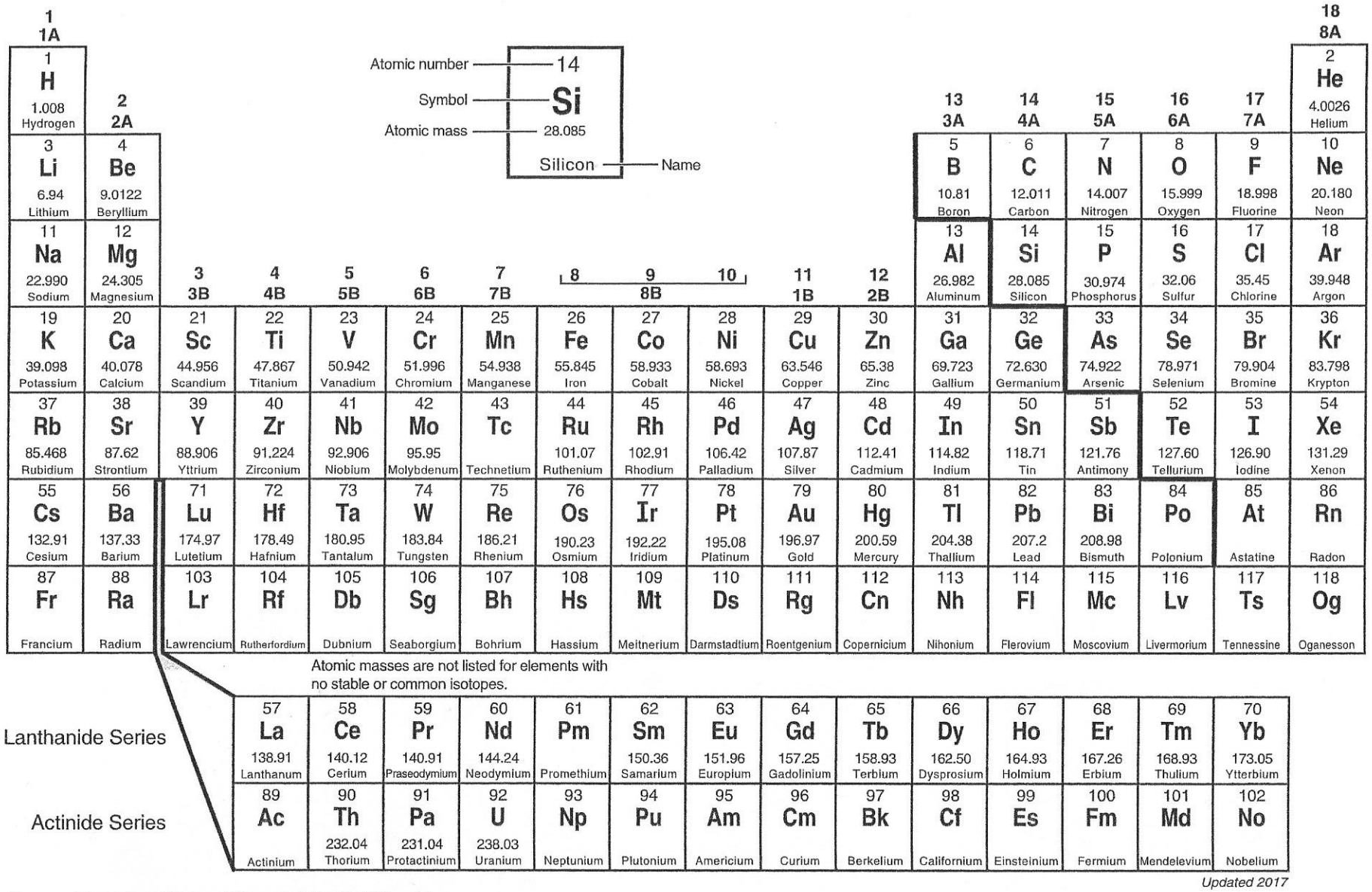

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