Cycles Packet:
Name:_____
Period: _____

Assignment	Self Check: Did I do it?	Peer Check Did they do it?	Final Grade	Points Possible
Day 1: Cycles pretest				5
Day 1:.Raging Planet Questions				5
Day 2:Section 1.1 notes 1:				5
Day 2: Section 1.1 reading part 1				5
Day 3: Earth Brainpop				5
Day 3: Section 1.1 notes part 2				5
Day 3: Section 1.1 Reading part 2				5
Day 3: Water Cycle brainpop				5
Day 3: Water and carbon cycle notes				5
Day 3: Section 1.3 book work				5
Day 4: Energy cycle notes				5
Day 4: 1.3 bookwork worksheet				5
Day 5:Pass/fail test 1: raging planet video				15
Day 6: Density lab				5
Day 7-8 Final project				10/15

Cycles pretest: Do your best!

1. _____ The gaseous envelope of air surrounding Earth.
2. _____ The continuous cycling of water through the hydrosphere as solid, liquid, or gas.
3. _____ All living organisms in the Earth system.
4. _____ Energy emitted by the sun.
5. _____ The rocks, mountains, lithospheric plates, and other physical features of Earth except for water.

Word bank: biosphere, Solar Energy, Geosphere, Atmosphere, water cycle

What do you think a cycle is? _____
_____
_____

After the Raging planet video:

We're going to learn about several cycles: The carbon cycle, the water cycle, and the energy cycle. Which of these cycles do you think a hurricane is more involved in?

_____

How is the hurricane involved in this cycle? _____
_____

What do you think you would do if a hurricane was to come to Santa Clarita (They don't, and we'll learn why this year!)

_____
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Earth Science Date:	Name: Period:

Section 1.1

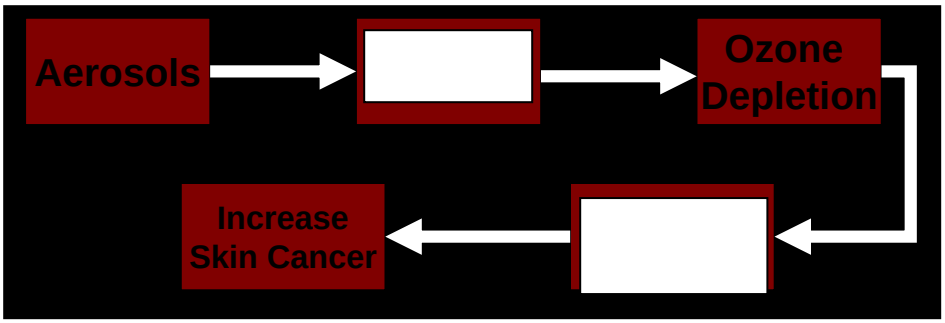
Earth Scientists Study:

- The _____ Earth _____ (geologist, geomorphologist, geophysicist)
- The _____ (meteorologist, atmospheric scientists.)
- The _____ (oceanographer)
- _____ (astronomers.)

The Rise of Earth's Systems:

Earth System Science model states that _____ individual parts (oceans, land, atmosphere, space) are _____ - _____ to one another.

Notice: No process in independent! Each process causes an effect on one another, they are all interrelated.



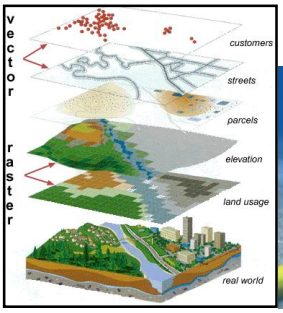
20th Century Rise of Earth System Model

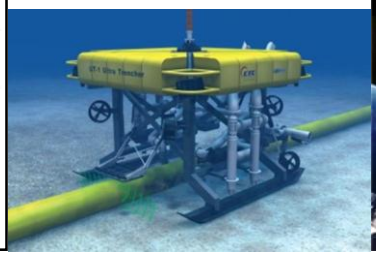
Due to _____ in _____:

- _____ – see Earth from space.
- Deep-Diving _____ – allows us to explore great ocean depths.

Summary:

- _____ – Scientists can study terrain.





These changes in technology allow us to create _____

- A model is a representation of an _____, a _____, or a _____.

What is a system?

A System is a kind of _____ that allows scientist to _____ part of the universe _____.

- Closed System: _____ can enter and leave, but _____ doesn't enter or leave.

- Open System: The system and its surroundings freely exchange both _____ and _____.

Summary:

A Planetary System

Although Earth is considered a _____ system, there are some exceptions:

- Atmosphere does lose _____ _____ into space.
- _____ enter the atmosphere from space.

Nature, Science, and Human Policy

How has science changed _____ policy towards the _____?

- _____
- Preservation of Nature
- Global _____ issues.
- Water rights and allocation.

Summary:

Reading Notes

Sec. 1.1 Pgs. 4-7

A New View of Earth

1_____

Past Perceptions Meet New Issues

1_____

2_____

The Rise of Earth System Science

1_____

2_____

What is a System?

1_____

2_____

3_____

4_____

A Planetary System

1_____

Nature, Science, and Human Policy

1_____

2_____

3_____

4_____

Section 1.1 Review Q's, Pg. 7

1._____
_____
2. _____
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3. _____
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4._____
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Section 1.1 Summary of Key Ideas, Pg. 22

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Water cycle brainpop:

1. What kind of water is in the atmosphere? _____
2. What do we call it when the water goes from liquid to gas? _____
3. Water constantly _____ from land to air and back again.
4. Why is the water cycle important for life?

_____

5. What powers the movement of the water in the hydrosphere?

_____

6. How does water return to the earth?

_____

7. Water flowing through the earth is called _____
8. What is water inside the ground called? _____
9. How long has the water cycle been going on? _____
10. Have we added more water in the last billion years? _____

Tim said that the sun acts like the heart for the water cycle. What does the sun do to water that is like what our heard does to our blood?

_____

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4 Questions:

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Agenda:

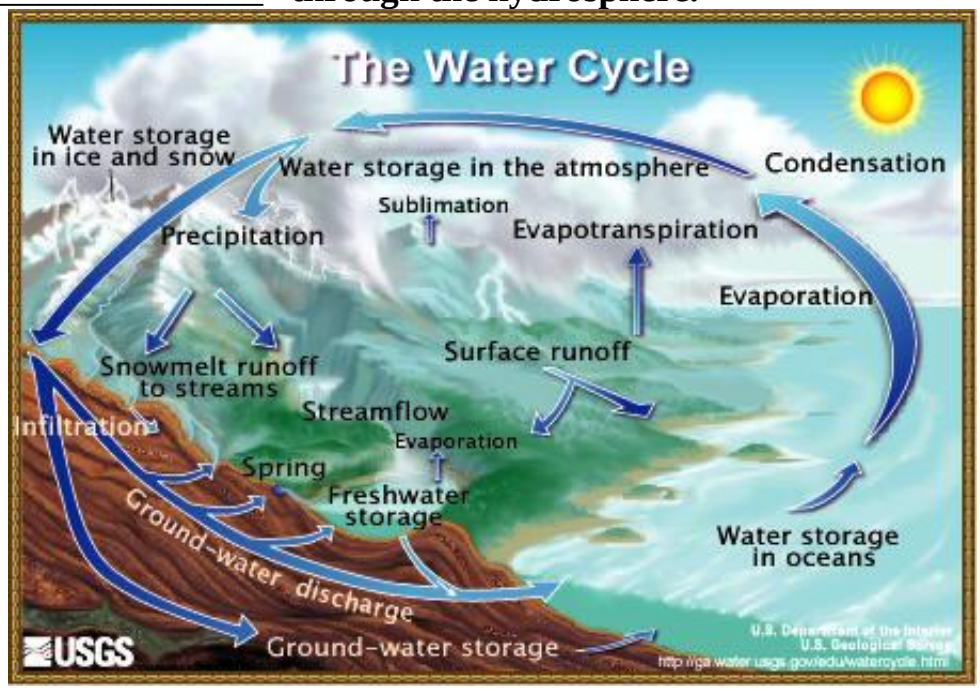
- **The Water Cycle**
- **The Carbon Cycle**

_____

A Cycle is a _____ of events that _____ . The _____ main cycles that work together on Earth are the Water Cycle, Carbon Cycle, and Energy Cycle.

Remember! All cycles work together to influence Earth's _____ .

The Water Cycle is the continuous _____ of _____ through the hydrosphere.



3 sentence summary: _____

_____

_____

_____

Carbon cycle brainpop:

1. What is carbon the building block of? _____
2. Animals add what to the atmosphere? _____
3. What do plants do with the carbon? _____
4. What happens to carbon when animals and plants die?

_____

5. How does the earth return carbon to the atmosphere?

_____

6. How has the cycle gone out of balance?

_____

7. Why does clearing forests cause more carbon dioxide to be in the atmosphere?

_____

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8. How does carbon dioxide warm the earth?

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4 Questions:

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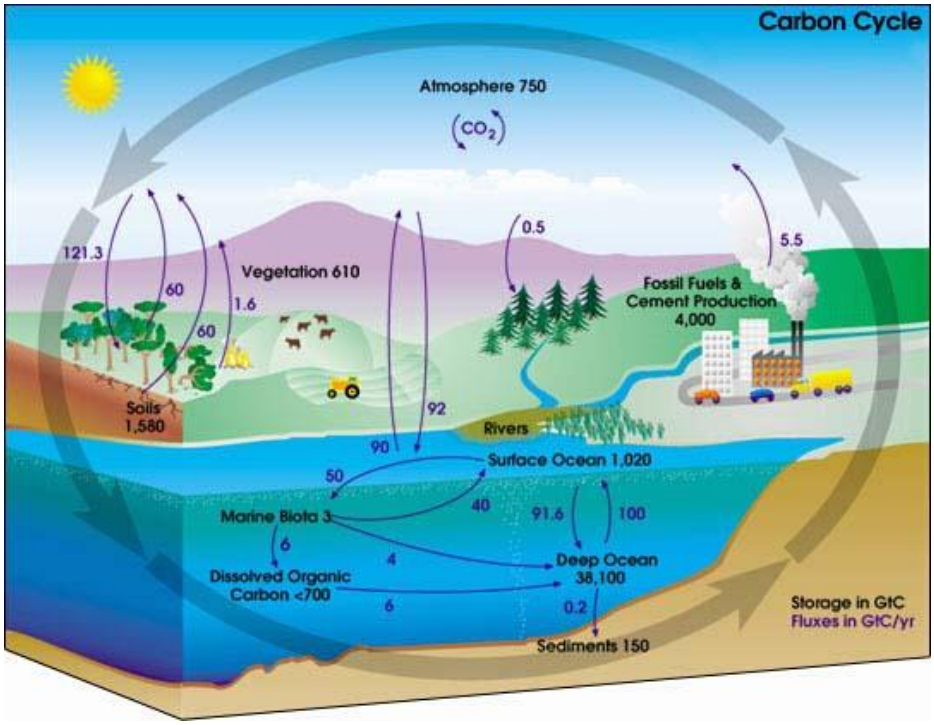
<u>The Carbon Cycle</u> is a _____ cycle involving the element _____ (C) that is the building block of _____ .

How does Carbon _____ our Atmosphere?

- **_____ _____**
- **Organism decay.**
- **Burning carbon materials.**
- **_____ _____**
- **Diffuses from oceans.**

How does Carbon Leave our Atmosphere?

- **Plants _____ , take in CO2 & release _____ .**
- **Phytoplankton**
- **Wave action _____ CO2, leads to Calcium Carbonate (lime, sea shells).**
- **_____ Fuel formation!**



3 sentence summary: _____

_____

_____

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Cycles and the Earth

1_____

The Water Cycle

1_____
2_____
3_____

The Carbon Cycle

1_____
2_____
3_____
4_____
5_____

The Energy Cycle

1_____
2_____
3_____
4_____
5_____

The Laws of Thermodynamics

1_____
2_____

The Effects of Earth's Surface

1_____
2_____

Human Activity and the Cycles

1_____
2_____

Section 1.3 Review Q's Pg. 18

1._____
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2. _____
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3. _____
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4._____
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Section 1.3 Summary of Key Ideas, Pg. 22

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4 Questions:

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The Energy Cycle

The Energy Cycle refers to the _____ that moves into and out of _____ system. Earth acts in constant _____ The Energy going in equals energy going out. There are three sources:

1. **_____ Energy.**
2. **_____ Energy.**
3. **_____ Energy.**

Most of the energy received at Earth's surface is Solar Energy, energy that comes from the _____ .

- **Drives our _____**
- **Drives our _____ currents and waves.**
- **_____ of rocks.**
- **_____ plant and phytoplankton photosynthesis.**
- **Comes from _____ fusion reactions in the sun.**

Geothermal energy is heat that originates from deep within the _____

- **Makes up _____ of heat**
- **Drives movement of Earth's Lithosphere.**
- **Powers _____**
- **_____**
- **_____**

Tidal energy results from the _____ pull of the moon and the sun on Earth's _____

- **Makes up 0.002% _____ budget.**
- **Although accounts from little of Earth's energy, it is still enough to _____ down Earth's rotation.**

What Happens to the Energy?
In order to maintain a balance, incoming energy has to somewhere!!!

- **40% is reflected back to space before it even reaches Earth's surface.**

3 sentence summary: _____

_____

_____

_____

Section 1.3

Cycles and the Earth

KEY IDEA

The water cycle, the carbon cycle, and the energy cycle all involve interactions among the four spheres of Earth.

KEY VOCABULARY

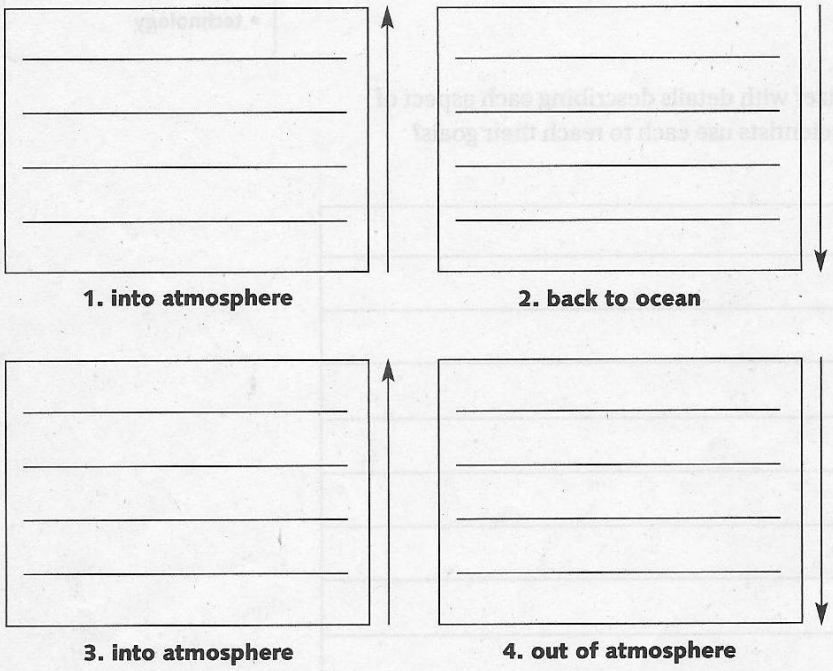
- cycle
- water cycle
- evapotranspiration
- carbon cycle
- energy cycle
- solar energy
- geothermal energy
- tidal energy

Before you read:

Preview the list of key vocabulary terms with a partner. Exchange knowledge you may have of the terms and concepts listed.

While you read:

Complete the organizer to show the continual steps in the water and carbon cycles.



1. into atmosphere
2. back to ocean
3. into atmosphere
4. out of atmosphere

After you read:

1. Compare and contrast the carbon and water cycles with the energy cycle.

2. What is albedo? What happens to the Earth's energy budget when the albedo in an area changes?

The Density of Earth Materials

Density, a measure of the amount of material (mass) in a given space (volume), is expressed as the ratio $D = m/V$. Differences in the densities of Earth's matter are the basis of many common processes. Wind, ocean currents, and plate tectonics are all driven by differences in density.

Even careful measurements of density contain some error. **Percent error** is the amount by which a measurement differs from an accepted value.

$$\text{Percent error} = \frac{\text{Calculated measurement} - \text{accepted measurement}}{\text{accepted measurement}} \times 100$$

In this lab, you will measure both mass and volume for regularly and irregularly shaped objects and then use the data to calculate densities.

Procedure

Part A: Finding the Density of Regular Solids

1. Use the balance to measure the mass of the cube to the nearest tenth of a gram. Copy Table 1 and record the mass.

Table 1: Density Chart for Regular Solids*

Object	Mass (g)	Length (cm)	Width (cm)	Height (cm)	Volume (mL)	Density (g/cm^3)	Percent Error
cube			———	———			
rectangle							
cylinder		———					

Round off all values to the nearest tenth of the given unit.

2. Measure and record the dimensions of the cube. Using the formula on page 732, compute and record the cube's volume.
3. Calculate the density of the cube by using its mass and volume.
4. Record the radius of the cylinder in the column labeled *width*. Repeat Steps 1–3 using the rectangle and the cylinder.
5. Obtain the accepted value for the density of each object from your teacher. Use this value to calculate the percent error for each object.

Part B: Finding the Density of Irregular Solids

6. Pour about 50 mL water into a 100-mL graduated cylinder. Copy Table 2 and use it to record the measurements. Record the water's volume to the nearest 0.1 mL. Leave the water in the cylinder.
7. Find the mass of the cylinder plus the water. Record the mass.

Table 2: Density Chart for Irregular Solids*							
Solid	Mass Cylinder + Water (g)	Mass Cylinder + Water + Chips (g)	Mass Chips (g)	Volume Water (mL)	Volume Water + Chips (mL)	Volume Chips (mL)	Density Chips (mL)
5 chips							
10 chips							

*Round off all values to the nearest tenth of the given unit.

8. Use the 50-mL beaker to obtain a sample of wet limestone chips. Select 5 chips and blot them with a paper towel. Slide the chips into the cylinder, without splashing any water. Record the volume of the water plus the chips. Leave the chips in the cylinder.

9. Subtract the volume you calculated in Step 6 from the volume in Step 8. Record this value as the volume of the 5 chips.

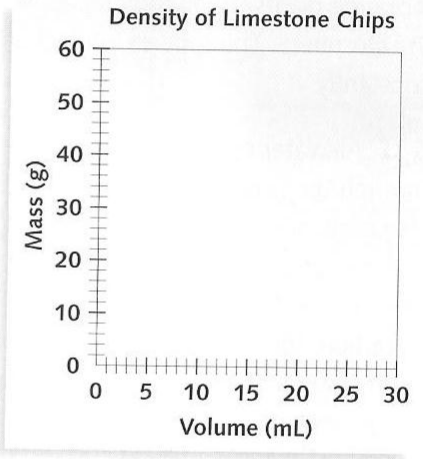
10. Find the mass of the cylinder containing the water and the 5 chips.

11. Subtract the mass of the cylinder and water from the mass of the cylinder, water, and 5 chips. Record your result as the mass of the 5 chips.

12. Use the formula $D = m/V$ to determine the density of the 5 limestone chips. Record the density in the table.

13. Repeat Steps 8–12 three times using a total of 10, 15, and 20 chips.

14. Copy the graph to the right and plot the data for the mass and volume of the chips. Draw a best-fit line for your data.



Analysis and Conclusions

1. Why are the densities of the regular solids about the same?

2. If one block were cut in two pieces, what would be the density of each piece? Why?

3. Why do the points on the graph form a nearly straight line? What does that say about the ratio of mass to volume? (Hint: Note that the slope of your line equals the density of the chips.)

4. On the graph, draw and label a line for a material with a density of 1.0 g/mL (slope equals m/V or 1.0 g/mL). Where is this line relative to the line for the chips? Explain.

5. On the graph, draw and label a line for a material with a density of 4.0 g/mL. Where is this line relative to the line for the chips? Explain.

6. What are some potential sources of error in this investigation?

Cycles (Chapter 1) Key Vocabulary, 10 Words

Word	Definition	Example or Image
Atmosphere		
Biosphere		
Carbon Cycle		
Energy Cycle		
Geothermal Energy		
Hydrosphere		
Model		
Solar Energy		
Tidal Energy		
Water Cycle		

Unit project: This will be done mostly at home, though some time in class will be allowed to begin it.

Pick one of three options:

1. Draw a picture or comic showing one or more of the following topics:
    a. The carbon cycle
    b. The water cycle
    c. The energy cycle

    This poster will be graded using a rubric below. 4 colors are required, and each picture must be explained with at least 6 lines of text. Text should be written in black marker or thick ink.

2. Write a three or more paragraph essay explaining 1. What earth science is. 2. Discribe at least 2 earth cycles. and 3. Explain why one of these cycles is important to our lives on earth.
3. On your own, research either the nitrogen cycle or the photosynthesis / respiration oxygen cycle. Perpare a 4 color poster showing the cycle or a 3 paragraph essay. This is worth extra credit.

Picture rubric: Cut out and tape to the back of your picture project:

Category	A	B/C	D/F
Content - picture	Contains at least 1 complete topic drawn out legibly and with care	One complete topic, but not legible or done without care	No complete topic
Content writing	At least 6 lines, most likely more – complete explanation of topic	6 lines, but not a deep or complete explanation of topic	Less than 6 lines, not complete
Content – Art quality	Care and time taken to with art and writing – 4 colors used, no stick figures, writing lined in with marker or felt tipped pen	Stick figures present, 2-3 colors used, writing done with pen or pencil	Art done quickly and without color, paper used is ripped or lined notebook paper.

Essay Rubric:

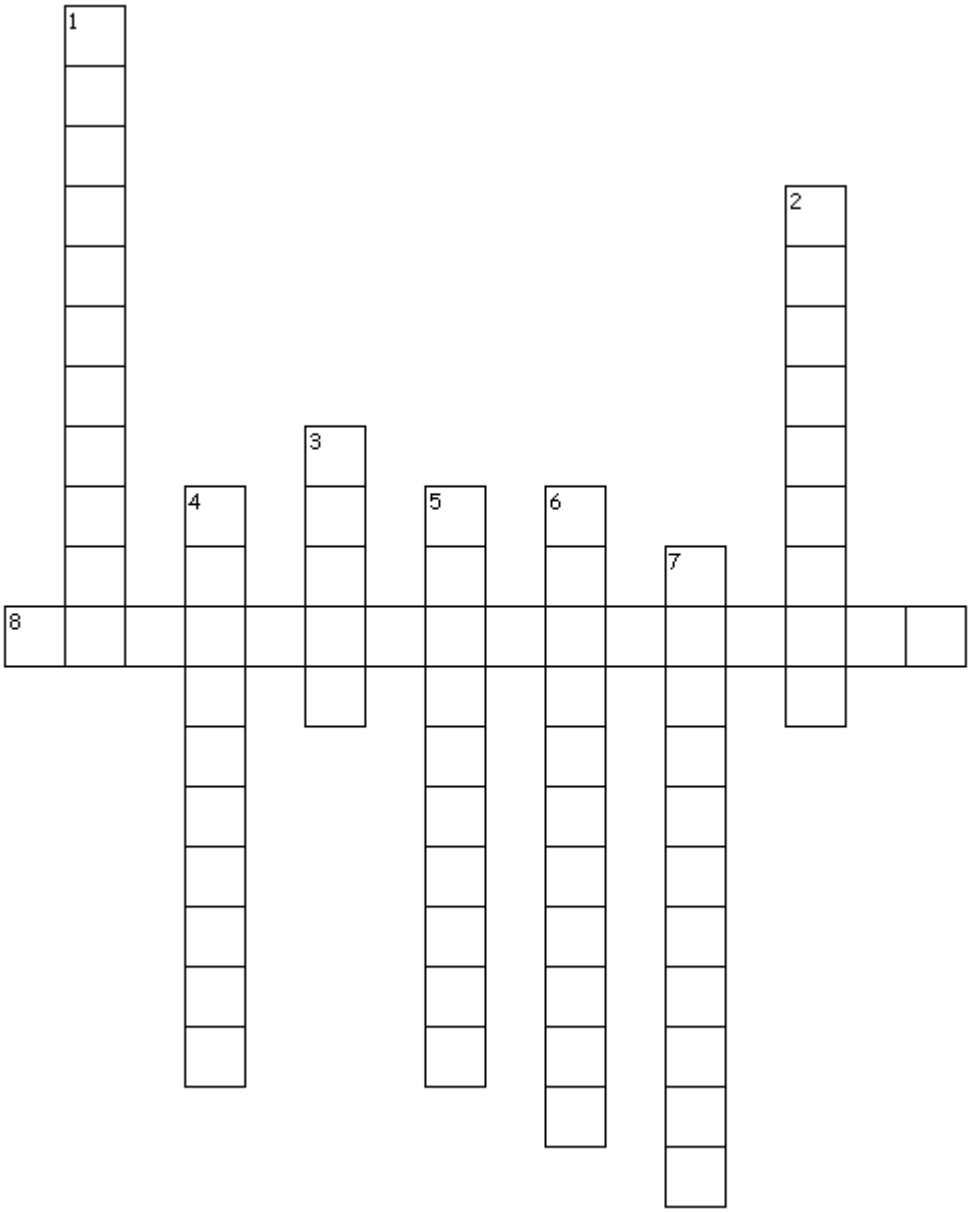
Category	A	B/C	D/F
Content - Ideas	Explains all 3 topics with a paragraph each accurately and clearly	Explains all 3 topics, with at least one complete and two partially explained	No topic is accurately and completely explained
Content writing	Grammar and spelling are correct, paper is easy and clear to ready.	Grammar and spelling are mostly correct, paper is mostly easy and clear to ready	Major grammar and spelling mistakes, paper is unclear
Content – presentation	Paper is typed or neatly handwritten. Font is 12 pt times new roman, margins are standard	Paper is not neatly handwritten but legible, odd fonts or margins.	Paper is ripped or tattered, handwriting is illegible. Fonts and margins are extremely odd.

Earth Cycle Word Search

O Z V T T W Y M U K U V I H X O D B C P
O N Q I K C U J Z S M I K Q D B H B E C
Z L F X R A N C Z V J W D V Y J G N M W
L Z J C P J C P C B A J U U H Q E F V F
Y P E B Z A O E Y T O D I Y J R O Z S X
U K Q D M Q L H E H M F D I G F T S V U
P S O S O L A R E N E R G Y Q D H Z D V
V G U W C O C A R B O N C Y C L E D O M
P L O V F Y T O L S R Y P J H R R E G Z
T T F F C D W O P M C M M B E C M T C Q
H T H L O C P H E L Y B S H U K A K I K
L V E V Y E E R E H P S O M T A L E X W
I S R R F R H D X O Q M B N Q W W O J G
C V R F E E Z L P Q M V A X H O O G S G
S D A T I H H V P B S C S K X W J V S R
L B V E U P P W C Q Z V E G Q Y Z R F V
S R R F L S T S Y J O G B C A W O C Z T
A N J N A O U D O B H S I R B S R S S Q
L C T F G E L T N I N B Y B X O U L A P
X C P O A G P P E Q B Q U O N B Q F P D

ATMOSPHERE
BIOSPHERE
CARBONCYCLE
ENERGY
ENERGYCYCLE
GEOSPHERE
GEOTHERMAL
HYDROSPHERE
MODEL
SOLARENERGY
WATERCYCLE

Earth Cycle Crossword puzzle



Across
8. energy from within the earth

Down
1. a biogeochemical cycle involving carbon
2. The living things on a planet
3. a representation of an object, process or phenomenon
4. the continuous circulation of water through the hydrosphere
5. The gaseous envelope surrounding the earth
6. Energy from the sun
7. The movement of energy into and out of the earth system

Extra credit: Read and take notes on section 1.2

Reading Notes

Sec. 1.2 Pgs. 8-12

The Earth System's Four Spheres

1_____

The Atmosphere

1_____

2_____

The Geosphere

1_____

2_____

3_____

The Hydrosphere

1_____

2_____

3_____

The Biosphere

1_____

2_____

Interactions Among the Spheres

1_____

2_____

3_____

How Interactions Change the Spheres

1_____

2_____

3_____

4_____

More Extra Credit:

Section 1.2 Review Q's Pg. 12

1._____
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2. _____
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3. _____
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4._____
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Section 1.2 Summary of Key Ideas, Pg. 22

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