Academic/ELL Earth Science AGENDA

**April 4, Wednesday: B Day**

* **Take out your agenda from Monday, Mar 19**

**WARM-UPS:  *CAREFULLY LISTEN TO INSTRUCTIONS***

1. ***We will review the groundwater zones, artesian formations, and water table wells***

**CONTENT OBJECTIVE:**

* Today you will understand that:
  + freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
* Identifying sources of fresh water including rivers, springs, and aquifers, with reference to the hydrologic cycle
* Earth’s fresh water supply is finite. Geological processes, such as erosion, and human activities, such as waste disposal, can pollute water supplies.

**Language Objective: Today you will:**

* **Using a diagram, differentiate between water table wells and artesian wells**
* **List the factors that contribute to Karst Topography**
  + **Describe/Identify the subsurface geology (rock)**
  + **Label the cave features that form**
* **Outline the Chesapeake Bay watershed using what you have learned about watersheds, topography, and divides**

**OBJECTIVES: Groundwater Zones and Karst Topography**

1. **NOTES: GROUNDWATER, WELLS, and KARST TOPOGRAPHY**
   1. **KARST topography and CAVES**

<https://www.youtube.com/watch?v=PpbxFpAZmSQ> **3-D animation**

[https://www.youtube.com/watch?v=e G9b\_xOLXCE](https://www.youtube.com/watch?v=e%20G9b_xOLXCE) **follows animation: subtitles**

<https://www.youtube.com/watch?v=DEaSCs661h8> **review of terms – subtitles**

1. **NOTES: Cave formations (dripstone)**
2. **Chesapeake Bay Watershed Map Lab**
   1. **Work in your group to complete the lab**
3. **TEST REVIEW: Questions?**

**EXIT TICKET: IF we have time:**

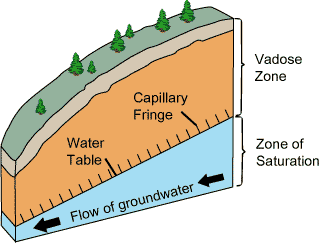
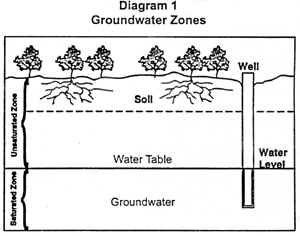
1. Choose a partner for the word sort
   1. **Ms. Hutson and I will select the group of 3 if there is an odd number**
   2. **Take out your groundwater notes fom Mar 19**
   3. **Match the definitions to the groundwater vocabulary terms**
   4. **Ms. Hutson and I will check your work**
   5. **Fill out your vocabulary chart/table**
   6. **Keep the chart but return all slips of paper back into the baggie and return the baggie to Ms. Hutson or Mrs. Francis**

**HOMEWORK:**

1. Complete the test review (March 21 agenda): TEST on surface and groundwater on FRIDAY

**Test REVIEW: Water Moving Underground & Review of the Water Cycle**

Label the Groundwater Zones.

** **

C

E

D

f

C

D

E

A

B

D

Identify the following locations on the diagram:

\_\_\_\_\_\_ 1. Capillary fringe

\_\_\_\_\_\_ 2. Dry section

\_\_\_\_\_\_3. Soil water storage

\_\_\_\_\_\_4. Water table

\_\_\_\_\_\_5. Zone of aeration

\_\_\_\_\_\_6. Zone of saturation

Identify which of the following affect the depth of the water table. If it **is a factor,** choose **“a”** = “***yes”***. If it is **not a factor,** choose “b” = “no”.

\_\_\_\_\_\_7 Season **a = Yes b = No**

\_\_\_\_\_\_8 Climate

\_\_\_\_\_\_9 Condensation

\_\_\_\_\_\_10 Type of impermeable rock (under the zone of saturation)

\_\_\_\_\_\_11 Soil thickness

\_\_\_\_\_\_12 Slope

\_\_\_\_\_\_13 Which of the following ***best*** represents the relationship between **depth of water table** and

**well-water levels?**

**A B C**

Water table rises, well level Water table lowers or rises, Water table rises, well level

Decreases; Water table sinks, Well water level remains rises; Water table falls, well

Well level rises the same. Level decreases

\_\_\_\_\_\_14 Which of the following ***best*** represents groundwater near wells after usage?

**A B C D**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_39 Term** used

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_15 Term** used to describe permeable rocks or deposits (sediments) that

transmit and carry water in sufficient quantities to supply wells.

\_\_\_\_\_\_16 Which diagram represents a water table **well? (Choose from A & B below)**

**\_\_\_\_\_\_17** Which diagram represents an **artesian well? (Choose from A & B below)**

**A B**

18 -19 Which description best fits the **groundwater** in the following locations (Choose from A, B, C):

1. Warm all year
2. Warm in summer, cool in winter
3. Average annual temperature for the region

Drawing NOT to scale:

Surface

18 (0 – 20 meters)

19 (1,000+ meters)

**\_\_\_\_\_ 18**

**\_\_\_\_\_19**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 20** What type of bedrock is found in **Karst topography**?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_21 List one other feature of Karst topography.

Diagram the cave formations in the space provided:

a. Column or pillar

b. Stalactite

c. Stalagmite

**Phase Changes, Water Cycle, & “All the World’s Water”**

\_\_\_\_\_25. The majority of Earth’s water is located in/as

1. Atmospheric water
2. Inland lakes, rivers, streams
3. In Ice Caps & Glaciers
4. Groundwater
5. Oceans

\_\_\_\_\_26. The majority of Earth’s fresh water is located in/as

1. Atmospheric water
2. Inland lakes, rivers, streams
3. In Ice Caps & Glaciers
4. Groundwater
5. Oceans

\_\_\_\_\_27. The majority of Earth’s ***useable*** fresh water (Where we get the majority of our freshwater).

1. Atmospheric water
2. Inland lakes, rivers, streams
3. In Ice Caps & Glaciers
4. Groundwater
5. Oceans

\_\_\_\_\_28. The hydrosphere involves water located in which of the following?

1. Atmosphere
2. Geosphere
3. Both a & b

***Phase change diagram***

Carefully examine the phase change diagram and use the information to answer the following:

29 30.

32 31

33

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_29 (Phase change)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_30

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_31

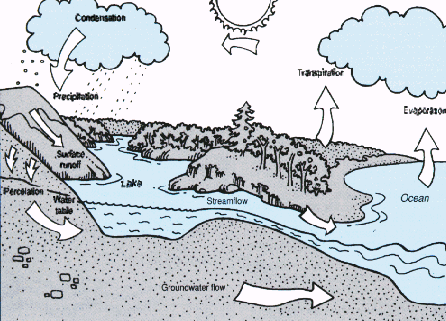
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_32

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_33

\_\_\_\_\_34. The cooling processes include

1. 29 & 30
2. 29 & 32
3. 31 & 32

**The Water Cycle: Label the diagram of the water cycle.**

**\**

37

37

40

38

39

36

35

2010 International Water Law Project

1. **Condensation**
2. **Evaporation**
3. **Infiltration**
4. **Precipitation**
5. **Run-off**
6. **Transpiration**

Surface Water Test Review

1. Vocabulary: Using a diagram, illustrate and label the following vocabulary

terms:

* Watershed
* Tributary
* River System
* Drainage Basin
* Divide
* Gradient
* Discharge
* Channel

1. Describe how channel shape and water flow will change in a river/stream over time.
2. Describe the relationship among energy and the 3 ways in which rivers/streams transport/carry material.
3. Compare & contrast depositional & erosional features of streams/rivers. Identify these features by name.
4. Compare & contrast flash floods & river floods
5. Using a diagram, illustrate the parts of young rivers/streams, middle-aged rivers/streams, and mature rivers/streams. Discuss the changes in energy and direction of erosion (vertical vs. horizontal) and the effect on formation of stream features.
6. Discuss the headward erosion in rivers/streams and compare this with the erosion evident in waterfalls, including the explanation of why waterfalls are continually moving back.

Karst Topography: Differentiate among Stalactites, Stalagmites, and Columns or Pillars. Where do you generally find these features?

**NAMES:**

**Chesapeake Bay Watershed: Mapping Activity**

* **Use the attached answer sheet to complete this lab activity**

**Read the attached information on the Chesapeake Bay:**

Write a brief description of a watershed/drainage basin

1. What is the Chesapeake Bay (physiographic feature)?
2. DESCRIBE the Chesapeake Bay Watershed

Outline the Chesapeake Bay Watershed on your map.

1. What is the name of the line you drew?
2. What feature would you look to find if this was a topographic map?
3. How many major rivers are tributaries (smaller streams that feed larger streams/river

systems) to the Bay on the WEST side of the Bay?

1. How many rivers/streams are tributaries to the Bay on the EAST side?

**Use the attached map to name the Rivers on the WEST side of the Bay**

**RIVERS**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_8 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_12

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_9 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_13

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_10 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_14

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_11

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 15. Which river contributes the MOST water to the Chesapeake (based on size of the WATERSHED)?

Identify ALL of the states/districts that ***have watersheds*** that drain into the Chesapeake Bay (how many states affect the Bay?)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_16 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_20

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_17 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_21

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_18 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_22

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_19

NAMES:

Chesapeake Bay Watershed Map Lab Answer Sheet

Complete the chart for questions #1 - #3

|  |  |  |
| --- | --- | --- |
| **Watershed/Drainage Basin** DESCRIPTION | **Chesapeake Bay** (physiographic feature) | **Chesapeake Bay Watershed** DESCRIPTION |
|  |  |  |

Chesapeake Bay Watershed Outline  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_15

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_16

\_\_\_\_\_\_6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_17

\_\_\_\_\_\_7 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_18

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_8 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_19

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_9 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_20

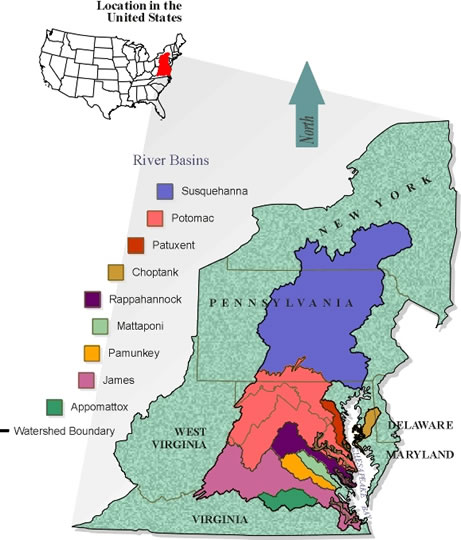
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_10 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_21

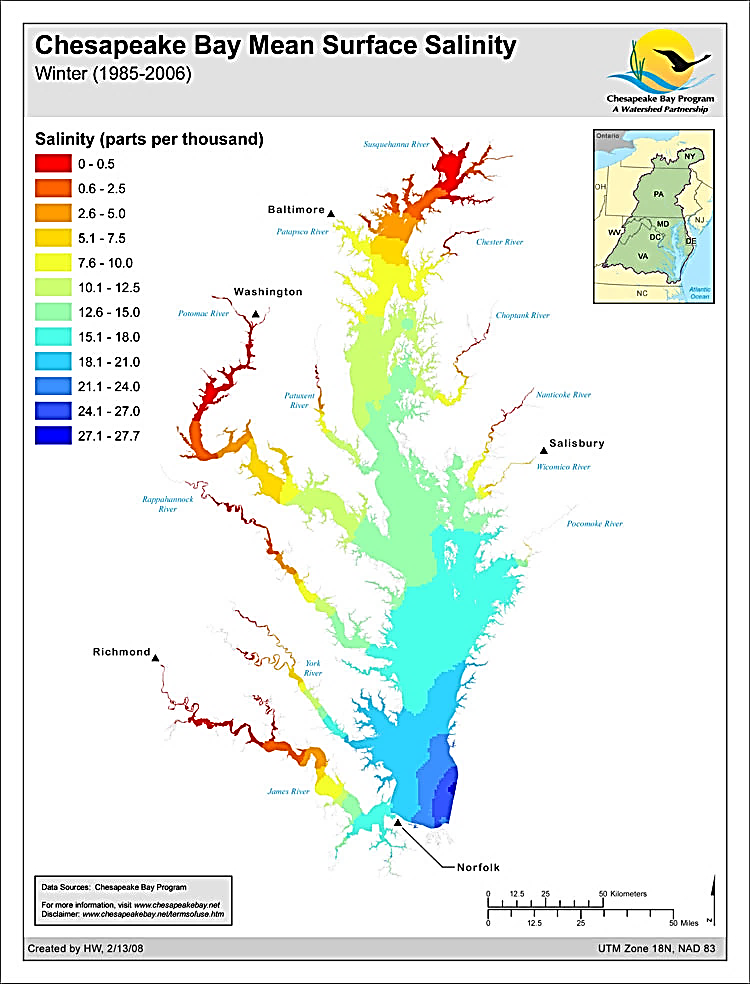
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_11 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_22

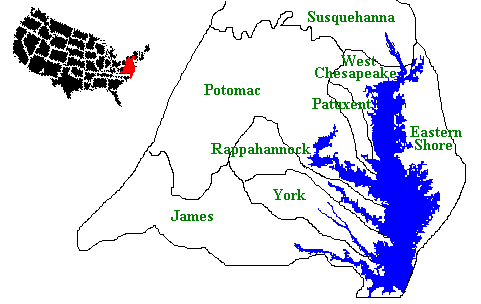
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_12

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_13

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_14







**Bay** Geography. The **Chesapeake Bay** is an ***estuary: a body of water where fresh and salt water mix. ..***. The **Bay** itself is about 200 miles long, stretching from Havre de Grace, Maryland, to Virginia Beach, Virginia. The **Bay's** width ranges from four miles near Aberdeen, Maryland, to 30 miles near cape Charles, Virginia.