Remote Learning Packet

NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.

April 27-May 1, 2020

Course: Science

Teacher(s): Mr. Weyrens

Weekly Plan:

Monday, April 27

☐ Practice Star-Splitter
☐ Weathering, Deposition, and Erosion Continued (Quiz Thursday)

Tuesday, April 28

☐ Practice Star-Splitter
☐ Erosion and Topographic Maps (Quiz Friday)

Wednesday, April 29

☐ Practice Star-Splitter
☐ Depositional and Erosional Features Review

Thursday, April 30

☐ Practice Star-Splitter
☐Depositional and Erosional Features Quiz

Friday, May 1

☐ Review
☐ Topographic Maps Quiz

Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

_____
Student Signature

_____
Parent Signature

Monday, April 27

- Practice reciting the Star-Splitter from the beginning until the line "Instead of a new fashioned one at auction?" at least 3 times.
    - Read the following 8 lines. In order to try to get to the end of the poem before the end of the year, we are going to skip learning these, but they are important for context. Think about how these lines are important to the development of Brad.
- Read through the material in "Weathering, Deposition, and Erosion Continued" and take notes.

Tuesday, April 28

- Practice reciting the Star-Splitter from the beginning until the line "Instead of a new fashioned one at auction?" at least 3 times.
- Read the material on topographic maps and erosion.
- Read "Erosion and Topographic Maps" section and answer the questions (answer key at the end of the packet).

Wednesday, April 29

- Practice reciting the Star-Splitter from the line "Mean laughter went about the town that day." Omitting the lines from "Out of a house…" to "That varied in hue from red to green," try to get all the way through to the line "His new job gave him leisure for star-gazing." Do this for 5-10 minutes.
- Complete the exercises for "Erosional and Depositional Features Continued" (answer key at the end of the packet).

Thursday, April 30

- Practice reciting the Star-Splitter from the line "Mean laughter went about the town that day." Omitting the lines from "Out of a house…" to "That varied in hue from red to green," try to get all the way through to the line "at a star quaking at the other end." Do this for 5-10 minutes.
- Spend 5-10 minutes reviewing for the Quiz.
- Complete the Erosional and Depositional Features Quiz on a separate sheet of paper using your notes and the material in the packets.

Friday, May 1

- Take 5-10 minutes to review for the quiz.
- On a separate sheet of paper, complete the "Topographic Map Reading Quiz" using your notes and the information in the packets.

Weathering, Deposition, and Erosion Continued

Try to recall the definitions for weathering, deposition, and erosion without consulting your notes (Stop here, say them in your head or out loud, then continue reading).

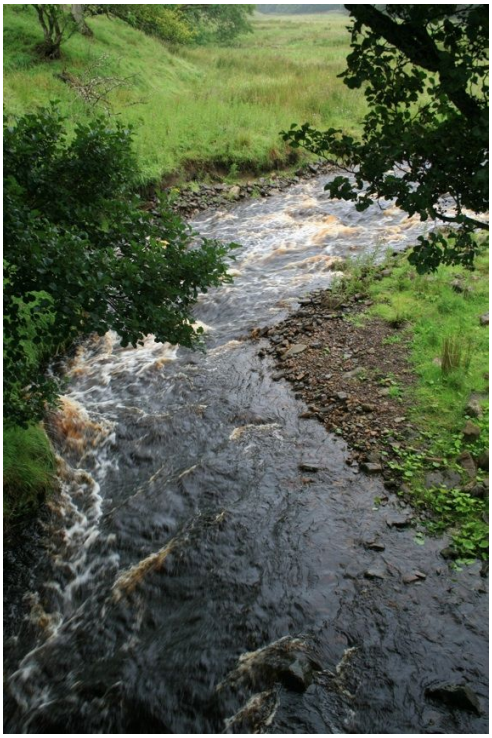
Weathering is any process which breaks down rocks into smaller pieces called sediments. Erosion is the process of carrying these sediments from one location to another. Deposition is the process of these sediments settling down in a new location. Erosion is inherently a destructive force, because it is taking material away from existing features. Deposition, on the other hand, is inherently a constructive force, because it is adding material to a location thereby creating new features.

These processes are very interconnected. You may see these forces in action if you've ever stood on the sandy shore of a lake or ocean and let the tide wash over your feet. If you stand in the same place long enough, you will find yourself sinking into the sand. The water is moving the sand out from under your feet; erosion is occurring. Likewise, new sand is being deposited on top of your feet by the tide; deposition is occurring.

Now we can think about what kind of features will occur from these processes and how. Erosion we said is destructive, so how will things like elevation change where erosion is occurring (say, along a river)? The Grand Canyon was formed (at least in part) by the erosional action of the Colorado River. The area where the erosion was occurring went downwards (the elevation was lowered) just like what happens to your feet when you stand in the tide. Likewise, where there is deposition, material is being added. The elevation should be rising where there is deposition occurring.

We looked at some features of erosion and deposition last week: alluvial fans, deltas, barrier islands, flood plains, meanders, and oxbow lakes. To get an idea of how these kinds of features form we will look at the example of meanders and oxbow lakes. These form in several stages.

The first stage is when the river is fairly straight. Because the river is not perfectly uniform, the erosion and deposition will be occurring unevenly, causing sediment bars to form in some areas and river wear to occur in others (think about which one means there is more deposition occurring and which one means there is more erosion occurring):



In stage two (shown left), more material is being deposited where there is the sediment bar because the water is being slowed down. Likewise, more erosion is occurring where there is river wear as the water will begin moving faster. This leaves the area with the sediment bar becoming the inside of the meander and where there is river wear will be the outside of the meander:

In stage 3 (shown below), a river cliff or bluff is created on the inside of the meander. A gently sloping area of pebbles or sand forms due to the combined processes of deposition and erosion that are occurring. This is not necessary for you to know: the meander is perpetuated by something called helicoidal flow (think helix). This is where the water hits the bank and corkscrews, leaving sediment deposited on the bank:

In stage four, the inside of the meander can be breached, causing part of the curve to be cut off from the rest of the river and creating an oxbow lake. In the picture below, you can see the River Derwent getting close to creating an oxbow lake:

Source: http://www.geography.learnontheinternet.co.uk/topics/river_middle_course.html

Erosion and Topographic Maps

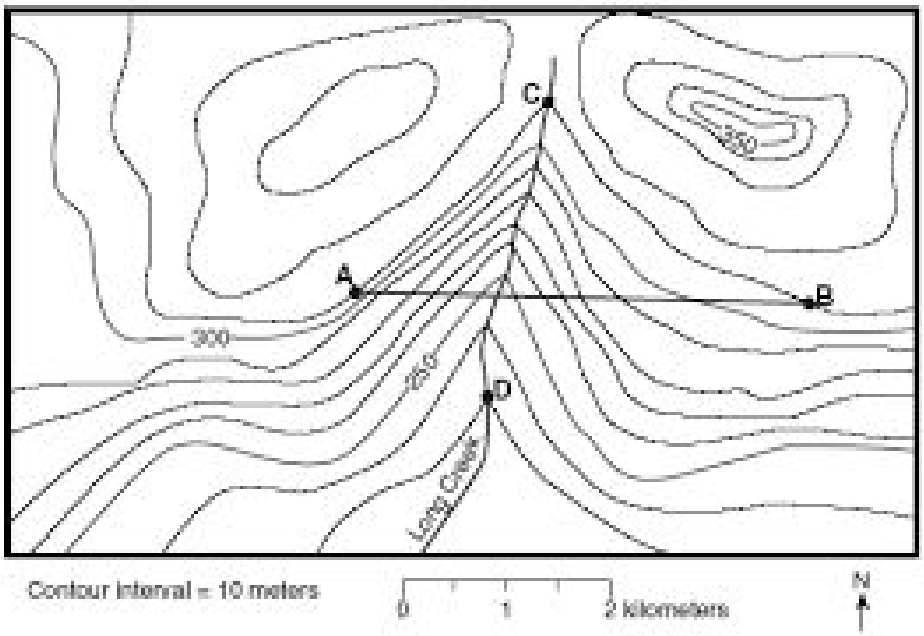
Knowing how different features are created can help us interpret topographic maps. Recall, for instance, that both a ridge and a valley can be shown on the topographic map when the contour line forms a U or V shape. There are often markings on the maps which can tell us which one it is (the tick marks which point in an uphill direction), but we can also tell by the other features which are present on the map.

Think, for instance, if there is a river or creek marked on the map where the contour line forms a U or V shape. Based on what you know of erosion and deposition, do you think that this will indicate a valley or a ridge? Try to reason why it should mean one or the other before continuing to read.

The river or creek will often mark a valley. Why? Because the moving water is taking sediment away from this area; in other words, erosion is occurring. Just like with the Colorado River and the Grand Canyon, the water will be carving down into the earth as it flows, not building up on top of it.

It is also true that you can use the contours to learn things about the rivers or creeks. For instance, due to gravity, rivers will flow downhill. So if you are trying to figure out which direction the river is flowing, you can look at the various contour lines that it flows through and read their elevation.

Exercises:



1. Which point(s) lie along a valley in this map?
2. What is the elevation of point C? D?
3. In which direction does long creek flow?

Exercises for Erosional and Depositional Features

1. For an alluvial fan to form, the water must flow down a narrow path that is fenced in by canyon walls or other features, and then reach an open plain. Using what you know about how deposition and erosion occur to form meanders and oxbow lakes, as well as the picture below, answer the following questions:
    a. Identify where the narrow path is and where the open plain is in the picture. Now think about what happens to the water as it flows down the path and reaches the open plain. Where do you think the water will be moving faster? Where will it be moving slower?
    b. Based on the picture, where is deposition occurring? Where is erosion occurring?
    c. Based on the picture, what happens to the sediment-carrying water as it exits the narrow path and enters the open plain?
    d. What conclusions can be drawn about the relative speed of the water (slower or faster) and the causes of erosion and deposition?

Answer Key:

Topographic Map exercises:

1. Points C and D lie along a valley. They lie along a river where the contour lines form a v, therefore they are on a valley.
2. The elevation of point C is 310 meters. The elevation of point D is 230 meters.
3. Because point C is more elevated than point D, the river flows from point C to point D. Therefore, the river flows south.

Erosional and Depositional Features Exercises:

1a. When the water reaches the open plain, it will slow down. The water is moving faster in the narrower path than in the open plain.

1b. The deposition is occurring in the open plain. That is where all the sediment appears to be, so that is where the deposition is occurring.

1c. As the water exits the narrow path, it begins to spread out into the open plain. The water is what is carrying and depositing the sediment, so since the sediment "fans" outward, that is what happened to the water.

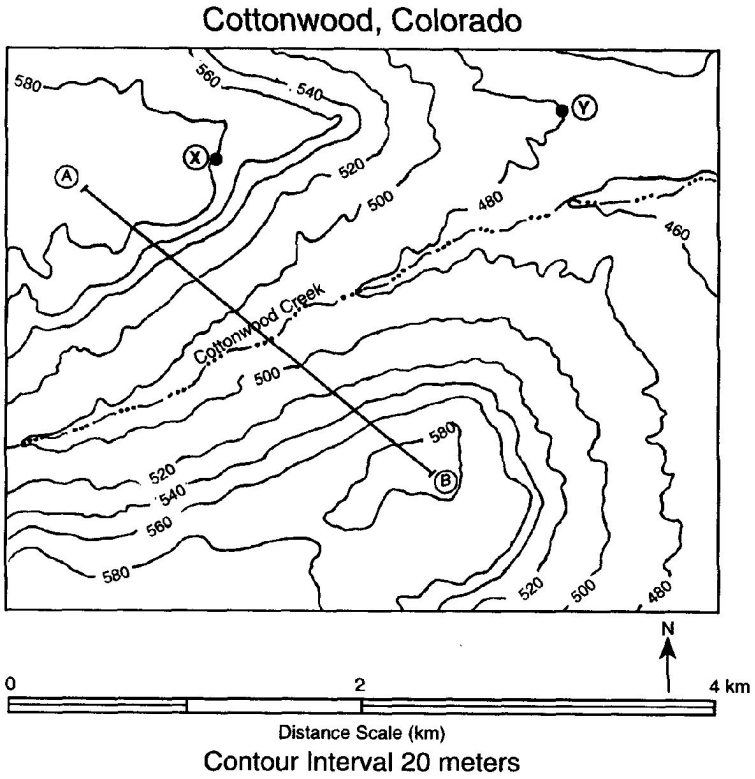
1d. We can conclude that where the water is faster, erosion will be occurring, and where the water is slower, deposition will be occurring. The deposition occurred in the open plain, as seen in the picture, and that is where the water is moving slower. This is also true of the meander, where the slower water on the inside of the curve is depositing sediment and the faster water on the outside of the curve is eroding the bank.

Erosional and Depositional Features Quiz

A river delta is formed when the sediment-carrying water of a river joins slower moving or stagnant (unmoving) water. Based on what you know of deposition and erosion, explain why river deltas form at these junctions. Based on the picture, is a river delta an example of deposition or erosion? How do you know? Answer these questions in no less than 4 complete sentences (total, not each).

Topographic Map Reading Quiz

Use the following map to answer the questions in complete sentences:



1. When traveling from point A to point B, how will your elevation change?
2. Suppose the map-maker made a mistake and you couldn't trust the numbers showing the elevation of each contour line. How might you still know that part of the journey from point A to point B is downhill?
3. In which direction is Cottonwood Creek flowing? (N, S, E, W, NE, SE, SW, or NW)?