

Virtual Erosion Scavenger Hunt

Name: _____

Block: _____

Introduction: While processes of weathering break down a rock either mechanically or chemically into smaller sized sediments, erosion refers to the transport of these sediments. There are five major agents of erosion. Each work to reshape the land over time. Evidence of erosion can be visually identified globally, whether it be an arid or humid landscape. The land is constantly changing beneath our feet due to the ongoing processes of weathering and erosion. In this lab, you will source real life images from multiple regions to look for and identify erosional processes and features.

1. What are the five agents of erosion?

2. Which agent, is the only agent that works **alone** to produce mass movements?

Part I: Gravity – MASS MOVEMENTS

Define:

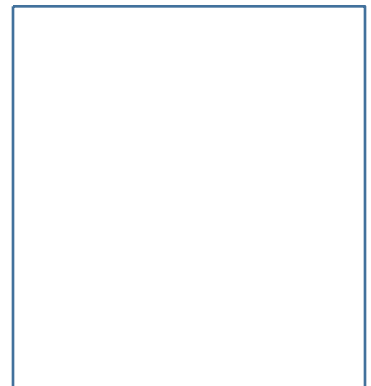
1. Mass Movement:

2. Mass movements are often caused by a decline of friction between the land surface and large or small sediments; List three natural variables that could cause a mass movement to occur.

- a.
- b.
- c.

3. Which form of mass movements occur over a **slowest** period of time?

4. Using Google Earth, search for “Eggardon Hill, Bridport, UK.” The sediment underlying the vegetation here is weakly held chalk (a soft carbonate compound that is actually a form of limestone). Zoom into the outer perimeters of the hill to see **thin grooves/linear looking concentric circles** that wrap around the hill. Take the **“person”** icon (yellow on the bottom right of google earth) and drop them on the road side (Kings Road) directly surrounding the hill where you see the grooves. You can now see what those linear grooves really are! Draw a picture to the right →
What **type** of mass movement is this? _____



5. Search for **“Mud Creek, California”** on Google Earth. What you are looking at is a major “scar” in the landscape (look at all the missing vegetation). This section of highway 1 looked completely different last year on google earth at the time we did this lab! Which **type** of mass movement is evident at this location?

6. Zoom in to check out the topography of the land. Is this landscape steep or gentle on topography?

7. List two **possible** causes for this mass movement at this geographic location.
- a.
 - b.
8. Last year, California was subject to horrific mudslides. In an area that receives little precipitation compared to NY, how is this possible? Read the following article:
<https://www.theverge.com/2018/11/29/18118735/california-weather-mudslides-holy-camp-woolsey-fire-landslides> . After reading through the article, explain **why wildfires in California have led to an increased risk and occurrence of mudslides**.
9. Search Palisades Interstate park commission, NJ. This will bring you to the region of the Englewood Cliffs. Directly below the parking lot, there is a major scar in the cliff faces. Which **type of mass movement** has occurred at this location? Feel free to google images of this area!
10. Because this type of mass movement involves frost action, but no running water, describe how the sediments; both large and small would be **shaped** at the **bottom** of the cliffs (round/smooth or angular/jagged).

PART II -Wind Erosion

11. Google Earth the Namib Desert, Africa. Although this is a large geographic region, magnify your view. What erosional and depositional **feature** stretches across much of this desert?
12. Find the following coordinates: 24°10' S, 15° 00' E, or select any major sand dune you can see. Based on the slope of the sand dune, which direction is the wind blowing across this dessert? _____
13. Explain why Wind Abrasion and erosion commonly takes place in arid regions, rather than humid or temperate areas with more vegetation.
14. The following image was taken from the **White Desert, Egypt**. Explain why more erosion has taken place along the **bottom** of this feature compared to the top.



Part III-Erosion by Water

15. What **variable** in a stream or river determines if **erosion** of sediments will occur **as opposed to** the **deposition** of them? _____

16. What three factors determine stream velocity in a stream/river?

- a.
- b.
- c.

17. Google Earth "**Grand Canyon of the Yellowstone.**" Make sure you are scrolling **North East** from the major parking lot vicinity. Looking at the topography of this region, is the canyon considered to have a **steep** or **gentle gradient**?

18. **Describe the shape** of the Canyon where the river cuts through (V or U?). Based on your answer, **is erosion or deposition the dominant process** here?

Shape: _____ Process: _____

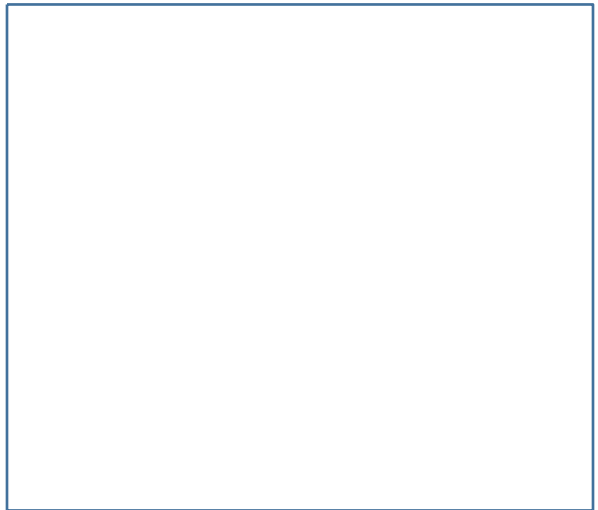
Google Earth "**Cirque de la Madeleine in the Gorges de l'Ardèche, France,**" This area in France, is along a major curve/bend in a river called a meander.

19. These features only develop as a river **ages**. In older rivers, the stream velocity changes throughout the river as water travels around these bends. Looking at the Cirque de la Madeleine, Draw an image of what you see in the space provided. Make sure you label the "**cut bank**" and "**point bar**" in the image. Along the meander, label where stream velocity is the **fastest** with the word "**fast**" and where stream velocity is the **slowest** with "**slow**"

20. How do the **sediment sizes** along the **point bar** differ from the sediments along the **cut bank** at this location (finer vs. course)?

Cut Bank-

Point Bar-



21. Is it possible that the cirque de la madeleine could one day become an **oxbow lake**? If so, where would the water erode the land to create it? **Label** the likely point of travel in your diagram above with a thick line or highlighter.

22. Google Search **Baton Rouge**, along the Mississippi River in the USA. Based on the topography of the Mississippi river valley, would you conclude that the river running through the cirque de la madeleine **is older or younger** than the Mississippi river in the USA? **Explain using topography and river shape.**

Glacial Erosion

23. Google **Denali National Park and Preserve, Alaska**. Are the glaciers you are looking at Alpine or Continental Glaciers?

24. Zoom in to one of the valleys, and describe the **general shape of the valley** where these glaciers are. You may draw a picture below.

25. What are the **striped like** patterns you see **within** the glacier?

26. The sediments that are scraped along the bottom of a glacier, and that are deposited along the **frontal edges** of a glacier are referred to as **till**. These piles of till will eventually form what **major landscape feature**? These also indicate the extent to which the glacier reached and can be seen at this location in multiple areas.

27. Google Earth **Seneca Lake, NY**. Seneca Lake reaches a total depth of 618 ft., incredibly deep for a lake of its size. How does the shape of Seneca lake, and the surrounding lakes differ from other lakes in NYS? Are these lakes an erosional or depositional feature of the last ice age in NYS?

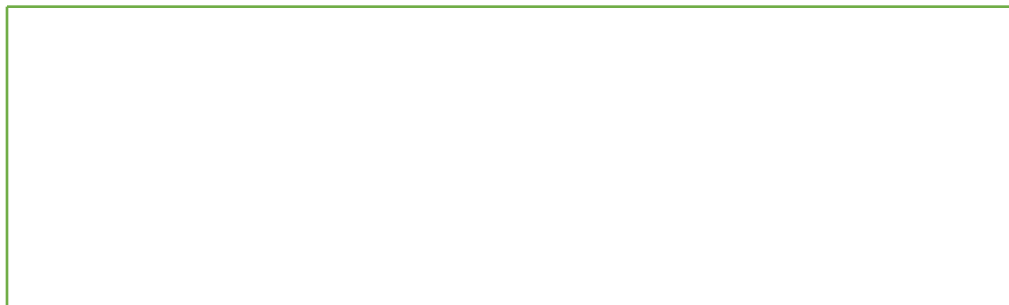
Shape:

Erosional/Depositional:

WAVE ACTION

28. Erosion will naturally take place along a coastline as waves break into the shore and take sediment back out with them to transport along longshore drift. **Google Earth East Atlantic Beach, NY**. Zoom into the coastline of this region. What structures are built here to prevent shoreline erosion? _____

29. Draw a picture below to show an area that depicts four jetties and the shore line between them paying attention to where sand is eroding and where it is being deposited. Label where erosion is evident and deposition on each side of the four jetties you drew.



30. Based upon what you see, in which **direction** is the longshore current moving (E or W?) You may also draw this in your diagram above if you are unsure of compass directions to show the direction of the current.