Refer to the diagram above to answer the questions below.

1. The large curve in the river is referred to as a ____________________.

2. The river water can appear crystal clear yet enormous amounts of material may be transported in solution. Define solution.
   ___________________________________________________________________
   ___________________________________________________________________

3. Area  X is called the slip-off slope or point bar where much deposition has occurred. Why has so much material been deposited at this location?
   ___________________________________________________________________
   ___________________________________________________________________

4. Area  Y is the undercut bank where erosion occurs continuously. Why does so much erosion occur on this side of the river?
   ___________________________________________________________________
   ___________________________________________________________________
5. Draw a profile of the river channel from point A to B. Place your drawing in the box on the right.

6. A small landslide is evident at location X, but the heavy vegetation has helped to stabilize the slopes throughout the river valley. How does vegetation make slopes more stable?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

7. Far into the future an oxbow lake may form in this river valley. Define oxbow lake.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Draw a line in the area where the river may cut its new channel.

8. Draw a profile of the river channel from point C to D. Place your drawing in the box on the right.

9. Suspension is another way that rivers transport sediment. Define suspension.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

10. Hydraulic action and attrition are 2 forms of erosional action carried out by rivers. Define hydraulic action and attrition.

Hydraulic action _____________________________________________________
________________________________________________________________________

Attrition __________________________________________________________
________________________________________________________________________
Pick the correct term from the following group of words in the box and place it in the correct space below.

<table>
<thead>
<tr>
<th>attrition</th>
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<th>dendritic</th>
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<td>levees</td>
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<td>flood plain</td>
<td>point bar</td>
<td>oxbow lake</td>
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<tr>
<td>traction</td>
<td>dikes</td>
<td>solution</td>
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</tr>
<tr>
<td>corrosion</td>
<td>radial</td>
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</tbody>
</table>

1. A natural mound of debris along a river bank created by flood waters. _______________________
2. Drainage pattern often seen on volcanic cones. _______________________
3. Rich river deposits found on and near the river delta. _______________________
4. This erosional action is responsible for making rocks smooth. _______________________
5. Method of river transport in which heavy rocks drag along bottom of the river bed. _______________________
6. Area of the river valley that is periodically covered in water. _______________________
7. Man-made mounds designed to limit river flooding. _______________________
8. Part of an original flood plain that has undergone uplifting. _______________________
9. Area of the river bank where fast moving water causes severe erosion. _______________________
10. Erosional action in which rocks strike together and reduce in size. _______________________
11. Curve of a slow moving mature river. _______________________
12. Area of the river bank along which deposition occurs. _______________________
13. Dissolving of river rock by the water. _______________________
14. The transport of dissolved river materials is referred to as. _______________________
15. A small lake formed along a river valley when a bend in the river has been completely cutoff from the rest of the river. _______________________
16. Method of transport in which material carried by a river bounces and rolls along the river channel. _______________________
17. Created when pebbles are spun around in a river bed depression. _______________________
18. Drainage pattern that resembles the veins of a tree leaf. _______________________

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Glaciers: Moving rivers of ice

As global temperatures warm, ablation exceeds accumulation year after year.

Deep scratches on bedrock

Eroding cliffs of glacial till on Whidbey Island in Washington State
Use the glacier photographs to answer the questions below.

1. In photograph 1 the dark strands of glacial debris at X are called ___________________________
   How did they form? ________________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________

2. The debris along the side of the glacier at Y is referred to as ___________________________

3. Give the proper name for the sharp peak at W. _______________________
   How did this peak form? ____________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________

   Numerous sharp ridges are often evidenced leading away from sharp mountain peaks. What are these
   ridges called? __________________
   How were these ridges formed? _______________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________

4. The typical shape of a glacial valley is _______________________
   The steep valley sides left behind after glacial ice melts away are often vertical drop-offs with
   numerous waterfalls cascading down to the valley bottom. These steep cliffs are known as
   _______________________.
   Explain how they were formed.________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________

5. A terminal moraine is a huge mound of glacial debris deposited at the farthest
   advance of a glacier. Define recessional moraine. _________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
6. Could there be more than 1 recessional moraine? ____________ Why or why not?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

7. As global warming accelerates, both alpine glaciers and continental ice sheets worldwide are in a state of rapid retreat. Within 50 years many glaciers will have all but disappeared. In a paragraph discuss some of the environmental changes that will occur as a result of the loss of glaciers around the world.
________________________________________________________________________________
________________________________________________________________________________
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________________________________________________________________________________

8. In photograph 3 deep scratches are evident in the bedrock. What are these scratches called? __________________ How did these scratches form? __________________
________________________________________________________________________________
________________________________________________________________________________
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________________________________________________________________________________

9. Debris deposited by glaciers is referred to as glacial drift. There are 2 types of glacial drift, till and outwash. Photograph 4 shows glacial till that was deposited by ice action. State 2 differences between till and outwash?
________________________________________________________________________________
________________________________________________________________________________
1. Unsorted and unstratified glacial deposits. __________________
2. A sharp knife-like ridge, created by ice action. __________________
3. Indicates the farthest point of glacial advance. __________________
4. A hillside hollow created as ice plucks and abrades the rock surface. __________________
5. Sorted and stratified glacial deposits. __________________
6. A lake created when a block of ice is left behind in a depression. __________________
7. A large boulder deposited far from its source of origin by moving ice. __________________
8. Small elongated hill of glacial deposits. __________________
9. A transitional stage of glacial ice, consisting of a snow and ice mix. __________________
10. A small lake left behind when glacial meltwater fills a hillside hollow created by glacial erosion. __________________
11. Deep scratch created when rocks attached to glacial ice abrade bedrock. __________________
12. Glacial debris carried along the side of a valley glacier. __________________
13. A sharp mountain peak created by ice action. __________________
14. A mountain pass resulting from excessive glacial erosion. __________________
15. A long narrow glacial lake. __________________
16. Long snake-like ridge of glacial deposits formed as glacial meltwater flows from tunnels at the base of the glacier. __________________
17. Dark strands of glacial debris carried in the middle parts of a valley glacier. __________________
18. Steep, often vertical valley walls created when a glacier moves through a river valley and transforms it into a u-shaped valley. __________________
19. Deep cracks in ice, created when a glacier moves over uneven bedrock. ________
Use the photograph above to answer the questions below.

1. The spit in the photograph has taken thousands of years to form. Do you think the waves approaching this beach now are constructive waves or destructive waves? ______________________________
   Support your answer.
   __________________________________________________________________________
   __________________________________________________________________________

2. With the use of a diagram describe longshore drift.
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

3. In which compass direction is the sand moving.
   __________________________
4. The long spit is evidence that a great deal of sand is being deposited on this beach. Where is the supply of sand coming from?

__________________________________________________________________________________

5. Locate the distant headland area. Name the 2 features of headland erosion evident in the photograph.

____________________       ____________________

6. The breakup of rock has been generated by 4 processes - corrosion, abrasion, attrition, and hydraulic action. Define abrasion and hydraulic action.

Abrasion ________________________________________________________________________

________________________________________________________________________________

Hydraulic action __________________________________________________________________

________________________________________________________________________________

7. As waves crash and retreat, air is able to enter cracks in rock cliffs. As the next wave strikes the cliff this trapped air can greatly increase the work of hydraulic action. Explain how.

________________________________________________________________________________

________________________________________________________________________________

8. What will be the final stage of cliff erosion once all the rock has broken apart and disappeared from view? ________________________________

9. Cliffs along the distant headland are very steep, some even with vertical drop-offs. Why are rocky ocean cliffs often so steep?

________________________________________________________________________________

10. Name the depositional feature that would form if the existing spit joined an island to the mainland. ________________________________

11. Is there anyway to slow the sand from moving along this beach?

________________________________________________________________________________
Pick the correct term from the words in the box and place it in the correct space below.

<table>
<thead>
<tr>
<th>corrasion</th>
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<td>tombolo</td>
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<td>arch</td>
<td>caves</td>
<td>longshore drift</td>
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<tr>
<td>undercutting</td>
<td>plunging wave</td>
<td>wave of oscillation</td>
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</tbody>
</table>

1. A long sandy depositional feature formed by wave action. ___________________
2. The first stage of cliff retreat. ___________________
3. The movement of sand and water onto the beach caused by wave action. ___________________
4. A wave commonly seen in deep ocean water. ___________________
5. Refers to the bending action of waves as they approach the shoreline. ___________________
6. A sandy depositional feature that joins an island to the mainland. ___________________
7. The main reason why ocean cliffs are often very steep. ___________________
8. The second stage of cliff retreat. ___________________
9. Wave-driven water returning to the ocean by force of gravity. ___________________
10. This feature is designed to stop the movement of sand along the beach. ___________________
11. A destructive wave that often will remove sand from the beach. ___________________
12. Hard rocky areas along shorelines become this feature. ___________________
13. The horizontal movement of sand along a beach caused by wave action. ___________________
14. An advanced stage of cliff retreat in which water action has eroded a large opening through a headland. ___________________
15. This shoreline area commonly contains a mixture of fresh and salt water and the water level rises and falls with the tides. ___________________
16. The eroding power of wind-driven waves. ___________________
17. Also known as abrasion. ___________________
18. A small opening through a headland that allows water to go from one side to the other. ___________________
19. A rock pillar in the ocean that is an advanced stage of headland erosion. ___________________
Use the photograph above to answer the questions below.

1. In Karst landscapes very little water is seen on the surface. Surface water flows into the underground cave system through a series of openings called ________________________.

2. The cave network above has been created by water dissolving 100% of the rock and transporting it away. This method of transport is referred to as ____________________.

3. Underground cave networks can sometimes cover many square kilometers. In these areas the rock type is mainly ________________________.

4. As water drips from the ceiling of the cavern, deposits are left behind to form a feature that resembles an icicle in winter (see W in photograph). This depositional feature, known as a ________________________, can take 10’s of thousands of years to form. Directly below it on the cavern floor a similar feature starts to grow up towards the ceiling (see X in photograph). This is called a _______________________. Eventually a time will come when the two meet and a continuous column from floor to ceiling known as a ________________________ will be formed.
5. Small ponds and streams with crystal clear water are a common sight in many cave systems. As water flows along the stream bed, deposits are placed down by the passing water. This type of depositional feature is referred to as a ____________________.

6. Over time as the rock continues to dissolve, holes on the surface through which the water enters the cave system become larger and larger and may join together to create a larger depression known as a ____________________.

7. Eventually the entire cavern may collapse creating a massive depression called a ________________.

8. Areas of Karst landscapes have become a major problem in many locations in North America and Europe. In the past, homes were constructed without any knowledge of the underlying rock type. Today huge holes are appearing in some areas where thousands of homes are located. The underlying rock has dissolved to the point that it is unable to support the layers of rock above it, resulting in sudden collapses. Once cave systems begin to collapse it can take hundreds of years for the area to stabilize. Can you think of one economic benefit derived from these dangerous, mysterious cave systems? ____________________
Pick the correct term from the words in the box and place it in the correct space below.

<table>
<thead>
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</tr>
<tr>
<td>travertine terrace</td>
<td>hydraulic head</td>
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</tr>
</tbody>
</table>

1. A large depression resulting from the collapse of several sinkholes is known as a ____________
2. A rock that dissolves 100% in water. __________________
3. The top of the zone of saturation is called the __________________________.
4. Is often the result when too much water is drawn from the ground. __________________________
5. A rock layer that can store a substantial amount of water is called an _______________________
6. A depositional feature hanging from the ceiling of limestone caves. _______________________
7. This depositional feature can often be seen around hot springs and geysers. _________________
8. Layered deposits found along cavern stream beds are referred to as _________________________
9. From this well, water may flow to the surface under its own pressure. _______________________
10. _________________________ refers to the portion of open spaces in soil material.
11. The collapse of an entire cavern creates a gorge-like feature called a _______________________
12. An area with substantial limestone rock is referred to as a ____________________________ landscape.
13. This term refers to hills of rock fragments following the collapse of all caves. __________________
14. Water level will fluctuate up and down in this type of well. _____________________________
15. _________________________ refers to how fast water can pass through rock layers.
16. Growing mound of limestone deposit on a cave floor is known as a _________________________
17. The higher the__________________________, the greater the hydrostatic pressure in the aquifer.
Unit 2: Gradational Processes
Topic: Desert Terminology

Fill in the blanks choosing the correct term from the box below.

<table>
<thead>
<tr>
<th>mesa</th>
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<th>loess</th>
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<td>parabolic</td>
<td>bolson</td>
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<tr>
<td>butte</td>
<td>suspension</td>
<td>alluvial</td>
<td>barchan</td>
</tr>
<tr>
<td>blowout</td>
<td>transverse</td>
<td>slip face</td>
<td></td>
</tr>
</tbody>
</table>

1. The process of sediment being transported by bouncing and rolling is referred to as ____________.
2. Fertile wind blown dust found on the leeward side of great deserts is called ________________.
3. Deposit of roughly sorted sediment found at the base of a mountain is called an ________________ fan.
4. A small tabletop feature frequently seen in desert landscapes. ________________
5. A crescent shaped dune with horns pointing downwind. ________________
6. Lightest materials such as silt and clay will always be carried by this method of transport. ________________
7. A dry desert ditch is called a ________________.
8. A large tabletop feature seen in desert regions is called a ________________.
9. A crescent shaped dune with point facing upwind. ________________
10. Rocky desert floor from which all sand has been blown away. ________________
11. A shallow desert lake that will contain water after a flash flood is known as a ________________.
12. A continuous sand ridge in the desert is called a ________________ dune.
13. One climate control that is responsible for desert formation. ________________
14. A fissure spring in the desert may create this feature. ________________
15. The steep leeward slope of a desert sand dune is referred to as the ________________.
16. A deep desert hollow created as wind removes layers of sand. ________________
17. Two or more depositional features at the base of desert mountains have joined together to form this feature. ________________
18. A desert basin filling up with wind carried debris is referred to as a ________________.
19. An endless sea of desert sand. ________________.