Rivers and Groundwater Student Notes, Chapters 13, 14 Name _____
Date _____

Vocabulary: On a separate sheet of paper, please number and identify the following terms. (terms with a *, please illustrate) (26)

Delta	Divide	Floodplain*	Water Table
Gradient*	Headward Erosion	Headwater*	Meander*
Levee*	Oxbow Lake*	Rejuventated	Stream Load
Stream Piracy*	Tributary*	Water Gap	Wind Gap
Aquifer	Artesian well*	Cone of Depression*	Geyser
Impermeable	Permeabilty*	Porosity*	Sinkhole
Stalactite*	Stalagmite*		

Chapter 13 Water and Erosion

A. The Water Cycle

1. What are the four ways the continents lose water?
   - _____-liquid changes to water vapor
   - _____- plants give off water vapor into the atmosphere
   - _____- rivers and streams
   - Soaks to become groundwater
2. Why are lakes usually short lived?
   - Too much of their water drains away or evaporates, an outflowing stream can drain a lake, climate change, sediments may fill in lake basin and organic deposits may accumulate, creating a _____
3. What are the two approaches to ensure future fresh water is available, which is better?
   - _____ and desalination (not profitable as of now), so conservation is best approach right now

B. River Systems

1. What are the different parts of a river system?
   - _____- streams that flow into the main river
   - _____- a river system is identified as water from all of the tributaries that empty into the river, drainage basin
   - _____- borders of a watershed that are usually ridges or elevated regions that separate watersheds
2. What is headward erosion?
   - Process of lengthening and branching of a stream carrying away sediments and gradually extending the area of the drainage basin
3. How does stream piracy work?
   - The rate of erosion in one stream may be higher than another stream from a different watershed, the captured stream drains into the other river system
4. What are the three types of stream load, how are they different
   - _____- consist of fine sand and silt, the velocity of the stream keeps them suspended and don't sink to the stream bed (muddy water after a storm)
   - _____- matter that is dissolved in water and transported downstream
   - _____- material on the bottom that moves by rolling, sliding and saltation or short jumps
5. How does discharge and gradient affect the way a stream erodes their channels?
   - _____ is the steepness of its slope, the higher the gradient the faster the stream will flow and carry more sediments eroding a channel rapidly
   - _____ is the volume of water moved by a stream in a given time, the more water flowing down a stream the higher the erosion rate

6.What makes a water gap different than a wind gap?

-When land is uplifted and elevated, a deep notch is formed where the stream has eroded its channel through raised mountains, these notches are _____

-A _____ forms when land is uplifted faster than it erodes causing the stream to abandon the water gap and become a wind gap

7. What are some features of youthful rivers?

-_____, waterfalls, rapids, few tributaries

8. What are some features of a mature river?

-Well established tributaries, can carry a larger amount of water, channels aren't as deep as a youthful, _____

-A series of _____, meanders, form across the valley floor, sometimes forming an oxbow lake

9.What are some features of old rivers?

-Its gradient and velocity have decreased, no longer erodes the land, less tributaries because they have combined to form a _____

10.What causes a river to be rejuvenated?

-The gradient has become steeper due to movement of the crust, creating step-like terraces

C. Stream Deposition

1.What is a river delta, what determines its shape?

-A _____ at the mouth of a stream, shaped by waves, tides, offshore depths and sediment load

2.What usually develops in dry climates due to stream deposition?

-_____ are fan-shaped due to temporary streams that dry up

3. How does an alluvial fan differ from a delta?

-Alluvial fans (dry) and leave behind sediments which are coarse sand and gravel while delta (always wet) sediments are made up _____, an alluvial fan has a slope while a delta is relatively flat

4.What is a floodplain, why do people live on them?

-Part of the _____ that tends to fill up with water during a flood

-During a flood, sediments make the soil on a floodplain more _____

5.How are natural levees produced?

-The accumulation of _____ is deposited along the banks which are gradually raised

6.What are flood control methods?

-_____ prevents excess runoff during periods of heavy rainfall

-_____ prevents floods but also serves as a source of crop irrigation and hydroelectric energy

-Building _____, they have to be periodically raised due to deposition

-A permanent _____ or floodway can prevent the main stream from overflowing

Chapter 14 Groundwater and Erosion

1. Water Beneath the Surface

-_____- underground water that fills almost all pores in a rock/sediment from the seeping of rainwater

-_____- large amounts of water can flow and be stored in a body of rock

-Some aquifers are more porous than others- _____ and sandstone

-_____- amount of water a rock can hold, affected by size of particles and how closely packed sediments

-_____- indicates how freely water passes through the open spaces in it, a rock can have high porosity but low permeability (clay has high porosity but poor permeability)

-Zone of _____-layer of ground where all the pores are filled with water; the upper surface of the zone is called the water table

-Zone of _____- zone above the water table; some water found here due to capillary fringe in soil

2. Wells and Springs

-Well- hold dug below water table that fills with groundwater

-_____- natural flow of groundwater to the Earth's surface

-_____- where the water table is lowered due to pumping water out via an ordinary well

-Artesian well- gets its water from hundreds of kilometers away, digs below cap rock (top layer of impermeable rock) into deeper aquifers causing water to push up from intense pressure

-_____- often source of water in a desert oasis

-Hot spring- groundwater exposed to pockets of molten rock above 37 C

-_____- hot springs that periodically erupt; water under pressure that boils and released to the surface

3. Groundwater and Chemical Weathering

-_____- water that contains large amounts of dissolved minerals (ions of calcium, magnesium and iron)

-Soft water- few dissolved minerals

-_____ is formed due to CO_2 + water- chemically weathers rocks

-Caverns- rocks rich in calcite (limestone) chemically weathers producing caverns (large cave)

-_____- during dry periods, the water table is low and caverns are not completely filled with water, lack of support causes a collapse into a circular pattern

-Stalactites/Stalagmites- calcite solidifies on the ceiling of a cavern forming a cone shaped deposit- _____; drops of water fall on the cavern floor, deposited can form cone upward- _____

-Natural bridges- when the roof of two cavern collapses the uncollapsed rock between can create a natural bridge or when a surface river enter a crack in a rock eventually creating a hole- natural bridge above

-_____- regions were chemical weathering clearing visible at the surface