Mass Movement; Streams and Floods; Chapter Questions (2 Chapters)

1. **What principle force causes downslope movement? Provides resistance against downslope movement?
2. In what two ways does water increase the likelihood of mass movement on a slope?
3. Describe a slope that would be most prone to downslope movement. Least prone? Be thorough.
4. **What are some triggers for mass movement events?
5. **Compare and contrast fall, slide, flow, slump, and creep.
6. Describe the distribution of Earth's water. What percentage is fresh? Of that, what percentage is in each of glaciers, groundwater, and lakes + streams?
7. Describe the movement of water through the hydrologic cycle. What is the source of energy that powers the cycle? Once precipitation has fallen on land, what paths are available to it?
8. **Compare and contrast these channel patterns:

	Description or picture	**Conditions in which found**
Meandering	Stream that take circuitous, bending, looping path to base level.	Mature streams, which have eroded the backcountry mostly flat. Slope very gentle.
Braided	Stream that separates into multiple strands, all crossing an area of high sediment.	At the base of a steep slope, where there is an alluvial fan (much sediment dumped by stream, then stream makes its way across pile).
Straight	No bends. V-shaped in cross-section.	Steep slopes, usually up in the mountains.

9. A stream starts 2000 m above sea level and travels 250 km to the ocean. What is its average gradient in m/km? This stream develops extensive meanders lengthening its course to 500 km. Calculate its new gradient. Which steepness represents the more youthful stream? Why? (Be sure in your explanation that you understand the meaning of the headwaters and the mouth of a stream.)
10. Through what methods do streams physically weather rock?
11. Under what conditions do streams erode? Where along a river does this most occur?
12. **In what three ways does a stream transport its load? If you collect a jar of stream water, what part of its load settles to the bottom? What remains in the water? What part is missing?
13. Under what conditions do streams deposit sediment? Where along a river does this most occur?
14. **What is unique about alluvium (river-deposited sediment)? Why? Compare an alluvial fan and a delta.
15. **What is base level? Give some examples of local versus ultimate base level.
16. How do base level changes affect erosion and deposition equilibrium of a stream?
17. Use this table to describe various characteristics of a stream, what factors affect those characteristics, and how they change from the headwaters to the mouth of a stream. Know how these answers were determined!

	Definition	**Factors that increase it**	**Headwaters**	**Mouth**
Gradient	$\frac{\text{elevation difference}}{\text{horizontal length}}$	Base level drops Headwaters uplift	High	Low
Discharge	water volume passing a point every second = channel width X channel depth X velocity = m^3/s	High precipitation (rain) Large drainage basin High river velocity	Low	High
Drag or friction	slowing down of the river as a result of its shape and materials	• Channel shape is narrow and deep or shallow and wide. Channel bed is rough, like boulders, gravel, and sand.	High	Low: shape is deep and wide, and bed is mud.
Speed	$\frac{\text{distance traveled}}{\text{time for travel}}$	High gradient Low drag or friction High discharge Narrow channel	Low	High

	Definition	Factors that increase it	Headwaters	Mouth
Amount of erosion	Material picked up by the running water of the river and removed.	Velocity increases Discharge increases Load of river decreases	High	Low
Amount of deposition	Material dropped by the river and left in a pile (deposit).	Velocity decreases Discharge decreases Load of river increases	Low	High
Capacity	Total load that a portion of a river can transport at any given time.	Discharge increases.	Low	High
Competence	Largest grain size that a portion of a river can transport.	Velocity increases		

18. **Explain what happens during flood stage of a river. Include a description of levees and floodplains.
19. **How does a glaciated mountain valley differ from a mountain valley that was not glaciated?