Landslides

The ‘prime mover’ of landslides is _____.

	Student Response	Correct Answer
A. earthquakes		
B. gravity	✓	✓
C. deforestation		
D. heavy rainfall		
E. u-hauls		

Score: 1/1

Which of the following did NOT contribute to the Frank slide in the Eastern Rocky Mountains?

	Student Response	Correct Answer
A. dissolution cavities in bedrock		
B. weak, fractured, and faulted bedrock		
C. bedding planes of sedimentary bedrock parallel to the slope		
D. wet weather in years preceding the slide		
E. removal of vegetation above the slide	✓	✓

Score: 1/1

Which of the following is NOT a way to trigger landslides?

	Student Response	Correct Answer
A. climate change	✓	✓
B. loud noises		
C. earthquakes		
D. heavy rainfall		
E. excavation		

Score: 1/1

Which statement is FALSE?

	Student Response	Correct Answer

A. Soil creep movement is measured in millimeters or centimeters per year.
B. Coastal landslides can create a tsunami that can affect areas thousands of kilometers away.
C. The prime mover of landslides is gravity.
D. A community developed on steep hillsides supporting a dense population will have a high landslide hazard.
E. Debris avalanches and flows commonly moves at velocities of less than 5 km/hr. ✓

Score: 1/1

Gravity influences _____.

Student Response	Correct Answer
A. trigger frequency	
B. slope composition	
C. shear stress	✓
D. shear strength	
E. precipitation	

Score: 0/1

Suppose you are a geological engineer retained to deal with rockfall problems along new sections of the Sea-to-Sky Highway (Highway 99). You need to prevent smaller rock blocks from falling onto the road. Which approach to mitigation would you take?

Student Response	Correct Answer
A. Prevention through rock bolts and anchors.	
B. Avoidance by closing the highway and selecting an alternative route.	
C. Protection by installing netting.	✓
D. Protection by planting trees.	
E. Prevention by installing drains.	

Score: 1/1

With regard to landslide hazards, which location would be the LEAST safe to build your house?

	Student Response	Correct Answer
A. A		
B. B		
C. C		
D. D		✅
E. E		

Score: 0/1

In the factor of safety calculation, increasing pore pressures act to destabilize the slope by _____.

	Student Response	Correct Answer
A. decreasing the driving shear forces		
B. increasing the driving force		
C. adding weight to the slope		
D. decreasing frictional strength		✅
E. decreasing the cohesive strength		

Score: 1/1

A landslide will MOST LIKELY occur in which of the following scenarios?

	Student Response	Correct Answer
A. A hillside with a slope of 12 °composed of a saturated soil layer with abundant vegetation.		
B. A hillside with a slope of 20 °composed entirely of granite in an arid environment.		
C. A hillside with a slope of 12 °composed of fractured sandstone in an arid environment.		
D. A hillside with a slope of 20 °composed of fractured sandstone in a wet environment.		✅
E. A hillside with a slope of 20 °composed of fractured sandstone with abundant vegetation.		

Score: 1/1

Mass movements can be triggered by all of the following EXCEPT _____.

	Student Response	Correct Answer

A. hurricanes
B. meteor impacts
C. volcanic eruptions
D. earthquakes
E. radioactive disaster ✅

Score: 1/1

Which of the following is NOT a factor that increases cliff erosion at UBC?

Student Response	Correct Answer
A. tides	
B. wave action	
C. precipitation	
D. revegetation	✅
E. stormwater runoff	

Score: 1/1

Which statement about causes and triggers of landslides is TRUE?

Student Response	Correct Answer
A. There can be many triggers for one event.	
B. Causes can trigger landslides in some situations.	✅
C. There is usually one cause for a landslide event.	
D. Causes are always short-lived events.	
E. Triggers develop instability in a slope.	

Score: 0/1

The MAIN difference between a translational slide and a rotational slide is _____.

Student Response	Correct Answer
A. that a translational slide is also called a slump while a rotational slide is not	
B. the shape of the failure surface	✅
C. the condition of the material moving downslope (coherent blocks verses a turbulent mixture of material)	
D. the type of material involved in the landslide	

E. cause of the landslide

Score: 1/1

Slopes with daylighted bedding (as shown in the figure below) are most susceptible to _____.

	Student Response	Correct Answer
A. creep		
B. rotational slides		
C. translational slides		✓
D. debris flows		
E. rock topples		

Score: 0/1

Which of the following statements is FALSE?

	Student Response	Correct Answer
A. A landslide may be stabilized by applying a resisting force at the toe of the slope.		
B. Stabilization of a landslide may be achieved by clearing the trees from the slope.		✓
C. The rapid infiltration of rainfall is the mechanism by which most shallow landslides are generated during storms.		
D. Landslides may occur without an apparent trigger because of processes that gradually bring the slope to failure.		
E. High pore pressures may adversely affect the stability of a slope due to a decrease in effective normal stress.		

Score: 1/1

Increased vulnerability to landslide hazards may result from all of the following EXCEPT _____.

	Student Response	Correct Answer
A. logging on unstable slopes		
B. deep infiltration of water		
C. clearcutting		

D. legislation ✓

E. urbanization

Score: 1/1

For the valley shown in the diagram (right), the MOST LIKELY slope failure modes originating from the western (W) and eastern (E) slopes would be _____.

Student Response	Correct Answer
A. topples (W) and translational slides (E)	✓
B. spreads (W) and rockfalls (E)	
C. translational slides (W) and topples (E)	
D. rockfalls (W) and rotational slides (E)	
E. translational slides (W) and rotational slides (E)	

Score: 1/1

How does a debris slide differ from a debris flow? A debris slide _____.

Student Response	Correct Answer
A. does not contain as much water	
B. is composed of different material	
C. has a curved surface of failure	
D. moves more slowly than a debris flow	
E. is not confined to a channel	✓

Score: 1/1

Quick clays often lead to what type of landslide?

Student Response	Correct Answer
A. rotational slides	
B. translational slides	
C. spreads	✓
D. flows	
E. topples	

Score: 1/1

Debris barriers and channels decrease damage from debris flows by all of the following EXCEPT _____.

Student Response	Correct Answer
A. boulder-lined channels decrease flow velocity	
B. concrete lined channels prevent more debris from being incorporated into the flow	
C. grates remove large debris from flow masses	
D. boulder and concrete-lined channels decrease erosion	
E. basins collect water which prevents flows from moving quickly	☑

Score: 1/1

How does a debris slide differ from a debris flow? A debris slide _____.

Student Response	Value
A. has a curved surface of failure	
B. is not confined to a channel	100%
C. moves more slowly than a debris flow	
D. does not contain as much water	
E. is composed of different material	

Score: 1/1

Which list correctly orders mass movements from slowest to fastest?

Student Response	Value
A. creep, slump, translational slide, rock fall	100%
B. slump, debris avalanche, rock fall, translational slide	
C. translational slide, slump, rock fall, rock avalanche	
D. slump, creep, loess flow, rock fall	
E. slump, debris flow, translational slide, debris avalanche	

Score: 1/1

Which statement is FALSE?

Student Response	Value
A. A rotational slide often leaves a crescent-shaped scarp.	
B. Altering the way water drains naturally from steep slopes can have a significant effect on landslide frequency.	

C.	If the driving mass equals the resisting mass in a slope then a landslide will occur.	100%
D.	Hydrothermal alteration increases the frequency of landslides in volcanically active areas.	
E.	Increasing the pore pressure in a slope will decrease slope stability.	

Score: 1/1

Which of the following causes of landslides is LEAST important in British Columbia?

	Student Response	Value
A.	climate	
B.	slope angle	
C.	quick clays	100%
D.	removal of vegetation	
E.	overloading	

Score: 1/1

Which statement is TRUE?

	Student Response	Value
A.	Translational slides move in a rotational manner, accommodated by deformation of the weak soil.	
B.	Flows move downslope as a coherent mass.	
C.	Topples involve the backward rotation of a rock block, with the toe of the block moving outwards first.	
D.	Falls involve the rock detaching from a steep slope along a surface on which little shear displacement takes place.	100%
E.	Liquefaction is usually related to slow creep-like movements of a soil slope.	

High pore water pressure can cause landslides by _____.

	Student Response	Value
A.	reducing friction between adjacent grains	100%
B.	affecting the rate of infiltration	
C.	dissolving cement between adjacent grains	
D.	increasing water surface tension	
E.	decreasing the likelihood of liquefaction	

Score: 1/1

Which is FALSE?

Student Response	Value
A. Increasing the normal stress across the sliding surface helps to increase the frictional strength.	
B. Infiltration of water and increasing pore pressures acts to reduce the shear strength of a rock slope.	
C. Faults and cracks weaken the shear strength of a rock slope.	
D. Shear stress is the component of gravity acting parallel to the sliding surface of a landslide.	
E. The main force acting on a slope is pore pressure and not gravity.	100%

Score: 1/1

Tensioning a rock anchor helps to stabilize a slope by _____.

Student Response	Value
A. reducing gravity	
B. preventing rain water from infiltrating into the slope and reducing the pore pressure	
C. breaking the rock, allowing it to be easily removed	
D. increasing the frictional strength	100%
E. increasing the tensile strength of the slope	

Score: 1/1

With regard to landslides, shear strength is _____.

Student Response	Value
A. the cohesion between grains in a rock or sediment sample	
B. the degree to which the surface tension of water holds material together	
C. a combination of all the factors causing geologic materials to resist shear stress	100%
D. a combination of composition, density, and electromagnetic attraction within geologic materials	
E. slope steepness plus composition	

Score: 1/1

Which of the following is the BEST example of rapid erosion?

Student Response	Value
A. debris flows occurring on steep slopes due to deforestation and removal of the protective vegetation cover	
B. liquefaction of a sensitive clay layer in a slope leading to its rapid failure	
C. undercutting of a slope through water action leading to a series of retrogressing landslides	100%
D. a series of rockfalls that occur due to changes in weather in winter and spring	
E. wave action on highly resistant rock	

Score: 1/1