Waves and tsunami

The Pacific Tsunami Warning Center issued a tsunami warning after the major earthquake off of Sumatra on 26 December 2004. For people on the coast of Sumatra close to the earthquake epicentre, the warning was ineffective because the wave struck before the warning was issued. But why did so many people die in areas around the Indian Ocean that were much farther away from the epicentre?

Student Response	Value
A. Most places around the Indian Ocean are low lying, so there was no place to go.	0%
B. The Pacific Tsunami Warning Center has issued so many false alarms in the past that the public no longer trusts tsunami warnings.	
C. Most countries had no effective system to communicate the warning to the public.	
D. There were no working tide gauges in the places with high loss of life.	
E. Most people had taken refuge in tall buildings, which collapsed.	

Score: 0/1

Waves plunge as they break onto shore because _____.

Student Response	Value
A. the slope of the bottom on the approach to shore is very steep	100%
B. too many waves approach shore at the same time	
C. shoaling waves "run into each other" as their wavelength shortens	
D. beaches are eroded away in the winter	
E. incoming waves interfere with the backwash	

Score: 1/1

Following a tsunami warning after an earthquake off the coast of Alaska, one of the worst places to be is _____.

Student Response	Value
A. on the 5th floor (or higher) of a reinforced concrete building on a beach in Japan	
B. on a sailboat off the coast of Halifax, NS	
C. lying on a beach in Hilo Bay, Hawaii	100%
D. on a submarine on the surface of the Pacific Ocean, where the water is at least 3500 meters deep	

E. in a park located beyond the tsunami inundation zone

Score: 1/1

In the Northern Hemisphere, in which part of the hurricane is storm surge the MOST disastrous for the coastline? Choose the BEST answer.

Student Response	Value
A. to the west of the eye of the hurricane	
B. to the north of the eye of the hurricane	
C. directly under the eye of the hurricane	
D. on the left side of the hurricane (if you're facing in the direction the hurricane is traveling)	
E. on the right side of the hurricane (if you're facing in the direction the hurricane is traveling)	100%

Score: 1/1

Wave action tends to straighten a shoreline over time because _____.

Student Response	Value
A. refraction concentrates wave energy in bays and deposits sand there	
B. wavelengths shorten as waves approach headlands so waves hit with greater frequency	
C. refraction concentrates wave energy on headlands	100%
D. wave crests reach headlands first and some of the energy dissipates before they reach bays	
E. waves erode beaches in bays and carry the material offshore	

Score: 1/1

Which of the following is TRUE?

Student Response	Value
A. With the advances of tsunami preparedness, people living on the Pacific rim are safe from tsunami, regardless of its origin 10,000 km or 8 km offshore.	
B. Ships in the middle of the Pacific rely on the International Tsunami Warning System to warn them of passing tsunami.	
C. People living close to shore can prepare for a tsunami by evacuating to higher ground immediately after an earthquake is felt.	100%
D. According to historical accounts, only people living close to shore in the Pacific	

rim are in danger of a tsunami.

E. People living along sheltered bays and inlets are less likely to be affected by tsunami.

Score: 1/1

In which location on the map would a ship be most at risk of being hit by a rogue wave?

Student Response	Value
A. A	
B. B	
C. C	
D. D	100%
E. E	

Score: 1/1

The most influential agent that changes the shape of the coast is _____.

Student Response	Value
A. freezing and thawing of coastal cliffs	
B. wave action	100%
C. prevailing winds	
D. hurricanes and storm surges	
E. the tidal range	

Score: 1/1

The depth below which there is essentially no water particle movement caused by the passing of a deep water wave is called the _____.

Student Response	Value
A. wavelength	
B. wave bottom	
C. wave base	100%
D. wave height	
E. amplitude	

Score: 1/1

The tsunami that occurred on Boxing Day of 2004 _____.

	Student Response	Value
A.	caused measurable wave height increases in the west coast of North America	
B.	caused more than 200,000 deaths because the tsunami alert system was offline	0%
C.	caused significantly more deaths in Bangladesh than Indonesia because it is very close to sea-level	
D.	affected only coastal areas close to Indonesia	
E.	caused damage to property as the towering waves crashed onto homes and buildings	

Score: 0/1

Imagine a huge earthquake occurs off the coast of Vancouver Island, like the one that occurred in 1700. People in Japan would like to know something about the tsunami risk from the earthquake. Which ASPECT OF PREDICTION can we be most confident about (before the tsunami arrives in Japan)?

	Student Response	Value	Correct Answer	Feedback
A.	wave period	0%		
B.	wave energy			
C.	arrival time		☑	
D.	destruction potential			
E.	wave height			

Score: 0/1

All of the following wave types are restored by gravity EXCEPT _____.

	Student Response	Value	Correct Answer	Feedback
A.	tide			
B.	seiche			
C.	wind			

wave

D. tsunami

E. capillary wave 100%

Score: 1/1