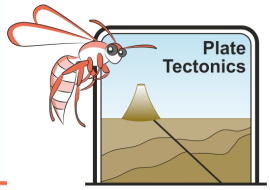
Surface Waves (L&R) – Student Activity



Seismic waves are energy waves released during earthquakes. There are two kinds of seismic waves:

1. **Body waves** travel through the body of the Earth. **P** waves are compressions that pulse through rock. **S** waves are also known as secondary, shake or transverse waves.

2. **Surface waves** are triggered when P and S waves are deflected to travel along the surface of the Earth. They are slower but much more destructive than body waves. Love (**L**) waves are polarised shear waves and Rayleigh waves (**R**) cause the ground to roll.

Movement from surface waves can cause sediments to behave as a liquid. During the 2011 earthquake in Canterbury in New Zealand whole suburbs were rendered uninhabitable as houses sank into the ground and water, electricity and sewage services were twisted and fractured. Because of the possibility of more earthquakes, building in these zones is prohibited.

AIM **To model liquefaction during an earthquake**

Materials per student or group

- A large stone, block of wood or Lego house.
- A beaker or plastic drink cup
- Sufficient dry seeds (sunflower, rice, lentils etc.) or dry clean sand to half fill the beaker
- Water

Method

1. Half fill the beaker with seeds.
2. Place the “house” or rock on top.
3. Shake the beaker rapidly side to side without spilling the seed.
4. Observe and report
5. Add water and repeat

Observation

What happened to the “house” when the beaker was shaken? _____

_____

_____

What happened when water was added to the dry material? _____

_____

_____

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The old hymn says: *"Build on the rock, the rock that ever stands*
Oh! Build on the rock and not upon the sands
You need not fear the storm or the earthquake's shock
You are safe for evermore if you build on the rock!"

Will building on a rock make your house safe from earthquakes? Explain your answer. _____

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