

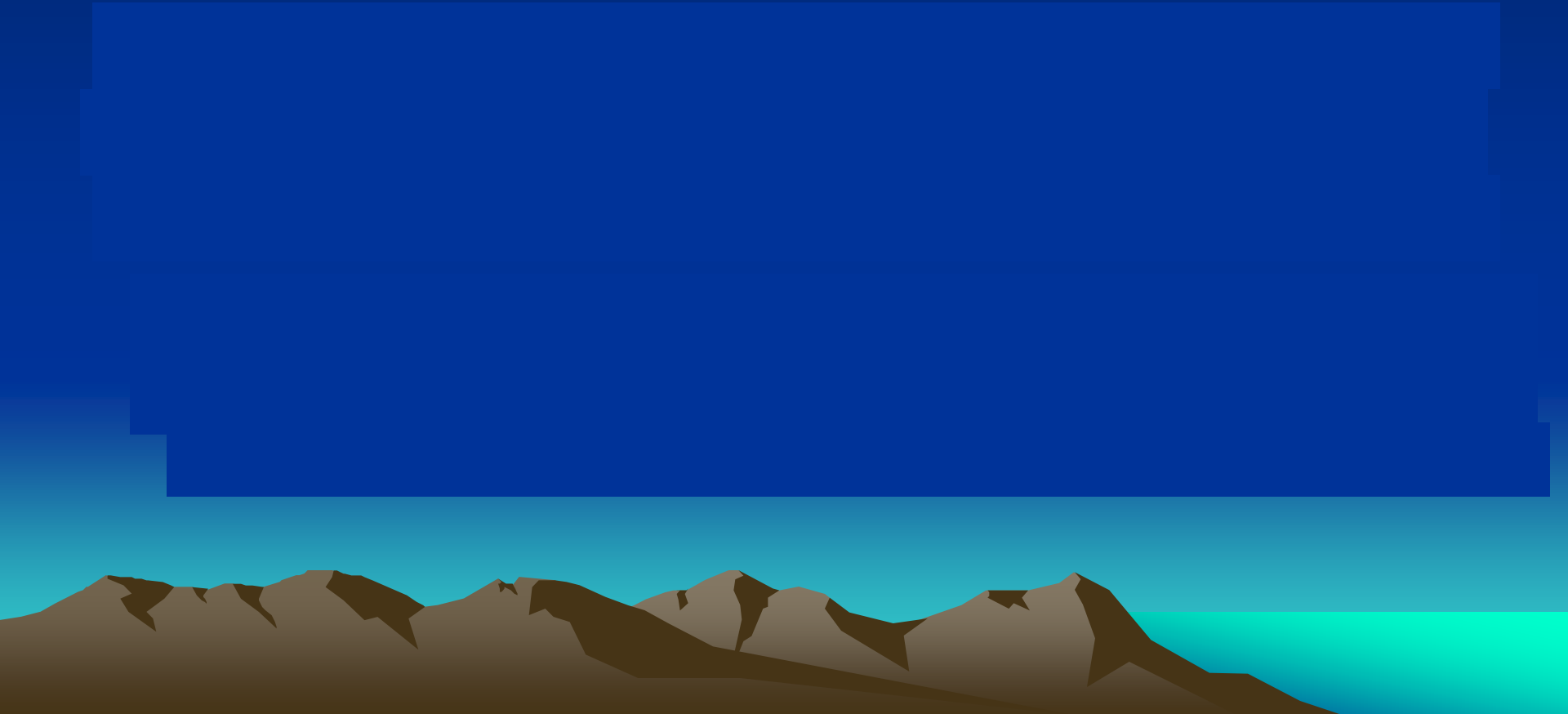
The Technological World

Forces and Engineering



Geological Phenomena Review

- Earthquakes:
 - What is an earthquake?



So What if the Plates Move?

- Video Clip (<http://video.nationalgeographic.com/video/player/environment/environment-natural-disasters/earthquakes/earthquake-101.html>)
- Watch/Listen for the following:
 - How often do earthquakes happen
 - What makes these plates move
 - How are earthquakes measured
 - How many are “serious”
 - What’s the biggest one that has happened in N.A.



Video Reflection

- 100s of earthquakes everyday 100 000 each year that can be perceived (we can feel)
- 1000 each year that damage property
- 10 000 people lose their lives each year from earthquakes



Types of Motion

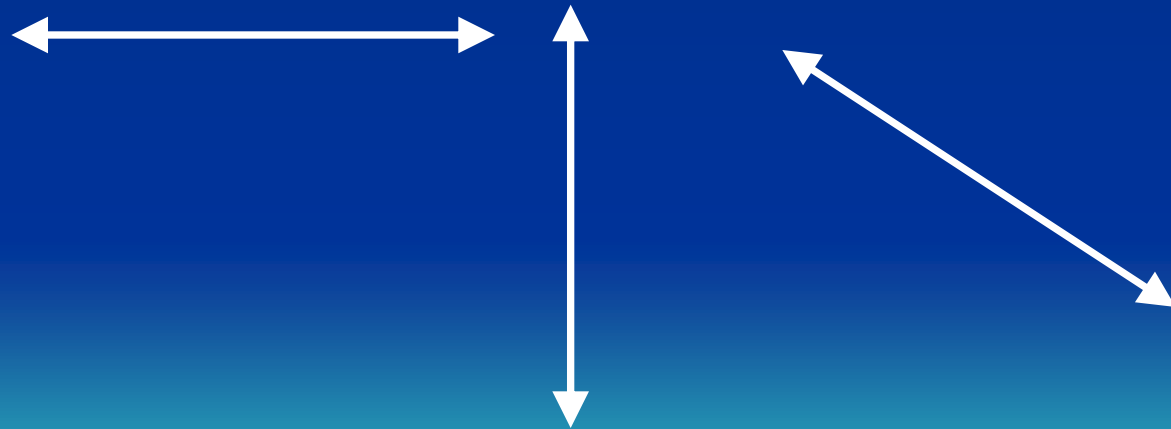
- All “motion” can be put into one of the following categories:
 - 1) Rectilinear Motion
 - 2) Alternating Motion
 - 3) Circular Motion
 - 4) Oscillatory Motion



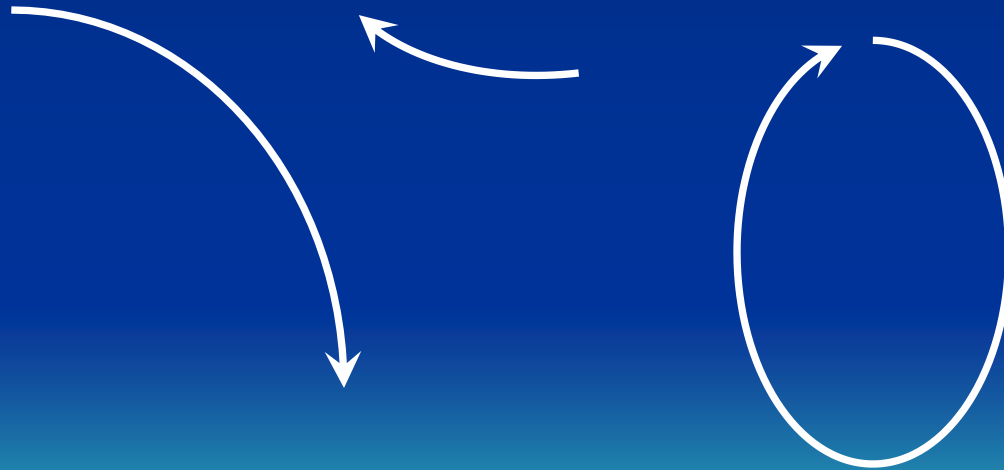
- 1) Rectilinear Motion
 - Motion in a single direction and in a straight line



- 2) Alternating Motion
 - A rectilinear motion that is executed in one direction and then the other



- 3) Circular Motion
 - Motion that describes a curve or circle



- 4) Oscillatory Motion
 - A back-and-forth motion around a central point



What Triggers Motion?

- Motion cannot start on it's own
- Some type of force must be present to start motion
- The most common force is gravitation force
- Gravitational Force: the force that pulls objects towards the centre of the Earth; the greater the mass of the object, the stronger the pull



What Slows Motion?

- The most common reason that a motion stops is due to friction



Friction

- Copy the Definition (Textbook—Glossary)
- Read pages 406 and 411 (textbook)
- Answer these questions:
 - What must you use to set an object in motion?
 - What type of force makes objects fall to the ground?
 - What is used to measure forces (unit, device)?
 - Why does a bike stop moving when you stop pedalling?
 - How can you overcome friction?
 - Give another example of where you have experienced frictional force (describe)



Friction Manipulation

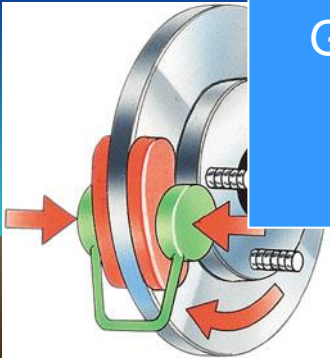
All-Season



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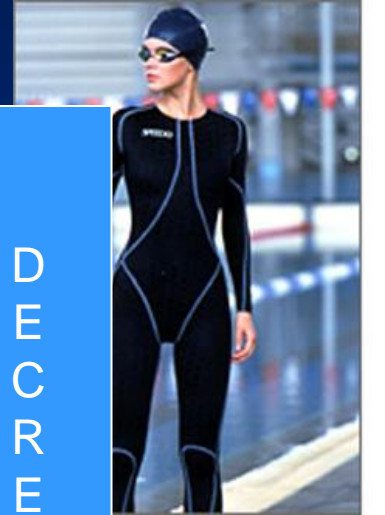
Break



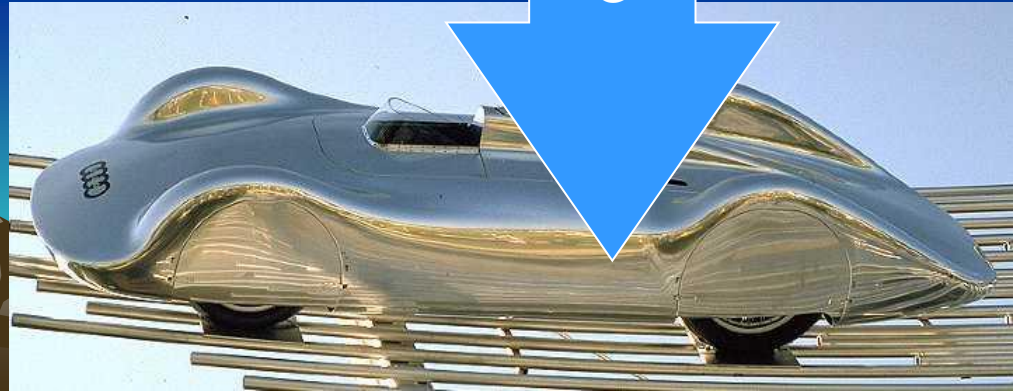
Vs. Water



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Vs. Air

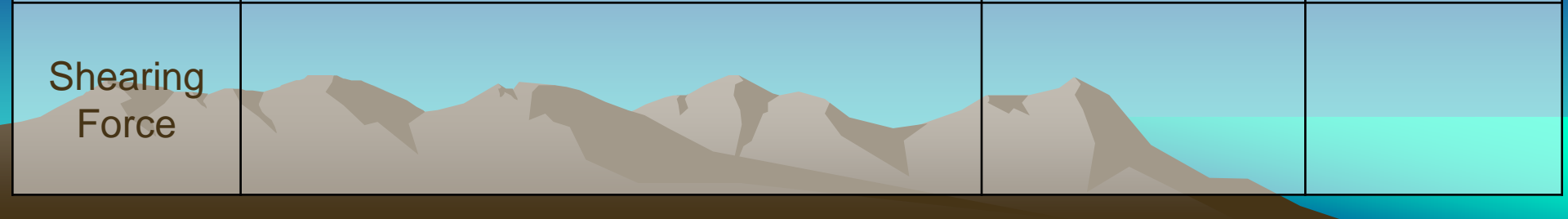
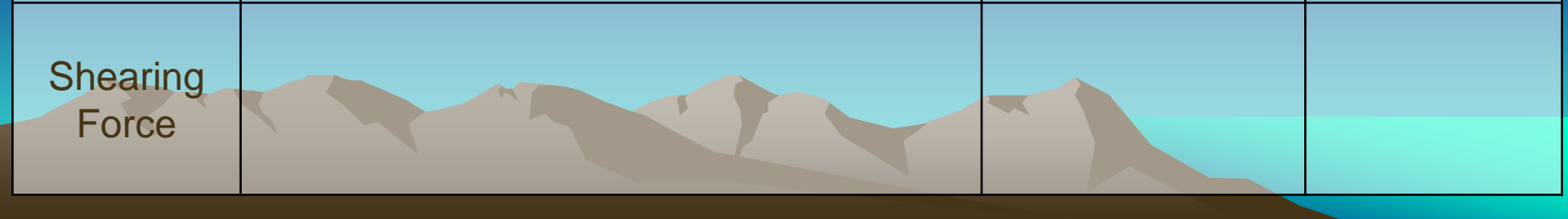
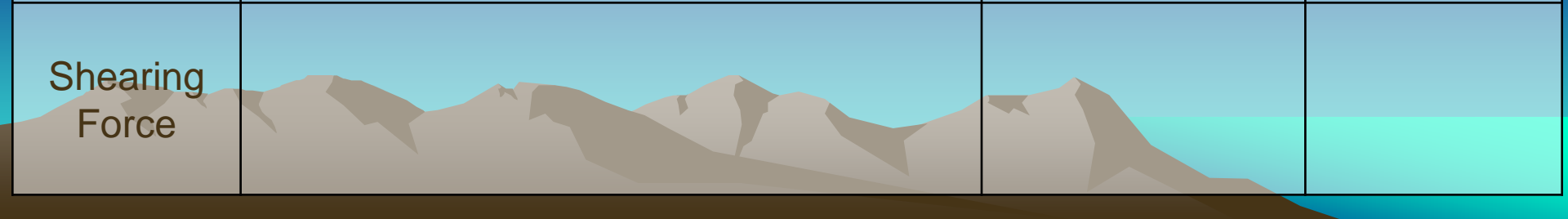


Friction

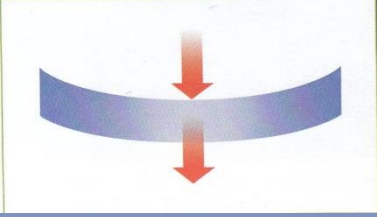
- Reflection: If we reduce the friction or apply enough force to “overpower” it what happens to friction’s energy?



Other Types of Forces

Type of Force	Description	Diagram	Example
Flexion Force			
Tension Force			
Compression Force			
Torsion Force			
Shearing Force			

Other Types of Forces

Type of Force	Description	Diagram	Example
Flexion Force	When a gymnast presses or pulls on the bar, her weight applies a flexion force. The bar is likely to bend under the effect of the force.		
Tension Force			
Compression Force			
Torsion Force			
Shearing Force			

Questions

- Which types of force are used in the following situations:
 - A) I take a tissue from a box of tissues
 - B) I sit on a chair
 - C) I wring out a wet towel
 - D) I tear a piece of paper
 - E) I press a button on my calculator
- Write down the questions and your answers and hand them in before leaving.



Forces and Structures

- Magnitude: A measure of how strong a force is. Example: Hitting a nail with your hand vs a hammer --- Which works better?
- Direction: The effect of a force depends on the direction it come from. Example: Pushing on a door that opens by pulling.



Forces and Structures

- Point and Plane of Application of Force:
 - Point: Where on the object you apply the force. Example: Pushing your dresser towards the wall in your room
 - Plane: Which cross-section you are applying the force to. Example: A structure designed to be stood on will not be effected by you standing on it, however it may collapse if you push it from the side



Review of Simple of Machines

Wedge: Door stop, Axe

Lever: 1st class – seesaw, crowbar

2nd class – nutcracker, wheelbarrow

3rd class – hockey stick, tweezers

Wheel and axle: car, water well



Pulley: clothesline, tow truck

Inclined plane: moving van ramp, slide

