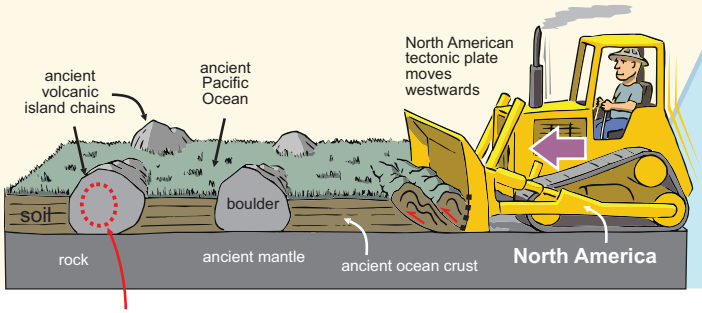
SEA TO SKY STORY: MAKING OF MOUNTAINS

British Columbia's mountains began forming 170 million years ago, and are still growing to this day. Seventy kilometres below the Sea to Sky corridor, the Pacific oceanic plate is sliding eastwards below the crust of British Columbia, part of the North American plate. This collision of tectonic plates is the source of British Columbia's coastal mountain range.

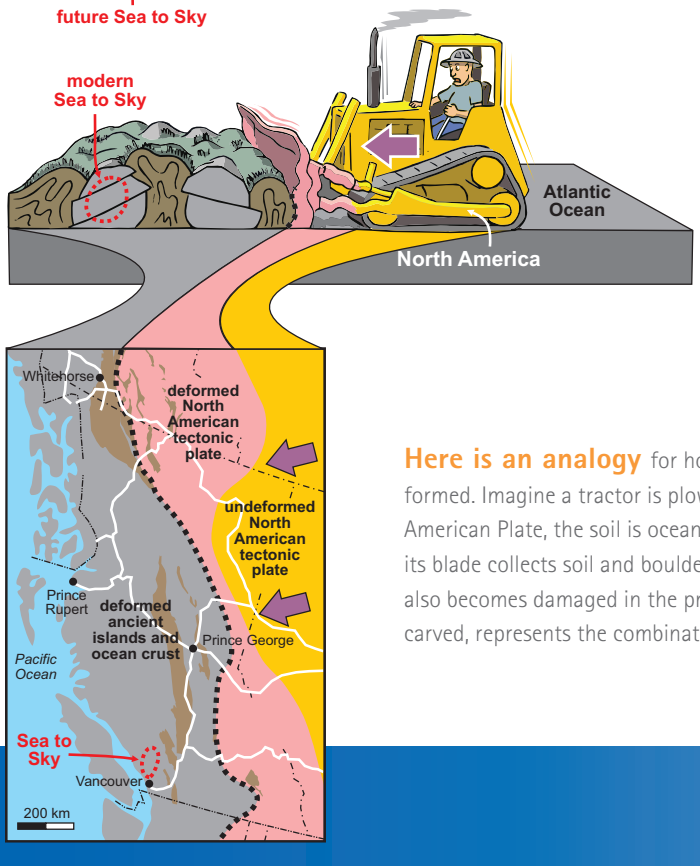
Crustal Collisions

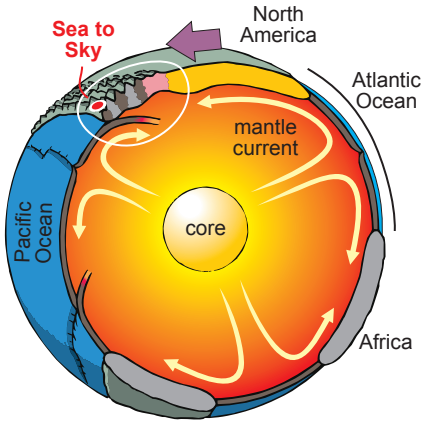
The surface of the Earth is made up of large pieces called tectonic plates. These plates are tens of kilometres thick and thousands of kilometres wide. They float on top of a layer of molten rock called the mantle. Currents within the mantle push these plates slowly and steadily in different directions.



British Columbia is on the leading edge of the North American tectonic plate which is colliding with the Pacific oceanic plate. Keep in mind that tectonic collisions happen in slow motion. The North American Plate is overriding the oceanic plate at a rate of four centimetres per year. That's about how fast a person's toenails grow!

Because of this collision, the compressed edge of the North American Plate is rising. This is the first step to creating mountains.





Here is an analogy for how British Columbia's land, and its characteristic mountain ranges were formed. Imagine a tractor is plowing a field with scattered boulders. The tractor represents the North American Plate, the soil is ocean floor and the boulders are ocean islands. As the tractor moves forward, its blade collects soil and boulders, deforming the soil and breaking the boulders. The tractor blade also becomes damaged in the process. Modern British Columbia, from which our mountains have been carved, represents the combination of broken boulder, deformed soil, damaged blade and tractor.

EROSION IS THE PROCESS THAT CARVES STEEP MOUNTAIN VALLEYS AND CRAGGY CLIFFS FROM THE RISING LAND. WITHOUT EROSION, COASTAL BRITISH COLUMBIA WOULD BE A HIGH PLATEAU. BUT THE RELENTLESS EROSION BY RIVERS AND GLACIERS HAVE CARVED THE PLATEAU INTO VALLEYS AND MOUNTAINS TO CREATE BRITISH COLUMBIA'S CHARACTERISTIC LANDSCAPE.

During the last Ice Age, glaciers covered British Columbia. These glaciers followed river valleys, carving them deeper and wider, and creating steep valley walls. And wherever they went, they took souvenirs with them.

Glaciers pick up rocks and rivers wash them away

Glaciers are constantly picking up rocky souvenirs. Steep, narrow river valleys become wide and round when glaciers flow through them for thousands of years. This is because glaciers pick up rock and debris as they travel. The sediment freezes into the glacier and moves along with it, grinding the underlying rock that it travels across.

When glaciers melt, all of the rock and debris they had been carrying drops on the ground, or is carried away by rushing water. Rivers carry the discarded silt, sand and other debris downstream and out to sea.

The height of the glaciers that flowed down Howe Sound during the last Ice Age can be interpreted from the shape of the local mountains. Only the highest peaks escaped the grinding and rounding effect of the glaciers.

Tongues of a great glacier extend down valleys on the edge of the Pemberton Icefield. When these glaciers retreat, they will leave a widened valley full of rocky debris.

Scientists at the Geological Survey of Canada have mapped the bedrock, the landscape and the seafloor of the Sea to Sky area. These maps provide a foundation for understanding the environment, hazards and mineral potential of the area.

The steep slopes of the Sea to Sky mountains are prone to landslides, which can damage local infrastructure and endanger communities and travellers. Natural Resources Canada scientists map potential landslide areas and take part in emergency planning to help keep British Columbians safe.

If you are interested in studying glaciers and plate tectonics, consider a career with Natural Resources Canada's Earth Sciences Sector.

For more information, contact the Geological Survey of Canada, or visit the Natural Resources Canada website for more information:

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