SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

What are Strata in Rocks?	Grade 4 - Rocks, Minerals, and Geological Processes

Lesson Plan

Learning Outcomes

- Students will learn the differences between igneous, sedimentary, and metamorphic rocks.
- Students will learn how fossils are formed in strata.

Specific Expectations

E2.1 explain geological processes that result in the formation of igneous, sedimentary, and metamorphic rocks, using the rock cycle
E2.2 describe the physical properties of igneous, sedimentary, and metamorphic rocks
E2.5 describe how fossils are formed and what information they can provide about Earth's history

Description

In this lesson plan students will learn about the 3 types of rocks on the Earth, how they are formed, and how fossils are formed inside the strata of sedimentary rocks. Students will then participate in a hands-on activity where they will make their own strata.

Materials

- Coloured sand
- Beads of different sizes and colours (at least 5)
- Jar
- Big spoon
- Something to rest jar on, ex. Modelling clay

Introduction

What are Rocks?

On Earth, there are three types of rock: igneous, sedimentary, and metamorphic. They are all formed differently through the physical changes of melting, cooling, eroding, compacting, or deforming. They are part of the rock cycle. These three families are constantly changing from one to another. The change is due to tectonic plate movement. Tectonic plates are like puzzle pieces under the earth; they are constantly moving and changing the surface of the Earth.

What is Igneous Rock?

Deep inside the Earth, there is hot melted rock called magma. When magma cools down, it becomes solid and forms igneous rocks. It is like making rock candy by letting hot, sugary water cool and harden.

What is Metamorphic Rock?

Metamorphic rocks form when other pre-existing rocks are subjected to high heat, high pressure, hot mineral-rich fluids or, more commonly, some combination of these factors. These

changes do not melt the rock, but the chemicals they contain may change their forms or crystal shapes. Just like baking a cake, all the ingredients you add at the beginning are still a part of the cake after taking it out of the oven, however, it is now chemically changed.

What is Sedimentary Rock?

Think about the beach where you find lots of sand. Over a long time, tiny bits of rocks, shells, and other stuff pile up and press together, just like when you make a sandcastle you compact sand together. This pressing makes layers of rocks, and these layers turn into sedimentary rocks.

What are Strata?

These are the sedimentary rock layers; you can think of it like a layered cake, but instead the earth is layered with rock, and those rocks can tell a story. Scientists study the layers. You can find fossils in the layers.

How are Fossils Made?

When a dinosaur or a plant or even a tiny sea creature dies, sometimes it gets covered in layers of mud or sand, which also keeps the thing intact and safe from weathering, then over a very long time the mud or sand hardens into rock, then millions of years later, when we carefully chip away at the rock we find a fossil inside. So, fossils are like time capsules, little bits of the past waiting for us to uncover their secrets and piece together the story of our planet's history.

Action

Make your own strata!

In this activity, students will be creating their own jar of "strata" using a variety of ingredients of different sizes and textures.

Step 1: Press one edge of the jar into a piece of modelling clay, so that the jar sits on an angle. Slowly and carefully spoon the first layer of beads about 2.5 cm deep into the jar.

Step 2: Carefully add more layers of the different colours and sizes of beads.

Step 3: Remove the jar from the clay and stand it upright. The different layers are like a section through a sequence of natural sedimentary rocks.
*Students can add an animal figurine while layering the beads to be a "fossil" in the sedimentary rock.

Consolidation/Extension

Ask students if they have ever found fossils before, and where they have found them.
Fossils are always found in sedimentary rock, so often found along a beach.
Watch: https://youtu.be/2E_OaO_qAVI?si=quTMbxOHb7AcsQoM The Rock Cycle