

Minerals in our Lives

Introduction:

- Brainstorm minerals that are mined in Western Australia - gold, bauxite, iron ore, copper, diamonds, coal, oil, salt and minerals sands.
- Identify a few places on the map of WA where these minerals are mined.
 - GOLD : Eastern Goldfields Region
 - BAUXITE: Pinjarra and Boddington
 - IRON ORE: Pilbra Region
 - COPPER: Mainly Pilbra and Kimberly regions
 - DIAMONDS: Kimberly Region
 - COAL: Collie
 - OIL: North West Shelf
 - SALT: Dampier
 - MINERAL SANDS: Along the coast from Busselton to Geraldton
- Discuss what products contain each mineral.
 - GOLD: Jewellery, collector coins, gold medals, electronic circuit boards
 - BAUXITE (Aluminum): soft drink cans, alfoil, bike frames, scooters, boats, door and window frames, airplanes.
 - IRON ORE: Steel - bridges, buildings, parts of cars, trucks trains, ships cranes.
 - COPPER: Electrical wires, water pipes.
 - DIAMONDS: Jewellery, saw blades and drill bits (industrial diamonds).
 - COAL: Electricity
 - OIL: Bitumen, lubricating oil, petrol, diesel, nylon (stockings), plastic.
 - SALT: Food (hot chips), soap.
 - MINERAL SANDS: Some food products, paint, crayons, plastic, fabric, paper.

M&M's Test:

- Give students two M&M's.
- Students eat one M&M straight away.
- Instruct students to put second M&M into their mouth and suck all of the colour off until the M&M turns white.
- Students take the M&M out of their mouth as soon as it turns white, and have a look at the white part of the M&M very closely.
- As students eat their M&M, ask them what mineral they think makes the white part of the M&M.
- After they have had a few guesses tell them that the white part of the M&M is made of sand! Mineral Sands that has been processed into Titanium Dioxide - see sample. The makers of M&M's coat the chocolate with Titanium dioxide so that when they put the dye over the top the lolly comes out nice and bright. Titanium Dioxide is also used in Smarties, Skittles, Jaffas, Tictacs, Minties and Mentos.

Exploration: Marble Cake Drilling

- Discuss how geologists need to explore the land to work out where the minerals are. They need to conduct tests to find where the minerals are and how much of the mineral is underground.
- Tell students that today they are going to explore for minerals by taking drill core samples from a piece of marble cake.
- Pass out clear straws (each straw is to be cut into 3 even parts), marble cake record sheets, and scrap paper.
- Explain to students how to take 3 drill core samples - gently twisting and pushing each straw into cake, take a left, right and centre sample.
- Pull each sample out and record the sample onto their record sheet by colouring each column according to what their core sample looks like.
- Once students have coloured all three columns, then they have to predict what the cake looks like in between each core sample, and colour their predictions so that they end up with a complete cross-section of cake.
- If the yellow part of the cake represents gold, students need to decide
 - Is there enough gold to make it worth developing a mine?
 - Would you develop and open cut mine (if the gold is close to the surface) or and underground mine (if the gold is well below the surface)?
- Once students have made their decision, teacher cuts cake pieces in half to let students see how close their recording and predictions were.
- Students may then eat their cake.

CME

Marble Cake Exploration



Create a key below;

Gold

Rock

Rock

1. Take 3 drill core samples.
2. Record your 3 drill core samples above.
3. Colour in your data.
4. Predict and colour what you think the marble cake looks like between your core samples. Record your drill core samples below;

Do you think it would be best to develop an open cut mine or an underground mine to extract the mineral ore body from your sample?

Why?
