

Fruit Cake Mining

Mining activities have many impacts on the environment. However, there are many ways companies are able to limit the impacts and changes caused by mining. These methods are considered in an Environmental Impact Study. The study provides information about where and how mining could be carried out as well as the possible effects of the operation. If mining goes ahead without making informed decisions the environment could be damaged beyond repair.

This activity provides an insight into the activities and decisions made around mining.

Materials

- One A 4 piece of cardboard with 12 cm circle in the centre
- Fruit Cake
- Toothpicks, tweezers, skewers, forks, spoons – implements to 'mine' with
- Paper towel / tray to work on
- Other materials will depend on extension activities

Steps

1. Examine the piece of fruit cake. You will be able to see different types of fruit representing different minerals and so each type of fruit has been given a different value. (Different minerals will have varying values. The value of a mineral is determined by how rare it is and how much people want or need it.)
 - SULTANA \$0.85
 - FRUIT RIND \$0.90
 - CHERRY \$1.10

Questions to answer (in your workbook)

- Predict which type of fruit you think you will find most of in your ore body and what do you think its value will be?
 - Which type of fruit do you think will have the highest total value?
2. Using the tweezers and toothpicks provided remove as many 'minerals' as possible without the mine collapsing.
 - The mining must take place only within your lease (The circle on the laminated card).
 3. Now that mining is complete you must rehabilitate the mine site and reshape the "overburden" back to as close as possible as its original shape.
 4. Ask your teacher to assess your mine site.

Questions to answer (in your workbook)

- Calculate how much fruit you have mined and its value?
- List one difficulty with "mining" the minerals in a manageable way.
- Describe one environmental impact of mining.
- What steps need to be taken to reduce the environmental impact of mining?



For Teachers

Equipment Required

- Fruit Cake (light coloured makes it easier for students to identify 'minerals' and extract them)
- Toothpicks, tweezers, skewers, forks, spoons – implements to 'mine' with
- Paper towel / tray to work on
- Other materials will depend on extension activities

Possible lesson steps

- Discuss mining process with students. Discuss topics such as a mining lease and steps in mining – exploration, mining and rehabilitation (as main steps) – and safety.
 - With respect to mining lease – make students aware of the fact that all mining activities need to stay on lease – the paper towel / tray can act as the lease – make students aware that any material that leaves the 'lease' – product, tools etc - will be confiscated. (This will aid with clearing up)
 - For Exploration, students could use straws to take drills core samples from cake to determine location of 'minerals'.
 - Mining can be open cut or underground, and students should plan their mine based on 'mineral' location.
 - Rehabilitation involves returning the site to as near to the original state as possible. They should consider rehabilitation before they begin mining – sometimes it is necessary to leave minerals in the ground so that the site can be suitably rehabilitated. Discuss legislation around rehabilitation.
 - Safety is the industry's first priority. Mining processes need to occur so that safety is assured. Mine collapses for example may endanger the lives of site employees. Students should consider safety aspects at all times. (Similarly, with use of 'mining tools' safety should be discussed with students.
- Before starting ask students about the roles performed on a mine site. Ask them to assign roles to each group member. This will ensure that each student is involved in the activity for the duration of the 'mining'. Roles may include:
 - Miners - to extract 'minerals'
 - Environmental Scientists / Rehabilitation - to return the site to as near as original condition
 - Processors - to 'clean up' minerals – remove cake from fruit
 - Finance Officer - to calculate profit
- Provide students with an A4 piece of paper or card with a 12 cm circle drawn in the centre (The mining Lease). In the centre of the circle place a rectangular piece of fruit cake.

Extension Activities

- Ask students to determine the percentage (weight) of each of the fruits extracted from their 'mine'. (Will require a set of scales or an electronic balance)
- Write a newspaper report about the exploration and discovery of a new ore body.
- Consider the impact of mining from the perspective of a farmer, mining company, local workforce, native title holder, mayor
- Research mining activities in the local area.
- Discuss different types of mining including – open cut, underground, dredge etc.

