

# Manual Chocolate Chip Mining

<http://www.fisme.science.uu.nl/toepassingen/22016>

## Requirements (group)

Each group of students will need:

- 2 chocolate chip biscuits (which should be stored in a refrigerator or other cool place before use)
- clean containers, e.g. margarine tubs, or yoghurt pots
- access to a variety of equipment and materials such as:
  - knife
  - spatula
  - sieve or strainer
  - water bath
  - a balance
  - measuring cylinder
  - oven



Try to get 'mineral' from a 'rock' sample.

## Research

You are a mining engineer working at a mining company. You work in the laboratory which investigates methods for getting useful minerals from rocks. You have just been sent a sample of rock which seems to have small pieces of a valuable mineral mixed up with unwanted waste material. The mineral is dark brown.

- Find a method for separating the valuable mineral from the rock sample.
- Measure the amount of mineral and the amount of waste. Compare your results with those obtained by other working groups. Does the amount of the valuable mineral seem to be about the same in each rock sample?
- Compare the volume of waste rock with the volume of your original sample. Is it likely to be possible to put the waste back into the hole made during mining?
- If a second rock sample is available, try to see if you can extract the mineral more efficiently.

## Product

Write a report for the directors of your company.

## Background

This is an activity for students age 15 years, and consists of one or 2 lessons. Students will work in groups.

Students will need to be explicitly encouraged to record all data (quantities, etc.) and process these in tables, and possibly graphs.

## Source



Mathematics and Science for Life

[www.mascil-project.eu](http://www.mascil-project.eu)

SATIS , Science and Technology in Society (UK) (1984). Task 1001, only part 1.