

Learning Outcomes

Provincially prescribed learning outcomes that apply taken from the Ministry of Education's Math Integrated Resource Packages for Grades K-7 and 8-10.

- Grade 5
 - represent and describe proper fractions concretely, pictorially, and symbolically
- Grade 6
 - demonstrate and explain the meaning of ratio concretely and pictorially
 - demonstrate and explain the meaning of percentage concretely and pictorially
- Grade 7
 - estimate and calculate percentages
- Grade 8
 - add, subtract, multiply and divide fractions concretely, pictorially, and symbolically without the use of a calculator
 - derive and apply unit rates using real world situations
 - use concepts of ration, rate, proportion, and percentage to solve problems: given two numbers, determine the percent that one is of the other; determine the percent of a given number; given the percent of a number, determine the number

Materials

- [Fractions-Slice of Soil Worksheet pdf](#) (129KB)
- [Percent-Slice of Soil Worksheet pdf](#) (131KB)
- statistics from Pop Clock (optional)
- apple
- paring knife

Introduction

Ask students what some of the most important natural resources in the world are. Lead students toward soil as a very important resource (people need food to live and need soil directly or indirectly to produce food). Explain that our food producing land is finite, yet the world population continues to grow. You may want to use the [Population Clock](#) to show how fast the world population is growing. Check it a month or week before you need the statistics and then right before the lesson. Ask for estimates in percentage or fraction form as to how much of the earth's surface they think can grow food. Tell them to write this estimate down on a worksheet. They may follow along, filling in the appropriate boxes on the worksheet as the demonstration with the apple proceeds to show how much arable land surface is available.

Procedure

1. Cut an apple in half and then into quarters. three parts represent the oceans of the world. The fourth part represents the land area. Tell them to write down on the worksheet what percentage/fraction of the earth is land and what percentage/fraction of the earth is water (two worksheet blackline masters have been provided). One deals only with fractions and the other with percentage and fractions.) You may want to have them write a ratio somewhere on the worksheet also.
2. Put aside the water pieces and cut the land section in half lengthwise. Tell them that one section represents land such as deserts, swamps, Antarctic, Arctic and mountain regions and the other represents land where people can live. What is the percentage of land where people can live? What is the total percentage/fraction of the earth that is uninhabitable, including the oceans and not including the oceans.
3. Slice one of the 1/8 pieces lengthwise into four equal parts. Three of these 1/32 parts represent areas of land that are too rocky, too wet, too hot, or where soils are too poor for production, as well as areas developed by people. What is the percentage/fraction of the earth's surface where the soil

and conditions are good enough to grow food? What is the percentage/fraction of the land portion of the earth that can be used for agriculture? Land that can be used to produce food is called arable land.

4. Peel the last section. This small bit of peel represents the topsoil of the earth on which people depend on for food production.
5. Go back, and using the apple slices as a guide, go through questions on the *Slice of Soil* worksheet.

Evaluation

1. Have students draw a pie graph of the total earth surface and its uses. They will need to know what a good pie graph looks like.
2. In groups, have students think of a way, using a symbolic method similar to the apple, to represent the way that they use their time in a twenty-four hour period or how the school timetable is broken up. You may want to have the groups do presentations when they are done.
3. Have students draw a pie graph or another type of graph to show the information on the worksheet.