STEM@CGI
SCIENCE - TECHNOLOGY - ENGINEERING - MATHEMATICS

LEARNING LINKS FOUNDATION

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STEM from Home

Comparing Quantities: Ratio and Proportions

Introduction:

Have you ever wondered how does the food that you eat at home always tastes yummy even if it is cooked in small or large amounts? You always get the perfect amount of salt and spices which makes the taste perfect! Have you seen your parents compare two different packs of grocery items at a store before selecting one? How do they know which one is a better value-for-money? The simple answer to these two examples is ratio. You use ratios every time you double or triple a recipe, or compare prices while grocery shopping.

We need a standard measure or way for Comparing Quantities. The ratio and proportion are among them. While ratio compares the size of two quantities, proportion compares the relationship between two sets of quantities.

In this STEM pack, you will use an online simulation to understand the concept of Ratio and Proportion, learn how to compare different quantities, and also explore different tech tools for creating puzzles and survey forms online.

Main Activity: **Ohm's Law**

Introduction

In this activity, you will study about Ohm's Law to understand the relation between current, voltage and resistance in an electric circuit.

What You Will Need:

A computer with internet connection

What You Will Learn:

- How current will change when resistance of the circuit is fixed and voltage is varied.
- Using simulations to manipulate the quantities and record observations to verify Ohm's Law.
- Concept of equivalent ratios using recorded observations.
- How to design an online crossword puzzle using "Crossword Labs".

Access the activity here.

Bonus Activities

Activity 1: Proportions Game

Two quantities are in proportion when a change in one causes a change in the other. Two examples of this are direct and indirect (also known as inverse) proportion.

Two quantities are in **direct** proportion if the ratio between them is always the same. For example, if one quantity doubles, the other will also double.

Two quantities are in **indirect** proportion if their product is always the same. For example, if one quantity doubles, the other will be halved.

In Bonus Activity, you will explore Dirt Bike Proportions — an online game which supports learning as well. It is a self-paced game where you can pick the slow or fast option of playing as per the comfort level. This absorbing game will definitely challenge your math and thinking skills as much as it entertains.

Here's a little tip:

Start slow, and then reduce the time so that you can practice faster calculation, quicker thinking, and appropriate reasoning.

Challenge Activity: Measuring Height of Objects Through Shadows

How do we measure things that are too big for our measuring tools? Find out how math can help! Get outdoors and harness the power of ratios and geometry to estimate the height of trees and other tall objects.

What You Will Need:

- Tree or other tall object, like a telephone pole or building to measure
- Ruler or measuring tape
- Marker or chalk powder
- Calculator (optional)

Access the activity here.

Check out the link https://nrich.maths.org/8704 to access several other simulations and interactivities on ratio and proportion. Play at least 3 interactive games and solve the questions in them. Prepare a presentation on the 3 games which you have selected and played, describing your understanding of Ratio and Proportions using docs or presentations.