Eureka Math Parent Guide

A GUIDE TO SUPPORT PARENTS AS THEY WORK WITH THEIR STUDENTS IN MATH.

GRADE FOCUS

Eighth grade mathematics is about (1) formulating and reasoning about expressions and equations, with a special focus on linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

- Module 1: Integer Exponents and Scientific Notation
- Module 2: The Concept of Congruence
- Module 3: Similarity
- Module 4: Linear Equations
- Module 5: Examples of Functions from Geometry
- **» Module 6: Linear Functions**
- Module 7: Introduction to Irrational Numbers Using Geometry

LET'S CHECK IT OUT!

MODULE 6 FOCUS

In this 14-lesson module, students are introduced to bivariate data. Students work with functions and use their understanding of functions to model the possible relationships of bivariate data. This module is important in setting a foundation for students' work in algebra in Grade 9 with respect to functions and statistics.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.

- Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

- Construct and interpret scatter plots to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

- Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line.

- Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

- Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

TOPIC OVERVIEW

Topics are the lessons within a module that help children master the skills above. Here are the lessons that will guide your child through Module 6:

- Topic A: Linear Functions
- Topic B: Bivariate Numerical Data
- Topic C: Linear and Nonlinear Models
- Topic D: Bivariate Categorical Data

WORDS TO KNOW

- **Association**: A relationship between two variables. The tendency for two variables to vary together in a predictable way.

- **Bivariate Data**: Data for two variables (usually two types of related data). For example, ice cream sales vs. the temperature on that day.

- **Two-way table**: A table used to summarize data on two categorical variables. The rows of the table correspond to the possible categories for one of the variables, and the columns correspond to the possible categories for the other variable. Entries in the cells of the table indicate the number of times that a particular category combination occurs in the data set or the frequency for that combination.

	Sport Utility Vehicle (SUV)	Sports Car	**Totals**
male	21	39	60
female	135	45	180
Totals	156	84	240

- **Row relative frequency**: In a two-way table, a row relative frequency is a cell frequency divided by the row total for that cell.

- **Column relative frequency**: In a two-way table, a column relative frequency is a cell frequency divided by the column total for that cell.
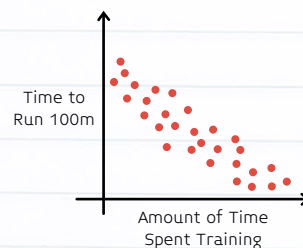
SAMPLE PROBLEMS

SAMPLE 1: PATTERNS IN SCATTER PLOTS

Positive Linear Relationship: there is a pattern in this graph that looks as though it could be described by a line. Therefore this graph represents a *positive* linear relationship (as one variable increases, the other variable increases at a consistent rate).
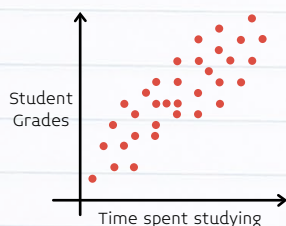
Negative Linear Relationship: there is a pattern in this graph that looks as though it could be described by a line. Therefore this graph represents a negative linear relationship (as one variable increases, the other variable decreases at a consistent rate).

SAMPLE 2

Problem:

A rental car company offers a rental package for a mid-size car. The cost is comprised of a fixed $30 administrative fee for the cleaning and maintenance of the car plus a rental cost of $35 per day.

1. Using x for the number of days and y for the total cost in dollars, construct a function to model the relationship between the number of days and the total cost of renting a mid-size car. (solution: y = 35 + 30)

2. The same company is advertising a deal on compact car rentals. The linear function y = 30 + 15 can be used to model the relationship between the number of days (x) and the total cost (y) of renting a compact car.

   a. What is the fixed administrative fee? (**Solution**: $15 is the fixed administrative fee)

   b. What is the rental cost per day? (**Solution**: $30 is the rental cost per day.)

HOW YOU CAN HELP AT HOME

- Every day, ask your child what they learned in school and ask them to show you an example.
- Ask your child what an outlier means when analyzing a set of data.
- Discuss what a graph of a linear function with a positive slope would look like and have your child draw a sketch of this relationship.