Dear Family,
The next unit in your child's mathematics class this year is *Moving Straight Ahead: Linear Relationships.* In this unit, students are developing skills in areas that are traditionally known as algebra. This unit introduces them to situations that can be modeled with linear relationships and graphed with straight lines.

UNIT GOALS

The primary goal of this unit is to develop understanding of linear relationships or linear functions. Students learn to recognize linear functions by the constant rate of change between two variables in a verbal context, table, graph, and equation. This idea is introduced in an experiment that has students determining their walking rate. This experiment is more closely tied to the central idea of constant rate of change between two variables.

Identifying, representing, and interpreting linear relationships is the central idea in this unit. Solving linear equations and writing equations for lines is also important. These last two ideas will be revisited with more complexities in later units—in particular, the 8th grade units, *Thinking with Mathematical Models* and *Say It With Symbols*.

HOMEWORK AND CONVERSATIONS ABOUT THE MATHEMATICS

You can help with homework and encourage sound mathematical habits as your child studies this unit by asking questions such as:

- *What are the variables in the problem and how are they related?*
- *How can I recognize a linear pattern if it is represented in a problem, a table, graph, or with an equation? And how can I use these representations to answer given questions?*

You can help your child with his or her work for this unit in several ways:

- Ask your child to describe some real-world situations in which linear functions are used. Here are some examples:
  - Income at a movie theater that increases at a constant rate based on the number of tickets sold
  - The distance traveled in a vehicle moving at a constant speed
  - The amount of water in a sink that is draining at a constant rate
- Look at your child's mathematics notebook. Read some of the explanations that have been written and, if they aren't clear, talk with your child about why you think they may need more explanations.
- Look at your child's homework and make sure all questions are answered and explanations are clear.

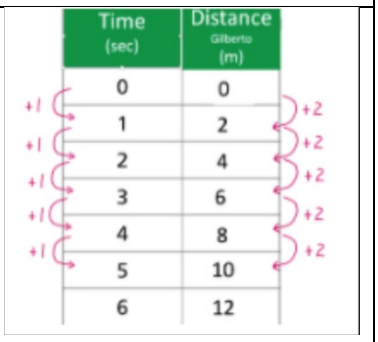
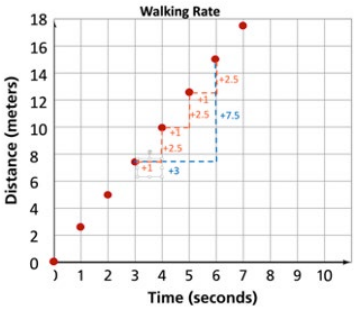
COMMON CORE STATE STANDARDS

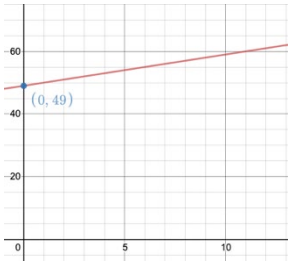
While all of the Standards of Mathematical Practice are developed and used by students throughout the curriculum, particular attention is paid to modeling with mathematics as students solve linear problems with tables, graphs, and equations. *Moving Straight Ahead* focuses largely on the Expressions and Equations domain. As students explore linear relationships, parts of the Ratio and Proportional Reasoning and Functions domains are also addressed.

A few important mathematical ideas that your child will learn in *Moving Straight Ahead* are given on the back.

As always, if you have any questions or concerns about this unit or your child's progress in class, please feel free to call. All of us here are interested in your child and want to be sure that this year's mathematics experiences are enjoyable and promote a firm understanding of mathematics.

Sincerely,

<table>
<tr><th>Important Concepts</th><th>Examples</th></tr>
<tr><td colspan="2">Linear relationships
A relationship is linear if there is a constant rate of change between the two variables. That is, for each unit change in x there is a constant change in y.</td></tr>
<tr><td>Tables
In the table, the constant rate of change can be observed as a pattern of consistent change in the variables.</td><td>Gilberto's walking distance;
As the time increases by 1 second the distance increases at a constant rate of 2 meters.
 
</td></tr>
<tr><td>Graphs
If we graph the data, the constant rate of change between the two variables shows up as a straight line.
This constant rate of change is called the slope of the line. It is the ratio of change between the two variables.
$\text{Slope} = \frac{\textit{vertical change}}{\textit{horizontal change}}$,
for any two points on the line.</td><td>Leanne's Walking Rate
 

Here, the slope is $\frac{7.5}{3}$ or $\frac{2.5}{1}$ or 2.5</td></tr>
<tr><td>Equations
In the symbolic representation the constant rate of change shows up as the coefficient of t.</td><td>Here, the coefficient is 2.
$d = \mathbf{2}\,t$ (Gilberto)</td></tr>
<tr><td>y-intercept
The point where the graph of a line crosses the y-axis (vertical axis).</td><td>Suppose the cost to purchase T-shirts for walkathon participants is \$49 for the design plus \$1 per shirt. Symbolically, we write C = \$49 + \$1n, where C is the cost in dollars and n is the number of T-shirts.
 

The y-intercept is at \$49.
For 0 T-shirts the cost is \$49. This means there is a fixed charge in addition to the charge per T-shirt.
The y-intercept is the constant term in the equation, $C = 49 + 1n$.
The slope (or the constant rate of change) of the line is 1.</td></tr>
<tr><td>Solving Equations
We write a series of equivalent equations until it is easy to read the value of the variable. Equivalent equations have the same solutions. Equality or equivalence is maintained when you add, subtract, multiply and divide the same quantity to both sides of the equation. For multiplication and division, the quantity must not be zero. These procedures are called the properties of equality.</td><td>$C = 150 + 10n$ If C is 750, what is the value of n?
<table><tr><th>Equation</th><th>Reasons</th></tr><tr><td>$750 = 150 + 10n$</td><td>Original equation</td></tr><tr><td>$750 - 150 = 150 - 150 + 10n$</td><td>To undo 'adding 150' on the right side, 150 is subtracted from both sides</td></tr><tr><td>$600 = 10n$</td><td></td></tr><tr><td>$\frac{600}{10} = \frac{10n}{10}$</td><td>To undo 'multiplying by 10' on the right side of the equation, divide by 10.</td></tr><tr><td>$60 = n$</td><td>The value of n must be 60.</td></tr></table>Note that if n is replaced by 60 in each step, we have a true equation. The original equation would give $750 = 750$.</td></tr>
</table>