

STUDY LINK
2•12**Unit 3: Family Letter****Variables, Formulas, and Graphs**

In Unit 3, students will be introduced to variables—symbols such as x , y , and m —that stand for a specific number or any number in a range of values. The authors of *Everyday Mathematics* believe that work with variables is too important to be delayed until high-school algebra courses. The problem “Solve $3x + 40 = 52$ ” might be difficult for some high-school students because they see it as merely symbol manipulation. Problems such as these are posed to *Everyday Mathematics* students as puzzles that can be unraveled by asking, “What number makes the equation true?” *I need to add 12 to 40 to get 52. Three times what number yields 12? The answer is $x = 4$.*

In addition to being used in algebraic equations, variables are also used to describe general patterns, to form expressions that show relationships, and to write rules and formulas. Unit 3 will focus on these three uses of variables.

In this unit, your child will work with “What’s My Rule?” tables like the one below (introduced in early grades of *Everyday Mathematics*). He or she will learn to complete such tables following rules described in words or by algebraic expressions. Your child will also determine rules or formulas from information given in tables and graphs.

Rule: $y = (4 * x) + -3$

x	y
5	17
2	
0	
	37

In addition, your child will learn how to name cells in a spreadsheet and write formulas to express the relationships among spreadsheet cells. If you use computer spreadsheets at work or at home, you may want to share your experiences with your child. The class will play *Spreadsheet Scramble*, in which students practice computation and mental addition of positive and negative numbers. Encourage your child to play a game at home. See the *Practice through Games* section of this letter for some suggestions.

	A	B	C	D	E	F
1						Total
2						
3						
4						
5	Total					

Please keep this Family Letter for reference as your child works through Unit 3.

Math Tools

Your child will be using **spreadsheets**, a common mathematics tool for the computer. The spreadsheet, similar to the one shown here, gets its name from a ledger sheet for financial records. Such sheets were often large pages, folded or taped, that were *spread* out for examination.

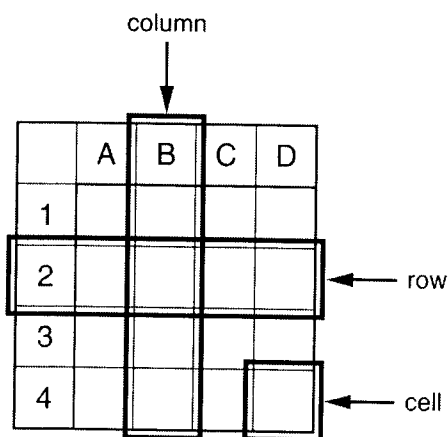
	A	B	C	D
1	budget for class picnic			
2				
3	quantity	food items	unit price	cost
4	6	packages of hamburgers	2.79	16.74
5	5	packages of hamburger buns	1.29	6.45
6	3	bags of potato chips	3.12	9.36
7	3	quarts of macaroni salad	4.50	13.50
8	4	bottles of soft drinks	1.69	6.76
9			subtotal	52.81
10			8% tax	4.23
11			total	57.04

Vocabulary

Important terms in Unit 3:

algebraic expression An expression that contains a variable. For example, if Maria is 2 inches taller than Joe, and if the variable m represents Maria's height, then the algebraic expression $m - 2$ represents Joe's height.

cell In a spreadsheet, a box formed where a column and a row intersect. A *column* is a section of cells lined up vertically. A *row* is a section of cells lined up horizontally.

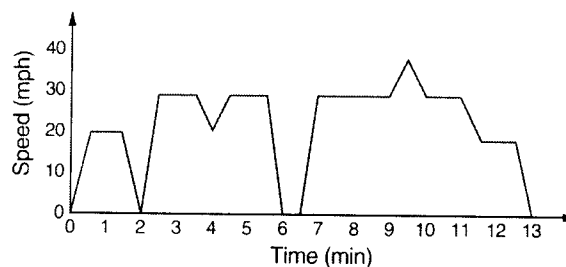


formula A general rule for finding the value of something. A formula is often written using letters, called *variables*, that stand for the quantities involved. For example, the formula for the area of a rectangle may be written as $A = b * h$, where A represents the area of the rectangle, b represents its base, and h represents its height.

general pattern In *Everyday Mathematics*, a number model for a pattern or rule.

special case In *Everyday Mathematics*, a specific example of a *general pattern*. For example, $6 + 6 = 12$ is a special case of $y + y = 2y$ and $9 = 4.5 * 2$ is a special case of $A = l * w$. Same as instance of a pattern.

time graph A graph representing a story that takes place over time. For example, the time graph below shows the trip Mr. Olds took to drive his son to school. The line shows the increases, decreases, and constant rates of speed that Mr. Olds experienced during the 13-minute trip.

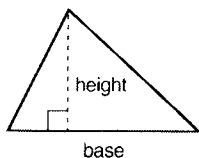


variable A letter or symbol that represents a number. A variable can represent one specific number, or it can stand for many different numbers.

Do-Anytime Activities

Try these ideas to help your child with the concepts taught in this unit.

1. If you are planning to paint or carpet a room, consider having your child measure and calculate the area using the area formula for rectangular surfaces: $\text{Area} = \text{base} * \text{height}$. If the room is irregular in shape, divide it into rectangular regions, find the area of each region, and add all the areas to find the total area. If a room has a cathedral ceiling, imagine a line across the top of the wall to form a triangle. Your child can use the area formula for triangles: $\text{Area} = \frac{1}{2} * (\text{base} * \text{height})$, to calculate the area of the triangle.



2. If you use a spreadsheet program on a home computer, help your child learn how to use it. You might help your child set up a spreadsheet to keep track of his or her math scores and to figure out the mean.
3. Practice renaming fractions, which is a prerequisite skill for Unit 4. **Examples:**

Rename as Fractions

$$3\frac{1}{2} = \frac{\quad}{\quad}$$

$$8\frac{1}{3} = \frac{25}{3}$$

Rename as Mixed or Whole Numbers

$$\frac{33}{5} = 6\frac{3}{5}$$

$$\frac{25}{5} = 5$$

Building Skills through Games

The concepts learned in Unit 3 will be reinforced through several math games included in this unit that are fun to play in class and at home. Detailed game instructions for all sixth-grade games are available in the games section of the *Student Reference Book*. Here is a list and a brief description of some of the games in this unit:

Getting to One See *Student Reference Book*, page 321

Two players can play this game using a calculator. The object of the game is to divide a number by a mystery number and to find the mystery number in as few tries as possible. Players apply place-value concepts of decimal numbers to determine which numbers to play.

Division Top-It (Advanced Version) See *Student Reference Book*, page 336

Two to four people can play this game using number cards 1 through 9. Players apply place-value concepts, division facts, and estimation strategies to generate whole-number division problems that will yield the largest quotient.

As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. Some of the answers listed below will guide you through the unit's Study Links.

Study Link 3•1

Sample answers (1–7):

- The sum of any number and 0 is equal to the original number.
 - $36.09 + 0 = 36.09$; $52 + 0 = 52$
- $(2 * 24) + 24 = 3 * 24$; $(2 * 10) + 10 = 3 * 10$
- $100 + 0.25 = 0.25 + 100$;
 $0.5 + 0.25 = 0.25 + 0.5$
- $x^2 * x^3 = x^5$ 5. $s * 0.1 = \frac{s}{10}$ 6. $m^0 = 1$
7. 10 8. 100, 0.25 9. 20
10. 75, 100 11. 80, 0.80 12. 70, 0.70

Study Link 3•2

Sample answers (1–7):

- $(6 * 2) * 3 = 6 * (2 * 3)$;
 $(6 * 1) * 5 = 6 * (1 * 5)$
- $12 \div (\frac{6}{2}) = (2 * 12) \div 6$; $10 \div (\frac{4}{2}) = (2 * 10) \div 4$
- $\frac{10}{5} = 10 * \frac{1}{5}$; $\frac{3}{4} = 3 * \frac{1}{4}$
- $a - b = a + (-b)$ 5. $\frac{m}{n} = \frac{m * 3}{n * 3}$
- $\frac{s}{t} = \frac{s \div 2}{t \div 2}$ 7. $\frac{c}{d} * \frac{1}{2} = \frac{c * 1}{d * 2}$
8. 2.5 9. 1.06 10. 1.00

Study Link 3•3

- $x - 7$ 2. $d + 2.5$ 3. $\frac{c}{12}$, $c \div 12$, or $\frac{1}{12}c$
- $2 * h$, or $2h$; 8 5. $3r + 8$, or $(3 * r) + 8$; 44
6. 275 7. 35 8. 0.5

Study Link 3•4

- Subtract 0.22 from m .
 - $n = m - 0.22$
- Multiply r by $\frac{1}{2}$ or divide r by 2.
 - $r * 0.5 = t$
- $q = (2 * p) - 2$
4. 15 5. 210 6. 1,760 7. 29,040

Study Link 3•5

- in: $6\frac{1}{2}$; out: $10\frac{1}{2}$, $9\frac{1}{2}$, 3, $-\frac{1}{2}$
- in: 6, $\frac{1}{4}$; out: 48, 1.2, 2 3. in: 7, 0; out: 0, 18
4. Divide the *in* number by 3; $d = b \div 3$
5. Answers vary. 6. -3 7. -12 8. -3 9. 10

Study Link 3•6

- Perimeter (in.): 4, 8, 12, 16, 20;
Area (in.²): 1, 4, 9, 16, 25
- 10 in. 4. 17 in. 6. $2\frac{1}{4}$ in.²
- $10\frac{1}{2}$ in.² 8. 54.45 9. 4.2

Study Link 3•7

- January 2. \$115.95 3. A5 4. C3
5. Column E: \$118.75; \$152.95; \$2,625.00
6. E3 = B3 + C3 + D3 7. E5 = B5 + C5 + D5
8. \$128.75 9. 144 10. 9 11. 73.96 12. 17

Study Link 3•8

- 6 2. 4 3. 1 4. -6 5. 8
6. 2 7. -15 8. -5 9. -13 10. -12
11. 0, -2, -9
- Sample answer: Add -6 to x .
 - $x + (-6) = y$

12. a. 25 b. 32 c. 50 d. -19

13. a. $\frac{1}{10}$ b. $\frac{1}{2}$ c. 2 d. -9

Study Link 3•9

1. Sample answer: People are getting on the Ferris wheel.
2. 125 sec 3. 170 sec 4. 4 times 5. 40 sec

Study Link 3•10

- Jenna's Profit: \$3, \$6, \$9, \$12, \$15;
Thomas's Profit: \$6, \$8, \$10, \$12, \$14
- \$18, \$16 3. Jenna 4. Jenna's
- \$3, \$2 6. (4,12)
7. a. 81 b. 8,000 c. 76 d. 875 e. 3