

Grade 8 Mathematics

Algebra: Lesson 3

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (\Rightarrow) by them.

Purpose of Lesson 3:

- In this lesson, the tutor and the students will
 - ✓ create equations based on information found in tables.

Equipment/Materials Needed:

- Student Sheet 18
- Paper and pencils

Preparations before beginning Lesson 3:

- Run off one copy of Student Sheet 18 for each student.
- Have paper and pencils available.

Lesson 3: Algebra

⇒ Give Student Sheet 18 to the students. Have the students look at Table 1.

Say:

Nancy has just started working at a department store. Her hours will vary each week, depending on her studies. Her employer gave her a table to show how much she will earn for certain hours of work. Nancy wants to write an equation that would tell her how much she would earn for any number of hours. In the table, h stands for hours and e stands for earnings. What patterns do you see? (Sample responses: For the first four entries, the hours are increasing by one (1) and the earnings are increasing by seven. Then the hours jump, so the information is not doing me much good. If I look at the earnings, it appears that, if I multiply seven times the number of hours, I get the earnings. So I think the equation is $e = 7h$.) **Try the equation on 10 hours and 40 hours.** (For 10 hours, I would get \$70; and for the 40 hours, I would get \$280; therefore the equation that I wrote is correct.) **How much would Nancy earn if she worked 13 hours?** (\$91) **How much would she earn if she didn't work at all one week?** (0)

Say:

Let's look at Table 2. This table shows the distances traveled of a car driving 55 miles per hour. Write an equation that would allow you to find the distance for any number of hours. Let d = distance in miles and h = hours. ($d = 55h$) How many miles would a car travel in 8 hours? (440 miles) **How far would the car travel in 1/2 hour?** (27.5 miles)

Say:

Let's look at Tables 3 – 5. Write an equation to show the relationship between the x values and the y values. Then use your equation to find the values missing in the tables. Allow the students time to discuss what patterns they see.

Answers:

3) Each y value is 10 less than the x value; $y = x - 10$. For $x = 10$, $y = 0$; for $x = 100$, $y = 90$, for $x = 200$, $y = 190$.

4) For each y value, 5 is added to x ; the equation is $y = x + 5$. For $x = 30$, $y = 35$; for $x = 100$, $y = 105$; for $x = 2000$, $y = 2005$.

5) For each y value x is divided by 5; the equation is $y = x/5$. For $x = 200$, $y = 40$; for $x = 1000$, $y = 200$; for $x = 0$, $y = 0$.

6) For each y value, x is doubled and one (1) is subtracted; the equation is $y = 2x - 1$. So for $x = 100$, $y = 199$; for $x = 200$, $y = 399$; for $x = 1$, $y = 1$.

⇒ Have one student summarize today's lesson. You want to make sure that the students understand that the numbers in the two columns of each table are related and that the equation describes the relationship.

Student Sheet 18 (Algebra: Lesson 3)

Write an equation that describes the relationship of the 2 variables. Use your equations to finish the tables.

1.

h (hours)	e (earnings)
1	7
2	14
3	21
4	28
10	70
40	280
13	
40	

2.

h (hours)	d (distance)
1	55
2	110
3	165
5	275
10	550
20	1100
8	
1/2	

3.

x	y
25	15
30	20
35	25
40	30
10	
100	
200	

4.

x	y
18	23
20	25
22	27
24	29
30	
100	
2000	

5.

x	y
10	2
30	6
50	10
100	20
200	
1000	
0	

6.

x	y
2	3
3	5
5	9
10	19
100	
200	
1	