Name: _____ Date: _____

BLM 5–1

Chapter 5 Math Link Introduction

This worksheet will help you with the Math Link introduction on page 173.

1. Mark tells Sally he is 14 years old. Sally asks Mark to complete a set of steps as a number trick. In the table, complete each column to show the arithmetic of each step and the algebra that represents each step. The first two rows have been done for you.

Step	Arithmetic	Algebra
Step 1 Give a two-digit age.	Mark is 14.	If n = tens digit, y = ones digit, then age is $10n + y$.
Step 2 Multiply the tens digit in the age by 5.	$1 \times 5 = 5$	$5n$
Step 3 Then, add 3.		
Step 4 Then, double the sum from Step 3.		
Step 5 Add the value of the second digit of the age to the value in Step 4.		
Step 6 Finally, subtract 6.		

a) What is the arithmetic answer?

b) Try again with another age.

c) Explain in words why this trick works.

2. Suppose you roll a single die and a 4 turns up.

a) What number is on the bottom of the die?

b) What is the sum of the number on the top and the number on the bottom?

c) If you roll a 2, what number is on the bottom? What is the sum?

d) If you roll a 1, what number is on the bottom? What is the sum?

e) What do you notice about all the sums?

3. You roll a pair of dice and a 4 and a 1 turn up.

a) What number is on the bottom of the die that has the 4? What number is on the bottom of the die that has the 1? What is the sum of the numbers on the top and bottom of the dice?

b) Roll a pair of dice. Record the numbers on the top and the bottom of each die. Find the sum of all four numbers. What do you notice?

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(continued)

4. This is an example of a number trick. Fill in the blanks for Steps 3 and 4.

Guess a Number

Step	Example
Step 1 Have someone choose any whole number and keep it secret.	33
Step 2. Then, have that person roll a pair of dice and add the sum of the numbers from the top of the dice to the chosen whole number.	4 and 1, so the sum is 38
Step 3 Next, add the numbers from the bottom of the dice to the number.	The numbers would be _____ and _____. The total would be _____.
Step 4 Have the person tell you the answer from Step 3.	The answer is _____.

How could you use your results from Step 3 to find the original number?

5. Fill in the blanks to help explain this number trick.

Step	Arithmetic	Algebra
Step 1 Pick a number.	The number is _____.	The number $= n$
Step 2 Double the number.	$2 \times$ _____	_____n
Step 3 Add 9.	$2 \times$ _____ $+ 9$	_____$n + 9$
Step 4 Subtract 3.	$(2 \times$ _____ $+ 9) - 3 =$ _____	_____$n + 9 - 3 =$ ____n + _____
Step 5 Divide by 2.	$\frac{(2 \times \_\_\_\_\_ + 9) - 3}{2} =$ _____	$\frac{(\_\_\ n + \_\_\_\_)}{2}$
Step 6 Subtract the original number.	$\frac{(2 \times \_\_ + 9) - 3}{2} - \_\_\_\_ = \_\_\_\_$	$\frac{(\_\_\ n + \_\_)}{2} - n =$ _____

a) Try again with another number.

b) Explain in words why this trick works.