



First Name: _____	Last Name: _____	Grade: _____
Teacher: _____	Parent's email: _____	

## Working Backwards

Welcome to the Math Challenge #14. Most problems in this set require you to work backwards. Working backwards is a particularly useful method in situations when the end result of a problem is known, and one has to find the initial quantity.

If you are new to any of the problem solving strategies, check out our complete overview of elementary problem solving strategies at <https://www.mathinaction.org/problem-solving-strategies.html>.

**Kinder & First Grade: solve at least 3 problems.**  
**Second & Third Grade: solve at least 7 problems.**  
**Fourth Grade and above: solve at least 12 problems.**

*Answer*

1.	Natalia has \$5 more today than yesterday. If today she has \$11, how much did she have yesterday?	
2.	Liza owned a few pairs of earrings. That was last week before her 9 <sup>th</sup> birthday . She now has 9 pairs of earrings. On her birthday, she received 2 pairs of sparkly earrings, and just yesterday, her older sister gave her 3 pairs of earrings. How many pairs of earrings did she own at first?	
3.	 It was a good day at school but the children were tired and eager to get home to their families. Before the last stop, the driver had 11 children on the bus. Now there were only three. How many children had gotten off?	
4.	 Brian spent \$6 on a book, \$9 on snacks, and \$2 on bus fare. He gave \$3 to his sister, and he has no money left. How much money did Brian start with?	
5.	On George's four-day vacation, he took 25 photographs the first day and 41 photographs on the second day. On the third day, he took twice as many photographs as he did the first day. If he took a total of 151 photographs during the four days, how many did he take on the fourth day?	
6.	 Ronald had some comic books. He then traded 8 of the books for a series of 13 new comic books he has not read. He now has 28 comic books. How many comic books did Ronald have at the beginning?	

7.	Samantha bought some tickets. Each ticket cost \$3. She gave the clerk \$20 and got \$2 in change. How many tickets did Samantha buy?		
8.	Tom was getting on an elevator starting on the floor where his apartment is located. He stayed on the elevator as it went up 8 floors, down 2 floors, up 12 floors, down 3 floors, and then up 6 floors to the top floor of the building. If the building has 25 floors, at which floor is his apartment?		
9.	Delilah bought a bag of peanuts at the Redmond Brothers Circus. She feeds half the peanuts to Elle the elephant. She then gives 14 peanuts to Matt the monkey. Delilah eats the last 3 peanuts. How many peanuts were in the bag to begin with?		
10.	 <p>Kayla sat down to begin her homework at 4:15 p.m. in the afternoon. After school, her bus ride home is 15 minutes. Then she had a snack and talked with her friends for 25 minutes. She also did her chores for 20 minutes before beginning her homework. What time does Kayla's school end?</p>		
11.	Myron the muffin-maker made a special batch of huckleberry muffins this morning. He sold half the batch to Ralph the roofer. Then he sold 18 muffins to Beatrice the ballerina. He gave away half that amount to the free Muffin Cafe. And he ate the last muffin himself. How many muffins did Myron make this morning?		
12.	The number of acorns on the sidewalk doubles every 6 hours. After 1 day, there are 96 acorns. How many were there at the beginning of the day?		
13.	A certain number is doubled. The result is then increased by nine. This result is decreased by 3. If this last number is 28, what was the original number?		
14.	 <p>A cube has been painted and then cut up into smaller equal sized cubes. If there is only 1 smaller sized cube that has no paint on it, how many smaller cubes have 2 sides painted?</p>		

15.



During a clothing sale, the price goes down by half each day an item is not sold. If an item costs \$2.50 after 8 days, what was the original price?

16. You may have come across with a multiplication table such as the one shown on the right.

The numbers **2 to 12** were used to generate the multiplication table below, and only one of those numbers were used twice.

Find the sum of A, B, C, D and E.

×	4	9	2
2	8	18	4
7	28	63	14
3	12	27	6

×	C					D
A	32			40		
					49	
			22			
		15				27
			24			
B					42	E

17. If two sides of a square field were increased by three feet, the area of the field would increase by 159 square feet. Find the area of the original square.

18. The below calculation represents the multiplication of a 4-digit number by 3. The calculation uses each of the digits from 0 to 9 once and once only. The digit 3 is used as the multiplicand).

$$\begin{array}{r}
 \square\square\square\square \\
 \times \quad \quad \quad 3 \\
 \hline
 \square\square\square\square\square
 \end{array}$$

- The 4-digit number contains three consecutive numbers, which are not in order, and the third digit is the sum of two of the consecutive numbers.
- The first, third, and fifth digits of the five-digit product are three consecutive numbers, which are also not in order. The second and fourth digits are also consecutive numbers.

Find the product of the 4-digit number that is multiplied by 3.