What Fraction is White?

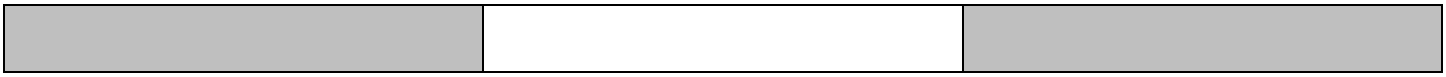
Unit 4 EXC-D

The strips below each equal one whole. Find the fraction of each strip that is white.

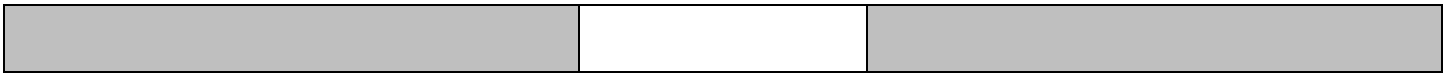
1.

2.

3.



4.



5.

Stamps on History

Unit 4 EXC-B

The table below provides information about 12 famous women who have left their stamps on history. Use the information to determine each woman's age when she died, and how many years passed between the year she died and when she was commemorated on a United States postal stamp. Challenge yourself to use multiple subtraction strategies!

Famous Woman	Year of Birth	Year of Death	Age at Death*	Year Honored by U.S. Postal Stamp	Years Passed from Death to U.S. Postal Stamp
Pocahontas	1595	1617		1907	
Martha Washington	1731	1802		1902	
Betsy Ross	1752	1836		1952	
Sojourner Truth	1797	1883		1986	
Susan B. Anthony	1820	1906		1935	
Harriet Tubman	1820	1913		1978	
Elizabeth Blackwell	1821	1910		1973	
Clara Barton	1821	1912		1948	
Helen Keller	1880	1968		1980	
Georgia O'Keeffe	1887	1986		1996	
Amelia Earhart	1897	1937		1963	
Rosa Parks	1913	2005		2013	

* Calculated age at death may be inaccurate. If the woman died before her birthday in that year, she would be one year younger than calculated.

Elevenses 1

Unit 4 EXC-C

Use the standard multiplication algorithm to calculate the following products.

13×11

18×11

24×11

27×11

36×11

What do you notice about the products? Use your observations to predict the products of 16×11, 42×11, and 54×11. What do you think will happen with 58×11? Check your predictions!

Can you use your observations to solve the following problems?

$\_\_\_ \times 11 = 572$

$\_\_\_ \times 11 = 781$

$\_\_\_ \times 11 = 385$

The Answer Is…

Unit 4 EXC-F

Let's turn things around again. In this task, you are given the answer. Write story problems that result in the following answers. Make sure that your question uses reasonable measurements!

The answer is 158 grams.

1. Write a story problem involving addition of two or more numbers.
2. Write a story problem involving subtraction of two numbers.

The answer is 726 milliliters.

3. Write a story problem involving addition of two or more numbers.
4. Write a story problem involving subtraction of two numbers.

The answer is 56 kilometers.

5. Write a story problem that needs two steps in order to solve it. For example, you may need to add and then multiply in order to solve the problem.

Abundant Numbers

Unit 1 EXC-B

A factor is a whole number that divides evenly into another number. Factors of 24 can be found by finding all the pairs of numbers that multiply together to make 24:

1×24 2×12 3×8 4×6

If we leave out the original number, 24, and add all the other factors, the sum is 36:

$$1 + 2 + 3 + 4 + 6 + 8 + 12 = 36$$

We call 24 an *abundant number*, because 24 is less than the sum of its factors (36), not including itself.

1. Find five other abundant numbers.
2. What kinds of numbers can never be abundant numbers? Why not? Explain your reasoning.

ABC

Unit 5 ADV-F

In the multiplication below, some of the digits have been replaced by letters and others by asterisks. Where a digit has been replaced by a letter, the same letter is used each time, and different letters have replaced different digits. Reconstruct the original multiplication problem.

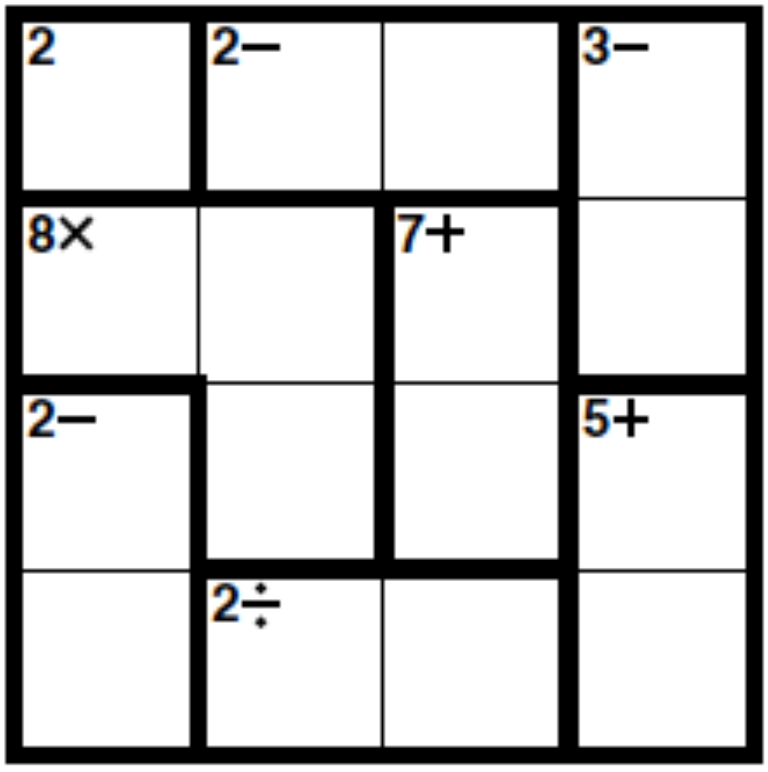
				A	B	C
			×	B	A	C
			*	*	*	*
			*	*	A	0
*	*	*	B	0	0	
*	*	*	*	*	*	

KenKen Again

Unit 5 EXC-A

Do you remember KenKens from a previous Concept Quest? In the KenKen puzzles provided for this task, the numbers 1, 2, 3, and 4 only appear once in each row and each column. The bold, outlined sections indicate what numbers add, subtract, multiply, or divide to the number provided.

Complete this KenKen puzzle, and the two other puzzles on the sheet provided.



Number Maze

Unit 1 ADV-A

Use multiplication and division to find the path through this maze. You may move horizontally, vertically, or diagonally. You may not pass through a square more than once. Watch out for dead ends!

Exit

4	60	6	10	20	3	4	12
1	4	8	2	18	5	54	16
18	16	63	3	9	27	6	9
42	9	2	21	24	6	1	9
7	6	3	8	11	4	8	81
15	5	3	10	80	2	6	12
3	48	30	6	5	7	4	5
2	6	8	25	2	14	8	3

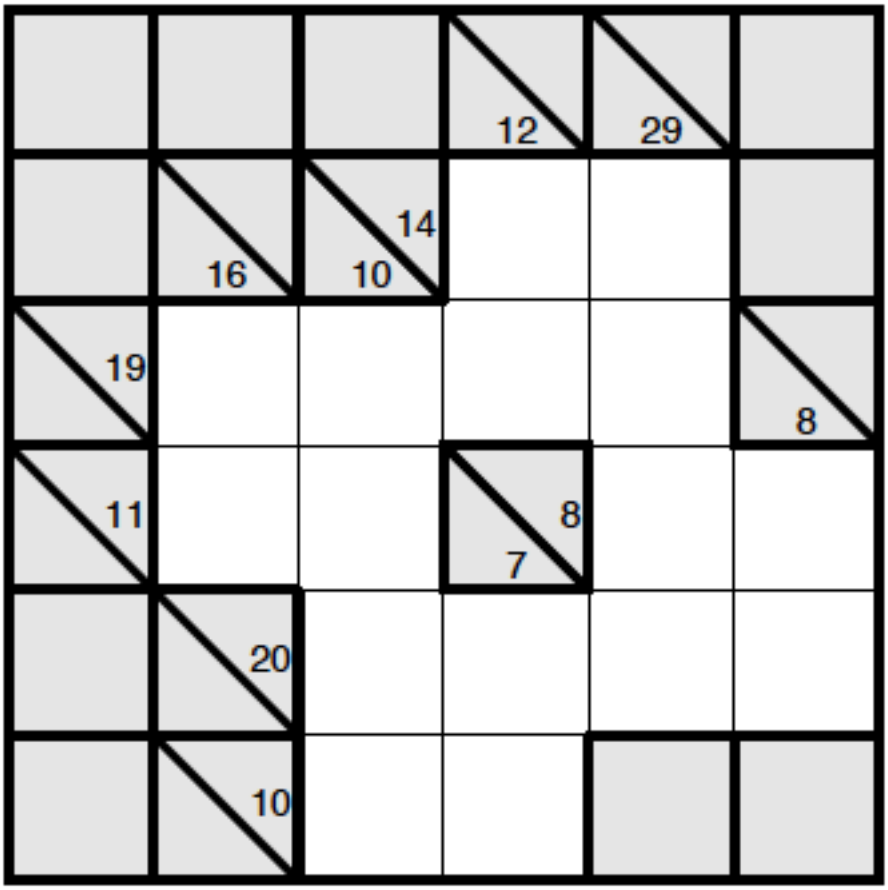
Enter

Extra Challenge: Design your own multiplication and division number maze. Make sure there is only one route through your maze!

Introducing… Kakuro Puzzles!

Unit 6 EXC-F

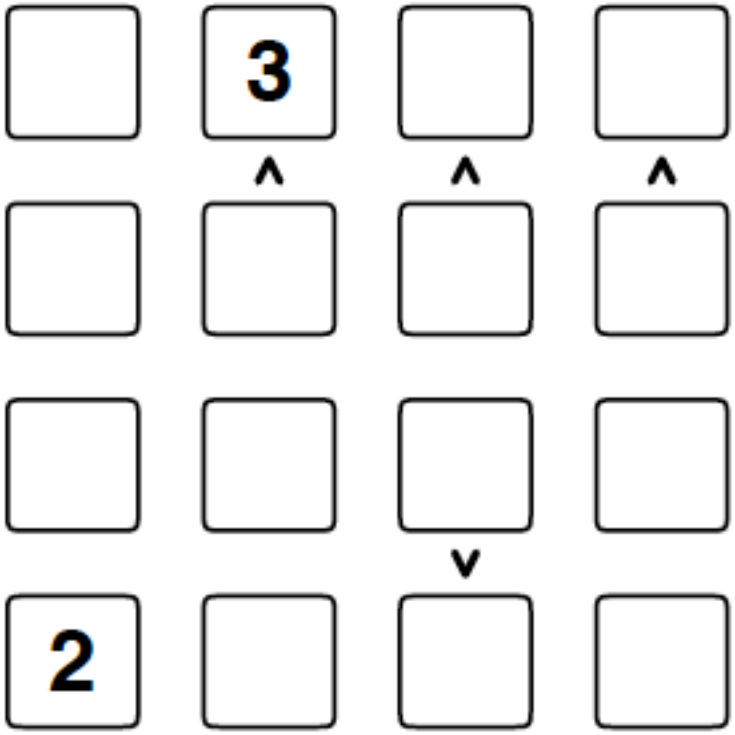
To solve the Kakuro puzzle below, fill in the white squares with the numbers 1 through 9, without repeating any numbers in any row or column. In the shaded squares, the numbers above a diagonal indicate the sum of the numbers in that row (going across). The numbers below a diagonal indicate the sum of the numbers in that column (going down). Solve the puzzle!



Fascinating Futoshiki

Unit 7 ADV-E

To solve a Futoshiki puzzle, fill in the squares so that the numbers 1, 2, 3, and 4 are used once in each row and once in each column. The < and > signs show the relationship between two neighboring squares. Good luck!



Be sure to grab the supplement that goes with this task. It has an extra Futoshiki puzzle for you to do!

Nonograms

Unit 7 ADV-F

A nonogram is a logic puzzle where you determine which squares in a grid are shaded in, and which squares are left blank. The numbers above each column indicate how many squares are shaded in each run in that column. The numbers to the left of each row indicate how many squares are shaded in each run in that row. There is always at least one white space between each run of shaded squares.

The numbers 1 and 3 above this column indicate that there are two runs of shaded squares. The first run is 1 square, and the second run is 3 squares. At least one unshaded square separates the two runs.

The numbers 1 and 1 before this row indicate that there are two runs of shaded squares in the row. The first run is 1 square, and the second run is 1 square. At least one unshaded square separates the two runs.

	1 1	2 2	4	2	1 3
2 2					
3					
1 1					
2 1					
3 1					

Solve the three nonograms on the separate sheet!

If you like these puzzles, http://www.puzzle-nonograms.com/ is a good source for more!

Multiplication Equation Sudoku

Unit 4 ADV-E

Like the standard Sudoku, this variant has two basic rules: each column, each row, and each box (3×3 subgrid) must have the numbers 1 through 9; and no column, row, or box can have two squares with the same number.

The Sudoku below is a bit different, however. At the bottom and right side of the grid are numbers, each of which is the product of the squares in that row or column marked by asterisks.

For example, the first row of the puzzle has four squares with asterisks; the product of the four numbers in these squares is 840. Solve the puzzle!

			*		*	*		*	840
	*		*						27
	*							*	8
	*		*	*		*			60
		*		*					27
*				*					48
*							*		40
	*				*		*	*	120
		*					*		63
40	576	63	180	18	30	12	72	35	