



Ideas

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IDEAS For Teachers

Levels: 1, 2

Objective

To practice basic addition and subtraction facts.

Directions

1. Give each student a copy of the worksheet.
2. Read the directions to the students and let them go to work. If you think students will have trouble writing their answers in the proper boxes, you may want to complete the top row of each square with the class as a whole.
3. Tell them that if all numbers in the boxes in the last square are not the same, they should check their work.
4. Although this worksheet is published in the October issue of the *Arithmetic Teacher*, you may want to wait until later in the year to use it.

Going further:

1. Help students recognize that every number in the last square is a 2 because the difference of the numbers that are added is $3 - 1 = 2$.
2. If students can add three numbers, ask them to add the numbers in

each row and column around the sides of each square. For each square, all four sums are the same.

3. For a related activity, see "Mystic Squares for Primary Grades" by Leland Moon, Jr., and Sharon Pearl Moon in the December 1976 issue of the *Arithmetic Teacher*.

IDEAS For Teachers

Levels: 2, 3, 4, 5

Objective

To practice addition and subtraction.

Directions

1. Give each student a copy of the worksheet.
2. Be sure the students understand the directions printed in the ovals before they begin work. It is important that students understand that answers are to be written in the same relative positions in each square.
3. Tell students, if they do not see it by themselves, that if all numbers in the last square are not the same, they should check their work.

Going further:

1. Each square is a magic square. The sums of the numbers in each

row (\rightarrow), each column (\uparrow), and each diagonal (\swarrow or \searrow) of each square are the same. Ask students to find each of these magic sums. Answers: $15, 57 = 15 + 3(14), 42 = 15 + 3(9), 15 = 57 - 42$.

- Ask the students to add corresponding numbers in the two middle squares. The result is a new magic square with a magic sum of $99 = 57 + 42$.

IDEAS For Teachers

Levels: 4, 5, 6

Objective

To practice basic multiplication facts and simple addition.

Directions

- Give each student a copy of the worksheet.
- Be sure the students understand the directions before they begin work; it is important that they understand that answers are to be written in the same relative positions in each square.
- Tell students to add the numbers in each row, column, and diagonal in each square. Each square should have its magic sum.

Going further:

- Ask students to explain the relationship between the numbers in the first and last squares. (In the last square each number is 10 times the corresponding entry in the first square; for example, $20 = 2(10) = 2(7 + 3) = 2(7) + 2(3) = 14 + 6$. This result is based on the distributive property of multiplication over addition.)
- The magic sums of the four magic squares are 15, $105 = 15(7), 45 = 15(3)$, and $150 = 15(10) = 15(7 + 3)$.

- For more information on magic squares see "Guided Discovery with Magic Squares," by Thomas P. Atkinson in the April 1975 issue of the *Arithmetic Teacher*. The reference list is very good.

IDEAS For Teachers

Levels: 6, 7, 8

Objective

To practice multiplication and addition of decimals.

Directions

- Give each student a copy of the worksheet.
- Let the students read the directions and begin work. It is important that students understand that answers are to be written in the same relative positions in each square.
- Tell students to find the magic sum for each square.

Going further:

- Help students see that each entry in the last square is .8 more than 10 times the corresponding entry in the first square; for example, $4.8 = .4(10) + .8$. That is, in the last magic square, the whole number part of each entry is the same digit that appeared as the decimal part of the corresponding entry in the first magic square. The decimal part of each entry is .8, which is the amount added in the right-hand path. For example, $4.8 = 3.6 + 1.2 = .4(9) + (.4 + .8) = .4(9) + .4(1) + .8 = .4(10) + .8 = 4.0 + .8$. This result is based on the associative property of addition and distributive property of multiplication over addition.
- The magic sums of the four magic squares are 1.5, $13.5 = 1.5(9), 3.9 = 1.5 + 3(.8)$, and $17.4 = 13.5 + 3.9$ or $17.4 = 1.5(10) + 3(.8)$.

I D E A S

Name _____

0	7	3
6		2
4	1	5

Add 3 to each number

Add 1 to each number

		6

$3+3$

		4

$3+1$

Subtract the smaller number from the larger

		2

$6-4$

From the Arithmetic Teacher,
October 1977

IDEAS

Name _____

6	7	2
1	5	9
8	3	4

Add 14 to each number.

Add 9 to each number.

		16

$2+14$

		11

$2+9$

Subtract the smaller number from the larger.

		5

$16-11$

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IDEAS

Name _____

This is a magic square.

6	7	2
1	5	9
8	3	4

The magic sum is ____.

Multiply each number by 7

Multiply each number by 3

		14

2×7

		6

2×3

Add corresponding numbers

		20

$14 + 6$

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Name _____

This is a magic square.

.6	.7	.2
.1	.5	.9
.8	.3	.4

The magic sum is ____.

Multiply each number by 9

Add .8 to each number

		3.6

4×9

		1.2

$4 + 8$

Add corresponding numbers

		4.8

$3.6 + 1.2$

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