



Isabelle Hoag M. Ed. Director of Education UnCommon-Core.com

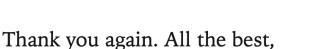
### Hello Teachers,

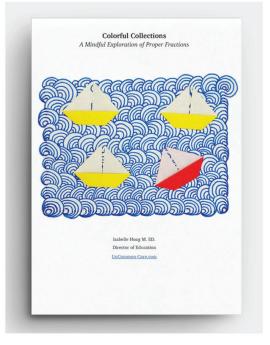
Thank you for downloading this handout. After decades of teaching, now I am sharing some of the activities I designed for my students and some new ones as well.

Please, check out the self-paced teacher education courses on UnCommon-Core.com.

While you are there, sign up for your free copy of **Colorful Collections**: *A Mindful Exploration of Proper Fractions*.

Also, visit my Teachers Pay Teachers store UnCommon-Core dot com.





### Isabelle

Isabelle Hoag M.Ed. Director of Education UnCommon-Core.com Teachers,

What do you want your students to gain by exploring digit sums of multiples of numbers from one to nine?

Do elementary students need to:

<ul> <li>Practice addition?</li> </ul>	YES!
<ul> <li>Practice multiplication?</li> </ul>	YES!
<ul> <li>Make sense of directions?</li> </ul>	YES!
<ul> <li>Use math vocabulary in writing?</li> </ul>	YES!
<ul> <li>Display data in various formats?</li> </ul>	YES!
• Compare graphic displays of data?	YES!
• Contrast graphic displays of data?	YES!
<ul> <li>Understand place value?</li> </ul>	YES!
<ul> <li>Develop number sense?</li> </ul>	YES!
<ul> <li>Get excited about math?</li> </ul>	YES!
<ul> <li>Know about digit sums?</li> </ul>	(Not really, shhh!)

Find parts of each activity that line up with the academic standards used in your school. Focus on these elements when you write learning goals, ask questions, and lead class discussions to reflect on the activity.

Exploring digit sums will grab your students' imaginations. It will give them an authentic mathematical context in which they can apply mathematical skills they need to practice.

### Ideas for Additional Activities

Make sure students understand the mathematical vocabulary. Let them work individually, in pairs, or in groups to contribute to a glossary of terms found in these activities. Have students translate the terms into other languages that they speak.

Focus on place value: Invite students to work in small groups. Give each group 4 dice and a blank sheet of paper. For each roll of the dice, students work together to create the largest number from the four digits. Then they decide if that number is divisible by nine (if it has a digit sum of nine). Next they make the smallest number possible and see if it is divisible by nine. Have them take turns tossing the dice, asking questions, and recording. All of the students are responsible for doing the calculations and making the largest or smallest numbers possible.

Focus on how to display data: Divide students into eight small groups that will create displays showing the patterns in the digit sums. Assign each group a number from one to eight. Give them pencils, erasers, colorful pens or pencils, a ruler or straight edge, and copies of page 17.

Post the displays where everyone can see them. Have class discussions to compare and contrast the displays. Make a class list of questions, comments, puzzles and observations.

Focus on multiplication facts: Give each student copies of pages 15 and 16. <u>Watch Multiples of Nine slide show</u>, stopping when necessary to talk about ideas, puzzles or questions.

## Digit Sums of Multiples of One

name:

Find Multiples of One	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of One
1x1=	1	243
1x2=		876
1x3=		1,000
1x4=		1,053
1x5=		7,462
1x6=		6,083
1x7=		5,442
1x8=		7,702
1x9=		3,014
1x10=	1+0=1	40,203
1x11=		78,600
1x12=		63,150

### Questions to think about:

How can you describe the pattern in the digit sums of multiples of one?

Did this pattern surprise you? Why or why not?

## Digit Sums of Multiples of Two

Find Multiples of Two	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of Two
2x1=	2	243
2x2=		876
2x3=		1,000
2x4=		1,053
2x5=	1+0=	7,462
2x6=	1+2=	6,083
2x7=		5,442
2x8=		7,702
2x9=		3,014
2x10=		40,203
2x11=		78,600
2x12=		63,150

### Questions to think about:

How can you describe the pattern in the digit sums of multiples of two?

How can you tell when a number is a multiple of two?

### Digit Sums of Multiples of Three Can be divided by three!

name:

Find Multiples of Three	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of Three
3×1=	3	243
3x2=		876
3x3=		1,000
3x4=	1+2=3	1,053
3x5=	1+5=	7,462
3x6=		6,083
3x7=		5,442
3x8=		7,702
3x9=		3,014
3x10=		40,203
3x11=		78,600
3x12=		63,150

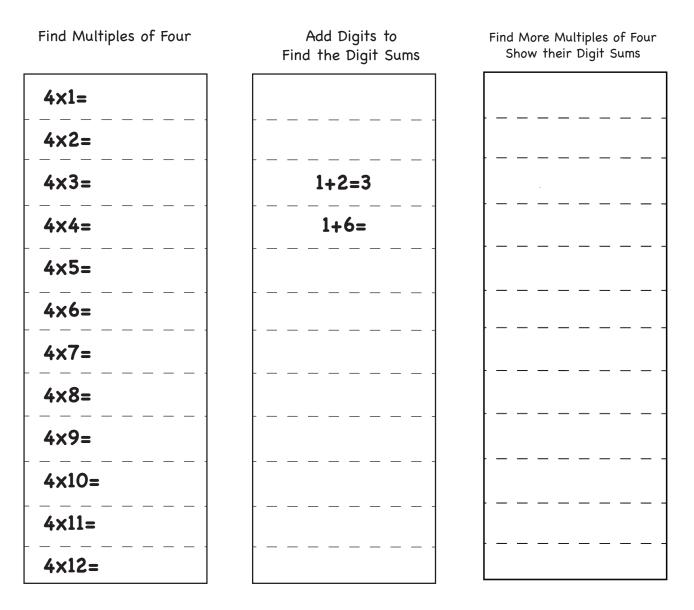
### Questions to think about:

How can you describe the pattern in the digit sums of multiples of three?

Did this pattern surprise you? Why or why not?

## Digit Sums of Multiples of Four

name:

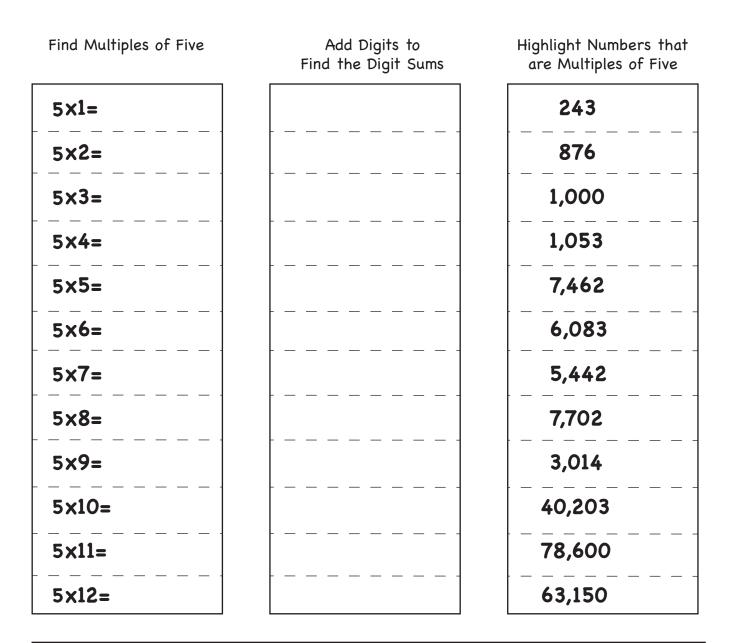


### Questions to think about:

How can you describe the pattern in the digit sums of multiples of four?

### Digit Sums of Multiples of Five

name:



### Questions to think about:

How can you describe the pattern in the digit sums of multiples of five?

## Digit Sums of Multiples of Six Can be divided by three!

name:

Find Multiples of Six	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of Six
6x1=		243
6x2=	1+2=	876
6x3=	1+8=	1,000
6x4=		1,053
6x5=		7,462
6x6=		6,083
6x7=		5,442
6x8=		7,702
6x9=		3,014
6x10=		40,203
6x11=		78,600
6x12=		63,150

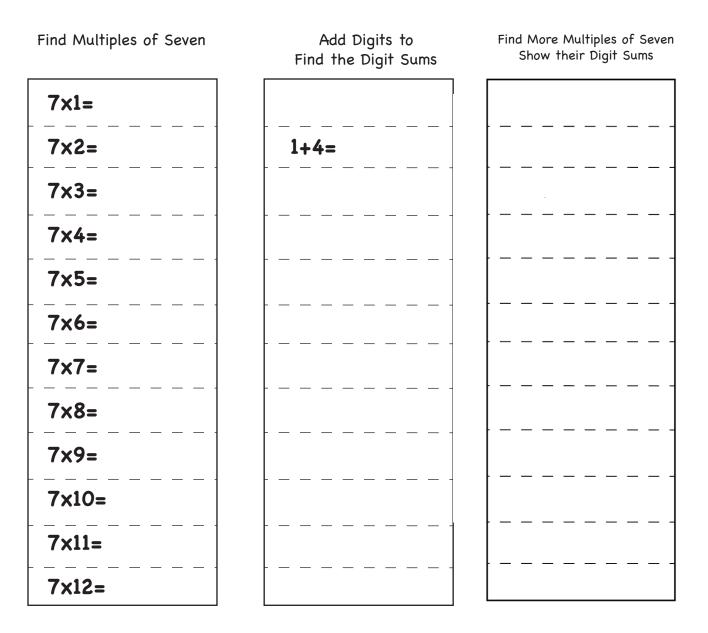
### Questions to think about:

Can all multiples of 3 be divided by 6? Why or why not?

Describe the pattern in digit sums in multiples of six.

### Digit Sums of Multiples of Seven

name:

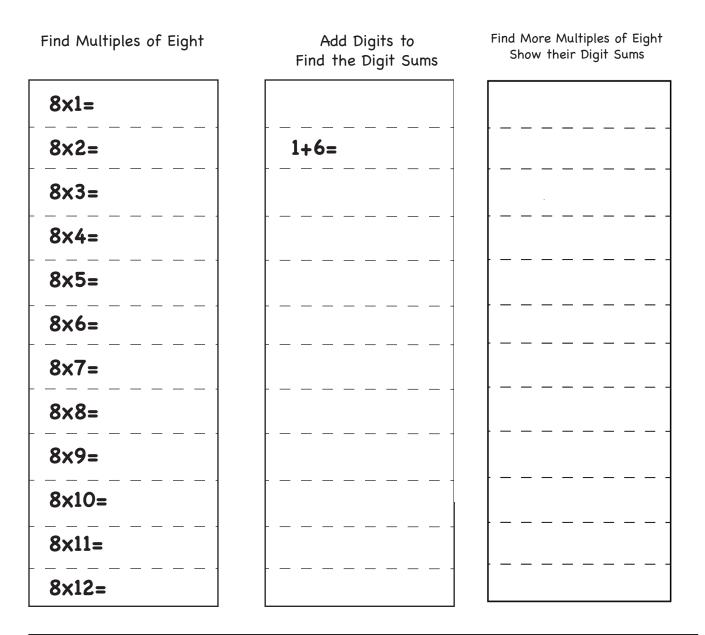


#### Questions to think about:

Think about this equation: **7x?=42**. How could digit sums help you recall this math fact?

### Digit Sums of Multiples of Eight

name:



### Questions to think about:

How would you describe the pattern in the digit sums of multiples of eight?

### Digit Sums of Multiples of Nine Are name:

Find Multiples of Nine	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of Nine
9x1=		243
9x2=	1+8=	876
9x3=		1,000
9x4=		1,053
9x5=		7,462
9x6=		6,083
9x7=		5,442
9x8=		7,702
9x9=		3,014
9x10=		40,203
9x11=		78,600
9x12=		63,150

### Questions to think about:

How would you describe the pattern in the digit sums of multiples of nine?

Did this surprise you? Why or why not?

## More about Multiples of Nine

Find Multiples of Nine	Write the Number in the Ten's Place	The Ten's Digit and the Unit's Digit Add to Nine
9×1=	0	0+=9
9x2=		1+=9
9x3=	2	2+=9
9x4=		
9x5=		
9x6=		
9x7=		
9x8=		
9x9=		
9x10=		
9x11=		
9x12=		

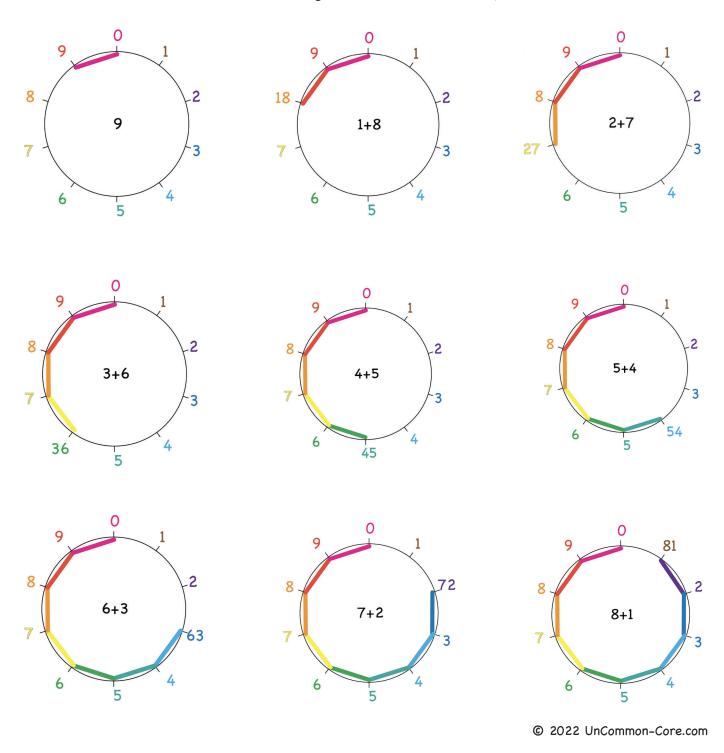
### Questions to think about:

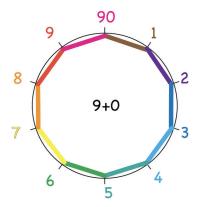
What pattern do you see between the multiplier and the ten's digit in the product?

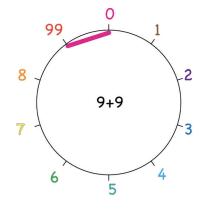
How could this pattern help you remember the nines multiplication facts?

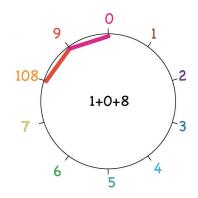
## Multiples of Nine Have a Digit Sum of NINE name:

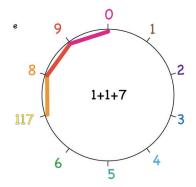
Write the multiplication fact inside each circle. Then calculate the digit sum to double check your work.

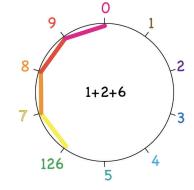


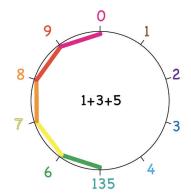


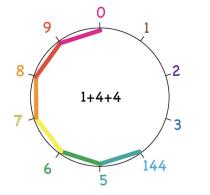


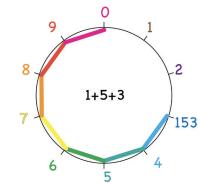


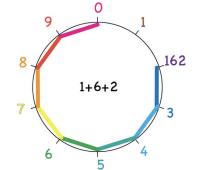


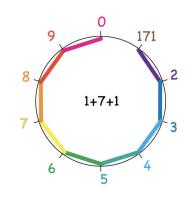


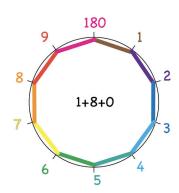


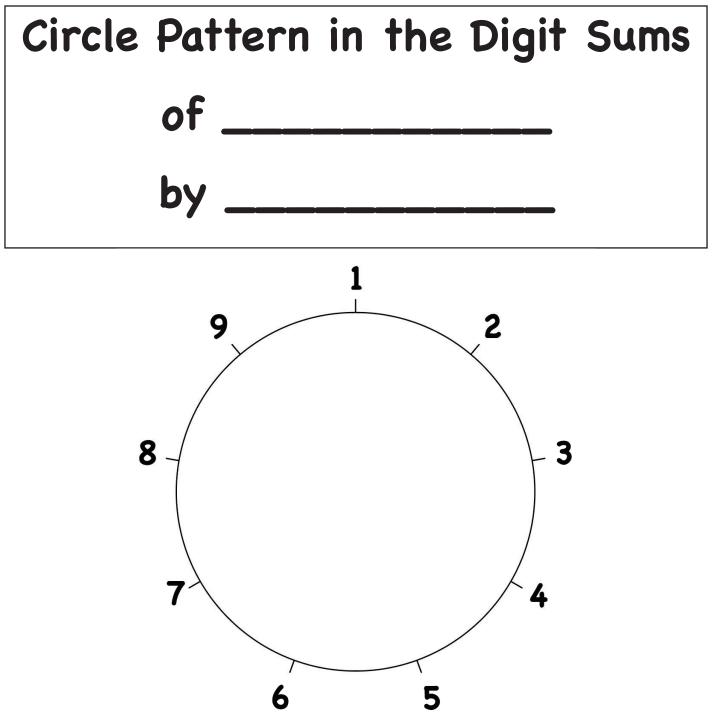








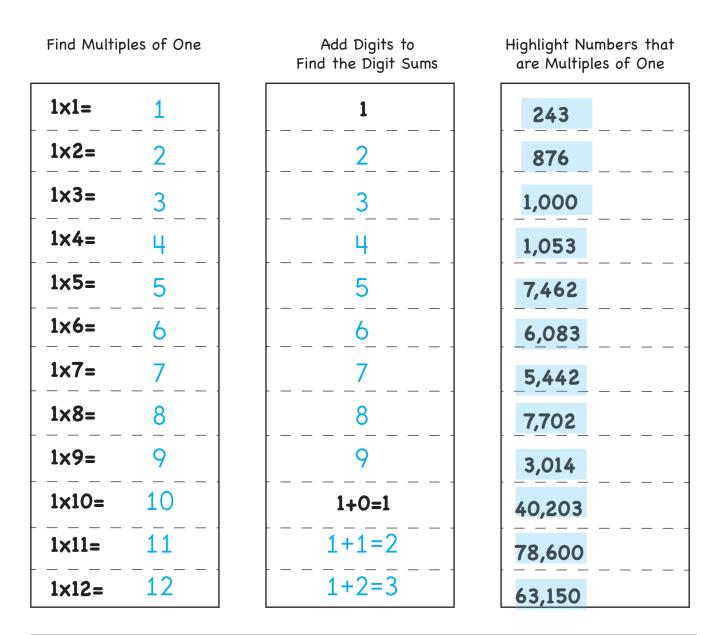






#### Digit Sums of Multiples of One Answers

name:



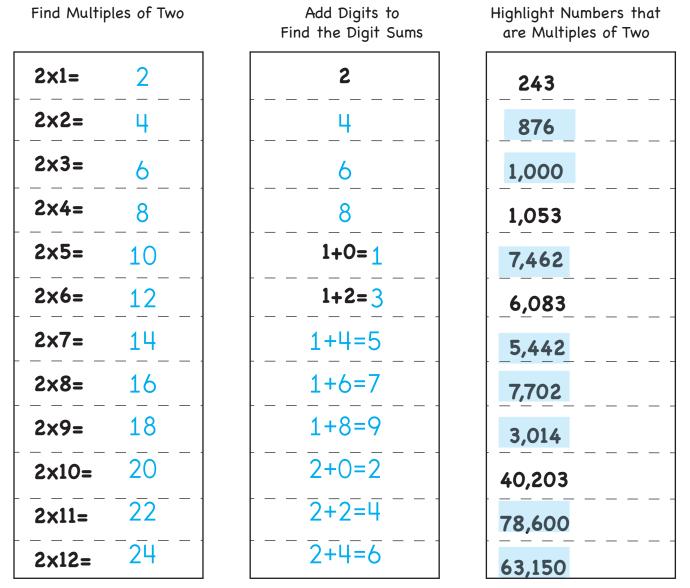
#### **Questions to think about:**

How can you describe the pattern in the digit sums of multiples of one? Multiples of one can have any digit sum except zero. The digit sums are in the same order as the numbers. They are in sequential order.

Did this pattern surprise you? Why or why not?

Answers will vary.

## Digit Sums of Multiples of Two Can be divided by one name: Answers



### Questions to think about:

How can you describe the pattern in the digit sums of multiples of two? Multiples of two can have any digit sum except zero. The even digits are in order followed by the odd numbers in order. The even and odd digits alternate.

How can you tell when a number is a multiple of two?

Multiples of two can be divided by two. This means they are all the even numbers. If the digit in the unit's place is an even number, the entire number is even.

### Digit Sums of Multiples of Three Can be divided by three! name: Answers

Find Multiples of Three Add Digits to Highlight Numbers that Find the Digit Sums are Multiples of Three 3x1= 3 3 2+4+3=9243 **876**<sup>8+7+6=21</sup><sup>2+1=3</sup> 3x2=6 6 3x3= 1+0+0+0=19 1,000 9 1+2=33x4= **1,053** 1+0+5+3=9 12 3x5= 1+5=615 7,462 3x6= 18 1 + 8 = 96,083 21 2+1=33x7= 5,442 24 2+4=6 3x8= 7,702 27 2+7=93x9= 3,014 3+0=3 30 3x10= 40,203 3+3=6 33 3x11= 78,600 3+6=9 36 3x12=63,150

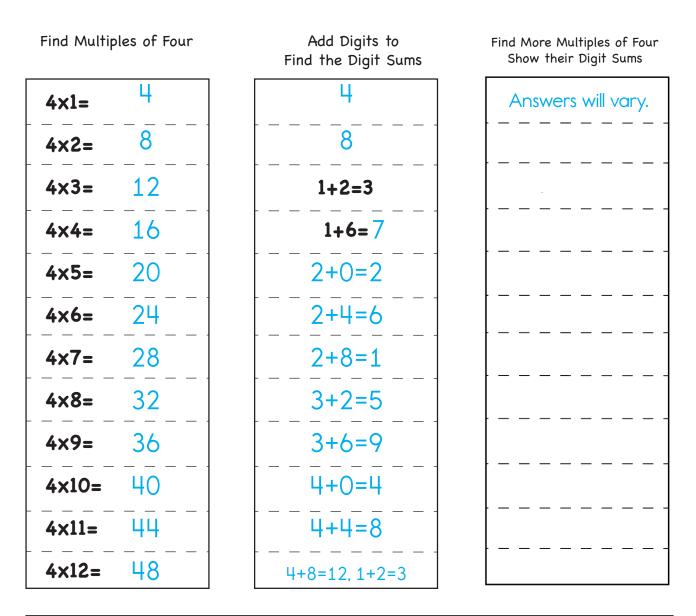
#### Questions to think about:

How can you describe the pattern in the digit sums of multiples of three? Multiples of three have a digit sum that can be divided by three. The digit sum pattern is 3, 6, 9 repeated over and over.

Did this pattern surprise you? Why or why not?

Answers will vary.

## Digit Sums of Multiples of Four name: Answers



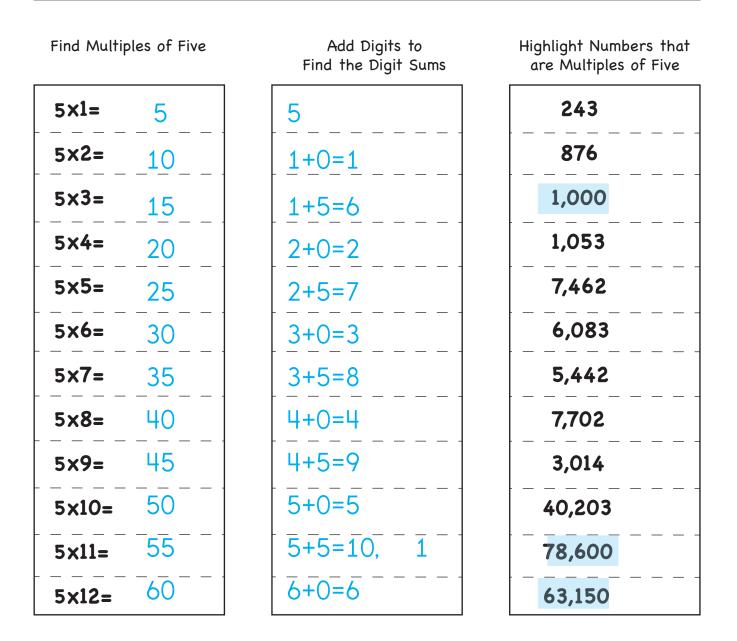
#### Questions to think about:

How can you describe the pattern in the digit sums of multiples of four?

Multiples of one can have any digit sum except zero. The digit sums are in the same order as the numbers. They are in sequential order.

### Digit Sums of Multiples of Five

name: Answers



### Questions to think about:

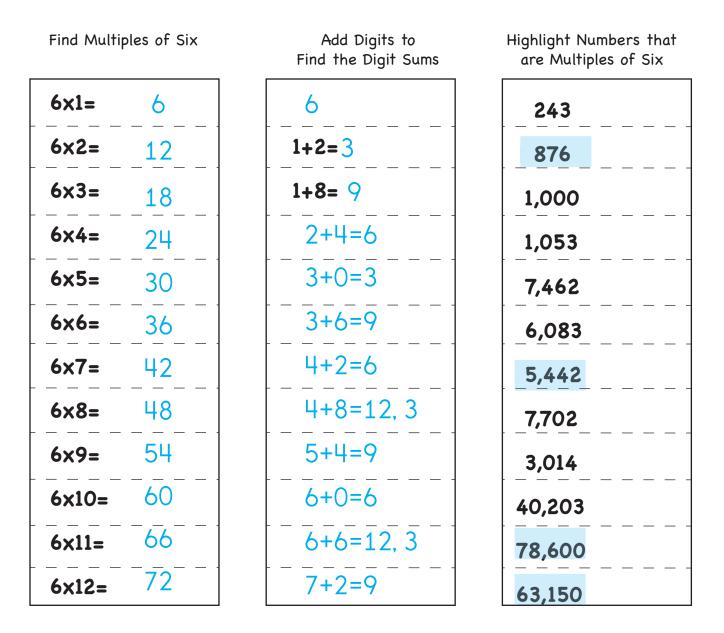
How can you describe the pattern in the digit sums of multiples of five?

Digit sums of multiples of five follow this sequence:

5, 1, 6, 2, 7, 3, 8, 4, 9 and then they repeat that sequence over and over. The digit sums of multiples of five follow and even/odd pattern.

### Digit Sums of Multiples of Six Can be divided by three!

name: Answers



### Questions to think about:

Can all multiples of 3 be divided by 6? Why or why not?

Multiples of six can be divided by three but not every number that can be divided by three is a multiple of 6. Every other number that can be divided by three can also be divided by six. Numbers that can be divided by 2 and 3 are divisible by six.

Describe the pattern in digit sums in multiples of six.

Multiples of six have a digit sum of 3, 6 or 9, but in this order: 6,3,9 over and over.

### Digit Sums of Multiples of Seven name: Answers

Find Multiples of Seven Add Digits to Find More Multiples of Seven Show their Digit Sums Find the Digit Sums 7x1= 7 7 Answers will vary. 1+4=5 7x2= 14 7x3= 2+1=321 7x4= 2+8=10, 1 28 7x5= 35 3+5=8 7x6= 42 4+2=649 4+9=13. 4 7x7= 5+6=11, 2 56 7x8= 6+3=9 63 7x9= 7+0=7 70 7x10= 7+7=14, 5 77 7x11= 8+4=12. 3 84 7x12=

#### Questions to think about:

Think about this equation: 7x?=42. How could digit sums help you recall this math fact? 7x6=42 and the digit sum of 42 is six.

## Digit Sums of Multiples of Eight

Find More Multiples of Eight Find Multiples of Eight Add Digits to Show their Digit Sums Find the Digit Sums Answers will vary. 8x1= 8 8 1+6= 7 8x2= 16 8x3= 24 2+4=6 8x4= 32 3+2=58x5= 40 4+0=44+8=12, 3 8x6= 48 56 5+6=11, 8x7= 2 6+4=10, 1 8x8= 64 72 7+2=9 8x9= 8+0=8 80 8x10= 8+8=16, 7 88 8x11= 9+6=15. 6 96 8x12=

#### Questions to think about:

How would you describe the pattern in the digit sums of multiples of eight?

Digit sums of multiples of eight follow and even odd pattern: 8, 7, 6, 5, 4, 3, 2, 1, 9. It is like counting backwards from eight over and over.

#### Digit Sums of Multiples of Nine Answers

Are always nine!!

name:

Find Multiples of Nine	Add Digits to Find the Digit Sums	Highlight Numbers that are Multiples of Nine
9x1= 9	9	243
9x2= <u>18</u>	1+8= 9	876
9x3= 27	2+7=9	1,000
9x4= 36	3+6=9	1,053
<b>9x5=</b> 45	4+5=9	7,462
<b>9x6=</b> <u>54</u>	5+4=9	6,083
9x7= 63	6+3=9	5,442
9x8= 72	7+2=9	7,702
9x9= 81	8+1=9	3,014
9x10= 90	9+0=9	40,203
9x11= 99	9+9=18, 9	78,600
9x12=108	1+0+8=9	63,150

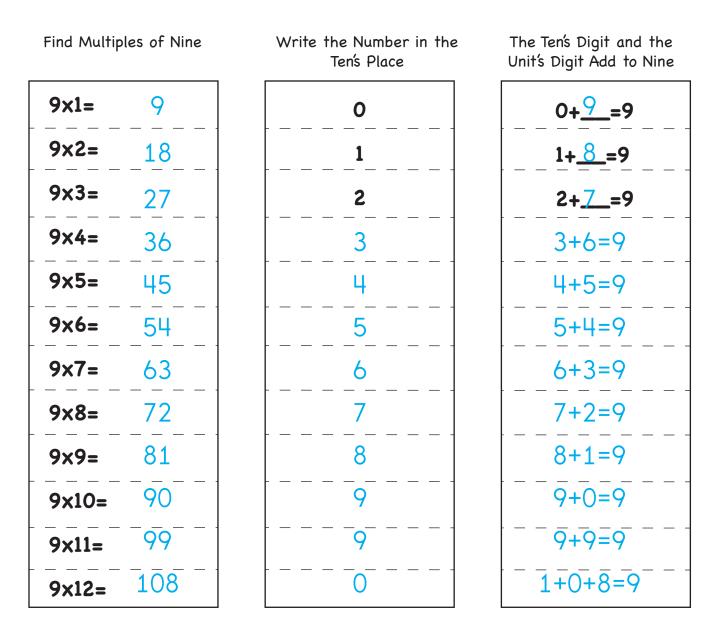
### Questions to think about:

How would you describe the pattern in the digit sums of multiples of nine? Multiples of nine always have a digit sum that adds up to nine!!

Did this surprise you? Why or why not?

Answers will vary.

# More about Multiples of Nine name: Answers



### Questions to think about:

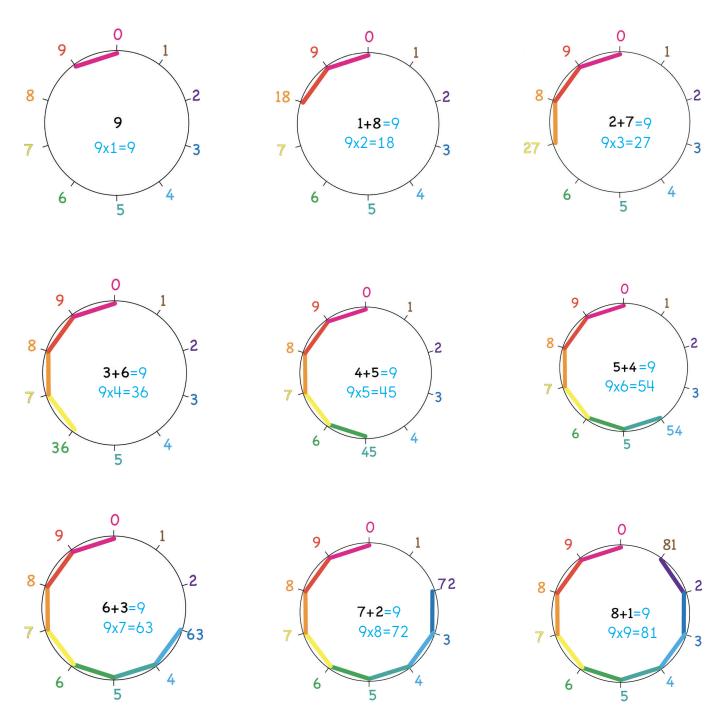
What pattern do you see between the multiplier and the ten's digit in the product? When multiplying a single digit number by nine, the digit in the ten's place of the product will be one less than the number multiplied by nine.

How could this pattern help you remember the nines multiplication facts?

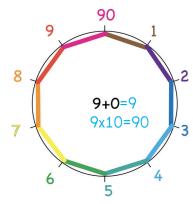
Answers will vary. The ten's digit is one less than the multiplier, the unit's digit when added to the number in the ten's place will make nine.

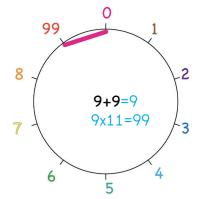
## Multiples of Nine Have a Digit Sum of NINE name: Answer

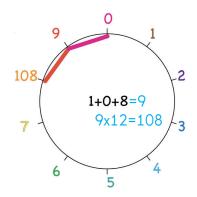
Write the multiplication fact inside each circle. Then calculate the digit sum to double check your work.

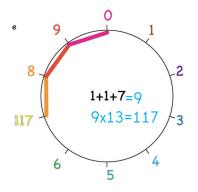


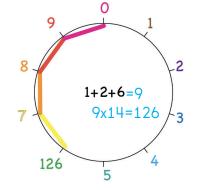
© 2022 UnCommon-Core.com

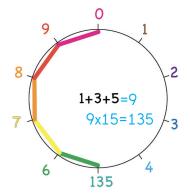


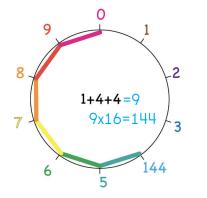


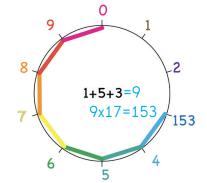


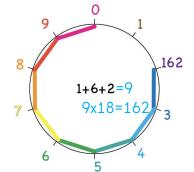


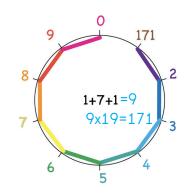


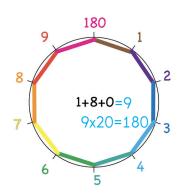


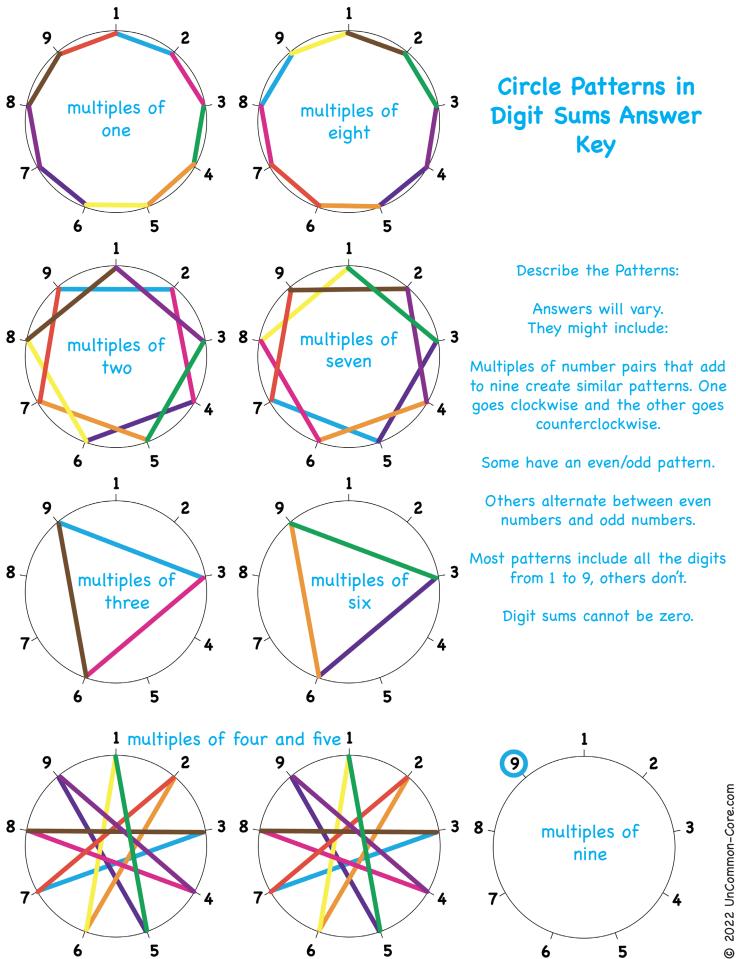












## Terms of Use

By downloading this product, you agree that the contents are the property of Isabelle Hoag M. Ed., Director of Education at <u>UnCommon-Core.com</u> and licensed to you only for classroom/personal use as a single user. I retain the copyright, and reserve all rights to this product.

### YOU MAY:

- Use this product with your own students, in your classroom, or for your own personal use.
- Reference this product in blog posts, professional development workshops, at seminars, or other similar venues, ONLY if both credit is given to me as the author and a link to <u>UnCommon-Core.com</u> is included.
- Please direct others to <u>UnCommon-Core.com</u> where they can download their own free copy.

### YOU MAY NOT:

- Claim this work as your own, alter the files in any way or remove copy-right/watermarks.
- Sell the files or combine them into another unit for sale or for free.
- Post this document for sale or free elsewhere on the internet including Google Doc links on blogs.
- Make copies of this product to share with others.

Thank you for following universally accepted codes of professional ethics while using this product. If you have any issues with the file, or notice an error please contact me and I will be happy to help sort it out.

Thank you!

Isabelle@UnCommon-Core.com