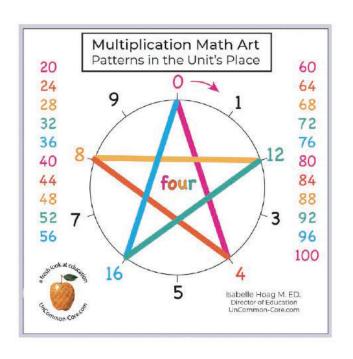
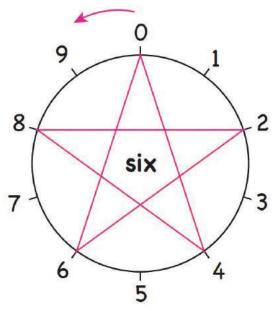
Addition with Regrouping: Patterns in the Unit's Place

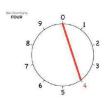




times one

4+6=10 Number Bonds of Ten

one line



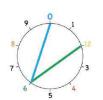


ten

Multiples of Number Bonds of Ten

two lines





twenty $\frac{+12}{20}$

x2

x3

three lines





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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.



Thank you again. All the best,

Isabelle

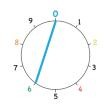
Isabelle Hoag M.Ed.
Director of Education
UnCommon-Core.com

Number Bonds of Ten

one line



4+6=



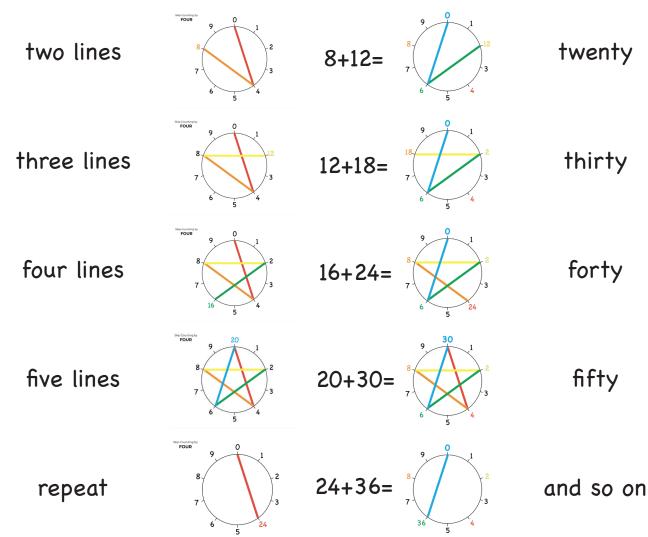
ten

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After completing Multiplication Math Art: Patterns in the Unit's Place students may have wondered why pairs of numbers that add to ten had similar patterns which were built in opposite directions. In this set of activities, students will see the digits in the unit's place of number bonds of ten (and their multiples) working together – perfectly combining to create a zero in the unit's place of sums that are multiples of ten.

Schedule time for you and your class to enjoy the beauty of math.

Multiples of Number Bonds of Ten

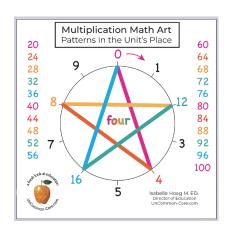


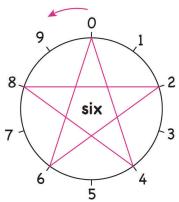
Teacher Tips

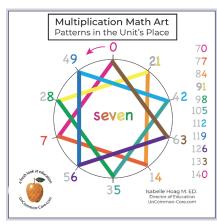
These problems can be solved at any point after your students have learned to carry when adding.

Have your students solve the problems vertically; column by column. They should complete one column before moving on to the next.

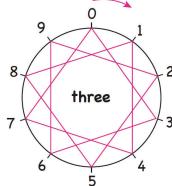
Each student should check their own work. Check the worksheets row by row. After checking, students might want to work in small groups to explore the number patterns and relationships. This will help students learn number bonds up to ten and multiplication facts fluently.







If your students have done Multiplication Math Art; Patterns in the Unit's Place, they will be familiar with these relationships already. Their work from Multiplication Math Art will help them make sense of the numerical relationships in this activity.



Focusing on the numbers in the unit's place will help students explore number pairs that add to ten with similar circle patterns – in opposite directions. Students will also notice how this fascinating relationship extends beyond pairs that add to ten.

Encourage the joys of discovery and the excitement of uncovering hidden mathematical relationships. This type of activity is an example of what mathematicians do when they are at work.

1+3=

Add

name:

3+3=

Add

name:

3+4=

Add

name:

Start with the column on the left. Work your way across the page column by column.

3

4+4=

Add

name:

1+7=

Add

name:

2+7=

Add

name:

4+6=

Add

name:

1+9=

Add

name:

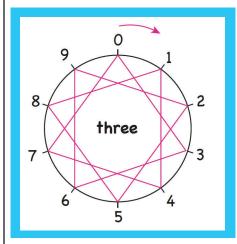
Answer Key

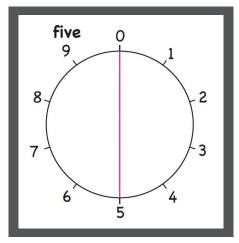
Solving problems vertically makes it difficult to see that the sums are arranged in a specific order. When your students check their work, they will see a pattern in the addition problems. Working across the page, left to right, the first, thirteenth, and twenty-fifth problems are the start of a new group of multiples from 1 -12.

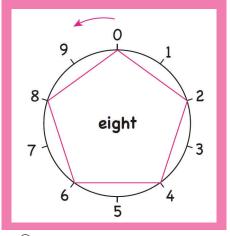
For example, a group of problems on page five (below) starts with 3+5=8. The addends in blue increase by three. The black numbers increase by five, and the pink numbers by eight. Bring your students' attention to the patterns in the unit's place. Notice how the patterns in the threes and fives coordinate to add up to the pattern in the eights. Discuss the situation slowly so everyone can understand.

Ask your students what number was multiplied by the 3, 5, & 8 to get to 6, 10 & 16. Help them see that the sums are multiples of eight – just as the addends are multiples of three and five. Let students connect each unit's place digit with the addends in the series of problems, step by step.

Feel free to express your amazement at how well numbers work together. Just as number bonds share 'part - part - whole' relationships, so do multiples of number bonds. (If a+b=c then 2a+2b=2c and 3a+3b=3c and so on.)







Graphics from Multiplication Math Art: Patterns in the Unit's Place.

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1+3=4

Add name: ANSWERS

x2

x3

x4 x5 x6 x7

x9 x10

x11 x12 x1 x2

x3

x8

x4 x5 x6 x7 x8 x9

x10

×11

×12

3+3=6

Add name: ANSWERS

x2 6 +6 12

3+4=7

Add name: ANSWERS

x2 x3 x4 x5 x6 x7 x8

6

<u>+8</u>

14

9 +12 21

28

12 15 <u>+16</u> +20 +24 +28 +32 35 42

18

21 24

56

27

63

+36

30 +40 70

x9 x10 x11 x12 x1 x2

33 <u>+44</u> +48 77

84

36

1 <u>+5</u> 6

2 <u>+10</u> 12

49

x3

3 +15 18

×4 ×5 5 <u>+25</u> +30 +35 +40 +45 +50 +20 30

6 36

7 42 48 54

8

9

x6 x7 x8 x9 x10

10 60

×11

24

12 +60 11 +55 66 72

2

x12 x1 x2 x3 x4 x5 4 +8 12

18

6 8 +12 +16 24

10 +20 30

12 <u>+24</u> <u>+28</u> <u>+32</u> <u>+36</u> <u>+40</u> <u>+44</u> <u>+48</u> 36

42 48 54 60 66

14 16 18 20 22

x6 x7 x8 x9 x10 x11 x12

24

72

times one 4+4=8

Add name: ANSWERS

1+7=8

Add name: ANSWERS

16

x4 x5 x6 x7 x8 x9 x10

32

15

+25

40

x7 x8 x9 x10 x11 x12

56 64

x6 18 48

72 80 88

96

2+7=9

Add name: ANSWERS

×4

x5 x6 x7 x8

4

18

27

14

x9

18

+63

81

90

x11 x12 x1

×2

x3

x6 x7 x8 x9 x10

×12

times one 4+6=10

Add name: ANSWERS

x8

times one 1+9=10

Add name: ANSWERS

x8

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