

What is decomposing then distributing?

To recall, the distributive property of multiplication is a strategy to **break down a big problem into smaller solutions** in order to derive the answer. The distributive property of multiplication states that **one number, A, multiplied to 2 numbers with a sum of a bigger number, B, will have the same answer to the product of A and B**. The first step before distributing a multiplier is decomposing the multiplicand into two or more smaller numbers. Decomposing means having smaller numbers that will have the sum of the decomposed number. **Once the multiplicand is decomposed into two smaller values, the multiplier is multiplied to the two addends respectively.**

That means, decomposing is actually the step before applying the distributive property. Decomposing produces **two smaller numbers to easily be multiplied by the same multiplier**.

For example, 7×2 .

We know that 7 is a big number that can be decomposed into two smaller numbers like 2 and 5.

Now that we have two smaller values, we can distribute the multiplier 2 to the two values:

$$7 \times 2 = (2 + 5) \times 2 = (2 \times 2) + (5 \times 2) = 4 + 10 = 14$$

Decomposing by Distributing

For example:

$$7 \times 2$$

Number to be decomposed **Multiplier to be distributed**

7 is the bigger number to be decomposed

Think of two addends that add up to 7:

$$(1 + 6), (2 + 5), (3 + 4)$$

Once you have chosen a pair of addends, that means you decomposed 7 into those smaller values:

Here, we choose the values 2 and 5 as the decomposed values.

Now, distribute the multiplier 2 to the decomposed values:

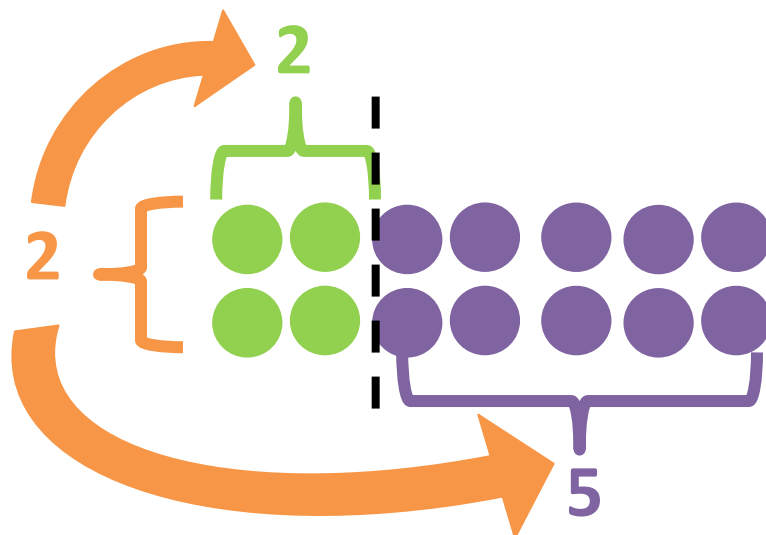
This means that we multiply 2 to 2 and to 5 respectively.

$$2 \times 2 = 4$$

$$2 \times 5 = 10$$

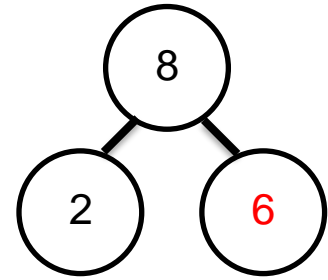
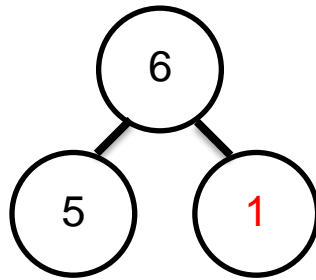
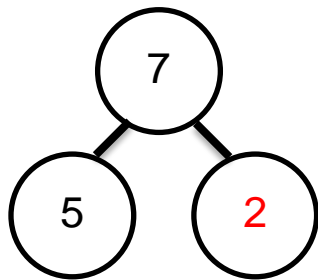
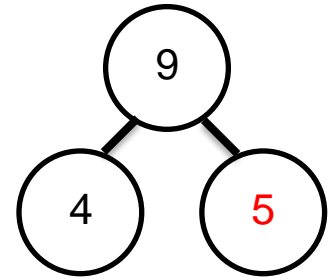
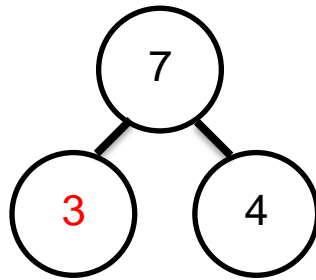
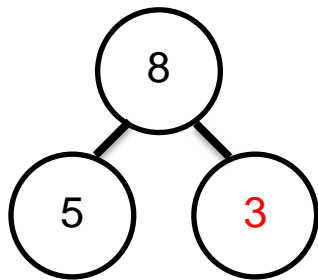
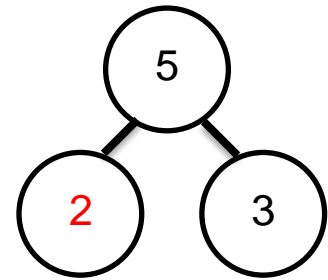
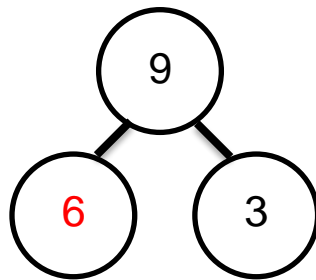
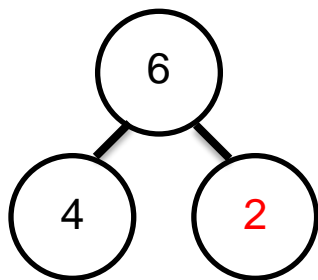
Now that we know the products of the two small numbers, we add them to get the product of 7×2 :

$$4 + 10 = 14 = 7 \times 2$$



Decomposing by Distributing

Complete the number bonds with the appropriate addend.



Time to think

1. What does decomposing mean? How do you decompose a number?

Decomposing means making a bigger number into smaller numbers. To decompose, find the addends that have a sum of the number to be decomposed.

2. How do we distribute factors to decomposed units?

We distribute by multiplying to both decomposed units respectively.

Decomposing by Distributing

Fill in the blanks for the following array models.



$$6 \times 4 = (2 \times 4) + (4 \times 4) = 8 + 16 = 24$$

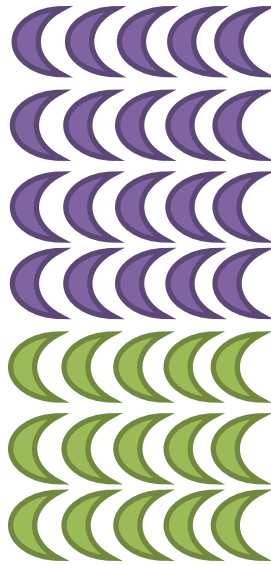


$$8 \times 3 = (3 \times 3) + (5 \times 3) = 9 + 15 = 24$$

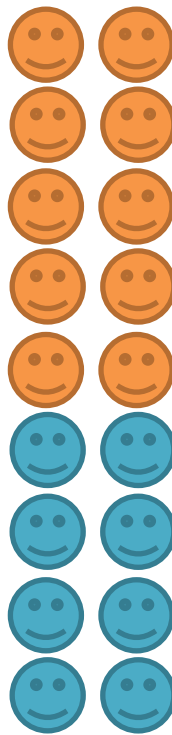
Decomposing by Distributing

Guided Notes

Math 3



$$7 \times 5 = (4 \times 5) + (3 \times 5) = 20 + 15 = 35$$



$$9 \times 2 = (5 \times 2) + (4 \times 2) = 10 + 8 = 18$$

Decomposing by Distributing

Time to Think

1. List down all the possible decomposed expressions for 9×5 :

All the possible pairs are:

$$(1 \times 5) + (8 \times 5) \quad (2 \times 5) + (7 \times 5) \quad (3 \times 5) + (6 \times 5)$$

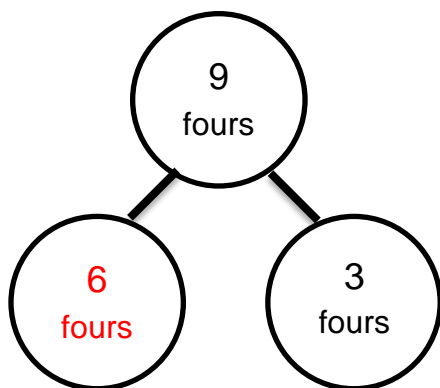
$$(4 \times 5) + (5 \times 5) \quad (5 \times 5) + (4 \times 5) \quad (6 \times 5) + (3 \times 5)$$

$$(7 \times 5) + (2 \times 5) \quad (8 \times 5) + (1 \times 5)$$

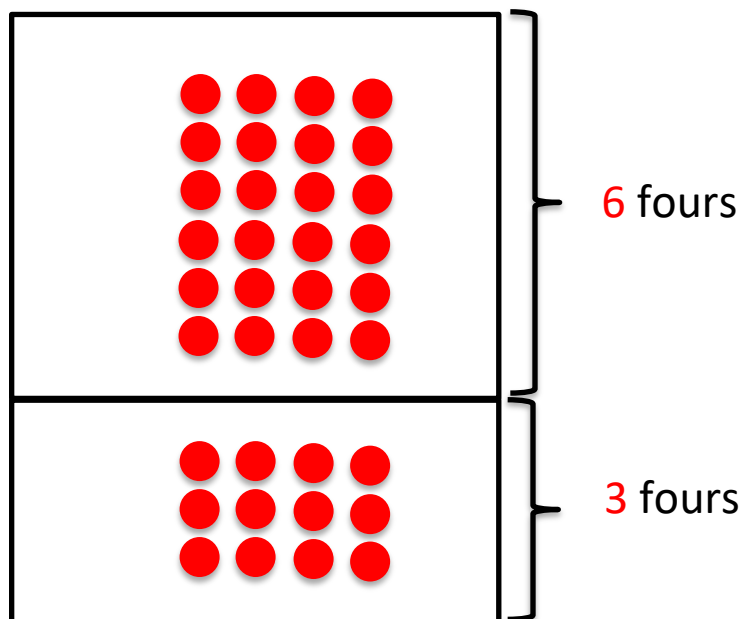
2. Decompose 7×4 wherein the difference of the two smaller numbers is only 1.

$$7 \times 4 = (4 + 3) \times 4 = (4 \times 4) + (3 \times 4)$$

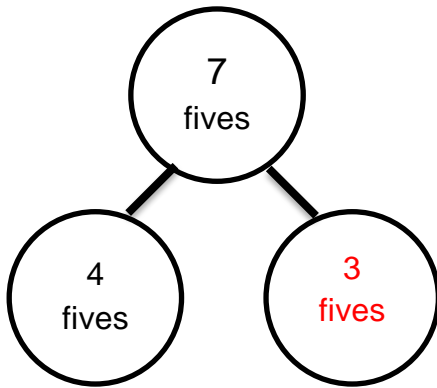
Complete the following number bonds and draw them into their equivalent arrays.



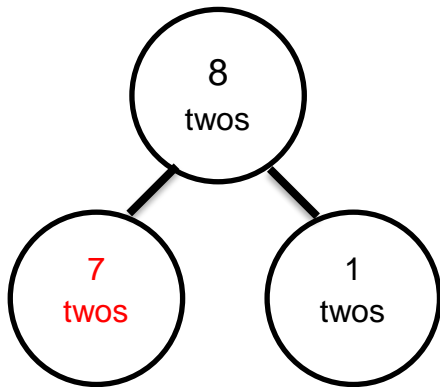
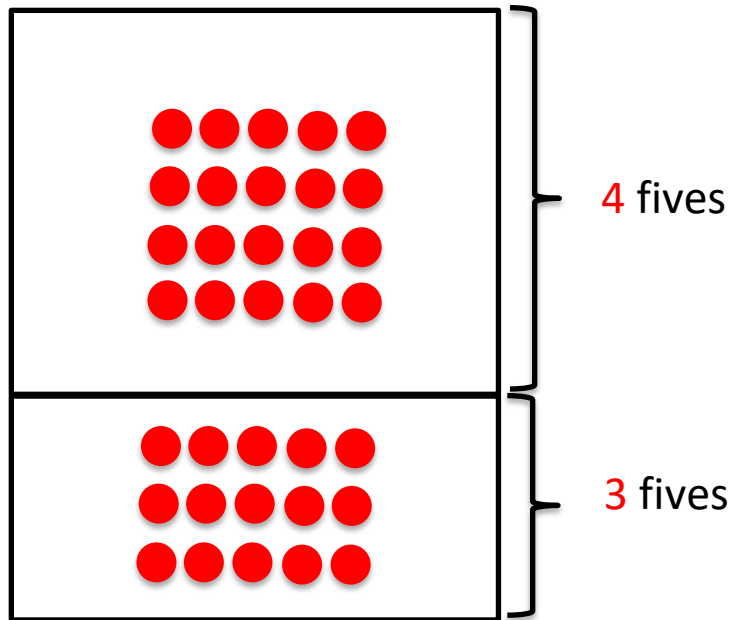
$$9 \text{ fours} = 36$$



Decomposing by Distributing



7 fives = 35



8 twos = 16

