Math Background

Multiplication Strategies for 6s, 7s, and 8s

Starting with a Known Count-by and Then Adding On

Given a multiplication example that students don't know, we encourage them to try to figure out the answer using the count-bys they already know.

$6 \times 6 = \square$

Start with a 5s count-by you know: $5 \times 6 = 30$

Then count by 6 from there: 30 plus 6 more is 36. So $6 \times 6 = 36$.

Using a Known Multiplication and Doubling

Another strategy we encourage students to use when they see a new multiplication they do not know is to see if using doubles can help. For example, for a 6s multiplication they don't know doubling a 3s multiplication can give the correct answer.

$6 \times 6 = \square$

6×6 is twice 6×3.

$6 \times 3 = 18$. Then $18 + 18 = 36$. So, $6 \times 6 = 36$.

Combining Two Known Multiplications

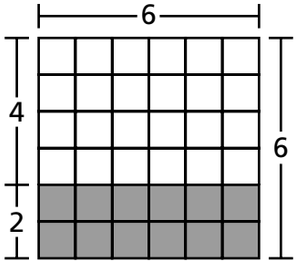
A strategy to find the answer to a new multiplication or a multiplication they don't recall is for students to think about two multiplications they do know. The products can be added to find the product of the example they don't know or recall.

$6 \times 6 = \square$

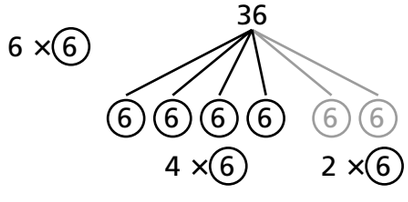
$4 \times 6 = 24$	4 sixes are 24
$2 \times 6 = 12$	2 sixes are 12
$6 \times 6 = 36$	6 sixes are 36

Using a Drawing to Combine Two Known Multiplications

Here are two ways to show combining two known multiplications to find the product of a multiplication they do not know.



unshaded area:	$4 \times 6 = 24$
shaded area:	$2 \times 6 = 12$
total area:	$6 \times 6 = 36$



Explanation:
6 groups of 6 is
4 groups of 6 plus
2 groups of 6.

Multiplication and Division Comparisons

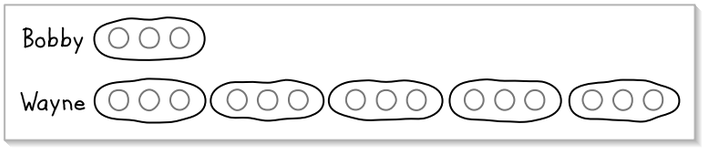
"As Many As" Comparisons

Students encounter problems involving one quantity that is a number of times *as many as* another quantity. These problems involve comparing equal groups. We work with students to find that they can solve these types of problems by using multiplication. They learn how to make comparison drawings to help.

> Bobby has 3 hockey pucks. Wayne has 15 hockey pucks.
> Wayne has _____ times as many hockey pucks as Bobby.

Students draw the number of hockey pucks each friend has. They circle groups of the smaller amount of hockey pucks: 3. Then they tell how many groups of hockey pucks each friend has: 1 group and 5 groups. We discuss how to tell how many times as many hockey pucks the friend with the greater amount has than the other friend: 5 times as many.

$$\mathbf{B = \frac{1}{5} \times W}$$



$$\mathbf{W = 5 \times B}$$

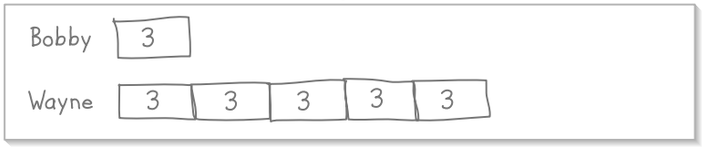
Each comparison can be said in two ways:
Bobby has $\frac{1}{5}$ as many as Wayne has.

Wayne has 5 times as many as Bobby has.

Students hear and practice the unit fraction language, but we do not expect mastery in this unit.

Later, students advance to drawing comparison bars, such as the following:

$$\mathbf{B = \frac{1}{5} \times W}$$



$$\mathbf{W = 5 \times B}$$

Fraction Comparisons

To solve a comparison problem that involves a unit fraction, students learn that division describes finding a unit fraction.

> Eduardo has 12 posters in his room.
> Manuela has $\frac{1}{3}$ as many posters as Eduardo.
> How many posters does Manuela have?

$\frac{1}{3}$ as many means to divide into 3 equal groups and take 1.

Students divide 12 into 3 equal groups. Students may make drawings or comparison bars or use their multiplication and division knowledge. 12 posters put into 3 equal groups gives 4 posters in each group. So Manuela has 4 posters.