

Math Myths and Misconceptions

A Series on Preventing and
Repairing Student Misconceptions
in Mathematics



Preventing Misconceptions

Session 3

Concepts of Subtraction

The title is centered at the top of the slide. It is flanked by five circles: a solid light purple circle on the far left, a hollow light purple circle, a solid light purple circle, a hollow light purple circle, and a solid light purple circle on the far right.

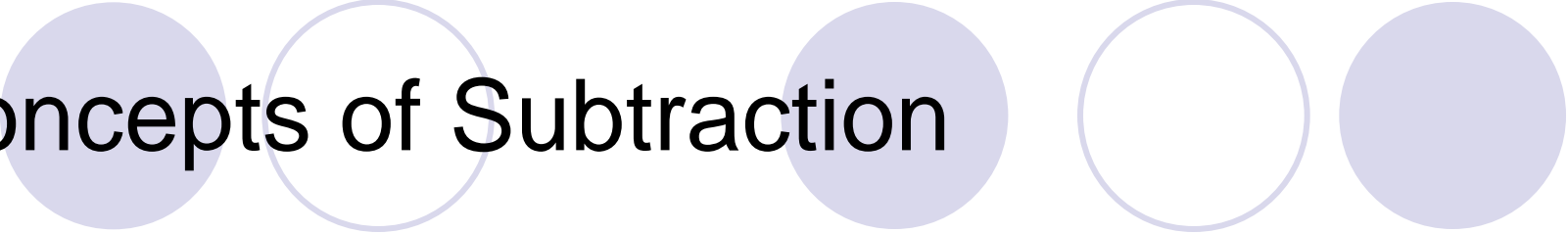
Concepts of Subtraction

Subtraction is more than just
“take-away.”

The title is centered at the top of the slide. It is flanked by five circles: a solid light purple circle on the far left, a hollow light purple circle, a solid light purple circle, a hollow light purple circle, and a solid light purple circle on the far right.

Concepts of Subtraction

Subtraction is the appropriate operation for a variety of situations.

The title is centered at the top of the slide. It is flanked by five circles: a solid light purple circle on the far left, followed by an outlined light purple circle, a solid light purple circle, another outlined light purple circle, and a solid light purple circle on the far right.

Concepts of Subtraction

Recognizing these situations can lead to success with word problems and problem solving, and can aid in the learning of number facts.

Key Concepts of Subtraction

Subtraction is used to take away from, take apart, or decrease from, a quantity

For example, “Grace starts with \$15, and spends \$7. How much money does she now have?” represents a partitioning of \$15 into two parts (\$8 and \$7) and the removal of one part.



Key Concepts of Subtraction

Subtraction is used to compare two quantities or to show the difference between two quantities

For example, “Gus has 8 cars, Bobby has 5. How many more cars does Gus have?”

Gus



Bobby



Key Concepts of Subtraction

Subtraction can be used to solve missing addend situations

For example, “Frannie wants to make 5 cakes, and so far she has made 3. How many more does she need to make?” This problem can be solved by subtracting $5-3$.



Developing Students' Understanding of Subtraction—Teaching Tips

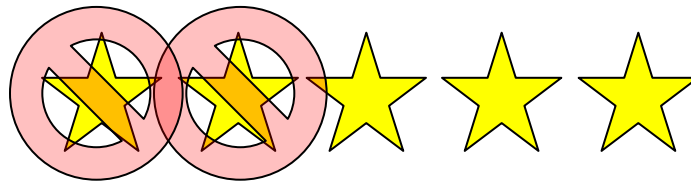
Give students a variety of experiences with subtraction, including “take-away,” comparing, decreasing, and finding the missing part

Initially teaching only “take-away” can limit a students' success with other subtraction situations and with learning the facts.

Developing Students' Understanding of Subtraction—Teaching Tips

Have students model adding sets and separating sets (taking away)

Students are modeling take-away when they count out the total amount, remove the subtracted amount, and then count the remaining objects.



Developing Students' Understanding of Subtraction—Teaching Tips

Have students model adding sets and separating sets (taking away)

Just as putting together 4 cookies and 3 cookies involves addition, removing 3 cookies from a set of 7 cookies involves subtraction.



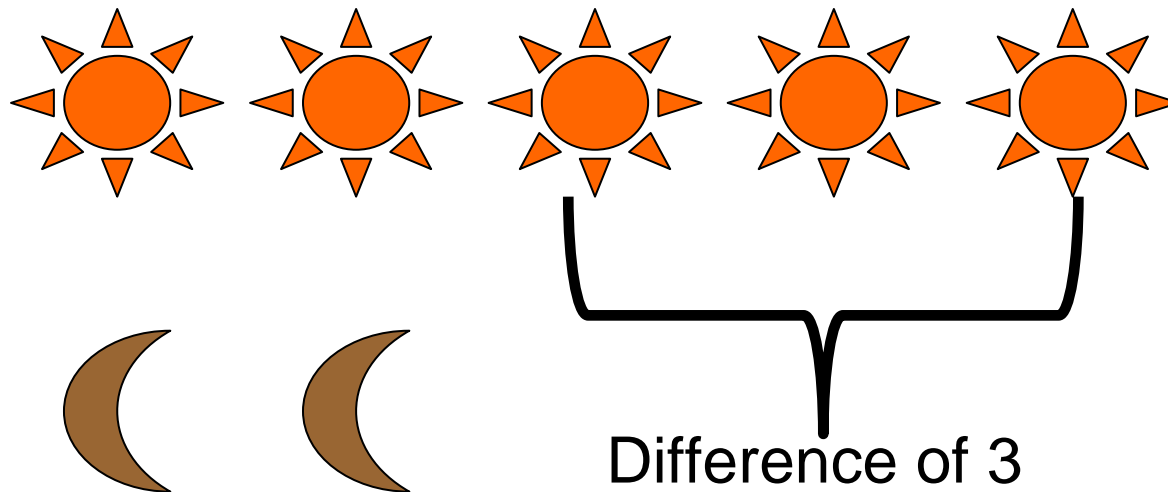
Developing Students' Understanding of Subtraction—Teaching Tips

Have students model finding a difference between two sets (comparing)

The two separate amounts can be counted out and lined up, then the difference can be viewed as the amount that would need to be added to the smaller set to equal the larger set, or as the amount that would need to be taken from the larger set to equal the smaller set.

Developing Students' Understanding of Subtraction—Teaching Tips

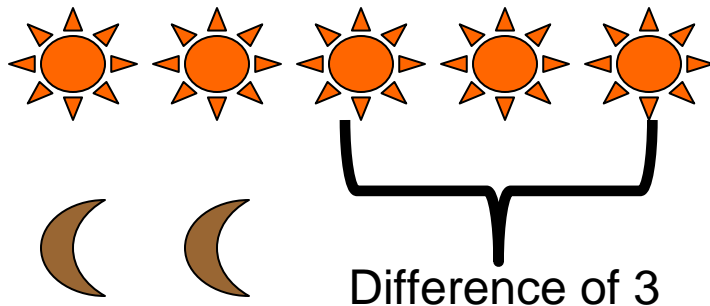
Have students model finding a difference between two sets (comparing)



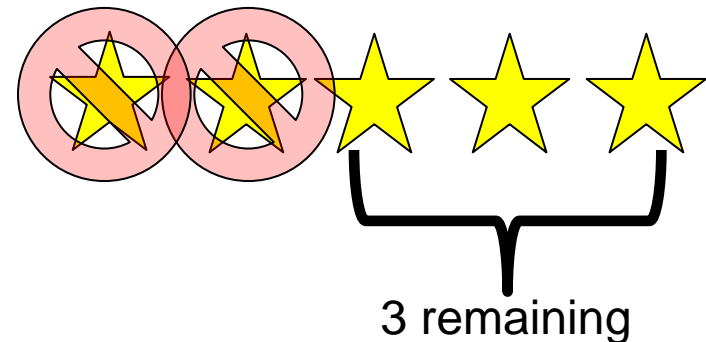
Developing Students' Understanding of Subtraction—Teaching Tips

Note that when modeling comparing, you start with 2 sets of objects, but when modeling take-away, you start with 1 set.

Comparing model



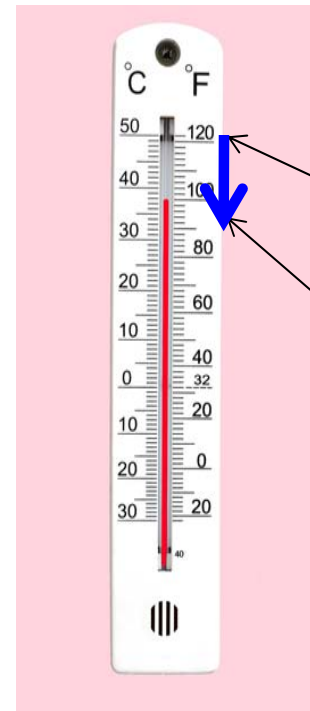
Take-away model



Developing Students' Understanding of Subtraction—Teaching Tips

Model decreases or shifts from a starting amount by using a thermometer or a number line

Locate the starting amount and show a decrease by counting toward colder temperatures.

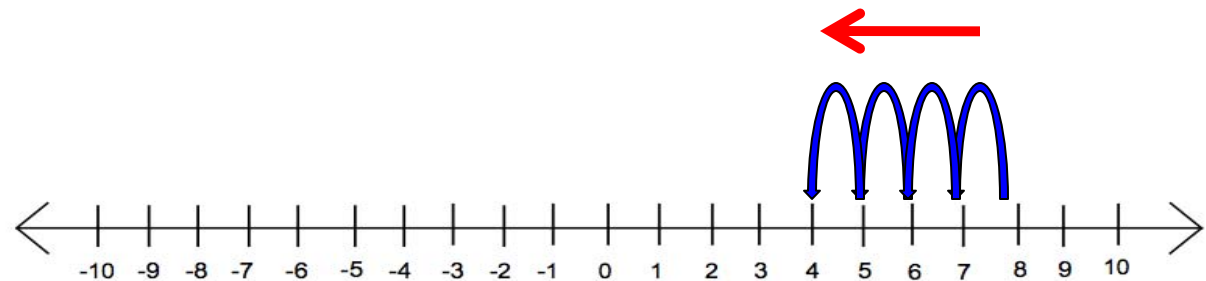


It was
120°
Now it's
98°

Developing Students' Understanding of Subtraction—Teaching Tips

Model decreases or shifts from a starting amount by using a thermometer or a number line

On a number line, count a decrease to the left.



Developing Students' Understanding of Subtraction—Teaching Tips

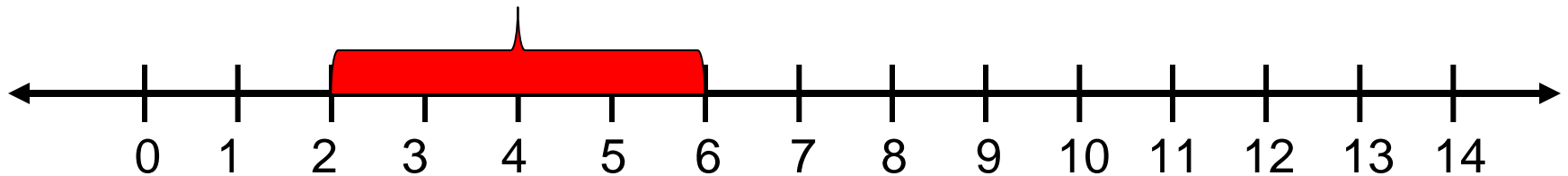
Model missing addends with comparisons

A missing addend problem such as $8 + \underline{\quad} = 12$ can be viewed as “what’s the difference, or distance, between these numbers?” It can also be interpreted as “what’s the other number that is added to 8 to give 12?”

Developing Students' Understanding of Subtraction—Teaching Tips

Use a number line to show that many pairs of numbers have the same difference or distance

$$6 - 2 = 4$$



$$13 - 9 = 4$$

