

## MILESTONE #2: Add and subtract within 10.



### Objective #4: Add or subtract 0, 1, and 2 to a number within 10.

Now that students have strong number sense, it's time to dive into the meaning of addition and subtraction while building fluency. The activities listed here will focus more on fluency and less on meaning. Ample time should be given during the math block to master the different forms of addition and subtraction. In fact, students should know all 15 types by the end of Grade 2. (Please see The Problem Solving Handbook for Addition and Subtraction for more information.) Refer to these problem types as you invite students to give real-life examples when they represent an addition or subtraction equation throughout this milestone of addition and subtraction within 10.

	Result Unknown	Change Unknown	Start Unknown
Add To	Three cats are on the mat. Two more cats join them. How many cats are on the mat? $3 + 2 = ?$	Three cats are on the mat. Some more join them. Now there are 5 cats on the mat. How many cats joined them? $3 + ? = 5$	There are some cats on the mat. 2 more cats join them. Now there are 5 cats. How many cats were there at first? $? + 2 = 5$
Take From	There are 5 candies on the table. 2 are eaten. How many are left? $5 - 2 = ?$	There are 5 candies on the table. Some are eaten. Now there are 3 left. How many candies were eaten? $5 - ? = 3$	There are some candies on the table. 2 are eaten and now there are 3 left. How many candies were there at first? $? - 2 = 3$

	Total Unknown	Addend Unknown	Both Addends Unknown
Put Together or Take Apart	There are 4 red cars and 2 blue cars. How many total cars are there? $4 + 2 = ?$	There are 6 cars. 4 of them are red. The rest are blue. How many blue cars are there? $4 + ? = 6$ $6 - 4 = ?$	There are 6 cars. Some are red and some are blue. How many are red and blue? $4 + 2 = 6, 3 + 3 = 6$ $5 + 1 = 6, 6 + 0 = 6$

Adapted from University of Arizona Common Core Progression Documents

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	<p>There are 5 sunflowers and 3 tulips. How many more sunflowers are there?</p> <p>There are 5 sunflowers and 3 tulips. How many fewer tulips are there? <math>5 - 3 = ?</math></p>	<p>There are 3 tulips. There are 2 more sunflowers than tulips. How many sunflowers are there?</p> <p>There are 3 tulips. There are 2 fewer tulips than sunflowers. How many sunflowers are there? <math>3 + 2 = ?</math></p>	<p>There are 5 sunflowers. There are 2 more sunflowers than tulips. How many tulips are there?</p> <p>There are 5 sunflowers. There are 2 fewer tulips than sunflowers. How many tulips are there? <math>5 - 2 = ?</math></p>

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The Developing Number Sense for Math Fact Fluency course provides additional information about developing the understanding for addition and subtraction. In this section of the manual, you will find games and activities that will focus on the objective of adding or subtracting 0, 1 or 2 as the first step in working on memory for facts within 10. This vital step helps connect students understanding of the counting sequence to the meaning of addition and subtraction. Many of the activities will even seem similar as students apply the abstract notation of an equation.

Students should be able to:

- Model addition as combining sets.
- Model subtraction as taking away.
- Understand that adding or subtracting a zero does not change the total.
- Use number lines or objects to add or subtract 0, 1 and 2 to a number within 10.
- Represent an addition or subtraction equation.

The following activities and resources will help students to reach the goals listed above:

- Teacher Resource 4.1: Adding Quantities
- Teacher Resource 4.2: Taking Away Quantities
- Teacher Resource 4.3: Adding to Ten with a Ten Frame
- Teacher Resource 4.4: Subtract to Zero with a Ten Frame
- Teacher Resource 4.5: Race to Ten
- Teacher Resource 4.6: Assessment Toolbox #4

## Teacher Resource 4.1: Adding Quantities Student Directions

Materials:

- Adding Quantities Work Mat
- 20 counters
- dry erase marker
- 1 two-sided counter

This game is designed for pairs.

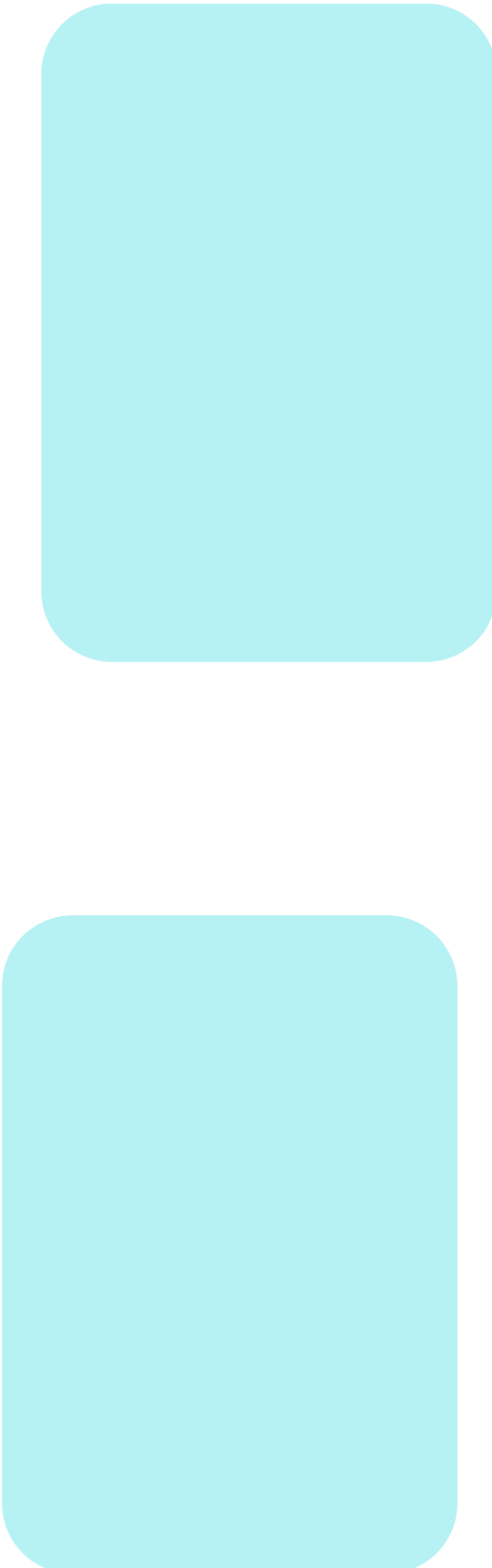
1. Give each player an Adding Quantities Work Mat placed in a page protector or laminated, a dry erase marker and 10 counters.
2. Write the number 1 on one side of the two-sided counter and the number 2 on the other side.
3. Invite STUDENT 1 to write the number 0 in the box to the left on the Adding Quantities Work Mat. Ask STUDENT 1 to flip the counter. Whatever number shows should be how many counters are placed in the box to the right on the Adding Quantities Work Mat.
4. Encourage STUDENT 1 to write an equation on his or her Adding Quantities Work Mat that shows  $0 + \underline{\quad}$  (the number rolled).
5. Invite STUDENT 2 to complete the same process on his or her Adding Quantities Work Mat.
6. On STUDENT 1's next turn, encourage STUDENT 1 to erase the sentence but to move all the counters from the previous sentence to the box on the left side. This is now the new number STUDENT 1 will add to when flipping the counter again.
7. Invite STUDENT 1 to flip the counter again and place that many counters in the box to the right. Encourage STUDENT 1 to write a new sentence and matching equation.
8. STUDENT 2 should do the same on STUDENT 2's next turn.
9. Both players should continue to play until the first player reaches 10.

Questions to Encourage Student Discussion:

- How did you decide what to write in your addition equation?
- What are the two parts in your problem? What is the whole?
- What story could you tell that would match your problem?

# Teacher Resource 4.1: Adding Quantities

1	2	3	4	5	6	7	8	9	10
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$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

## Teacher Resource 4.2: Taking Away Quantities Student Directions

Materials:

- Taking Away Quantities Work Mat
- 20 counters
- dry erase marker
- 1 two-sided counter

This game is designed for pairs.

1. Give each player a Taking Away Quantities Work Mat placed in a page protector or laminated, a dry erase marker and 10 counters.

2. Write the number 1 on one side of the two-sided counter and the number 2 on the other side.

3. Invite STUDENT 1 to place all ten counters in the box on the Taking Away Quantities Work Mat.

4. Encourage STUDENT 1 to flip the counter. Whatever number shows should be how many counters are removed from the box on the Work Mat. Encourage STUDENT 1 to complete the sentence and write the matching addition equation.

4. Invite STUDENT 2 do follow the same process on his or her own Taking Away Quantities Work Mat.

5. On STUDENT 1's next turn, encourage STUDENT 1 to erase the sentence and flip the counter again to determine how many counters to remove. Encourage STUDENT 1 to write a new sentence and matching equation.

7. STUDENT 2 should repeat and both players should continue to play until the first player reaches 0.

Questions to Encourage Student Discussion:

- How did you decide what to write in your subtraction equation?
- Where is the whole in your equation? Where are the parts in your equation?
- What story could you tell that would match your problem?

1	2	3	4	5	6	7	8	9	10
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\_\_\_\_\_ **take away** \_\_\_\_\_ **is** \_\_\_\_\_.

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

## Teacher Resource 4.3: Adding to Ten with a Ten Frame Student Directions

Materials:

- Adding to Ten Ten Frame
- 20 counters
- pencil
- dry erase marker
- paper clip
- Adding to Ten Spinner

This game is designed for pairs.

1. Give each player an Adding to Ten Ten Frame placed in a page protector or laminated, a dry erase marker and 10 counters.

2. Using a paper clip with a pencil as a spinner, invite STUDENT 1 to spin the spinner by placing a pencil in the paper clip and flicking the paper clip. Whatever number it lands on will be the number of counters that should be placed on the Ten Frame.

3. Invite STUDENT 1 to complete the addition equation on the Adding to Ten Ten Frame. For example, if STUDENT 1 spins a 2, the equation would read  $0 + 2 = 2$ .

4. Ask STUDENT 2 to repeat the same process to place counters on his or her own Adding to Ten Ten Frame.

5. When it's STUDENT 1's turn again, invite STUDENT 1 to spin the spinner and place counters on the mat, adding to the ones already there. Encourage STUDENT 1 to write the matching equation for this step. Using our above example, if STUDENT 1 spins a 1, STUDENT 1 would write  $2 + 1 = 3$ .

6. Both students should continue playing until the first player reaches ten by filling up the ten frame and writing the matching equations.

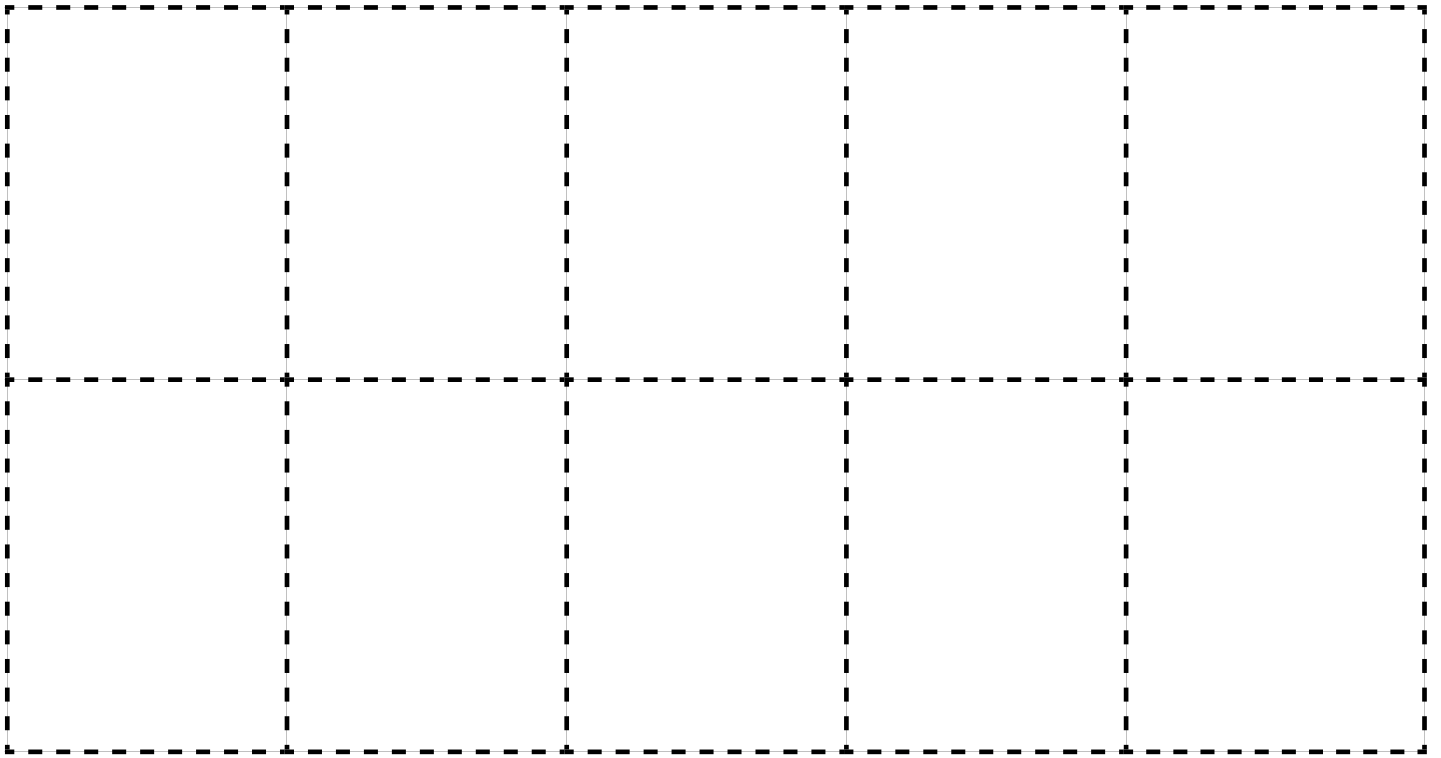
Differentiation Options:

- Encourage students to try to find the answer mentally before adding counters to the Ten Frame.
- Challenge students to show the addition by counting up on his or her fingers.

Questions to Encourage Student Discussion:

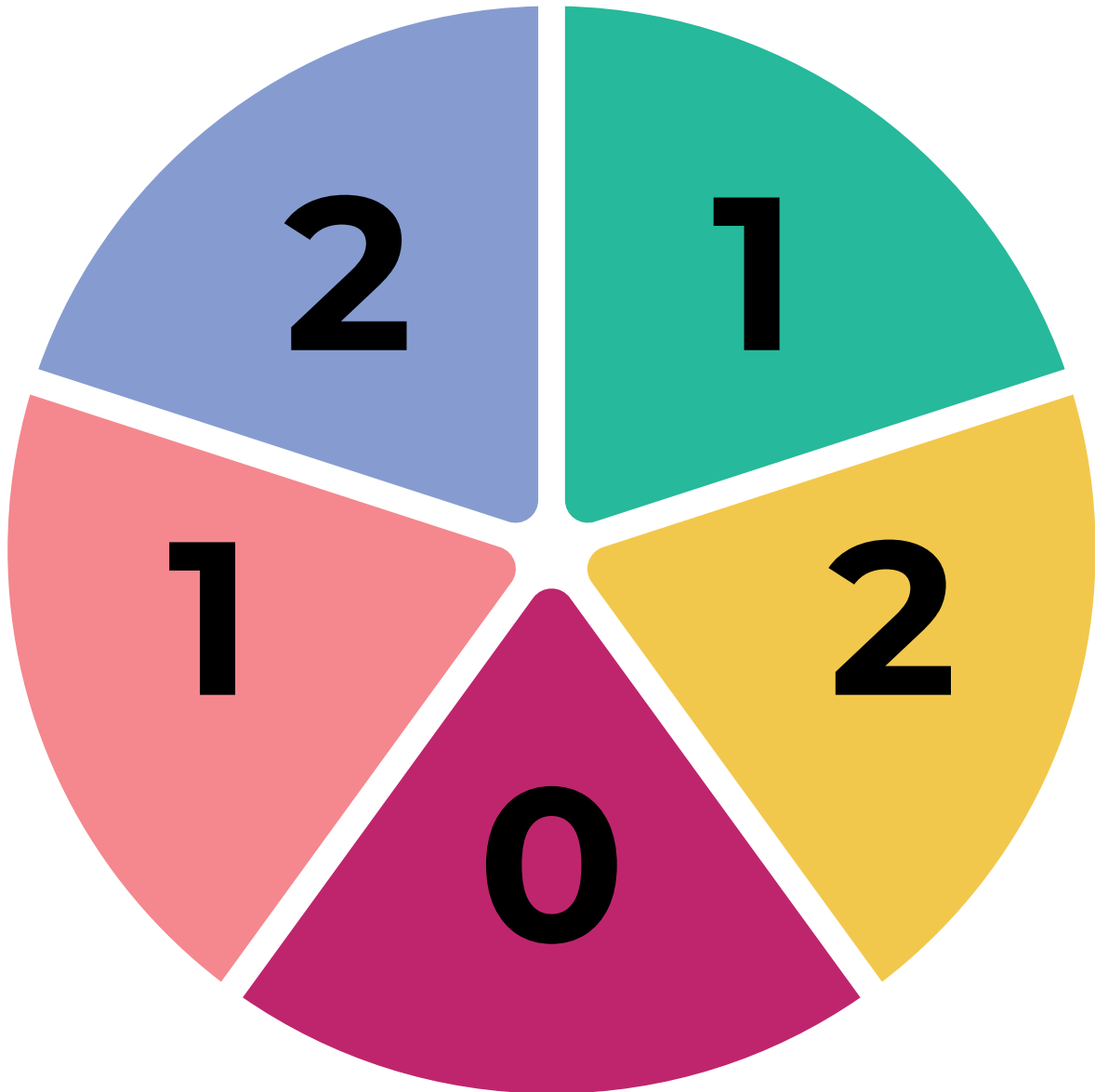
- What happens when you add 1 to a number? How is this like counting?
- What happens when you add 0 to a number? Why does this happen each time?

## Teacher Resource 4.3: Adding to Ten with a Ten Frame



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**Teacher Resource 4.3 and 4.4: Adding to Ten or Subtract to Zero with a Ten Frame Spinner**



## Teacher Resource 4.4: Subtract to Zero with a Ten Frame Student Directions

Materials:

- Subtract to Zero Ten Frame
- 20 counters
- pencil
- dry erase marker
- paper clip
- Subtract to Ten Spinner (TR 4.3)

This game is designed for pairs.

1. Give each player an Subtract to Zero Ten Frame placed in a page protector or laminated, a dry erase marker and 10 counters.

2. Encourage each player to place 10 counters to completely fill the ten frame on the Subtract to Zero Ten Frame.

3. Using a paper clip with a pencil as a spinner, invite STUDENT 1 to spin the spinner by placing a pencil in the paper clip and flicking the paper clip. Whatever number it lands on will be the number of counters that will be removed from the Ten Frame.

4. Invite STUDENT 1 to complete the subtraction equation on the Subtracting to Zero Ten Frame. For example, if STUDENT 1 spins a 2, the equation would read  $10 - 2 = 8$ .

5. Ask STUDENT 2 to repeat the same process by removing counters on his or her own Subtracting to Zero Ten Frame.

6. When it's STUDENT 1's turn again, invite STUDENT 1 to spin the spinner and remove counters on the mat. Encourage STUDENT 1 to write the matching equation for this step. Using our above example, if STUDENT 1 spins a 1, STUDENT 1 would write  $8 - 1 = 7$ .

7. Both students should continue playing until the first player reaches zero by removing the counters on the ten frame and writing the matching equations.

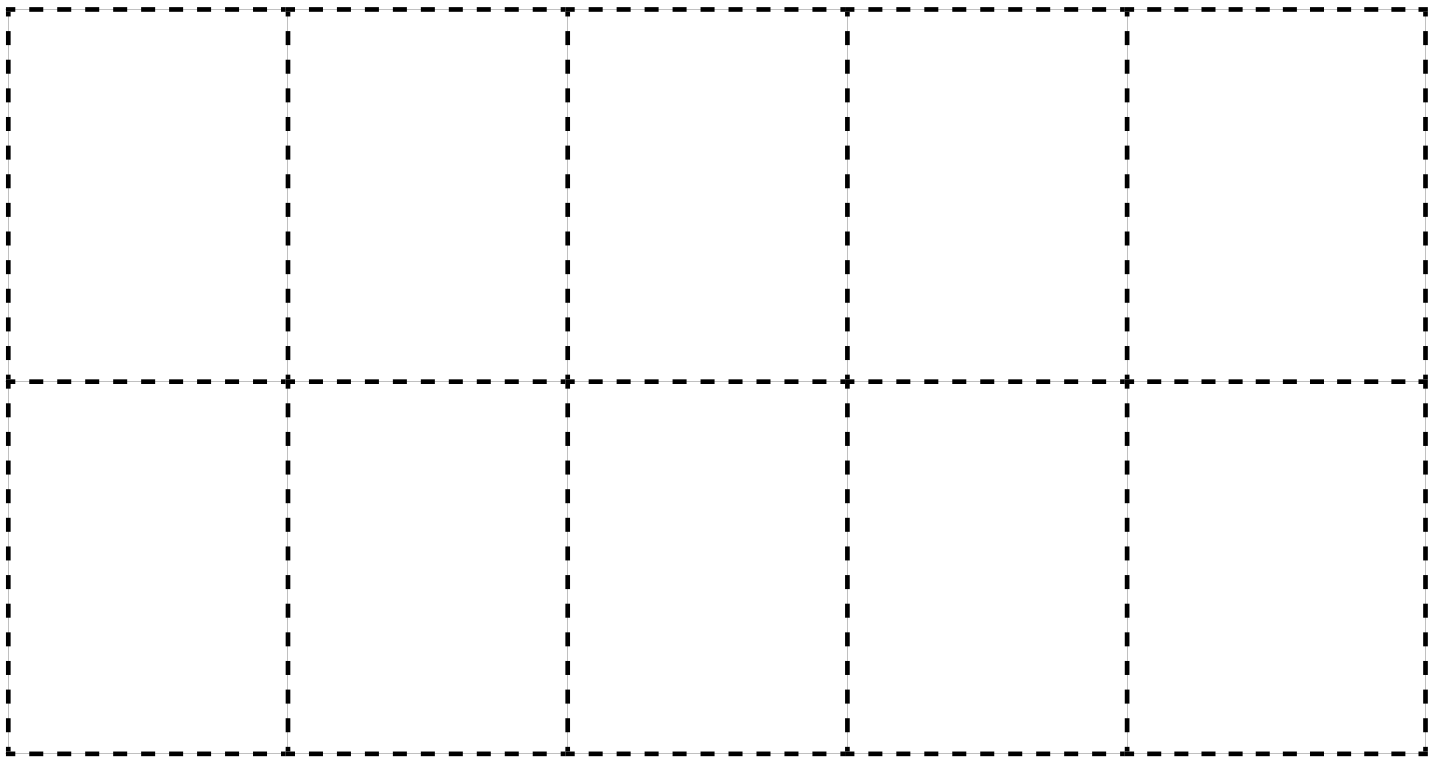
Differentiation Options:

- Challenge students to try and solve mentally before subtracting using the counters.

Questions to Encourage Student Discussion:

- What happens when you subtract 1 from a number? How is this like counting?
- What happens when you subtract 0 from a number? Why does this happen each time?

# Teacher Resource 4.4: Subtract to Zero with a Ten Frame



$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

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## Teacher Resource 4.5: Race to Ten Student Directions

Materials:

- Race to Ten Work Mat
- pencil
- 2 counters
- paper clip
- Race to Ten Spinner

This game is designed for pairs.

1. Give each player a counter and place it at the bottom of the mountain.
2. Using a paper clip with a pencil as a spinner, invite STUDENT 1 to spin the spinner by placing a pencil in the paper clip and flicking the paper clip. Whatever number it lands on will be the number of spaces moved on the mountain. If STUDENT 1 lands on a subtraction operation or a 0, STUDENT 1 will stay in place on the first turn. However, as students play they can move backwards when landing on a subtraction number.
3. Invite STUDENT 2 to spin the spinner and move the appropriate number of spaces.
4. Each player should continue spinning the spinner until one student makes it to the top of the mountain.

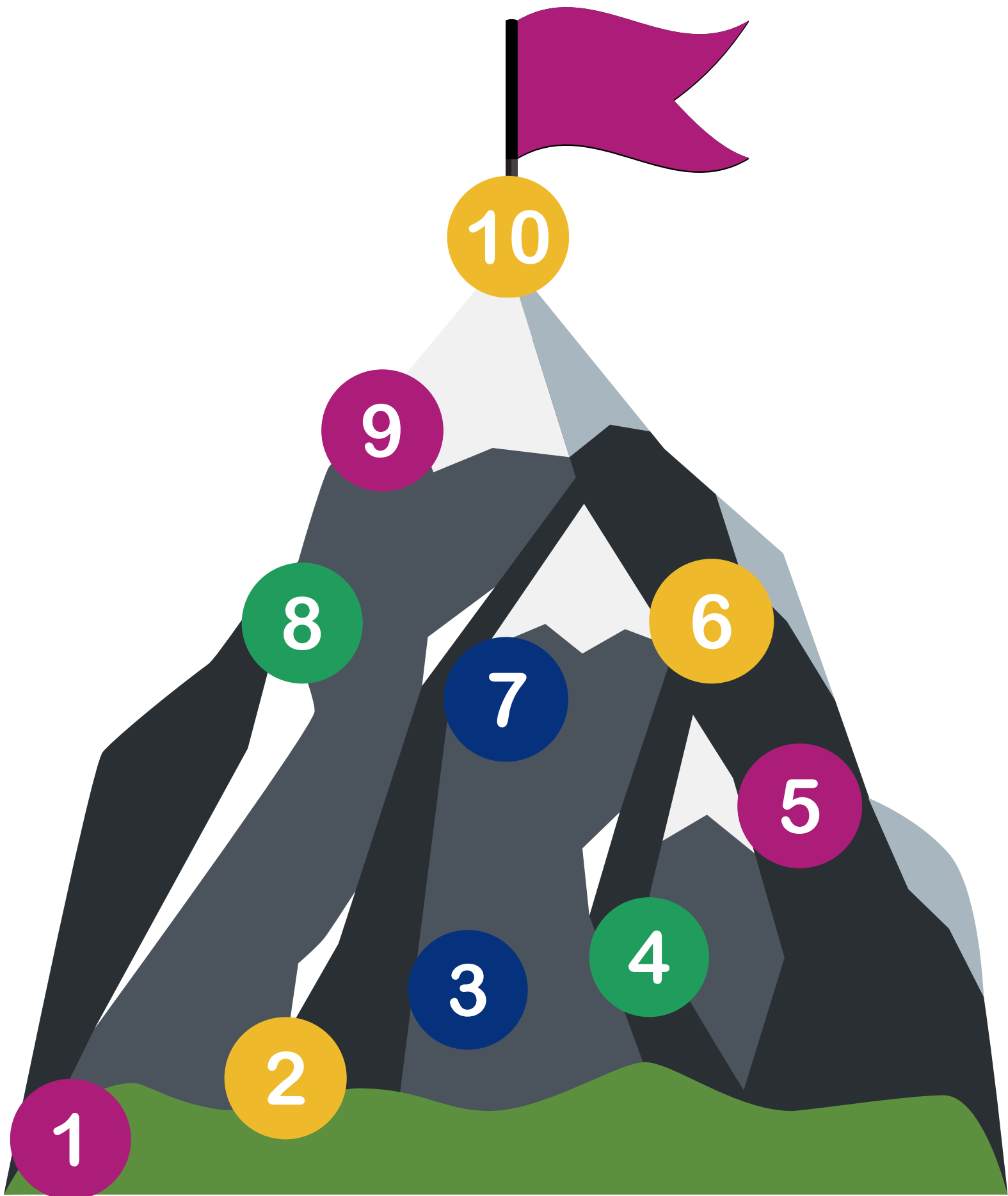
Differentiation Options:

- Challenge students to try and solve mentally. However, provide counters or the ten frames from previous activities to help students keep track of their progress. Students can even write the equations to match the spinner using Teacher Resource 4.3 and 4.4 Work Mats.
- Build the mountain using blue painter's tape on the floor of a classroom. Challenge students to use their bodies to jump up and down the mountain as they play the game. This can even be played having one person be the spinner while the other person jumps up and down the mountain similar to the game Twister.

Questions to Encourage Student Discussion:

- What numbers made it easier to climb up the mountain?
- What numbers made it harder to climb up the mountain?
- What facts do you know automatically? What facts were more challenging?

## Teacher Resource 4.5: Race to Ten



Teacher Resource 4.5: Race to Ten

