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Take Five for the Movies!

Content Standards: **Grade K**

Operations and Algebraic Thinking: understand subtraction as taking apart and taking from.

1. Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
5. Fluently add and subtract within 5. Include groups

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
4. Model with mathematics.

Desired Student Outcomes:

Through problem solving activities using hands on manipulatives the students will act out mathematical situations, students will visually and mentally conceptualize the concepts of addend and total.

Day 1: Conceptualize and organize different combinations of the number 5, Use manipulatives to solve word problems with the “how many more” concept.
Day 2: Create symbolic representation of different combinations of 5, going from part to whole.
Day 3: Move toward more abstract understanding of the number 5. Represent a number of objects with cardinal numbers focusing on part to whole and missing addends.

Day 1:

Conceptualize and organize different combinations of the number 5, use manipulatives to solve word problems with the “how many more” concept.
“Today we will use math materials to solve some word problems with “how many more” or addends. An addend is a missing number in a number sentence. It is like a mystery we must investigate” “Oooooo”

Materials:
Students will need one star strip work-mat, (laminated) with 5 stars on it and counters, (do not pre-count manipulatives for students).
Teacher will need six whole class, larger visuals of star strip (overhead, on board, etc.) one red marker and one blue marker. Place strips vertically as you do each problem so students can see the combination patterns develop.

To begin the lesson, start with a counting song that sequentially counts up to five, like "Five Little Elephants".

One little elephant went out to play, along a spider's web one day,
He had such enormous fun, he called for another elephant to come,
Oh, elephant!

Two little elephants went out to play, along a spider's web one day,
They had such enormous fun, they called for another elephant to come,
Oh, elephant!

Three little elephants went out to play, along a spider's web one day,
They had such enormous fun, they called for another elephant to come,
Oh, elephant!

Four little elephants went out to play, along a spider's web one day,
They had such enormous fun, they called for another elephant to come,
Oh, elephant!

Five little elephants went out to play, along a spider's web one day,
They had such enormous fun, they played all day under the sun.

Focus Questions
"**Raise your hand if you have counted stars before?"**
"How many stars do you see on your strip of paper?"
"Let's count them together..."
Students count stars with one-to-one correspondence while teacher is modeling, touching each star on the larger star strip as they count chorally, **"1, 2, 3, 4, and 5."**
(*Counting has an important and critical role in the early development of number sense.)

"I wonder how many counters it would take to cover the stars?"
"Show me on your fingers how many counters do you think we will need to cover the stars. Let's use the counters to cover the stars: one counter, two counter, … to 5."
Class counts one counter at a time and places it on a star while teacher is demonstrating the same visual on large star strip.

 star chart

Once all the stars are covered, ask, **"How many more counters do we need to cover the stars?**"

Desired student response: "zero" counters are needed, the stars have been covered.

"What do you notice about the stars and the counters?" (Desired response: Students should understand that there are the same number of stars and counters which makes them equal.)

"How many people have used their imagination before?"

"We are going to use our imagination and pretend that these stars are seats in a movie theater and the counters are people. We need to help the movie manager solve some problems with his movie theater seating. He wants to make sure he has a packed theater all the time and all the seats are filled."

"Let's clear off our counters and put them back in the center pile and review our information."

In the next progression you will help the students find:
0 and 5 makes 5, 1 and 4 makes 5, 2 and 3 makes 5, 3 and 2 makes 5, 4 and 1 makes 5 and 5 and 0 make 5.

"How many people are in the theater?"(0)

"We have zero people in the the movie theater. How many seats are in the movie theater?" (5)

"How many people does the manager need to fill the theater seats?" (5)

"Zero and 5 makes 5 or 0 and 5 total 5. Let's repeat that, 0 and 5 make 5."

"I'm going to record that information on our first star strip on the board." Teacher puts a red box around the five stars (seats) needed to fill the theater.

"So the theater had 0 people, than 5 people arrived which filled the theater, everyone enjoyed the movie, and then they went home. Let's clear our seat again."
(*Research shows that for conceptual understand in the early grades, it is better to use the

word “makes” or “total” instead of “sum” so they do not get it confused with the concept of “some”.)

 red box around 5 stars

“Now we are ready to fill the theater again. Okay, there is one person in the theater. Let’s take one counter and put it in the first seat (star).”

“The movie manager wants to fill up all his seats.

“How many people are in the theater?” (1).

“How many total seats are in theater?” (5)

“How many more people do we need to fill all the seats? Who can get us started on how to solve this problem?” (Desired response: Someone will suggest to use the counters to add on to the existing one, until all the stars are covered.)

“We have one person in the first seat of the theater, now let’s count together how many more people we need to fill the five seats?”

“How many more people did we need to fill the theater?” (4)

Possible misconception: students will see all five counters and say (5). Teacher note: cover up the one filled seat with your hand, lead students to count the 4 more added.

Model the problem on the next star strip.
“How many people were in the theater to start?” (1). Put a blue box around the first star.

“How many more people did we need to fill up the seats?” (4) Put a red box around the remaining 4 stars. **“1 and 4 make 5. Let’s repeat that together, 1 and 4 make 5.”** Teacher is pointing to the visual cues as choral response is being said.

 blue box around 1, red box around 4

Repeat the same type of word problems using the different combinations in sequential order totaling 5:
“Now, 2 seats are filled in the theater, how many more people are needed to make a total of 5 seats filled?”(3) Give student time to work this out.

“Yes, let’s repeat that, 2 and 3 total 5.”

(Continue on... **“Three seats filled, how many more needed (2), let’s repeat that 3 and 2 makes 5.”**

“Four seats filled, how many more needed (1), let’s repeat that, 4 and 1 totals 5.”

“Five seats filled, how many more needed (0), let’s repeat that 5 and 0 makes 5.”

**Teacher note: “make” and “total” are used interchangeably. Pacing is dependent on student feedback.

With each problem set, teacher models the number combinations by drawing a blue box around the existing people in the theater and a red box around the seats where more people are needed in order to fill the theater.

Focus the class’s attention on the larger star stips that the teacher modeled on the board showing the different combinations of 5.
“Raise your hand if you notice something?”

“Talk to your neighbor about something you noticed?” (Desired outcomes: Students may notice that there are similar combinations, like (2 and 3) and (3 and 2) that make 5, or all combinations total 5)

Whole group: **"Does anyone want to share something they noticed or heard in their group?"**

"What was our total number of movie seats for every problem?" (5)

"Let's look at these two middle rows of seats. Do you notice something?" (Desired outcome: Students should notice that the combinations of 2 and 3 and 3 and 2 both total 5.)

"Can anyone find other movie theater rows that are similar?" (Desired response: Students should connect the the **BIG IDEA** that the 0,5 and 5,0, the 1,4 and 4,1, and the 2,3 and 3,2 are all number combinations that total 5.)

(**Knowing the partners and combinations that make 5, sets the stage for future lessons on making tens as mental math strategies.)

"I wonder if there is a different way to organize our data that might make it easier to record all these different combination that total 5. I'll let you think about that for a while, and we will investigate that tomorrow."

Day 2

Create symbolic representation of different combinations of 5, going from part to whole.

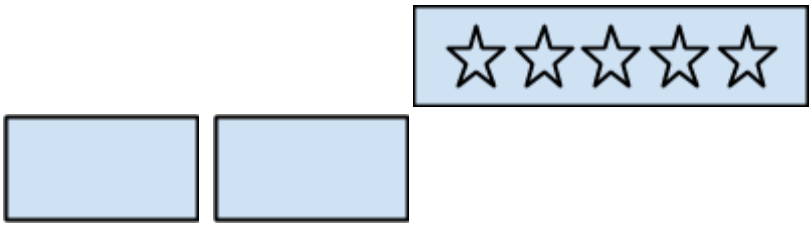
Materials: Two different color manipulatives (blue and red) for each child, Part to Whole workmat (laminated) for each child, one Part to Whole workmat for teacher, and larger star strips from Day 1, visible for students to see.

To begin the lesson, start with a counting poem that sequentially counts up to five or beyond, like One Potato, Two Potato, Three Potato, Four.

Focus Questions
"Show me on your fingers the number of movie seats we were trying to fill yesterday. (5)

" Raise your hand if you remember something about the number 5? Talk to your neighbor about two numbers that total 5."

"So we are going to look at our movie theater seats in a slightly different way, because we are mathematicians and we like to organize our data in different ways that make sense." (Draw a star strip of 5 and put two blank boxes underneath, one blue, one red.)



“Can we say our special movie theater with 5 movie seats is the “whole” movie theater?”

“So if 5 seats is the whole theater, let’s imagine that I had “part” of the movie theater filled with 3 people.

“The movie manager wants to fill up all his seats. In order to keep track of the number of empty seats we always start with the seats/stars on the left and fill the theater moving to the right. Let’s use three blue counters to represent people in seats in the first box, under the whole movie theater.”

“See if you can figure out how many more people we would need in the other part to make the whole theater filled?” Have students use red manipulatives to represent “empty seats” to figure out how many more manipulatives are needed and place in second box. “The empty seats represent the missing addend, the mystery number.”

“How many more people were needed in the other part of the movie theater to fill the whole theater.” (2) “Let’s make a statement that 3 and 2 make 5. Repeat that math statement with me.”


Counters go in boxes

Side note: Students need a lot of experience saying and hearing the math sentence with the two parts in order to comprehend that the two parts go together to make a whole.

“Let’s try another scenario. Clear your work mat.”

“Part of the movie theater has one person in a seat.

“Show me on your fingers how many blue counters we will put on our workmat in the first box, under the whole movie theater?”

“ Let’s put the blue counter in the box now. How many people are needed in the second part to fill the remaining seats in the whole movie theater?” (Students add 4 red counters.)

Possible misconceptions: Student do not put the correct number of red counters in the box. Let's go back to the whole. **"How many movie theater seats are in the whole?" (5).**

"Let's count our blue and red counters to make sure we do not have more or less than the whole." Count chorally the two colored counters to verify that they do total the whole of 5.

"Now that we know that we have the right amount of people, let's make a math sentence using the red and blue counters."

"Who wants to start a statement about that...?" (One and four total, or makes, 5).

"Is there a place on our movie theater strips from yesterday that shows 1 and 4 makes 5?" (Teacher refers to poster from Day 1. Students find the second strip that correlates with their Part to Whole Movie Theater workmat.)

Point to the third strip from the chart made on Day 1 (choral response, "2 and 3 makes 5"), **"Do you think we can take this data and put it into our Part to Whole Movie Theater workmat?"**

"Who can get me started on how many blue counters I will need for my first box under my whole theater? Let's count out 2." Model putting two counters in the first box.

"Now how many red counters will we need to put in the second box under our 'whole' theater?" (Give students an opportunity to figure out the second "part" box. Give students a chance to respond and model placing that number of counters in the second box.)

"Let's check what we have. Let's double check that our counters, or people, in seats total the 'whole' movie theater." (Have students start with the blue counters and continue counting on to the red counters until they get to five.)

"I wonder if we can all say a math statement about how many people are in our theater using our Whole to Part Movie Theater workmat?...Two and 3 makes 5."

Point to the fourth strip (4 and 1) from the chart made on Day 1, **"Do you think we can take this data and put it into our Part to Whole Movie Theater workmat?"**

"I'm going to let you work on your own to make your workmat represent the data on this movie theater strip we did the day before."

(Walk around and check for understanding... pick up the pacing if students are understanding the concept.)
"Talk to your neighbor about a math statement pertaining to the parts that make a whole on your work mat." Give students a chance to figure out a statement with a partner.

“Let’s say that math sentence together. What word do you want to use in your math statement, total or makes?” (Then say together 4 and 1 total {or makes} 5.)

“Now I wonder if you can make your own Part to Whole Movie Theater statement using the counters, remember our theater only holds 5 people?” Teacher walks around checking for understanding. Teacher can have students whisper a math statement about their theater or teacher can whisper the math statement into the student’s ear and ask the student if they are correct? Teacher could whisper an incorrect statement to check for understanding too.

Extension: Students can continue in a math station exploring part to whole using multiple star strips, cutting them into different parts to make a whole of 5. Save in an envelope for an extension on Day 3.

“Who knows what the ‘whole’ was in today’s lesson? Show me on your fingers what the whole is (5). How many people think we are going to learn some more things about 5 tomorrow? Give your neighbor a HIGH FIVE... I think I will leave you with that for today.”

Day 3:
Move toward more abstract understanding of the number 5. Represent a number of objects with cardinal numbers, focusing on part to whole and missing addends.

Materials: students will need Part to Whole Movie Theater work mats (laminated) for each child, one Part to Whole Movie Theater workmat for the teacher, markers, eraser

To begin the lesson, start with a counting song and poem that sequentially counts up to five, like “Five Little Elephants” and “One Potato, Two Potato, Three Potato, Four”.

Teacher displays the Part to Whole Movie Theater workmat used from day 2 and shows the two boxes (with 0 counters in the first box and 5 counters in the second box) making the “whole.”

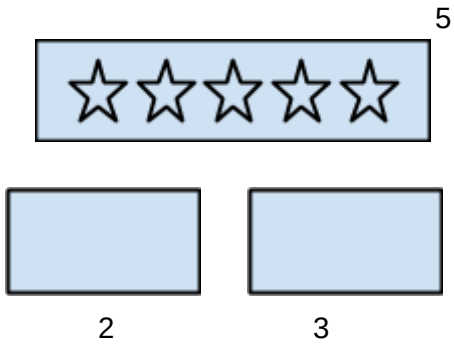
Focus Questions
“**Show me on your fingers what part of the whole is in the first box? (0)**
“Show me on your other hand what part of the whole is represented in the second box?”(5)

“Put both of your hands together, what is the whole, Let’s say that together “0 and 5 totals 5.”

Repeat the same procedure using 2 and 3. This time when the students show how many on their hand ask them, **“How many are in the first part of the whole?** Students say “2”, write 2 under the box of manipulatives.

“How many are in the second box, show me on your fingers?” Teacher writes 3 under the second box.

“Let’s put our hands together as we read the math statement about 5 together. “2 and 3 makes 5.” Teacher writes 5 above star strip.



“How many people noticed that I wrote something under each part of the whole? How many people think they are ready to write some numbers?”

Teacher hands out an erasable (laminated) Part to Whole Movie Theater workmat for each child with an eraser and white board marker.

“Let’s count again what is the whole?” Students count the five stars chorally together, while teacher models one to one correspondence.

“Let’s write the number five together on our Whole to Part Movie Theater workmat (above the star chart).”

Refer to manipulatives on display on Part to Whole workmat (2 and 3) parts.
“How many counters are in the first part?” (Choral response, 2)
“Who has an idea where we will write that number?”

Teacher replaces the manipulatives in the first box (and erases the number below) with the number 2. Guide the students to write the 3 in the second box in the same manner.

“Let’s read our math statement together as we point to our numbers, “2 and 3 totals 5”.” You may need to repeat this process a few times so that the students get practice writing and making statements about all of the combinations of 5.

“Now we are going to play a game, called the Missing Addend game with our whole number 5.

“I am going to write two parts in my box that make up the whole number five.”

“I am going to cover up one of the parts.”

“Your first job is to write down the number you DO see on your workmat and your second job is to uncover the mystery of the missing part, or addend.

“Once you think you have discovered the missing part, or addend, write that number in the other box.” (Attend to how students are figuring out the missing addend. Do they have it memorized, looking at the charts, are they counting on their fingers, drawing pictures, or using counters? If you notice some students are struggling to solve the problem make the counters available for them.)

Check for understanding, as students fill in the missing part. Be sure to have students say a math statement about the two parts totaling the whole. Play several rounds of the game.

Extension 1: Students can continue playing the game with a partner, instead of whole class.
Extension 2: Center Activity: Students can use the star strips saved from Day 2 extension to write the part to whole numbers on.

**This lesson can be adapted for other grade levels. This same process (with varied word problem scenarios) can be used to discover and internalize all the number compositions and decompositions of 10, and then 20.

To really jazz up this lesson, teachers can make movie theater tickets to introduce or close the 3-day lesson.