**Ten Frames 0-10**

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| In this lesson, students work with numbers less than 10 and explore the idea of one more and one less than a number. |

**NC Mathematics Standard:**

**Add and subtract within 20.**

**NC.1.OA.9** Demonstrate fluency with addition and subtraction within 10.

**Additional/Supporting Standards:**

**Understand and apply the properties of operations.**

**NC.1.OA.4** Solve an unknown-addend problem, within 20, by using addition strategies and/or changing it to a subtraction problem.

**Extend and recognize patterns in the counting sequence.NC.1.NBT.1** Count to 150, starting at any number less than 150.

**Standards for Mathematical Practice:**

2. Reason abstractly and quantitatively.

1. Use appropriate tools strategically.
2. Attend to precision.  
   7. Look for make use of structure.

**Student Outcomes:**

* I can represent a given number between 0-10 on a ten frame.
* When given a number between 0 and 9, I can tell how many more need to be added to make a 10.
* When given a number between 0 and 9, I can tell what one more and one less is.

**Math Language:**

**What words or phrases do I expect students to talk about during this lesson?**

ones, tens, less, more

**Materials:**

* Ten Frame Mats, 2-color counters, number cards (0-9), spinner, paperclip, pencil
* Ten Frame Cards (Optional)
* Computers to access interactive activity using ten frames (Optional): <http://illuminations.nctm.org/activitydetail.aspx?id=75>

**Advance Preparation**:

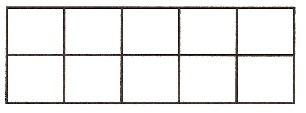
* Gather materials

**Launch**

1. Overview of Ten Frames (5-10 minutes)

Model the orientation of the ten frame mats in front of the students and provide directions for placing red/yellow counters left to right and top to bottom on ten-frames.

The teacher models what the number 1 looks like and the students build on their ten frame:



Continue with the numbers 2, 3 and 4.

Ask students: *What would the number six look like?*

Ask students to represent all the numbers 0 – 10 one at a time.

Extend their thinking by doing a quick image activity. Make a representation on the ten frame without showing it to students. Then show it for 3-5 seconds using a document camera or ten frame cards. After you have shown it to them, have students make the same representation on their own ten frames. Show it to them again for 3-5 seconds. Have them correct their representations if needed. Then show them the image and leave it up.

Ask students questions such as: How many counters are there?

Where are groups of counters that could help us count quickly?

**Explore (Part One)**

2. Representing Numbers on a Ten Frame (8-10 minutes)

Ask students to use counters to represent various numbers on a ten frame. Suggested numbers: 3, 5, 8, 7.

As students do this, observe:

Do students clear the ten frames each and every time OR do students add to or take from the counters on the board to make new numbers?

Ask: *How would you represent 1 more than 4? What would that look like on the ten frame?* The students should show the number 5 on the ten frames.

Follow up by asking: *What is 1 more than 4? How do you know that it is 5?*

Several numbers are given for children to represent **1 more than** that number.

Next, ask: *What would 1 less than 5 look like on the ten frame?* The students show the number 4 on the ten frames.

The teacher should then follow up by asking: *What is 1 less than 5? Can you use your ten frame to explain how you know?* Several numbers are given for children to represent **1 less than** that number.

Pose more **1 more** and **1 less** tasks.

Examples: *Use your ten frames to show me….1 more than 6, 1 less than 4, 1 more than 8*

Make sure to ask students to discuss the number of counters on their ten frames, and explain how they solved the task.

**Explore (Part Two)**  
3. One More/One Less Activity Using a Spinner (8-10 minutes)

Model the activity by first pulling a number card from a deck (0-9). Students will use counters to first represent the number on the ten frame.

Next, spin the spinner that has the words: *number*, *1 more* and *1 less*. Model how to use it. It is suggested that you use a paper clip to spin, and you use a pencil or an object to keep the paper clip on the spinner. Adjust the number of counters on the ten frame based on what the spinner tells you to do.

Repeat this activity numerous times with the students. As students are working, challenge them to see if they can mentally determine what *1 more, 1 less* orthe *number* is without using the counters. This process encourages students to mentally think about the numbers without the support of counting the counters.

Use a checklist to collect anecdotal notes on students. You could collect notes on the following questions:

* *Do students correctly represent the number on the card?*
* *Do students use the counters to determine what 1 more, 1 less, or the number is?*
* *Can students efficiently (within 3 seconds) determine what 1 more, 1 less, or the number is without using the counters?*

**Discuss**

4. Discussion of the Spinner Activity (8-10 minutes)

After the students have had a few minutes to work on the spinner activity, bring them together to discuss their work.

Give students a scenario, such as the number card 5 and *1 more* on the spinner. Ask students: *How many counters should we have?* Depending on students’ progress, you can continue with these types of tasks or move on.

**Explore (Part Three)**

5. How Many to Fill the Ten Frame? (8-10 minutes)

If students are comfortable with finding 1 more and 1 less than numbers, then begin to pose similar tasks with the question: *How many more counters will we need to fill the ten frame?*

The materials (tens frames, red/yellow counters, number cards 1-10, a spinner with the words *number*, *1 more* and *1 less*, pencils, paperclips) from the lesson will be placed in a math center/math tubs for children to practice what has been done in class.

**Additional Activities**

6. Centers

* Using an internet-connected computer, pull up the Ten Frame game on the NCTM Illuminations website ([http://illuminations.nctm.org/activitydetail.aspx?id=75).](http://illuminations.nctm.org/activitydetail.aspx?id=75)) The website has a few different activities depending on what you want to focus on.
  + How Many: Students determine the number of counters or the number of empty spaces.
  + Build: Students represent numbers on an empty ten frame.
  + Fill: Students determine how many counters are needed to fill a ten frame.
  + Add: Students use the ten frame structure to add numbers.
* One More/One Less with a Spinner (see Activity 3)
* How Many More to Fill the Ten Frame (see Activity 5)
* Pull a small group to go over related skills

**Evaluation of Student Understanding**

**Informal Evaluation:**

While students are working, there are ample opportunities to evaluate students’ performance. Questions to drive evaluation include:

* + *Do students correctly represent a number on the ten frame?*
  + *Do students use counters or mentally determine numbers that are more or less?*
  + *Do students accurately determine how many more are needed to fill a ten frame?*
  + *How do students determine how many more counters are needed to fill a ten frame?*

**Formal Evaluation:**

Ask students to look at a picture of a ten frame with some counters already on it. Have them identify how many more are needed to fill the ten frame. Students should record an answer and write a phrase about how they solved it.

**Meeting the Needs of Different Learners**

**Intervention:**

If a student is struggling to show numbers 0 - 10 on a ten frame, continue in a small group. Strategically pair students to work together during center time to help students that are struggling. Students may need to use five frames to build smaller numbers (0-5).

**Extension:**

Students that are successful with the numbers 0-10 can build bigger numbers using two ten frames. Add cards for teen numbers and let these students decide the numbers that they will represent.

**Possible Misconceptions/Suggestions:**

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| **Possible Misconceptions** | **Suggestions** |
| Students may not be consistent with the counting sequence. | Provide students access to a number line. |
| Students may not be consistent with finding one more/one less. | Allow students to count all of the counters at first, but encourage them to use a number line and their knowledge of the counting sequence to determine what is one more or one less. |

**Special Notes:**

It is recommended that the Spinner Game and the Illuminations computer activity are revisited as needed to give students many opportunities to determine 1 more and 1 less than a number, and compose the number ten.

**Possible Solutions:**

Solutions and answers will vary based on the tasks that are posed.

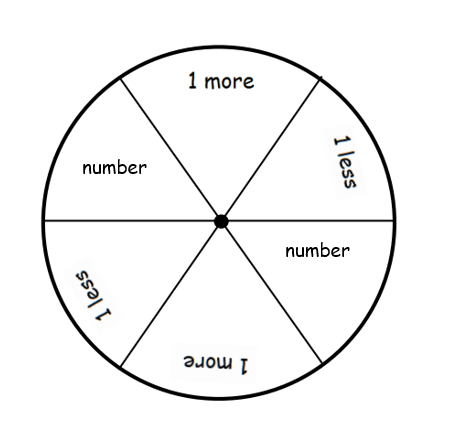
Ten Frame

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Ten Frame

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Spinner



Primary Number Cards Page 1 of 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **0** | **1** | **2** |
| **3** | **4** | **5** | **3** | **4** | **5** |
| **6** | **7** | **8** | **6** | **7** | **8** |
| **9** | **0** | **1** | **9** | **0** | **1** |
| **2** | **3** | **4** | **2** | **3** | **4** |

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| --- | --- | --- | --- | --- | --- |
| **5** | **6** | **7** | **5** | **6** | **7** |
| **8** | **9** | **0** | **8** | **9** | **0** |
| **1** | **2** | **3** | **1** | **2** | **3** |
| **4** | **5** | **6** | **4** | **5** | **6** |
| **7** | **8** | **9** | **7** | **8** | **9** |

Teen Number Cards

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| --- | --- | --- | --- |
| **11** | **11** | **11** | **12** |
| **12** | **12** | **13** | **13** |
| **13** | **14** | **14** | **14** |
| **15** | **15** | **15** | **16** |
| **16** | **16** | **17** | **17** |
| **17** | **18** | **18** | **18** |
| **19** | **19** | **19** | **19** |