**Popsicle Math**

**Resource ID#: 49507**

**Primary Type: Lesson Plan**

Popsicle Math

This lesson uses a I do, We do, You do approach to exploring the decomposition of 10. The students...

[x](http://www.cpalms.org/Public/PreviewResource/Preview/49507#standards-toggle)

* Show Remarks/Examples
* [MACC.K.OA.1.3 :](http://www.cpalms.org/Public/PreviewStandard/Preview/5294)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).

Belongs to: [Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.](http://www.cpalms.org/Public/Previewidea/Preview/1417)

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This lesson uses a *I do, We do, You do* approach to exploring the decomposition of 10. The students will use manipulatives to investigate the ways that 10 can be broken apart and put back together. The student will also work in groups to collaborate and expand their understanding of the subject. This lesson is a great way to get students involved in their learning and to help foster a love of math. Included in the lesson is a formative and summative assessment to help monitor the students' progress and understanding of the lesson.

**Subject(s):** CCSS: Mathematics

**Grade Level(s):** K

**Intended Audience:** Educators

**Suggested Technology:** Document Camera

**Instructional Time:** 1 Hour(s) 30 Minute(s)

**Freely Available:** Yes

**Keywords:** decomposition, breaking art 10,

**Instructional Component Type(s):** Lesson Plan (Primary Type) ,  Worksheet,  Assessment ,  Formative Assessment

**Instructional Design Framework(s):** Guided Inquiry (Level 3)

**Special Materials Needed:** Teacher

* 10, 2-sided counters
* pencil
* Popsicle stick
* sample recording sheet

Student

* 1 Popsicle stick per student
* 10, 2-sided counters per student
* pencil
* recording sheet

**Resource Collection:** [2013 Summer Workshop: Brevard Sandpipers](http://www.cpalms.org/Resources/PublicPreviewResourceCollection.aspx?ResourceCollectionId=174)

**LESSON CONTENT**

* **Lesson Plan Template:** General Lesson Plan
* **Learning Objectives: What should students know and be able to do as a result of this lesson?**

Students will gain a stronger understanding that there are various ways to break apart numbers less than or equal to 10.

Students will use Popsicle sticks to decompose 10 counters in varying ways.

Students will efficiently break apart 10 and use appropriate math language to discuss their findings.

* **Guiding Questions: What are the guiding questions for this lesson?**
  + What does it mean to break something apart?
  + Can we break numbers apart in math?
  + When numbers are broken apart, can we put them back together?
  + Do you think there is only one way to break apart numbers?  Why do you think this?
  + What is our whole number?
* **Prior Knowledge: What prior knowledge should students have for this lesson?**
  + Students should be able to break apart numbers up to five.
  + Students should be able to begin to represent addition and subtraction with objects , fingers, mental images, drawings, sounds (e.g. clapping), acting out situations, verbal expressions, expressions, or equations.
  + Students should be familiar with the number symbols 0-10.
  + Students should understand the relationship between number symbols and what that number represents 0-10.
  + Students should have number recognition 0-10 and the ability to understand that symbols, objects, expressions, drawings, etc. can represent numbers.
  + Students should understand that two addends (parts) make a total (whole).
* **Teaching Phase: How will the teacher present the concept or skill to students?**
  + Open with the beginning of the Formative Assessment where students are asked to make appointments with "Thinking Buddies". Tell students they will be meeting with these buddies later on in the lesson.
  + To hook students into the lesson and activate prior knowledge, the teacher will ask the students the following Guiding Questions: What does it mean to break something apart? Can we break numbers apart in math? Can you show me with my counters? Is there another way I can break apart this 10? Why do you think so? Show me. The teacher can model the recording of taking apart 10 using 2- sided counters and a piece of paper. Here is a sample recording sheet.
  + Using the document camera have students help you count out 10 counters. Tell a story similar to this: Rob made 10 hats. He made 2 groups of red and yellow hats. What are some ways we can show the different groups Rob might have made.
  + Flip some of the counters to one color and line them up in a row.
  + Place a Popsicle stick at the end of the row and line the remaining counters on the other side of the stick. Ask, How many yellow counters do I have? (4) How many red counters do I have? (6) Are there still 10 counters? Why do you think so? (You didn't add any or take any away, so it is still the same amount. The amount of counters did not change. You just put in a Popsicle stick to separate them.)
  + Ask 10 students up to the front of the room and break them up according to how the counters are separated. Example: There are 4 yellow and 6 red counters. There should be 4 "yellow" students in a group and 6 "red" students in a group.
  + Show students how when the students are together they make 10 total. (Write "10 =" on the piece of paper) Then show how to break ten into parts. Note that our whole did not change. We did not add any or take any away. We just split the group of ten students into two parts.
  + Combine the students back together and show them that when the parts are combined they are again 10 total. "When the parts come back together they made 10 again". (Record "4+6" on the piece of paper.) Ask why this is still a ten. (You didn't add any or take any away. You just split it into its parts.)
  + Try this process a few more times to see varying numbered groups of hats Rob could have had.
  + Then, have students return to their seats.
* **Guided Practice: What activities or exercises will the students complete with teacher guidance?**
  + Have students break up into groups with their first "Thinking Buddy".
  + Make sure each student is provided with a Popsicle stick, a piece of paper and 10, 2-sided counters.
  + Explain and model to students using the same manipulatives.
    - Example: Teacher- "I am going to place one of my chips on one side of the popsicle stick with the red side up. Now I am going to place the rest of my chips yellow side up on the other end of the popsicle stick.
    - When I count them all together did my total change? Just because my parts are smaller, did my total change? Will my total ever change from 10?  (Not unless I add some or take some away.)
    - Now I am going to record this. How many do I have in my first group? (Record 1 for red) What symbol should I have in the middle? Good, plus sign because we are combining to make a larger number. (insert plus sign) How many do I have in my second group? (Record 9 for yellow).
    - Now we are balancing it with the total. What sign means "the same as"? (record = sign). How many do we have altogether? Wonderful, we do have 10! (Record 10).
  + Have students make different pairs with their own manipulatives and allow Thinking Buddies to bounce questions and findings off each other while the teacher is walking around.
  + Circulate around the room to observe and help students.
* **Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?**
  + While continuing to circulate throughout the room have students continue the same process as in *Guided Practice* but work independently.
  + As you circulate give the students feedback.
  + During this time, the students should be encouraged to record their own findings on either the recording sheet or their own piece of paper.

Questions could include:

* + "Did you find any different number pairs than you did with your partner or when we worked together?"
  + "What did you learn about taking apart 10?"
  + "How is taking apart 10 similar to taking apart 5?"
  + "Do you notice any patterns with the numbers?"
  + "How many ways did you find to break apart 10?"
  + "How can we check our equation to make sure we were right?"
* **Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?**

Discuss the different ways that students found to break up 10. (Depending on your students, you might want to point out some patterns.)

Be sure to highlight that:

* + There are patterns to be found when making/breaking apart 10.
    - 0+10=10; 10+0=10
    - 1+9=10; 9+1=10
    - 2+8=10; 8+2=10
    - 3+7=10; 7+3=10
    - 4+6=10; 6+4=10
    - 5+5=10

You may want to collect the students' recording sheets and check for understanding.

Remind the students that they have done a great job and should continue to be hard workers.

**ASSESSMENT**

* **Formative Assessment:** 
  + For this lesson, most of the formative assessment is done in the *Guided Practice* and *Independent Practice* phases and will focus on finding out the students' understanding of the decomposition of 10 into pairs.
  + To begin the activities, the teacher has each student make 2 appointments by picking 2 classmates. These meetings will occur during *Guided Practice* after direct instruction.
  + The teacher decides the stopping point and asks students to meet with their 1st buddy and discuss what they have learned so far and any questions they may have while playing with the manipulatives.
  + Each meeting with buddies is only about 15 minutes long. The teacher walks around and listens for understanding, noting any misconceptions and questions asked. This information is then used to guide and redirect the lesson.
  + The practice continues for about 15 more minutes or whenever the teacher decides, then the same procedure is completed with the 2nd buddy.
  + The lesson is wrapped up and any further questions are addressed. This formative assessment allows teachers to easily find current levels of understanding and focus lesson where help is needed.

[Thinking Buddies](http://www.cpalms.org/Uploads/resources/49507/Assessment/FormativeAssessment/docs/Quarter%20Buddies.docx)

* **Feedback to Students:** 
  + During the activity, circulate among students to monitor their work, probe their thinking and scaffold the task for students needing assistance.
  + *The Guided* *Practice* section contains specific feedback for each center.
* **Summative Assessment:**

Listening to the student conversations during *Guided Practice* and *Closure* will provide the teacher with information on the students' understanding. A more formal assessment is attached. Answering 4 out of 5 questions would indicate a strong understanding of the topic. Please see the answer key for model responses to the explanations.

[Summative Assessment](http://www.cpalms.org/Uploads/resources/49507/Assessment/SummativeAssessment/docs/Making%2010%20Summative%20Assessment.docx)

[Summative Assessment Answer Key](http://www.cpalms.org/Uploads/resources/49507/Assessment/SummativeAssessment/docs/Making%2010%20Summative%20Assessment-Answer%20Key.docx)

**ACCOMMODATIONS & RECOMMENDATIONS**

* **Accommodations:** 
  + 2-sided counters are provided and may help those students who are struggling with what taking apart a number does to the total.
  + A part-part whole board might help some students to stay organized.
  + A teacher could create additional decomposition word problems to be done whole group, with thinking buddies, or individually.
  + If a teacher feels that a student may require additional support, interlocking cubes could be used to show parts of the total in a way that might be easier to understand. The teacher could also review with struggling student what was learned about breaking apart 5 and how we use the same method, just larger a number, to break apart 10.

* **Extensions:** 
  + When students have showed an understanding of the ideas, they are ready to move onto a more difficult level of decomposing 10 involving addition, subtraction and word problems.
  + When you introduce the concept that there are patterns in decomposing numbers, be sure to connect back to the decomposition of 10.
* **Suggested Technology:** Document Camera
* **Special Materials Needed:** Teacher
  + 10, 2-sided counters
  + pencil
  + Popsicle stick
  + sample recording sheet

Student

* + 1 Popsicle stick per student
  + 10, 2-sided counters per student
  + pencil
  + recording sheet
* **Further Recommendations:** You may wish to keep a clipboard nearby to record possible questions and concerns you want to discuss in *Closure* as you walk around.   
    
  **Classroom Management Tips:**   
    
  Encourage students to help one another find the equations during the thinking buddies time. While you do not want partners giving each other the answers, you want to be clear that this is not a race but more of a way to explore taking apart 10.   
  It may be beneficial with this age group to have the Thinking Buddies already filled in and picked out.   
  Rewarding hard work with stickers, taking star students picture, or other classroom specific practices, helps motivate students to want to do a good job.

**PUBLIC REMARKS**

***By Author/Submitter***  
  
This lesson addresses Mathematical Practice Standard:  MACC.K12.MP.4.1.  
  
Mathematical Practice 4.1: **Model with mathematics** is evident in this resource as students must try to find a variety of strategies to break apart 10 and put it back together.  

**SOURCE AND ACCESS INFORMATION**

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**Is this Resource freely Available?** Yes

**Access Privileges:** Public

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