Bean Counters (IT)

Overview

Students will add within 100 and compare two two-digit numbers using beans.

Standards

Understand place value.

1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of the comparisons with the symbols >, =, and <.

Use place value understanding and properties of operations to add and subtract.

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens and ones and ones, and sometimes it is necessary to compose a ten.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
1.NBT.B.3	• K.CC.C.7 • 1.NBT.B.2	1. https://www.illustrativemathematics.org/illustrations/6 2. https://www.illustrativemathematics.org/illustrations/682 3. https://www.illustrativemathematics.org/illustrations/1102	• https://www.illustrativemathematics.org/illustrations/697 • https://www.illustrativemathematics.org/illustrations/987
1.NBT.C.4	• 1.OA.C.6 • 1.NBT.B.2	1. http://standardstoolkit.k12.hi.us/going-to-the-store-1-nbt-11-nbt-41-nbt-6/ 2. http://standardstoolkit.k12.hi.us/scoops-1-nbt-11-nbt-4/	• https://www.illustrativemathematics.org/illustrations/1169 • https://www.illustrativemathematics.org/illustrations/1084

Task Materials

1. White kidney beans (or other small manipulatives)
2. Small brown paper bags
3. Small paper cups (or other small scooping devices)
4. Scoop and Compare Recording Sheet (two pages)
5. Pencils

Task Procedure

Working in pairs, students will count and record the number of beans each is able to scoop from a bag of beans. Then students will compare the two numbers. Then students will add the two numbers to find out how many beans they have altogether. This task will further develop students' understanding of place value and addition. Students should be familiar with counting up to 120 objects using a strategy like making groups of ten. Students should also understand that the two digits in a two-digit number represent the amount of tens and ones.

1. Students will work with partners for this activity.
2. Each pair of students will need a small brown paper bag filled with 60-70 beans and a small paper cup, a Scoop and Compare Recording Sheet, and a pencil.
3. Model the activity for the students.
   a. Tell the students that you will first demonstrate what Partner A will do. Using a document camera or other means of projection, scoop some beans and pour them onto the surface. Ask students how they would find out how many beans there are. Discuss student responses to ensure that all students understand multiple strategies. Accept all correct strategies. Say, "Today we will make groups of ten to find out how many beans we have." Have a student demonstrate counting the beans by making groups of ten. Have the students tell you how many beans you have scooped out by counting the groups of ten and any single beans. Then write the number in the first row of the Scoop and Compare Recording Sheet in the Partner A column. Have the students write the number in the correct place on their recording sheets.
   b. Tell the students that you will now demonstrate what Partner B will do. Scoop a second number of beans (without replacing the first scoop) and use the same counting strategy. Again, have the students state how many beans were scooped out and record the number in the Partner B column. Have the students write the number in the correct place on their recording sheets.
   c. Ask students to compare the two numbers. Review the symbols >, =, and <. Discuss with students how they can use the number of tens and ones to determine which number is larger. When the class has reached the answer, record the correct symbol between the two numbers on the recording sheet. Have the students record the symbol on their recording sheets.
   d. Ask students how they would add the two numbers. Discuss different strategies for addition (e.g., counting all groups of ten, then counting all of the single beans and composing a ten if needed). Record the addition sentence on the recording sheet. Have the students complete their recording sheets.
   e. Return all the beans to the bag, telling the students that they will return the beans to the bag after each round.
4. Have the pairs of students begin the next round. Partner A will scoop out some beans first. Students should work together to count the number of beans. Partner A will write the number in the Partner A column on the recording sheet. Then Partner B will follow the same steps as Partner A. Partner B will record his/her number of beans in the Partner B column on the recording sheet.
5. After students count the beans, they will compare the numbers. Students should work together to decide which symbol (>, =, or <) to use to compare the numbers.
6. After comparing the numbers, students will work together to add the two numbers and record the addition equation on the recording sheet.
7. To begin the next round, tell students to put all of the beans back into the bag and use the cup to scoop out a new amount of beans.

8. Monitor the pairs of students to determine which strategies they are using to count, compare, and add the number of beans. Ask probing questions as needed to clarify any misunderstandings and to help students correct their work.
9. After students have completed 3 rounds, lead a discussion with them about the strategies they used to count, compare, and add the numbers.

Task Notes

This task is best used toward the middle or end of the school year, when students have had experience with counting to 120, recording addition with equations, and working with groups of tens and ones. This task is designed to deepen students' understanding of comparing numbers and adding within 100.

The task can be modified by using a smaller or larger number of beans (or other small manipulatives) depending on the level of student understanding. Also, the students can be asked to only compare the numbers or only add the numbers.

Provide multiple ten-frames for struggling students. Have the students place the scooped beans on the ten-frames to determine how many beans they have and to assist them in comparing and adding the number of beans.

Scoop and Compare Recording Sheet

Round	Partner A Number of Beans	Symbol >, =, or <	Partner B Number of Beans	Addition Equation
Ex.				
1				

Round	Partner A Number of Beans	Symbol >, =, or <	Partner B Number of Beans	Addition Equation
2				
3				

Very Hungry Caterpillar (IT)

Overview
Students will use counting on and equations to determine the number of food items the hungry caterpillar eats through as they listen to the teacher read the book.

Standards

Represent and solve problems involving addition and subtraction.

1.OA.A.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Add and subtract within 20.

1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

Work with addition and subtraction equations.

1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 − 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

Understand place value.

1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
1.OA.A.2	• 1.OA.A.1	1. https://www.illustrativemathematics.org/illustrations/468	• https://www.illustrativemathematics.org/illustrations/160 • https://www.illustrativemathematics.org/illustrations/161
1.OA.C.5	• K.CC.B.4c	Show students a numeral card and a picture of 1, 2, or 3 dots. Have students say the name of the numeral and count on to count the dots. For example, show the numeral 9 and 3 dots. Students would say, "9, 10, 11, 12." Then have students write an addition equation to match the counting, such as 9 + 3 = 12.	

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
1.OA.D.7		1. https://www.illustrativemathematics.org/illustrations/466 2. https://www.illustrativemathematics.org/illustrations/1057	
1.NBT.B.2	• K.NBT.A.1 • 1.NBT.A.1	1. https://www.illustrativemathematics.org/illustrations/987	• https://www.illustrativemathematics.org/illustrations/1404 • https://www.illustrativemathematics.org/illustrations/681 • https://www.illustrativemathematics.org/illustrations/682

Task Materials

- *The Very Hungry Caterpillar* by Eric Carle (See task notes if the book is not available.)
- Three ten-frames per pair of students
- 30 counters or unit cubes per pair of students
- One dry-erase board per pair of students
- One dry-erase marker and "eraser" per pair of students
- Document camera or other means of projection
- Equal signs (make on index cards—one for each pair of students)
- One set of True or False Flashcards for each student (Cut the handout into sets of cards.)
- One True or False Recording Sheet for each student
- One bag of 53 counters/unit cubes for each pair of students (brown lunch bags work well for this)
- Making 10 Recording Sheet
- Pennies (between 11 and 30 for each student)
- Zipper bags (one for each student)

Task Procedure

By the end of this task, students will count the number of food items the hungry caterpillar has eaten. Students will also write addition equations representing the number of food items eaten. Students will discuss equations they write that are different, but correct, to deepen their understanding of the equal sign. Students should have experience with filling a ten-frame, writing equations to represent addition, and identifying the number of tens and ones in a two-digit number.

Teacher-Guided Activity

1. Students will work in pairs. Read the book *The Very Hungry Caterpillar* by Eric Carle. Ask, "How many things do you think the caterpillar ate in this story?" Allow the students some time to think independently at first, then ask them to share their guesses with their partners. Have a few students share their guesses with the class. Record the guesses on the board.

2. Give each pair of students three ten-frames, 30 counters or unit cubes, a dry-erase board, and a dry-erase marker.

3. Read the story again. After the first item the caterpillar eats, have the students add one counter or unit cube to the ten-frame. After the next page, have the students add counters for the two pears the caterpillar eats. Ask, "How many pieces of food has the caterpillar eaten?" Allow students time to discuss with their partner if necessary. Have students state how they found the total pieces of food eaten. Then have students write an equation on the dry-erase board that connects addition to the number of counters used. Have students show their equations and discuss them. Model various forms of this first equation for the students using a document camera or other means of projection. (Ex: $1 + 2 = 3$, $3 = 1 + 2$, $2 + 1 = 3$, and $3 = 2 + 1$) As you write each equation, tell how the equation relates to the story. (Ex: For $3 = 2 + 1$, say something like, "The caterpillar ate three pieces of food in all. That's the same as eating two pears and one apple."

4. After each remaining page, pause so that students can add counters or unit cubes to the ten-frame to represent the number of food items the caterpillar ate. Each time students add counters to the ten-frame, they should write an equation to connect the number of counters used to addition. Partners should take turns adding the counters and writing the equation. As students add counters to the ten-frames, remind them to start a new ten-frame when one is filled.

5. After each remaining page, ask students to share the equations they have written on their dry-erase boards and discuss them in relation to the counters and the story. It is possible that students will write different, but correct, equations. When this occurs, use this opportunity to ask students, "Can all of these equations be correct? How do you know? " Have students to erase the dry-erase board after each discussion is complete.

6. By the end of the story, there will be a total of 25 food items eaten and 1 leaf eaten (students can decide whether to count the leaf as food). There will be two complete ten-frames and 5 or 6 counters on the third ten-frame.

7. Have students discuss with their partners how the ten-frames represent the number 25 (or 26). Then have students share their thoughts with the class. Ask students what each complete ten-frame represents (*one ten*). Have students relate the two complete ten-frames and additional counters to the digits in 25 (or 26).

True or False

1. Students will work in pairs. Give each student a set of True or False Flashcards and a copy of the True or False Recording Sheet.

2. Tell students to mix up (shuffle) their own set of flashcards and keep them facedown in a pile. Alert students not to mix their flashcards with their partners' flashcards.

3. Place an equal sign index card between the two students in each pair.

4. Have each student choose a card from his/her true or false flashcard pile (see the sample below).

15 + 1	=	7 + 3

5. Have students decide if the equation they created is true or false.
6. If the equation is true, the students will record it on the recording sheet in the true column. If it is false, the equation will be recorded in the false column. Provide additional copies of the recording sheet if necessary.

Counting Using Groups of 10

Prior to the lesson, fill zipper bags with different numbers of pennies ranging from 11 to 30 pennies. Make a zipper bag for each student.

1. Students will work in pairs for this activity. Give each pair a bag of cubes (or other counters).
2. Have the partners work together to count the number of cubes in the bag.
3. Observe each pair to determine which method or strategy is being used to count the cubes.
4. After each pair has determined the total number of cubes, have the pairs share the strategies they used to count the cubes (counting by ones, making groups, making tens).
5. Have each pair recount their cubes using each strategy shared.
6. Have students discuss which strategy worked best for them and why. Explain to the students that ten is a friendly number and that making groups of ten is a strategy that can be used to count larger amounts. Tell students they are now going to practice this strategy.
7. Give each student a zipper bag containing pennies and a copy of the Making 10 Recording Sheet. Explain that the recording sheet will lead them through the steps needed to make groups of ten as a strategy of counting.
8. Lead students through the guide, asking questions as the students work each step of the process.
9. After the activity, have students explain the process in their own words to a table partner.
10. Have each pair share the number of pennies that were in the bag. Write the number on the board. Then have the students tell the number of groups of ten they made, and the number of pennies that was "left over" after making groups of ten. Have students explain how the number of groups of ten represents the digit in the tens place in the total number of pennies and how the number of "left over" pennies represents the digit in the ones place in the total number of pennies.

Task Notes

This task should be used to further develop students' abilities with relating counting to addition, understanding the equal sign, and understanding that the two digits of a two-digit number represent amounts of tens and ones.

Parts of this task were adapted from **https://www.illustrativemathematics.org/illustrations/1150**.

A video of the author reading the book can be found on the Internet. The video could be used and paused at different times to allow time to walk around to monitor the work students are doing.

While the standards in this task only call for sums within 20, it is appropriate to go slightly beyond that level in instructional situations.

The True or False activity can be modified to work on only subtraction, a mixture of addition and subtraction, or smaller sums (for the beginning of the school year or to work on fact fluency through 10). Some of the expressions on the flashcards can also be replaced with the sums or differences if students are not ready for the more complex equations.

The Counting Using Groups of 10 activity can be modified by using more or fewer unit cubes, depending on the number range students are working on at the time of year this task is used. Also, plastic coins (or other small manipulatives) can be used in place of the pennies.

Both the True or False activity and the Counting Using Groups of 10 activity can be used separately from this task throughout the year to build students' abilities with larger numbers or more complex equations as needed.

Ten-Frames

True or False Recording Sheet

True	False

True or False Flashcards

14 + 2	15 + 1	7 + 3	5 + 5
3 + 16	12 + 7	7 + 11	16 + 2
18 + 1	8 + 11	13 + 4	14 + 3
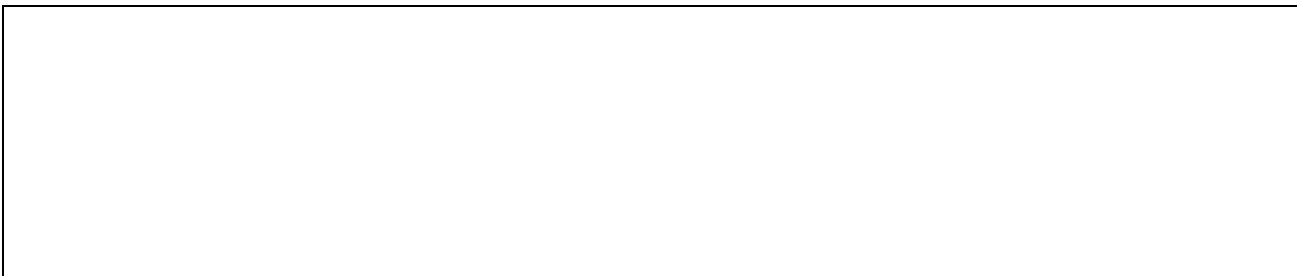
19 + 1	3 + 12	14 + 1	17 + 2
7 + 13	4 + 14	6 + 12	7 + 12

Making 10 Recording Sheet

1. Take the pennies out of your bag.

2. Can you make a group of 10 pennies? _____

3. Make your group of 10 pennies.

4. Can you make another group of 10 pennies? _____

5. Make as many groups of 10 pennies as you can.

6. How many groups of 10 pennies did you make? _____

7. How many pennies are left over? _____

8. Count your pennies.

9. How many pennies did you have in your bag? _____

10. Draw a picture of your pennies, showing your groups of 10 and leftover pennies.

Learning the Facts! (IT)

Overview

Students will use the commutative property and the relationship between addition and subtraction to learn the fact families for numbers up to 20.

Standards

Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.B.3 Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is known (commutative property of addition). To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12 (associative property of addition).*

Add and subtract within 20.

1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
1.OA.B.3	• K.OA.A.2	1. https://www.illustrativemathematics.org/illustrations/1219	• https://www.illustrativemathematics.org/illustrations/70 • https://www.illustrativemathematics.org/illustrations/1405
1.OA.C.6	• K.OA.A.2 • K.OA.A.3 • K.OA.A.4 • K.OA.A.5 • 1.OA.B.3 • 1.OA.B.4 • 1.OA.C.5	1. https://www.illustrativemathematics.org/illustrations/1169	• https://www.illustrativemathematics.org/illustrations/177 • https://www.illustrativemathematics.org/illustrations/175 • https://www.illustrativemathematics.org/illustrations/165 • https://www.illustrativemathematics.org/illustrations/1409 • https://www.illustrativemathematics.org/illustrations/1408 • https://www.illustrativemathematics.org/illustrations/1234

Task Materials

- Paper lunch bag for each pair of students
- 20 unit cubes for each pair of students—10 red and 10 blue (other counters and colors may be used)
- Two copies of the Shake Recording Sheet for each student per number used in the task
- Chart paper
- Blue and red markers or crayons (or the same colors as the counters) for each student
- One set of double-nine dominoes for each pair of students (can be printed at
  http://lrt.ednet.ns.ca/PD/BLM/pdf_files/number/dominoes.pdf)
- Two copies of the Domino Fact Family Recording Sheet for each student
- Document camera or other form of projection

Task Procedure

By the end of this task, students will write fact families for numbers up to 20. Students will use the commutative property (students do not have to know this formal term) and the relationship between addition and subtraction to write the facts. Repeating this activity throughout the year will help students develop fluency with the facts within 10 and provide experiences with addition and subtraction within 20.

Teacher-Guided Activity

Prior to the task, place 20 loose unit cubes (or other counters)—ten each of two colors—in a lunch-size paper bag. On chart paper, draw a chart similar to the Shake Recording Sheet.

1. Have students work in pairs. Give each pair of students a bag with 20 loose unit cubes, ten red and ten blue. If other manipulatives are used, be sure that there are only two colors. Have students fold the top over on the bag and shake the bag seven times as they count together, 1-2-3-4-5-6-7. Say, "Partner A, reach into the bag without looking and pull out seven cubes."

2. Give each student a copy of the Shake Recording Sheet. Have students write the numeral 7 in the large rectangle on the left. Demonstrate this on the chart paper. Then ask, "Would someone tell one way that you can show seven by sharing how many blue cubes and how many red cubes you pulled out?" Use blue and red markers to color the boxes in the first column of the chart paper to show the students' responses. Have the students color the boxes on the recording sheet. Use blue and red markers to record student answers by writing the number of blue cubes in blue ink first, and then writing the number of red cubes in red ink in the second column on the recording sheet. Make an expression by writing a plus sign between the numbers. Ask students to explain how they know that the expression matches the cubes. Tell the students to write the expressions on their recording sheet as well. The chart below shows how the recording sheet will be filled out. (The order of the expressions will vary depending on the cubes students pull from the bag.)

7	
3 + 4	
4 + 3	
0 + 7	
2 + 5	
7 + 0	
1 + 6	
5 + 2	
6 + 1	

3. The first time students pull cubes from the bag, all of the combinations of seven may not be listed. Have Partner B replace the cubes, shake, and draw seven cubes again. Record new combinations on the chart. Continue this activity, alternating partners, until all the combinations of seven have been written, including combinations with zero.

4. Discuss the chart with the students. Examples of questions to ask are:

   - How many combinations of seven could you make?
   - Do you see any pairs of addition facts that use the same numbers? (*Yes*.) Name one of them. (*2 blue + 5 red, 5 blue + 2 red*)
   - What is one way these facts could be put in order? Another way?

5. Ask, "What would happen to each of these facts if you wrote the number of red cubes first?" Allow students time to discuss their thoughts with their partners, then have some students share their thoughts with the class. Then write the combinations in the third column with the number of red cubes first.

7		
3 + 4	4 + 3
4 + 3	3 + 4
0 + 7	7 + 0
2 + 5	5 + 2
7 + 0	0 + 7
1 + 6	6 + 1
5 + 2	2 + 5
6 + 1	1 + 6

6. After the chart is complete, ask students to tell the sum of each fact in the third column. (*7*) Ask students if switching the order of the numbers changed the total. Ask students how they would explain this to a friend. As a class, come up with a student-friendly statement explaining the commutative property. (*The order of the numbers does not matter when adding. The total remains the same.*) Remember, students do not need to know the term "commutative property."

7. Repeat the activity using other numbers for the total. (Note: More rows will need to be added to the recording sheet for larger numbers.)

Partner Work

Prior to the task, create student dominoes by printing the template found at
http://lrt.ednet.ns.ca/PD/BLM/pdf_files/number/dominoes.pdf. The dominoes should be printed on card stock and
laminated for added durability before cutting them apart. If possible, run each set on different colored card stock to help
keep sets intact. If desired, a set of demonstration dominoes for the teacher can be printed at
http://mathwire.com/templates/domflash2.pdf and http://mathwire.com/templates/dominoflashcards.pdf (the
templates from both links must be used to have a complete set of double-nine dominoes). On chart paper, draw a chart
similar to the Domino Fact Family Recording Sheet.

1. Have students work in pairs. Begin by displaying the domino that shows 7 and 5 to the whole group with the
   document camera. Ask, "What value does this represent?" (*12*) Demonstrate on the chart paper how to draw
   dots to represent the domino.
2. Ask, "What addition sentences can you write for this domino?" Write the addition sentences on the chart.
   (7 + 5 = 12 and 5 + 7 = 12) Demonstrate the commutative property by turning the domino to show 7 + 5 = 12 and
   5 + 7 = 12. Discuss with the class that the value of the domino does not change.
3. Demonstrate with the domino under the document camera as you ask the following questions. Ask, "If there are
   12 dots on this domino, and I cover the side with 7 dots (cover the side with 7 dots), how many dots can you
   see?" (*5*) Ask, "What subtraction sentence can you write to show this?" Repeat the demonstration, if needed, to
   help students think about the subtraction sentence (12 – 7 = 5). Demonstrate and ask, "If there are 12 dots on
   the domino, and I cover the side with 5 dots, how many dots can you see?" (*7*) Ask, "What number sentence can
   you write to show this?" (*12 – 5 = 7*)
4. Hand out a set of double-nine dominoes to each pair of students. Give a copy of the Domino Fact Family
   Recording Sheet to each student.
5. Have Partner A choose one domino from the set. Tell both students to draw the dots to represent their domino
   on the recording sheet. Have partners work together to write the facts that can be made using the domino.
   Below is an example of what the recording sheet would look like when completed. Have students choose
   another domino if they pull the domino with seven and five on it from the set.
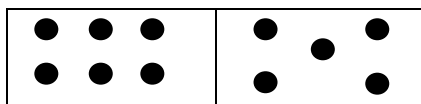
6 + 5 = 11

5 + 6 = 11

11 – 5 = 6

11 – 6 = 5

6. Allow students to work at their own pace. Monitor students' work by checking the recording sheet when
   complete.

7. Give students a new sheet to use with a new domino. Repeat this activity multiple times to allow students practice with writing the fact families for numbers up to 20.

Task Notes

This task should be used to help develop students' fluency with addition and subtraction facts within 10 and to build their skill with addition and subtraction within 20.

This task will likely take multiple days to complete. Parts of this task can be used as quick reviews throughout the year to determine student progress with their addition and subtraction facts. As needed, modify the activity to focus on the numbers students are working with during the time of year this task is used.

Shake Recording Sheet

7		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		
⬜⬜⬜⬜⬜⬜⬜		

Domino Fact Family Recording Sheet

_____ **+** _____ **=** _____

_____ **+** _____ **=** _____

_____ **–** _____ **=** _____

_____ **–** _____ **=** _____

_____ **+** _____ **=** _____

_____ **+** _____ **=** _____

_____ **–** _____ **=** _____

_____ **–** _____ **=** _____

Keeping Balance (IT)

Overview

Students will apply their understandings of addition and subtraction and work in groups to explore the meaning of equality using a balance scale.

Standards

Work with addition and subtraction equations.

1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 − 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

1.OA.D.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ? − 3, 6 + 6 = ?.*

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness
1.OA.D.7		1. https://www.illustrativemathematics.org/illustrations/466 2. https://www.illustrativemathematics.org/illustrations/475
1.OA.D.8	• 1.OA.D.7	1. https://www.illustrativemathematics.org/illustrations/4 2. https://www.illustrativemathematics.org/illustrations/991

Task Materials

- One balance scale per group of 4-5 students
- 30 identical items to be weighed per group, such as unit cubes
- One copy of Keeping Balance—Labs A-D for each student

Task Procedure

In this task, students will use unit cubes and a balance scale to determine whether given expressions are equal. Students will begin by identifying equivalent addition expressions, followed by subtraction expressions. Then students will be asked to determine whether given equations are true or false. Finally, students will use the balance scale and cubes to find the missing number that makes an expression equal to a given number.

Set up the classroom so there is a balance scale at every station. Each group of 4-5 students will be assigned to a station. Each group of students will complete each lab in order, from Lab A to Lab D. Each group will receive:

- A balance scale
- A collection of at least 30 of the same items, such as unit cubes (items should weigh enough so that a difference of one item will be obvious on the balance scale)
- Keeping Balance—Labs A-D (one for each student)

Labs A and B

1. Show the students the balance scale. Ask, "What is a balance scale?" Let students provide some answers. Then explain that a balance scale is used to tell if two objects have the same weight. If the scale is balanced, then they have the same weight.
2. Demonstrate how the scale works for students. Place 3 unit cubes on one side of the scale. Then place 3 unit cubes on the other side one at a time. After placing each cube one at a time, ask, "Is it balanced? How can you tell?" When it balances, ask the students, "Why do you think it balanced?" Lead the students to the conclusion that it balanced when the weight on one side was the "same as" the weight on the other side. Remove cubes from either side and have students discuss what is happening.
3. After demonstrating and discussing the scale, tell the students that the middle of the balance scale is like an equal sign. In an equation, the right side must have the same value as the left side to be equal.
4. Tell the students that today, they will discover if one expression is "the same value as" another expression. Write the expression 3 + 6 on the board. Then list the following expressions on the board: 2 + 7, 4 + 6, 10 − 1, and 12 − 2. Model for students how they can use the balance scale to determine which of the four expressions is equal to 3 + 6. (For example, on one side of the balance scale, place 3 cubes and then 6 more cubes. On the other side, place 2 cubes and then 7 more cubes. Check to see if these balance each other. To demonstrate subtraction, such as 10 - 1, place 10 cubes on one side of the balance scale and then remove 1 cube.) Encourage students to use the phrases "the same as" and "equal" interchangeably.
5. Make it clear that when the scale balances, then the weight on the right is "the same as" the weight on the left, so the expressions are "equal." Write the equations that show those expressions that are equal. (*3 + 6 = 2 + 7, 3 + 6 = 10 − 1*).
6. Tell the students that they will be completing Keeping Balance—Lab A and Lab B with their group. Tell students to follow the same procedure that was modeled.
7. Monitor groups as they conduct Labs A and B. Make sure that they are placing the same number of objects on the scale as the expression states and that they are circling the correct expressions.
8. Facilitate a discussion of the students' completed response sheets. Ask students to explain their thinking for their responses.

Lab C

1. Once students have completed Labs A and B, model the next lab for them.
2. Remind students that when the scale is balanced, the weight on the right is "the same as" or "equal to" the weight on the left. Say, "When one side of an equation has the same value as the other side of the equation, then the equation is true because the two sides are equal."
3. Write the equation 1 + 3 = 6 − 2 on the board. Use three different colored cubes to model these expressions. Ask students how many cubes should be placed on the scale on the left. If students are fluent with their facts, they

may immediately recognize that there should be four cubes on the left. If not, add one cube then three more to model 1 + 3. On the right, place six cubes. Then remove two cubes to model the subtraction. Ask students if the scale is balanced. Remind students to wait until the entire equation is modeled with cubes to check to see if the scale is balanced.

4. Explain that in the next lab, students will determine if an equation is true or false. If the value of the right side is the same as the value of the left (if the scale balances), then it is true. If not, then it is false.
5. Tell the students to continue to use the balance scale to determine whether the equations are true or false.
6. Monitor groups as they conduct Lab C. Make sure that they are placing the same number of objects on the scale as the expression states.
7. Facilitate a discussion of the students' completed response sheets. Ask students to explain their thinking for their responses. If students do not use the words "equal" and "not equal" in the discussion, prompt them to do so.

Lab D

1. After groups have completed Lab C, model the next lab for them.
2. Write the equation 6 + ? = 13 on the board. Explain to students that in order to make sure the scale is balanced, you need to know what number the square represents.
3. Place 13 cubes on the right side of the scale. Then place 6 cubes on the left side of the scale. Ask students if the scale is balanced. Then begin placing more cubes one at a time on the left side of the scale. Use a different color cube than the six already on the scale so students can easily see how many were added. Pause after adding each cube to let the students say whether the scale is balanced. Once the scale is balanced, ask how many cubes were added. Then say, "So the square represents 7 cubes in this equation because 6 + 7 is equal to 13."
4. Tell the students that they will now complete Lab D and decide what the unknown number in the equation is to make it equal the number given on the scale. Remind students that when an equation is true the scale is balanced.
5. Tell the students to continue to use the balance scale to help determine the unknown number.
6. Monitor groups as they conduct Lab D. Make sure that they are placing the same number of objects on the scale as the expression states.
7. Facilitate a discussion of the students' completed response sheets. Ask students to explain their thinking for their responses.

When all of the labs are complete, have students discuss what they learned about the equal sign with a partner. Have some students share their thoughts with the class.

Task Notes

This task should be used after students have had experience with counting 10 to 20 objects and adding/subtracting within 20. This task will take multiple days to complete.

In place of the unit cubes, teachers may choose to use pennies or other coins so that the weight is more noticeable when the objects are added to and taken off of the scale. However, with coins, you cannot change colors, as suggested in step 3 of Lab D. The task can also be modified by removing the more complex equations from each lab at first. The more complex equations can then be introduced later in the year.

By the end of the year, students should be able to answer questions similar to those in the labs without the aid of manipulatives, using their understanding of addition and subtraction and the meaning of the equal sign.

$$5 + 7 \qquad = \qquad $$
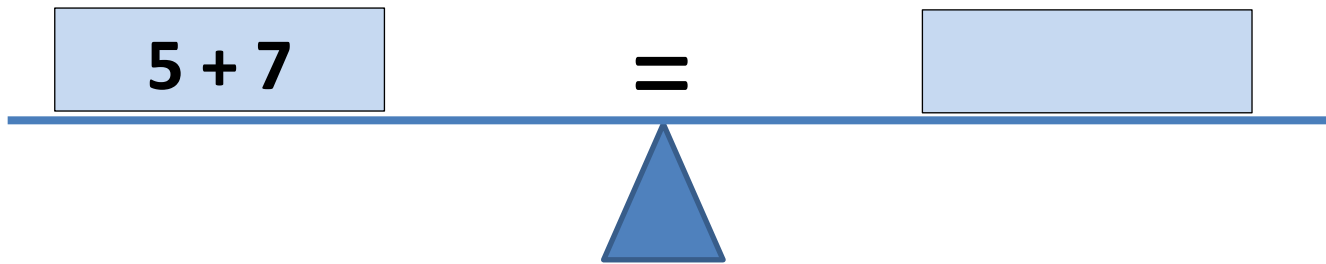
Circle the expressions that are equal to 5 + 7.

6 + 6   2 + 11

4 + 9   6 + 7 + 1

7 + 4   1 + 9 + 2

Keeping Balance—Lab B

16 - 9	=	
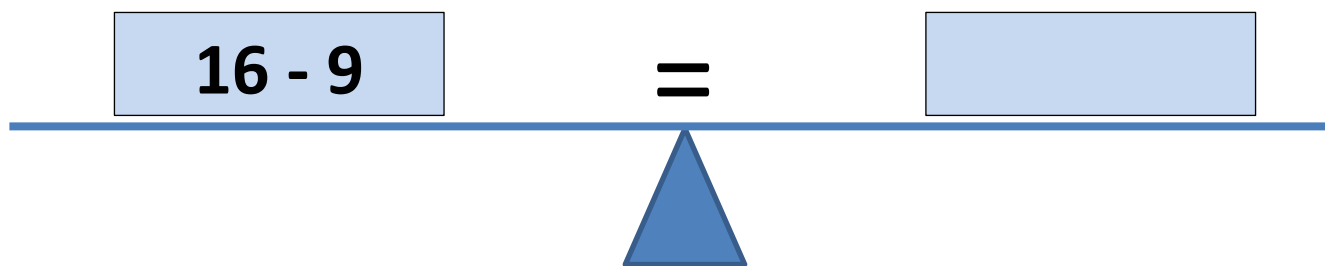
Circle the expressions that are equal to 16 - 9.

19 - 6   3 + 4

14 - 7   3 + 4 + 2

20 - 11   11 - 2

Keeping Balance—Lab C
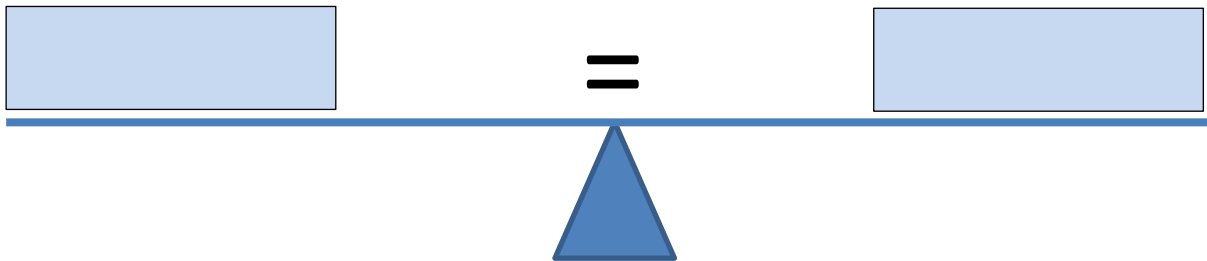
Determine whether the following equations are **true** or **false.** Use the balance scale and objects to help you decide.

1.) $3 + 7 = 4 + 6$

_____

2.) $2 + 8 = 8 + 2$

_____

3.) $12 - 2 = 1 + 9$

_____

4.) $11 - 1 = 4 + 5$

_____

5.) $6 - 1 = 5 + 3$

_____

6.) $15 = 8 + 5 + 2$

_____

7.) $2 + 1 + 5 = 6 + 4$

_____

8.) $7 + 6 = 19 - 6$

_____

Keeping Balance—Lab D

| | = | 16 |
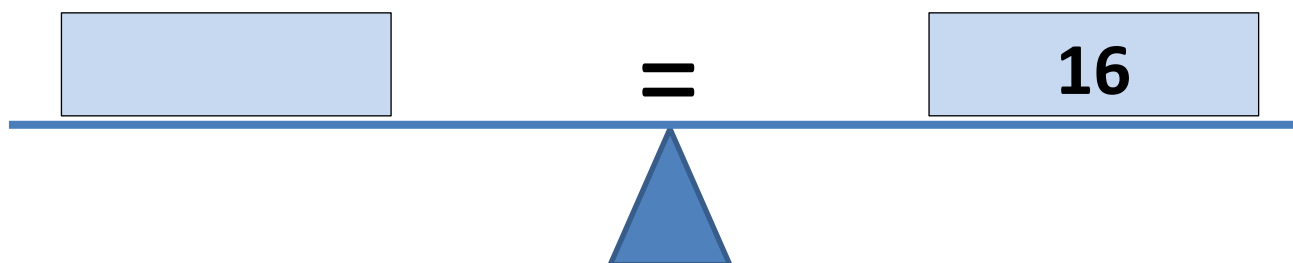
Write the number that makes the expression equal to 16.

☐ + 10	4 + ☐ + 4
12 + ☐	19 − ☐
☐ + 3 + 4	7 + 3 + ☐
2 + 6 + ☐	20 − ☐ − 1

Classroom Carnival (IT)

Overview

Students will apply their understandings of addition and subtraction to a real-world situation they might experience.

Standards

Add and subtract within 20.

1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
1.OA.C.5	• K.CC.B.4c	1. I had 18 cookies. I ate 2 cookies. How can I use counting to find how many cookies I have now? a. Starting at 18, count backward. 18, 17, 16. I have 16 cookies now. 2. There are 14 yellow marbles and 3 green marbles on the table. We can use 14 + 3 to find the total number of marbles. How can you use counting to find the answer to 14 + 3? a. Starting at 14, count forward. 14, 15, 16, 17. There are 17 marbles on the table.	
1.OA.C.6	• K.OA.A.2 • K.OA.A.3 • K.OA.A.4 • K.OA.A.5 • 1.OA.B.3 • 1.OA.B.4 • 1.OA.C.5	3. https://www.illustrativemathematics.org/illustrations/1084	• https://www.illustrativemathematics.org/illustrations/449 • https://www.illustrativemathematics.org/illustrations/401 • https://www.illustrativemathematics.org/illustrations/361 • https://www.illustrativemathematics.org/illustrations/399

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
			• https://www.illustrativemathematics.org/illustrations/400 • https://www.illustrativemathematics.org/illustrations/1113 • https://www.illustrativemathematics.org/illustrations/1209 • https://www.illustrativemathematics.org/illustrations/1420 • https://www.illustrativemathematics.org/illustrations/1219 • https://www.illustrativemathematics.org/illustrations/1234

Task Materials

- Envelopes
- Tokens (plastic chips, plastic coins, or paper cut outs)
- Tickets
- Prizes (to be given in exchange for one to ten tickets—pencils, erasers, stickers, etc.)
- Game Signs (one for each game)
- Game Instructions (one for each game)
- Paper clips
- Small jar
- Paper ducks (Write one of the numerals 1, 2, or 3 on the back of each of the ducks.)
- Game Spinner and small brad (requires assembly)
- Beanbags (at least 2)
- Target (see the Beanbag Toss game description for details)
- Hula-Hoops
- Timer
- Plastic or paper cup
- Cardboard or poster board
- Small, lightweight balls (like Ping-Pong balls)
- Yardstick or meter stick
- Game Recording Sheet (one per student)
- Game Pictures (copy and cut out enough for each student to use to create his/her recording sheet)
- Glue sticks (one per pair of students)

Task Procedure

Students will use addition and subtraction in a real-world experience set up in the classroom. In this activity, students will participate in a Classroom Carnival with six stations set up as games. Students will choose the games they want to play and will "pay" to play them using tokens they are given. After playing the games, students will trade in tickets they earn in order to receive prizes. Students will keep track of their scores or tickets using addition sentences. They can use the backs of their Game Recording Sheets as "scratch paper," if needed.

A few days before the task, have students play each one of these games as a station in the classroom to become familiar with the game. Once the class has played all of the games at least once, introduce the task as a Classroom Carnival. This will familiarize students with the games to assist with management during the task.

SETUP: Set up the classroom so there are six different stations. Each of the stations will have one of the games listed below. At each station, display the appropriate Game Sign (provided) and Game Instructions (provided). The description for each game is given below. Also, create a prize booth stocked with items worth different amounts of tickets from 1 to 10.

Paper Clip Drop

- Materials needed: paper clips, small jar
- Give each student three paper clips.
- Students will drop the paper clips, one at a time, into the jar.
- For each time one of their paper clips falls into the jar, they will get a ticket to turn in for a prize. If none of their paper clips fall into the jar, they will get one ticket.

Pick-a-Duck

- Materials needed: paper ducks with numerals 1, 2, or 3 written on the back of each duck
- Spread the paper ducks on the table.
- Students will select three ducks from the pile.
- Students will add the numbers on the ducks they selected and will receive that number of tickets.

Spin the Spinner

- Materials needed: paper/card stock spinner (may be laminated)
- Students will spin the spinner two times.
- Students will add the two numbers on which the spinner landed and will receive that number of tickets.

Beanbag Toss

- Materials needed: beanbags, target to place on the floor
- There should be at least three different target circles (similar to a bull's-eye target). Each target circle will have a different numeral 2 through 4.

- Students will toss two beanbags, one at a time, to earn tickets.
- Students will add the numbers of the targets they land on and receive that number of tickets.
- Students who do not land on any targets will get one ticket.

Hula-Hoop

- Materials needed: Hula-Hoop (multiple Hula-Hoops will allow more than one student to play at one time), timer
- Students will try to Hula-Hoop for 10 seconds.
- If the student can Hula-Hoop for 10 seconds, he/she will get two tickets.
- If the student cannot Hula-Hoop for 10 seconds, he/she will get a small prize (like a piece of candy or small toy).

Putt-Putt Golf

- Materials needed: plastic or paper cup; cardboard or poster board; small, lightweight balls (like Ping-Pong balls), a yardstick or meter stick (to use as a golf club)
- Set up a "putting green" with a plastic cup glued to a piece of cardboard or poster board so it will not roll.
- Students will use the yardstick or meter stick to try to putt a ball into the cup.
- If the student makes it into the cup in one putt, he/she will get 3 tickets.
- If the student uses two putts, he/she will get 2 tickets.
- If the student needs three putts, he/she will get one ticket.
- If the student needs more than three putts, he/she will get a small prize (like a piece of candy or a small toy).

Activity

- Once the Classroom Carnival is set up, pair students up as partners to go to the carnival.
- Give each student an envelope filled with 10 tokens. Tokens can be plastic chips, plastic coins, or paper cutouts.
- Give each student a Game Recording Sheet. Students will use this sheet to list the games they will play (using pictures) and record the number of tickets they receive at each station.
- Students will count their tokens, then decide which games they would like to play. Students should use all of their tokens if time allows. Partners do not have to play the same games. Each student should select the games he/she wants to play. Partners will travel around the room together, help each other keep track of scores/tickets earned at each game, and help check each other's work.
- Students will record the games they want to play on the Game Recording Sheet. Provide cutouts from the Game Pictures page so students have copies of the pictures to glue to the recording sheet. Have students decide the first game they would like to play, and guide them to glue the picture in the correct place on the page. Be sure that students are choosing different games for their first game so that one station is not overcrowded. For the remaining games, students can record their choices as they go or make all their choices before they start playing.
- As students play each game, they will record the number of tickets they receive in the Tickets column on the Game Recording Sheet. Students should be encouraged to use number sentences to record the number of tickets they should receive at the Pick-a-Duck, Spin the Spinner, and Beanbag Toss stations. At the end of each game, partners will check each other's work. Then they will count out the correct number of tickets. Students should put the tickets in the envelope to keep track of them.

After explaining to the students how the Classroom Carnival will work, give them time to play the games they choose. When students have finished playing their games, they may visit you in the prize booth.

- Create a prize booth with items worth different amounts of tickets from 1 to 10.
- Have students add and count to find how many tickets they received. Then have students show you their completed Game Recording Sheet. Students should use addition strategies learned in class to determine the total number of tickets.
- Once students have determined how many tickets they have, allow them to exchange their tickets for prizes.
- Each time students trade in tickets for an item, ask them to tell you how many tickets they have left. They can also record their work with a number sentence to make the connection between giving their tickets away and subtraction.

Task Notes

These games can be changed based on different classroom materials. The idea is to have a set of 4-6 games that students can play at stations around the room. The focus is for students to use addition and subtraction to make choices about the games they would play in order to use all of their tokens.

An extension to this task is to have a class discussion about the work students did to decide which games to play and which prizes to choose. Use this opportunity to help students see how different number sentences can be equal to the same amount (e.g., because they had the same number of tokens but played different games).

This type of task can be repeated with larger numbers as the year progresses and students can add/subtract with larger numbers.

Paper Clip Drop	Pick-a-Duck
1 Token	1 Token

Spin the Spinner	Beanbag Toss
2 Tokens	2 Tokens

Hula-Hoop	Putt-Putt Golf
3 Tokens	4 Tokens

Paper Clip Drop—1 Token

- Hold the paper clip above the jar.

- Try to drop the paper clip into the jar.

- You get **3** tries.

- You win 1 ticket for each paper clip that lands in the jar.

Pick-a-Duck—1 Token

- Choose any **3** ducks from the pile.

- Add the numbers on the back of the ducks you picked to find out how many tickets you get.

Spin the Spinner—2 Tokens

- Spin the spinner **2** times.

- Write down each number the spinner lands on.

- Add the numbers to find out how many tickets you get.

Beanbag Toss—2 Tokens

- Toss the beanbag to get as many points as you can.

- You get **2** tries.

- Add the numbers your beanbags land on to find out how many tickets you get.

Hula-Hoop—3 Tokens

- Try to Hula-Hoop for 10 seconds.
- You will get 2 tickets if you Hula-Hoop for the full time.

Putt-Putt Golf—4 Tokens

- Use the yardstick to putt the ball into the cup.
- You get **3** tries.
- Sink the putt in 1 try, get 3 tickets.
- Sink the putt in 2 tries, get 2 tickets.
- Sink the putt in 3 tries, get 1 ticket.

Paper Ducks: Cut out each duck and write one numeral, 1-3, on the back of each duck.
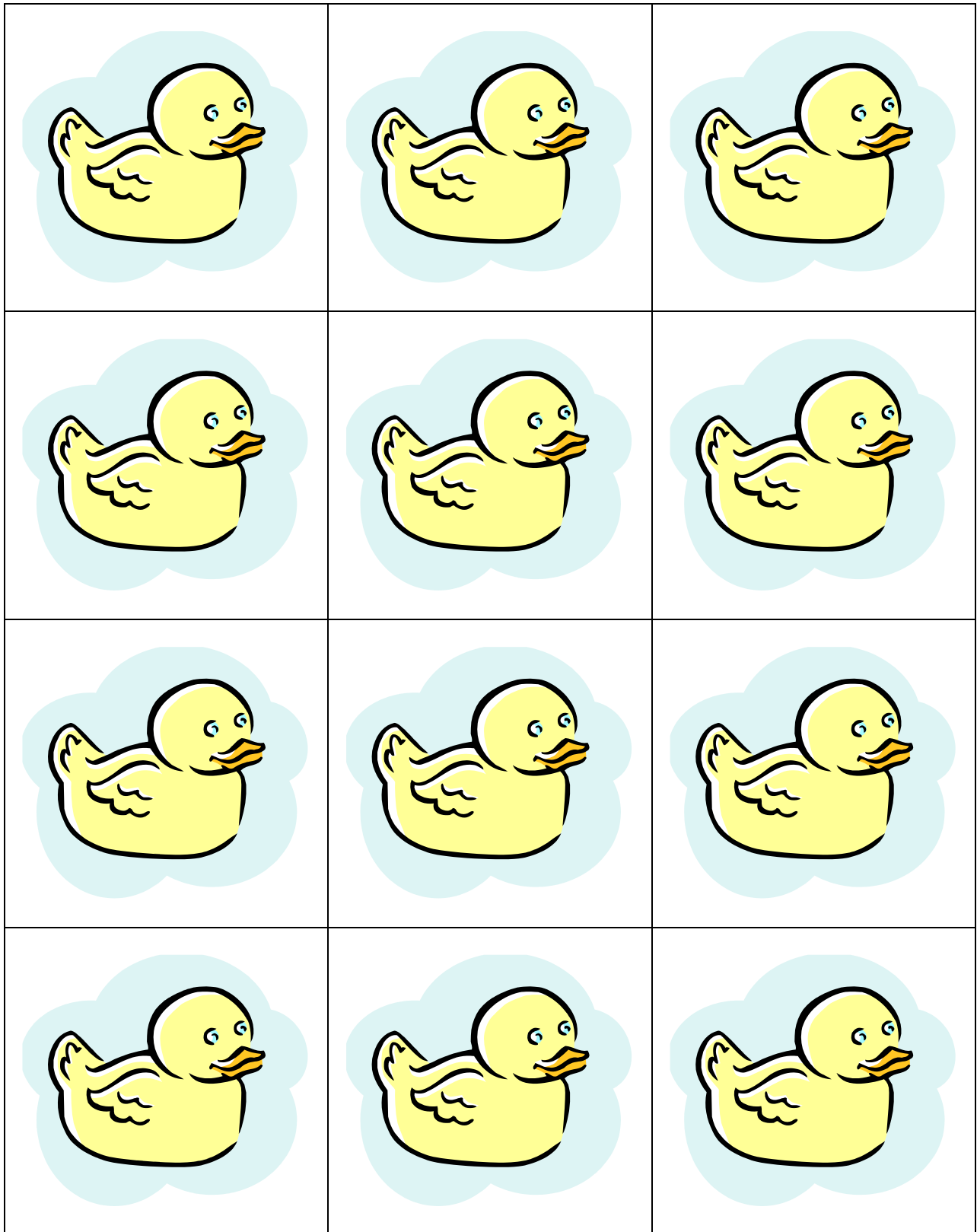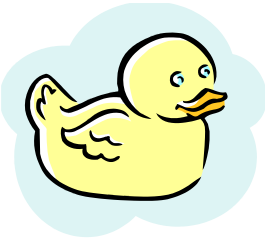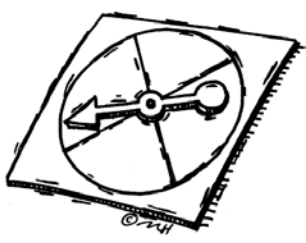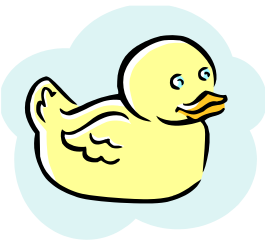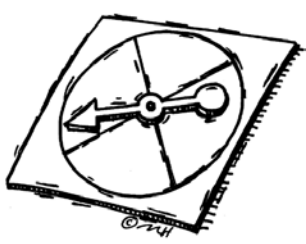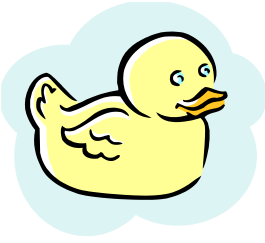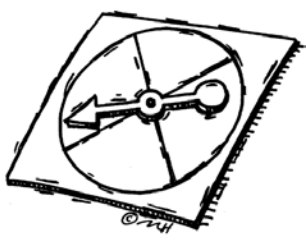
Game Recording Sheet

Name: _____

Game	Tickets

Game Pictures

Game Spinner