



Subitizing & Number Bonds

Starfall Education Foundation
P.O. Box 359, Boulder, CO 80306

Starfall Education Foundation P.O. Box 359, Boulder, CO 80306 U.S.A.

Email: helpdesk@starfall.com **Phone:** 1-888-857-8990 or 303-417-6414 **Fax:** 1-800-943-6666 or 303-417-6434

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Frequently Asked Questions

What is subitizing?

To be able to subitize is to have the ability to quickly identify numbers of objects in relatively small sets, without the need to count. It is recognizing a number without relying on other mathematical processes. Subitizing plays an important role in the development of basic math skills, especially addition and subtraction skills.

Why does the Starfall Math Curriculum introduce subitizing before addition and subtraction?

Subitizing is initially presented as the rapid recognition of images of the dots on dice and dominoes. Children quickly learn these patterns, and without really trying, commit the patterns to their visual memories. The children then extend this skill to the ability to add on from a given number. For example, if a domino has 3 dots on one side and 6 dots on the other side, the children learn to identify the larger number (6) then count on (3) from that number (6, 7, 8, 9). Repeated recognition of patterns of dots and use of tally marks help children learn number combinations, so eventually when a child looks at the same domino with 3 dots on one side and 6 on the other, he or she instantly realizes that 6 plus 3 is equal to 9. Therefore, subitizing provides an early basis for composing and decomposing numbers.

Unit 7 Research

Subitizing, a fundamental skill in the development of children's understanding of number, is the process of instantly recognizing how many objects are in a group without actually counting them. The importance of teaching subitizing to young children has been underscored by a series of studies, which found that doing so helps children mathematize their environment and stimulates their interest in numerical skills.⁽¹⁾

How is it that children see an eight-dot domino and "just know" the total number? Mathematics researchers Steffe and Cobb found that children recognize the number pattern as a composite of parts and as a whole. They see each side of the domino as composed of four individual dots and as "one four." They see the domino as composed of two groups of four and also as "one eight." Children are capable of viewing number and number patterns as units of units.⁽²⁾

The author of "Subitizing: What is it? Why teach it?," Douglas Clements, says that children can use pattern recognition to discover essential properties of numbers, such as conservation.⁽³⁾ Subitizing also helps children develop skills such as counting on, composing and decomposing numbers, as well as place value.

Many number activities can promote subitizing. One particularly valuable activity is known as "quick images." Starfall classrooms utilize this technique through the use of ten-frames. The children are shown a ten-frame with magnets placed in varying numbers of sections, then it is quickly hidden. The children respond by articulating how many magnets are on the ten-frame. Other variations of the quick image activity are matching games such as Concentration, and using dominoes or dice to help children develop pattern recognition by visualizing combinations of objects.

(1) Hannula, Minna M. (2005). *Spontaneous Focusing on Numerosity in the Development of Early Mathematical Skills*. Turku, Finland: University of Turku.

(2) Steffe, Leslie P., and Paul Cobb. (1988). *Construction of Arithmetical Meanings and Strategies*. New York: Springer-Verlag.

(3) Clements, Douglas H. (1999). "Subitizing: What is it? Why teach it?" *Teaching Children Mathematics*. National Council of Teachers of Mathematics.

Unit 7 Summary

Time Frame: 15 days

In Unit 7 the children are introduced to the concept of subitizing, or grouping and arranging objects in order to be able to count them more easily and quickly. They are introduced to number bonds (families), and The Commutative Property of Addition, and become familiar with even and odd numbers.

The focus of Unit 7 is grouping and arranging objects in order to count them more easily and quickly.

Essential Questions

(K.CC.A.2) How can we count on from a given number?

(K.CC.B.5) How can counting objects help me know how many there are?

(K.OA.A.3) How can we use objects and drawings to show how to take a larger group apart and make two smaller numbers?

(K.OA.A.1) How can we use objects to show addition and subtraction?

(K.NBT.1.) How can we group numbers by tens and ones to see how many of each we have?

(K.Starfall.CC.4) What does it mean to count by twos? Fives?

(K.Starfall.CC.6) What does it mean if a number is even? Odd?

(K.Starfall.OA.2) How can we group objects to make counting them easier?

Vocabulary

The children will be introduced to these vocabulary words. Mastery is not expected at this time.

Array

Odd

Arrange

Organize

Even

Pair

Number Bond

Enduring Understandings

Skip counting is an important skill that helps in speedy computation, leads to understanding multiplication, and is important when counting money and telling time.

Number bonds are pairs of numbers that go together to make a new number.

Finding missing numbers in equations is essential for higher-level math skills.

Subitizing is recognizing a quantity without counting.

Recommended Literature

Bedtime Math: A Fun Excuse to Stay Up Late by Laura Overdeck

Even Steven and Odd Todd by Kathryn Cristaldi

Leaping Lizards by Stuart J. Murphy

Math at the Art Museum by Group Majoongmul

One Odd Day by Doris Fisher

Splitting the Herd by Trudy Harris

Tally Cat Keeps Track by Trudy Harris

What Comes in 2's, 3's, and 4's? by Suzanne Aker

Standards & Benchmarks

Starfall Standards

Counting & Cardinality	
CC.4	Count to 100 by twos and by fives.
CC.6	Identify odd and even numbers.
CC.7	Compare two numbers between 1 and 10 presented as written numerals.

Operations & Algebraic Thinking	
OA.1	Identify, describe, or extend simple patterns.
OA.2	Divide objects equally into groups.

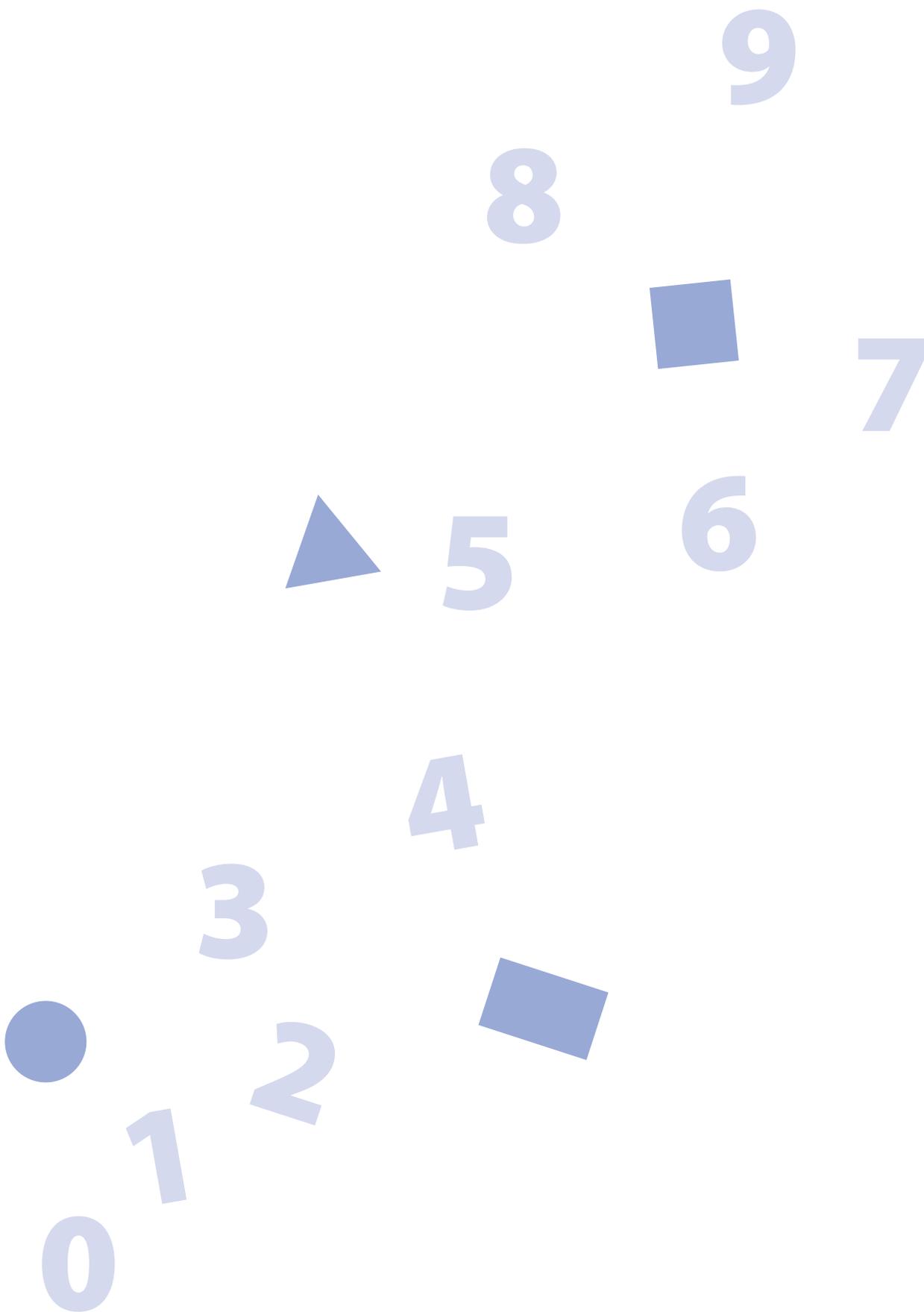
Money	
M.1	Identify the value of coins.

Common Core Standards

Counting & Cardinality		Inline Summary Form
A.1	Count to 100 by ones and by tens.	Count to 100 by ones and by tens.
A.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Count forward from a given number.
A.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	Write numbers from 0 to 20.
B.4	Understand the relationship between numbers and quantities; connect counting to cardinality.	Understand the relationship between numbers and quantities.
B.4a	When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	Say number names in order, pairing each object with one number.
B.4b	Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	The last number counted tells the total number of objects.
B.4c	Understand that each successive number name refers to a quantity that is one larger.	Each successive number refers to one more.

Operations & Algebraic Thinking		Inline Summary Form
A.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Represent addition and subtraction in a variety of ways.
A.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Solve word problems with addition and subtraction within 10.
A.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 $5 = 4 + 1$).	Decompose numbers less than 11.
A.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.	For 1-9, find the number that makes 10.
A.5	Fluently add and subtract within 5.	Fluently add and subtract within 5.

Measurement & Data		Inline Summary Form
B.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	Classify, count, and sort objects.



Daily Routines



Calendar

- A volunteer tells the name of the month.
- The children name the days of the week.
- The calendar helper turns the next number.
- Assist the calendar helper to place one penny on the money graph to match the number of today's date.
- Remind them that there are other coins (nickels, dimes) available, and lead the children to exchange the appropriate number of pennies for these coins.



Weather

- Review yesterday's weather.
- The meteorologist goes to the window to look outside, predicts the weather, and places a tally mark under his or her prediction.
- Add a tally mark next to today's weather on the Weather Graph.



Number Line

- Point to and count the days on the number line by ones, fives, or tens.
- Sing "How Many Days Have We Been In School?"
- Remove the sticky note to reveal the next number.

How Many Days Have We Been In School?

(Tune: "Here We Go Round the Mulberry Bush")

How many days have we been in school, been in school, been in school?
How many days have we been in school, who can tell me please?



Place Value

- Review the number of bundles and sticks in the *Tens* and *Ones* containers.
- Add one stick to represent today, and place it in the *Ones* container.
- Write the numeral that represents the number of days the children have been in school on the board.
- Every tenth day the children bundle the ten sticks that are in the *Ones* container and place the bundle in the *tens* container.



Hundreds Chart

- The number helper turns the next number on the chart.
- Ask: **The hundreds chart shows we have been in school how many days?**

Counting & Cardinality

A.2 – Count forward from a given number.

B.4 – Understand the relationship between numbers and quantities.

B.4a – Say number names in order, pairing each object with one number.

B.4b – The last number counted tells the total number of objects.

B.4c – Each successive number refers to one more.

Refer to this page for reminders of the Daily Routines for each day in this Unit.

Week 16 Summary

This week the children will be introduced to ways of looking closely at number representations and patterns for the purpose of identifying the number represented more easily and quickly. They will be introduced to The Commutative Property of Addition ($2 + 3 = 5$ and $3 + 2 = 5$) and addition number combinations of five.

The children will also:

- Practice skip counting
- Review the penny, nickel, and dime
- Sort representations of numbers
- Count on from numbers other than one

Preparation

DAY 1

Prepare four sets of Number Representation Cards for the numbers 1 through 5 by combining number, dice, tally marks, domino, and ten-frame cards.

DAY 2

Prepare an individual whiteboard to resemble a ten-frame. You will also need 5 small magnets. The children will use their math mats and math bags containing connect cubes and ten-frames.

DAY 3

You will need a domino for each child with different representations of the numbers 1-10. You will also use four sets of Representation Cards for the numbers 6 through 10.

DAY 4

The children will check the plastic bags of coins in their math bags to confirm they each contain 10 pennies, 1 nickel, and 1 dime. Have extra coins available to replace missing ones. You will also need an additional nickel for each child.

DAY 5

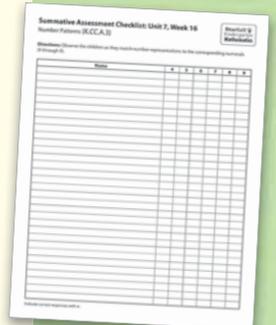
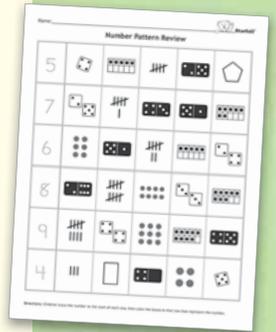
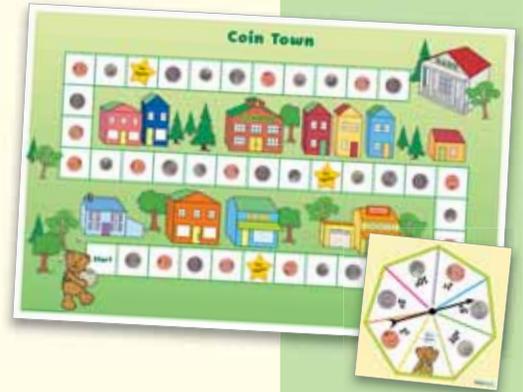
Activity Center 1 — Navigate classroom computers to *Starfall.com*.

Activity Center 2 — The children will use 1 or 2 “Coin Town” game boards, playing pieces, and coin spinners.

Activity Center 3 — The children will use a pocket chart, number, domino, dice, and ten-frame cards for the numbers 1 through 10. If two groups will play simultaneously, each group will need its own set of cards.

Activity Center 4 — Prepare materials for this week’s Teacher’s Choice Activity.

Summative Assessment — Make a copy of the Number Pattern Review worksheet for each child. Prepare to observe the children as they work in this center and to record notes on your observations on the Summative Assessment Checklist for Unit 7, Week 16.



Summative Assessment
Unit 7 - Week 16

DAY 1

DAY 2

Daily Routines

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Magic Math Moment

Toss the Dice

Count on from a given number

Math Concepts

Identify rolls of dice
Associate numbers with their representations

Practice counting on from a number other than one
Recognizing five in a ten-frame
Representations of five
Directionality of equations

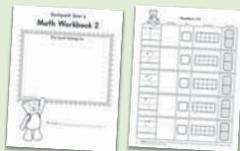
Formative / Summative Assessment

Create a representation chart

Use cubes to create equations

Workbooks & Media

Workbook #2, pages 1 and 2



DAY 3

DAY 4

DAY 5

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Learning Centers

Match dominoes to Number Cards

Count by ones, fives, and tens

Starfall.com:

- Monthly Calendar
- Money Activity
- Addition & Subtraction: "Addition Practice"

Count the dots on dominoes and match them to Number Cards

Number representations 6 through 10

Write numerals 6 through 10

Skip counting

Review penny, nickel, and dime and their values

"Coin Town"

Number representations 6 through 10

Use coins to match price tags

Number Concentration

Workbook #2, page 3



Teacher's Choice

Summative Assessment: Number Patterns

Number Pattern Review Blackline

Toss the Dice

Materials

- 1 die (large if available)

Gather the children in a circle. Say: **Watch as I toss the die. Say the number on the die as quickly as you know what it is. Remember, the dots on a die are always in the same order. Ready?**

Roll the die several times and the children say the number rolled as quickly as they can. Then pass the die so each child has a turn to “toss the die.”

Note: It is important that the children understand they must say the correct number, not just any number in order to do so quickly.

Counting & Cardinality

A.3 - Write numbers from 0 to 20.

B.4 - Understand the relationship between numbers and quantities.

Number Representations 1-5

1 Classifying Numbers

Say: **Today we will classify, or sort, Number Cards.**

Indicate a pocket chart. Distribute the Number Cards and Representation Cards to the children. Some children may receive more than one card.

Say: **Let's see if we can make five rows to represent the five different ways to represent each number.**

Ask: **Who has the numeral 1?** The child with the numeral 1 places it on the left side of the top row of the pocket chart.

Continue: **Let's make this a row of all the ways we can show or represent the number 1. Look at your card(s). If you have a way to show or represent 1, bring it to the pocket chart.**

The children do this and show their cards to the class in turn. The class confirms with a thumbs-up, or offers reasons why the cards don't belong.

Ask: **Who has the numeral 2?**

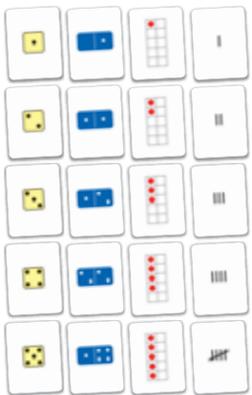
The child places the numeral 2 under the numeral 1. Continue: **Let's make this a row of all the ways we can show or represent the number 2.**

Say: **Look at your card(s). If you have a way to show or represent 2, bring it to the pocket chart.** The children do this and show their cards to the class in turn. The class confirms with a thumbs-up, or offers reasons why the cards don't belong.

Continue until all Number Cards 1-5 are sorted.

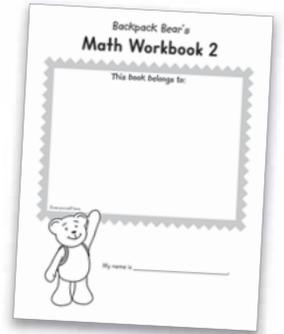
Materials

- Pocket chart
- Number Cards 1-5
- Four sets of Representation Cards for 1-5
- Backpack Bear's Math Workbook #2*, pages 1 and 2
- Pencil, crayons



2 Introduce Backpack Bear's Math Workbook #2

Distribute *Backpack Bear's Math Workbook #2* to each child and instruct the children to turn to page 1. Say: **You will draw a picture of yourself and complete the sentence (My name is _____.) by writing your name.** Observe as the children work to make sure they are following your directions.



Formative Assessment

Make a Representation Chart

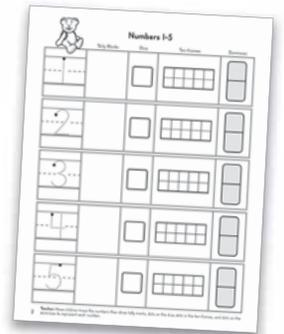
Instruct the children to turn to page 2 of *Backpack Bear's Math Workbook #2*.

Say: **Today you will make your own number representation chart. What strategy can you use for help? (Volunteers respond.) Right, you can use the strategy of looking at the pocket chart to help you!**

Continue: **Let's do the first one together.** Give the following directions one at a time, and allow the children time to complete each task before continuing. Observe to see that the children are following your directions. Say:

- Practice printing the numeral 1.
- Place tally marks on the line to represent 1.
- Place the dots in the dice to represent 1.
- Color in the number of squares on the ten-frame to represent 1.
- Place dots on the domino to represent 1.

Allow the children to complete the remainder of the page independently.



Counting On from a Given Number

Materials

-
- Math mats

Essential Question: How can we count on from a given number?

Distribute a math mat to each child. Indicate the number line at the top.

Say: **Look at your math mat. Point to the number line. Who can choose a number from the number line?** (A volunteer responds.) **Let's begin at (the volunteer's number) and count on to 20. You can use your number line to help you. Put your finger on the number and let's count together. Ready?**

Repeat, asking different volunteers to choose numbers. The class counts on from the numbers to 20.

Counting & Cardinality

A.2 - Count forward from a given number.

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.

A.3 - Decompose numbers less than 11.

Quick Images

Essential Question: How can we use objects and drawings to show how to take a larger group apart and make two smaller numbers?

Materials

-
- Backpack Bear's Math Big Book, page 22
-
-
- Math mats
-
-
- Math bags
-
-
- Prepared individual whiteboard
-
-
- 5 small magnets
-
-
- Classroom ten-frame



1 Backpack Bear's Ways to Represent 5

Indicate *Backpack Bear's Math Big Book*, page 22. Say:

Let's see if we can name all of the different ways Backpack Bear represented 5.

The children identify the different ways as you list them on a whiteboard.

2 Recognizing Five

Gather the children on a rug or the floor. Place 5 magnets in the top row of your individual ten-frame whiteboard, being careful not to allow the children to see.

Say: **I will show you an image very quickly, so you have to pay close attention. Give a thumbs-up if you know how many magnets there are in the ten-frame.**

Show the whiteboard for about 3 seconds. Choose volunteers to answer. Repeat their answers without indicating whether or not they are correct.

Continue: **Now, let's look at the whiteboard again. If you need to revise or change your answer, you may.** Choose volunteers to answer, but don't confirm their answers.

Say: **Now I will show you the whiteboard one more time.**

Show the whiteboard, but this time keep it visible. Continue: **How many magnets are there?** (Volunteers respond.) **Who can explain how you knew so quickly there are 5 magnets in the ten-frame?**

Without allowing the children to see, rearrange the magnets on the whiteboard (3 on the top left and 2 on the bottom right).

Say: **Look at the whiteboard now.**

Show the whiteboard for about 3 seconds. Say: **Give a thumbs-up if you know how many magnets there are.**

Choose volunteers to answer. Repeat their answers without indicating whether or not they are correct. Continue: **Now, look at the whiteboard again. If you need to revise or change your answer you may.** Choose volunteers to answer, but don't confirm their answers.

Say: **Now, I'll show you the whiteboard one more time.** (This time keep it visible.) **How many magnets are there?** (Volunteers respond.) **Who can explain how you knew there are 5 magnets in the ten-frame this time?**

Remove the 5 magnets.

Ask: **Who can arrange these 5 magnets in the ten-frame in a different way?** Volunteers create new number combinations.

3 Creating Sets of Five

Display a classroom ten-frame on a whiteboard and distribute a math mat and a math bag to each child. Say: **Remove 5 cubes (or counters) from your math bag.** The children do this.

Indicate the classroom ten-frame. Continue: **Watch as I create a set of 5 on the ten-frame.**

Place 5 magnets in the top row of the ten-frame. Say: **Now use your cubes (or counters) to make your ten-frame look like this one.** The children add 5 cubes to the ten-frames on their math mats.

Say: **There are 5 cubes in the top row of the ten-frame and zero in the bottom row. Who can tell us the equation that matches the ten-frame?**

A volunteer does this.

Write $5+0=5$.

Say: **Let's see how many different ways we can represent 5. Who can represent 5 on the ten-frame a different way?**

- The children arrange their cubes (or counters) a different way on their ten-frames.
- Choose volunteers to explain different ways of representing 5.
- Volunteers add their equations to the whiteboard under the $5+0=5$ equation. (Do not accept duplicates.)

4 Directionality of Equations

Gather the children on a rug or the floor. Choose 5 volunteers to move to the front of the classroom.

Say: **Here are 5 children. How could we divide these 5 children into two groups?**

A volunteer responds, and the children divide themselves into two groups as suggested.

Write 5 on the board. Explain: **There are 5 children. We arranged the 5 children into two sets.**

- **How many children are in the first set?**
- **How many in the second set?**
- **So, $5 = 3 + 2$.**

Finish the equation on the whiteboard to match the groups of children.

Write $5=5+0$ on the whiteboard. Say: **Look at this equation. Who can find the same equation written a little differently on our list?** (A volunteer points to $5+0=5$.) **We can say 5 equals 5 plus 0 or 5 plus zero equals 5. They both mean the same thing!**

Say: **Let's try some more.**

Write $5=3+2$ on the whiteboard. Choose a volunteer to find the corresponding equation ($3+2=5$) on the list.

Repeat for the remaining combinations of 5.



Formative Assessment

Creating Equations

The children return to their seats and place their math mats and cubes or counters in front of them.

Say: **I will write an equation on the whiteboard. Use your cubes (or counters) to create the equation on your ten-frame. Ready?**

Write $4+1=5$. Continue with different combinations. Occasionally write the equation as 5 equals.

Match Dominoes to Number Cards

Gather the children in a circle on the floor or a rug. Distribute a domino to each child. Demonstrate how to count the dots on both sides of the domino.

Say: **Let's play a game with dominoes. I will show you a Number Card. First look at the Number Card then look at your domino. If your domino matches the Number Card, stand. Ready?**

Shuffle the Number Cards and show one to the children. The children holding dominoes that match the Number Card stand and explain how they know their dominoes match the Number Card.

Repeat for all of the Number Cards.



Materials

- A domino for each child (with different representations of 1-10)
- Number Cards 1-10

Counting & Cardinality

A.3 - Write numbers from 0 to 20.

B.4 - Understand the relationship between numbers and quantities.

Number Representations 6-10

1 Classifying Numbers 6-10

Say: **Today we will classify, or sort, Representation Cards for the numbers 6 through 10.**

Display a pocket chart and distribute four sets of Representation Cards to the children.

Say: **We will make five rows for the five different ways to represent each number.**

Ask: **Who has the numeral 6?** The child with the numeral 6 brings it to the pocket chart.

Explain: **This row will be for all the ways we can show or represent the number 6.** The child places the numeral 6 in the top left pocket.

Say: **Look at your cards. If you have a way to show or represent 6, bring it to the pocket chart.** The children do this and the class confirms with a thumbs-up.

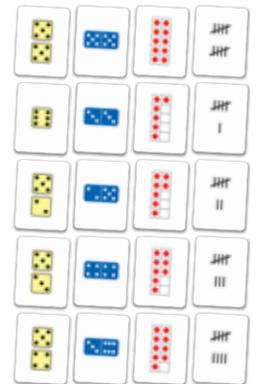
Ask: **Who has the numeral 7?** (The child places the numeral 7 under the numeral 6.) **This row will be for all the ways we can show or represent the number 7.**

Say: **Look at your cards. If you have a way to show or represent 7, bring it to the pocket chart.** The children do this and the class confirms with a thumbs-up.

Continue until all of the 6 through 10 Representation Cards have been sorted.

Materials

- Pocket chart
- Number Cards 6-10
- 4 Sets of Representation Cards for 6-10
- Backpack Bear's Math Workbook #2, page 3
- Pencils, crayons, scissors, glue
- Optional:** Math mats



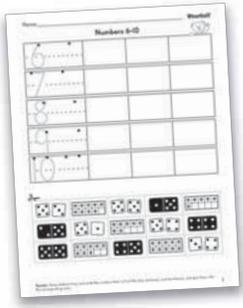
2 Writing Numerals 6-10

Distribute *Backpack Bear's Math Workbook #2*. Instruct the children to turn to page 3.

Say: **Today you will create your own number representation chart for the numbers 6, 7, 8, 9, and 10. What strategy can you use to help you?** (Volunteers respond.) **Right, you can use the strategy of looking at the pocket chart to help you!**

Say: **Let's practice writing the numbers first.**

The children trace the number 6 then write their own 6 on the handwriting line. They complete the tracing of numerals 6, 7, 8, 9, and 10 together with your direction.



Formative Assessment

Match Numbers

The children cut apart the boxes at the bottom of the page and glue them in the correct rows to match the numbers.

Note: The children may use the blank side of their math mats as a way to keep their materials, especially cut papers, organized and separate from those of their classmates.

Counting by Ones, Fives, and Tens

Say: **Let's count together to 30.** Use a pointer to indicate the numbers on the Number Line as you count.

Continue: **We just counted to thirty by ones. Raise your hand if you can think of another way to count to 30.** Volunteers respond.

Count together with the children to 30 by fives and then by tens. If children don't suggest counting by fives and tens, Backpack Bear whispers these options to you.

Ask: **Which way of counting was faster?** Right, tens!

Materials

- Backpack Bear

Review Money (Penny, Nickel, Dime)

1 Checking Money in Math Bags

Distribute a math bag to each child.

Say: **Today we will check our math bags to see if we each have all of our coins. Open your math bag and remove the plastic bag of money.** The children do this.

Continue: **Now, sort the coins so all of the pennies are together. Separate them from the nickel and the dime. While I check your coins, count the pennies so you can tell me how many you have.**

The children should each have 10 pennies, 1 nickel, and 1 dime. Replace any coins missing from the children's math bags.

2 Review the Penny, Nickel, and Dime

Indicate *Backpack Bear's Math Big Book*, page 13. Ask:

- **What is the name of this coin?**
- **How do you know this is a penny?**

Say: **Let's read the penny rhyme together.** Do this.

Say: **Find a penny from your math bag and hold it up for everyone to see.** (The children do this.) **Who can tell us how much is a penny worth?** **Right, a penny is worth one cent.**

Materials

- Math bags
- Container of extra pennies, nickels, and dimes (to replace missing coins in math bags)
- Backpack Bear's Math Big Book*, pages 13, 14, and 15
- Picture Cards with Price Tags
- 1 nickel for each child

Counting & Cardinality

A.1 - Count to 100 by ones and by tens.

B.4a - Say number names in order, pairing each object with one number.

CC.4 - Count to 100 by twos and by fives.

Money

M.1 - Identify the value of coins.





Indicate *Backpack Bear's Math Big Book*, page 14. Ask:

- **What is the name of this coin?**
- **How do you know this is a nickel?**

Say: **Let's read the nickel rhyme together.** Do this.

Say: **Find a nickel from your math bag and hold it up for everyone to see. How much is a nickel worth? Right, a nickel is worth five cents, or five pennies. Which is worth more, a penny or a nickel? Yes, a nickel is worth more.**

Indicate *Backpack Bear's Math Big Book*, page 15. Ask:

- **What is the name of this coin?**
- **How do you know this is a dime?**

Say: **Let's read the dime rhyme together.** Do this.

Say: **Find a dime from your math bag and hold it up for everyone to see. How much is a dime worth? Right, a dime is worth ten cents, or ten pennies. Here's a really hard question. Which is worth more, a penny, a nickel, or a dime? Yes, a dime is worth more than a penny or a nickel. Good job!**

Continue: **Now put all of your coins back into the plastic bag.**

3 Coin Values

Distribute math mats and explain to the children that they will use the blank side. Say:

- **Remove 5 pennies and place them on your math mat. Let's count them together 1, 2, 3, 4, 5. Is there a coin that is worth the same as 5 pennies? Right, a nickel is worth 5 cents, the same as 5 pennies.**
- **Put your 5 pennies away and place a nickel on your math mat. How much money do you have now? Right, you still have 5 cents because a nickel is worth 5 cents just like 5 pennies.**

Distribute another nickel to each child. Say:

- **Add the second nickel to your math mat. Each nickel is worth 5 cents and now you have two. How much money do you have now? Right, you have 10 cents. How did you count how much money you have? Since each nickel is worth 5 cents, you could count by fives to get the answer, 5, 10.**
- **What coin is worth the same as 2 nickels or 10 cents? Right, a dime! Put your two nickels away and trade them for a dime.**
- **Here's a tricky question, are you ready? What if you need 11 cents? What coin could you add to your dime? Right, a penny!**

Children put their coins back into their plastic bags.



Formative Assessment

Picture Cards with Price Tags

Say: **We're going shopping!** Place the *pencil* Picture Card in a pocket chart face up and the other Picture Cards face down.



Ask: **How much does this pencil cost?** (Volunteers respond.) **Take the coins you would need to buy the pencil and place them on your math mat.**

Confirm that each child placed 4 pennies on his or her math mat.

The children remove the coins from their math mats and continue with the remaining Picture Cards.

- A volunteer reveals a Picture Card and tells the cost.
- Volunteers tell which coins they used and explain why.

Take time after each Picture Card to explore possible options to pay for the item. For example, the apple costs 6 cents so there are two ways to pay for it, all pennies or a nickel and 1 penny.



1 Computer

The children explore:

- Monthly calendar
- Calendar
- Money Activity
- Add & Subtract: Addition Practice

Materials

- Computers navigated to *Starfall.com*

Counting & Cardinality

A.1 - Count to 100 by ones and by tens.

B.4 - Understand the relationship between numbers and quantities.

Money

M.1 - Identify the value of coins.

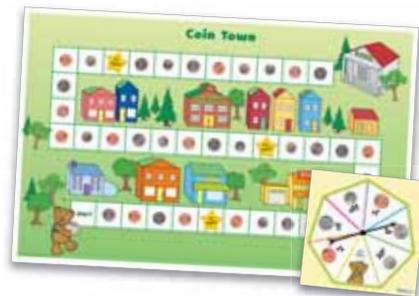
2 Coin Town

The children place their playing pieces on the start. For each turn, the child spins and then moves his or her playing piece to the next coin equal to the amount shown on the spinner.

If a child lands on a Go Again star, he or she takes another turn. The first child to get to the bank wins, or play can continue until all children reach the bank.

Materials

- "Coin Town" Game boards (1 or 2)
- Playing pieces
- Coin spinner



3 Number Concentration

The children mix together the different sets of cards and arrange them face down in a pocket chart. They take turns to reveal two of the cards.

The goal is to find two cards that represent the same number. If a match is made the child places the cards on a table or on the floor and takes another turn.

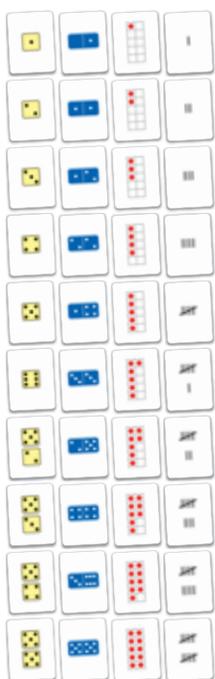
If a match is not made, the child turns the cards face down and play continues with the next player.

Note: You may vary the game by forming two groups.

Materials

- Pocket chart
- Number Representation Cards: 1-10

Note: If two groups play simultaneously, they will each need a set of Number Representation Cards



4 Teacher's Choice

Prepare an activity that will provide the children with an opportunity to practice a skill from this unit.

5 Summative Assessment: Number Patterns

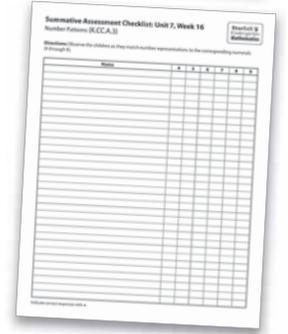
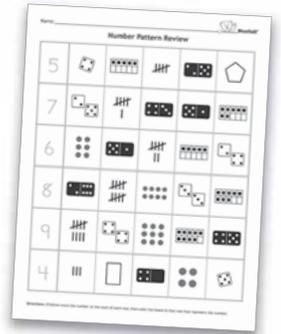
The children write their names at the top of the worksheets. They trace the numeral at the beginning of the first row and then find its representations in the same row and color or circle them.

Observe which children are able to recognize the patterns without counting and which children still need to count.

Record your observations on the Unit 7 Week 16 Summative Assessment Checklist.

Materials

- Number Pattern Review worksheet for each child
- Pencils, crayons
- Unit 7, Week 16 Summative Assessment Checklist



Week 17 Summary

This week the children will continue to practice looking for patterns that help them to count more quickly and easily (subitizing). They will be introduced to fact families and number combinations of 6, 7, 8, and 9. They will sort dominoes by the numbers they represent and create and solve equations to represent dominoes in their workbooks.

The children will also:

- Distinguish greater than and less than
- Use tally marks to represent numbers
- Determine the number that is one more and one less

Preparation

DAY 1

You will need a domino that represents a number from 1 to 10 for each child.

DAY 2

The children will use individual whiteboards and markers, math mats, and math bags.

DAY 3

Draw a ten-frame on an individual whiteboard for use in demonstrating the number 8 in today's lesson. You will also need eight small magnets.

The children will use their math bags, individual whiteboards, and markers.

DAY 4

Prepare a set of Number Representation Cards for the numbers 5 through 9 by placing number, domino, dice, tally marks, and ten-frame cards together in a deck.

The children will use their math bags, which should each contain at least nine connect cubes.

DAY 5

Activity Center 1 — Navigate classroom computers to *Starfall.com*.

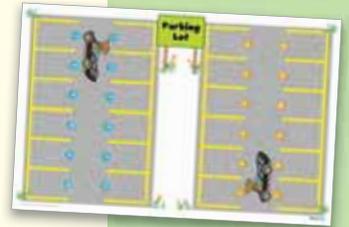
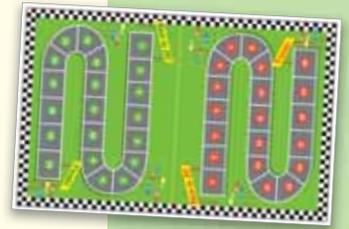
Activity Center 2 — You will need a “Race to 20” game board for every two children in this center, playing pieces, and 1 die.

Activity Center 3 — You will need a set of dominoes and a “Parking Lot” game board for every two children in this center.

Activity Center 4 — Prepare materials for this week’s Teacher’s Choice Activity.

Summative Assessment — Label large sheets of construction paper with the numerals 5 through 9 (one numeral on each sheet). The children will use Equation Cards 5 through 9.

There is no formal Summative Assessment this week. Prepare to observe the children as they work in this center and to record notes on your observations on the Summative Assessment Checklist for Unit 7, Week 17.



DAY 1

DAY 2

Daily Routines

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Magic Math Moment

Greater than/
less than

Tally marks

Math Concepts

Compare numbers and determine which is greater/less than the other

Strategies to count tally marks

Representations of 6 and 7

Create and solve equations using dots on dominoes

Number combinations of 6 and 7

Sort dominoes by their numbers

Number combinations

Formative / Summative Assessment

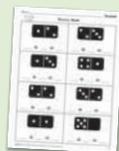
Write equations to match dominoes

Arrange connect cubes in combinations of 7

Number combinations of 6 and 7

Workbooks & Media

Workbook page 5



Workbook page 6



DAY 3

DAY 4

DAY 5

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Learning Centers

Sorting rules

One more/
one less

Starfall.com:

- Monthly Calendar
- Numbers: 6, 7, 8, and 9

Determine sorting attributes
Number combinations of 8
Recognizing 8 in a ten-frame
Create combinations of 8
Write number sentences for combinations of 8

Determine the number that is one more or one less than another
Number combinations of 9
Number patterns of 9
Create combinations of 9

“Race to 20”

Use connect cubes to show a combination of 8 and write an equation to match

Number combinations of 8 and 9

“Parking Lot”

Workbook page 7



Teacher’s Choice

Summative Assessment: Solve equations (number representations) for numbers 5 through 9 and sort them by sums

Magic Math Moment

Greater Than/Less Than

Materials

 None

Divide the class into two teams (Team A and Team B) and choose one child to keep score on a whiteboard using tally marks.

The first child on Team A stands. Say: **Tell me the number that is one less than 6.** If the child answers correctly, Team A receives a point. If the answer is incorrect, the class gives the correct answer, and play moves to Team B.

Play continues as time permits.

Note: The question should always be “What is 1 number greater than or less than (number)?”

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

A.5 - Fluently add and subtract within 5.

Addition to 5

Essential Question: How can we use objects to show addition and subtraction?

Materials

- Whiteboard, markers
- A domino for each child (with different representations of 1-10)
- Number Cards 1-10
- Backpack Bear's Math Workbook #2, page 5

1 Domino Math

Draw a domino on a whiteboard that represents 5 (3 and 2).

Say: **This is a domino. Notice that it has two parts. (Indicate the two parts.) To know what number the domino represents you add both parts together. Look at this domino. What number does this domino represent? Right, 5. How do you know?**

Say: **Let's write a number sentence that shows how much this domino represents.** Demonstrate writing a number sentence by doing the following on the whiteboard.

- **How many dots are on the left?** (Indicate) Write 3 on the board.
- **How many dots are on the right?** (Indicate) Leave a little space and write 2 next to the 3.
- **Should we add the dots together or take some dots away if we want to know how many dots there are in all? Right, we should add.** (Add a plus sign between the numbers.)
- Say: **3 + 2 equals** (Add the equal sign.) **what?** Volunteers respond.

Distribute whiteboards and markers.

Say: **Now it's your turn!**

Draw a domino with 2 dots in each section. Say: **Write a number sentence that matches the domino. Hold up your whiteboard when you are finished.**

Repeat for the combinations 0 and 3, 1 and 4, and 2 and 3.

2 Sorting Dominoes

Gather the children in a circle on a rug or the floor. Distribute a domino representing a number from 1 to 10 to each child.

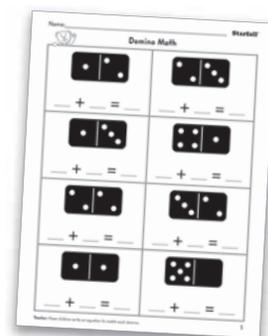
A volunteer places the Number Cards 1-10 face up inside the circle.

Say: **Here are numbers 1 to 10. Look at your domino. Add the two sides together and when you are ready place your domino on the Number Card that shows how much your domino represents.**

Choose the number 5. Say: **Let's look at the dominoes that represent 5.**

Identify the different combinations. Say: **There is more than one way to make a set of 5. I will hold up your domino and you tell us your number combination.**

Assist the children as necessary to identify their number combinations.



Formative Assessment

Writing Number Sentences

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 5. Project the page if you have the capability.

Say: **Look at the first domino. Write the number sentence under the domino and solve the equation.** Complete the first item as an example with the children and observe as the children complete it. Continue: **Now look at the other dominoes on the page one at a time and write the number sentences and solve the equations.**

Circulate around the room as the children complete the page independently and assist where necessary.

Note: If it is too difficult for your children to complete the workbook page on their own, direct them as they work each problem one at a time.



Tally Marks

Materials

- Individual whiteboards, markers

Draw a set of five tally marks on a whiteboard. Say:

Without counting the tally marks, raise your hand if you can tell how many tally marks you see. Volunteers respond.

Discuss how a set of five tally marks is a picture of 5.

Ask: **Why is it easy to tell there are 5 tally marks?** Lead the children to understand that when they see a set of tally marks (with one diagonal tally mark) they don't have to count each mark, they automatically know it is a set of five.

Say: **I will say a number and you draw tally marks to represent that number. Ready?** Say the following numbers one at a time. The children draw tally marks for each, and hold up their whiteboards for you to see.

- 5
- 7
- 10
- 4

Continue with other numbers as time allows.

Counting & Cardinality

A.3 - Write numbers from 0 to 20.

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.



Number Combinations of 6 and 7

Materials

- Backpack Bear's Math Big Book, pages 23 and 24
- Backpack Bear's Math Workbook #2, page 6
- Individual whiteboards, markers
- Math bags
- Math mats

1 Representations of 6

Indicate *Backpack Bear's Math Big Book*, page 23. Say:

Raise your hand if you can identify one of the ways Backpack Bear represented 6. Continue until all of the representations are identified.

2 Introduce Number Combinations of 6

Ask: **Who can remember when we wrote equations that equal 5?** (Volunteers respond.) **Today let's see how many equations we can create for 6.**

Create two defined areas in the front of the classroom and distinguish one as the right side and the other as the left side.

Choose 6 children to come to the front of the classroom. Say:

- **Here are 6 children. If you are one of the 6 children, move to the right side.** The children do this.
- Ask: **How many children are on the right side? Right, there are 6 children on the right side. Let's count them to make sure.** Do this then write 6 on a whiteboard.
- Ask: **How many children are on the left side?** Indicate the left side of the classroom. **Right, there are zero children on the left side.** Write +0 beside the 6 on the whiteboard.
- **How many children are there altogether?** Add = 6 to complete the equation on the whiteboard. Indicate and read the equation, $6+0=6$.

Choose a different set of 6 children to come forward.

Ask: **What is a different way to divide these 6 children into two groups?**

A volunteer separates the 6 children into two groups. Continue: **What is the equation that matches the way these children are arranged?** Assist the children, if necessary, to determine the equation that matches.

Ask: **Who can write the new equation on the board?** A volunteer writes the equation under the previous one.

Continue until the children create all of the combinations of 6 ($0 + 6$, $1 + 5$, $2 + 4$, $3 + 3$, $5 + 1$, $4 + 2$, $6 + 0$).

3 Representations of 7

Indicate *Backpack Bear's Math Big Book*, page 24. Say: **Raise your hand if you can identify one of the ways Backpack Bear represented 7.** Continue until all of the representations are identified.

4 Introduce Number Combinations of 7

Distribute math bags and math mats. Instruct the children to turn their math mats to the blank side and remove 7 cubes from their math bags.

Say: **I will write a number sentence on the whiteboard.** Write $7 = 6 + 1$.

Continue: **Arrange your cubes to show $6 + 1$. If you need help, you may ask your neighbor to help you.** Observe the children and assist if necessary.

Write $7 = 4 + 3$ on the whiteboard. Say: **Let's try another one. Arrange your cubes to show $4 + 3$.**





Formative Assessment

Complete Number Sentences

Ask: **Who can think of another way to arrange the cubes to equal 7?**

Volunteers create combinations and share them with the class. Write the combinations (equations) on the whiteboard or volunteers write them.

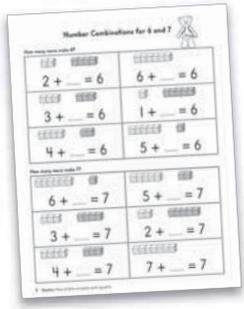
Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 6.

Explain: **This workbook page shows number combinations of 6 and 7. Look at the cubes and write the number that completes the number sentence.**

Say: **Let's do the first one together. The number sentence says 2 plus what number equals 6. If you already have 2, how many more do you add to have 6? Remember to count the cubes.** (Volunteers respond.) **Right, 2 plus 4 more equals 6. Use your pencil to write 4 in the blank.**

Continue: **Who can tell what is different in the bottom section of the page? Right, these number sentences are combinations of 7. You complete them the same way.**

The children work independently to complete the page. Observe the children as they work and assist them as needed.



What's My Sorting Rule?

Materials

 None

Select the boys in the class by name to come to the front of the classroom.

Ask: **What is the same about all of the children in this group? Right, they are all boys, so what is the sorting rule?** Volunteers respond. The boys return to their seats.

Select the girls in the class by name to come to the front of the classroom.

Ask: **What is the same about all of the children in this group? Right, they are all girls, so what is the sorting rule?** Volunteers respond. The girls return to their seats.

Say: **Those were easy! Now let's try some that are a little harder. Ready?**

Select children by name in the following groups to come forward one at a time. For each group, the children identify what attribute they have in common and what the sorting rule is.

- Children with short hair
- Children with brown shoes
- Girls wearing headbands

Note: You may choose to create groups according to specific attributes of your class.

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.

Measurement & Data

B.3 - Classify, count, and sort objects.

Number Combinations of 8

Materials

- Backpack Bear's Math Big Book, page 25
- Individual whiteboards, markers
- Prepared whiteboard
- Eight small magnets
- Math bags

Essential Question: How can we group objects to make counting them easier?

1 Representations of 8

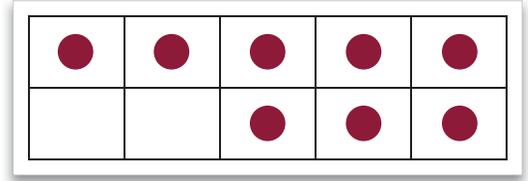
Indicate *Backpack Bear's Math Big Book*, page 25. Say:

Raise your hand if you can identify one of the ways Backpack Bear represented 8. Continue until all of the representations are identified.



2 Recognizing 8

Gather the children on a rug or on the floor. Place 5 magnets on the top row and 3 magnets in the bottom row of the ten-frame whiteboard (as pictured), being careful not to allow the children to see.



Say: **I will quickly show you a whiteboard with a ten-frame on it. Give a thumbs-up if you know how many magnets there are in the ten-frame.**

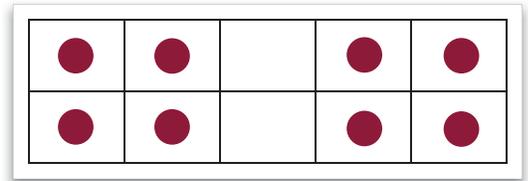
Show the whiteboard for about 3 seconds. Choose volunteers to respond, and repeat each child's response.

Continue: **Now, let's look at the whiteboard again. If you need to revise, or change your answer, you may.** Show the whiteboard for about 3 seconds. Choose volunteers to respond, but don't confirm their responses.

Say: **Now I will show you the whiteboard one more time.** This time keep the whiteboard visible.

Ask: **How many magnets are there? How did you know there were 8 magnets when you looked at the ten-frame so quickly?** Volunteers respond.

Rearrange the magnets, placing four on the left and four on the right. Again, be careful not to allow the children to see.



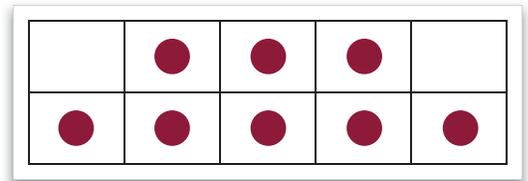
Say: **Okay, the magnets have been moved. Look at the whiteboard now and give a thumbs-up if you know how many magnets there are.** Show the whiteboard for about 3 seconds.

Choose volunteers to respond and repeat each child's response.

Continue: **Now, let's look at the whiteboard again. If you need to revise or change your answer, you may.** Show the whiteboard for about 3 seconds.

Choose volunteers to respond, but don't confirm their responses.

Rearrange the magnets again, placing three magnets on the top row and five on the bottom.



Say: **Now, I'll show you the whiteboard one more time.** This time keep it visible.

Ask: **How many magnets are there? How did you know there were 8 magnets this time?**

Repeat using the following magnet arrangement.

3 Combinations of 8

Distribute math bags, individual whiteboards, and markers.

Say: **Let's create a number combination for 8. Who can use the magnets to show a combination of 8 on this whiteboard?** A volunteer does this. Confirm the combination and discuss it with the class. The children copy the combination on their whiteboards.

Ask: **Who can write a number sentence to go with the combination of 8?** A volunteer does this on the classroom whiteboard.

Continue: **Write the number sentence on your whiteboard.** (The children do this.) **Look at your ten-frame and your number sentence. Does your number sentence match your ten-frame?**



Formative Assessment

Create Different Combinations of 8

Ask: **Are you ready to try a combination of 8 on your own? Let's review the steps.**

- **Use your 8 cubes to show a different combination of 8.**
- **Write your equation on your whiteboard.**
- **Ask your neighbor to check it for you.**
- **If you need help, raise your hand.**

Volunteers bring their whiteboards to the front of the classroom and share their equations. Repeat as time allows.

One More/One Less

Distribute individual whiteboards and markers.

Say: **I will hold up a Number Card. Look at the number on the Number Card, and write the number that is one more on your whiteboard. What strategies can you use to help you find the number that is one more?** (Volunteers respond.) **Right, you could use the Number Line or the hundreds chart. Let's try one together.**

Hold up the Number Card 14. Say: **Think of the number that is one more than 14. Write that number on your whiteboard and hold your whiteboard up.**

Repeat for several other numbers.

Say: **This time when I hold up a Number Card, think of a number that is one less. Let's try one.**

Hold up the Number Card 10. Ask: **What number is one less than 10? Write that number on your whiteboard and hold it up.**

Repeat for several other numbers.



Materials

- Number Cards 1-20
- Individual whiteboards, markers

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

B.4c - Each successive number refers to one more.



Number Combinations of 9

1 Representations of 9

Indicate *Backpack Bear's Math Big Book*, page 26. Say: **Raise your hand if you can identify one of the ways Backpack Bear represented 9.** Continue until all of the representations are identified.

Materials

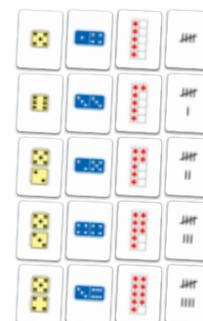
- Backpack Bear's Math Big Book*, page 26
- Backpack Bear's Math Workbook #2*, page 7
- Number Representation Cards 5-9
- Pocket chart
- Math bags
- 18 cubes

2 "Number Patterns of 9" Game

Shuffle the Number Representation Cards for 5-9.

Say: **Today we will look at number patterns for 9. I will flash some cards. When you see a card that represents 9, stand. Then we'll put that card in the pocket chart. Ready?**

Flash several of the Number Representation Cards. For each card representing 9, the children explain how they knew it was nine. Volunteers place the cards in the pocket chart.



3 Evaluating the Pocket Chart

Ask: **Who can share one of the ways 9 was represented? How did you know it was 9?**

Continue choosing volunteers until all the representation cards have been identified.

4 Create Combinations of 9

Say: **Today you will work with a partner to create combinations of 9. Let's practice.**

Choose a volunteer to partner with you. Each of you count out 9 connect cubes.

Say: **We each have 9 cubes. I will lay down 8 of my cubes. If we want to create a set of 9 cubes how many cubes should my partner add?**

The partner decides how many cubes to add to your 8 cubes to create a set of 9.

Continue: **Let's count to see if we have 9 cubes altogether.**

You and your partner count the cubes. If the set of cubes does not total 9, your partner removes his or her cubes and tries again, with help from the class if necessary.

Distribute math bags.

Say: **Stand up, hand up, partner up. Sit facing your partner.** Identify a child in each pair as partner 1 and partner 2.

Explain: **Now you will work with your partner to create number combinations of 9. Partner 1 will start by choosing some cubes. Partner 2 will decide how many more cubes to add to total 9. Ready, begin.**

Repeat the activity with partner 2 choosing the first set of cubes.

Continue as time allows.



Formative Assessment

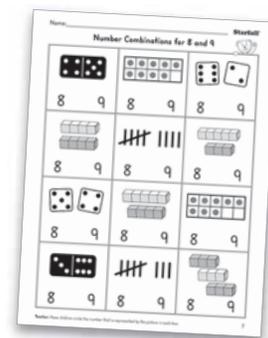
Circle Number Representations

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 7.

Say: **On this page there are representations of the numbers 8 and 9. Look at the representation in the first box and use a pencil to circle the number it represents.** (The children do this.) **What number did you circle?**

Volunteers respond.

The children continue to circle the numbers and the sets they represent. Circulate and observe as the children work. Assist individual children if necessary.



1 Computer

The children explore:

- Monthly calendar
- Numbers: "6, 7, 8, 9"
- Add & Subtract: "Addition Within 10"

Materials

- Computers navigated to *Starfall.com*

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

A.2 - Solve word problems with addition and subtraction within 10.

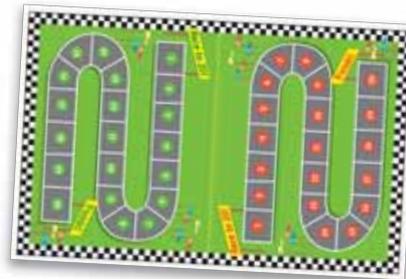
2 "Race to 20"

The first child rolls the die and moves his or her playing piece the corresponding number of spaces. Children take turns until one reaches 20, or the game may continue until all of the children land on 20.

The children repeat the game as time permits.

Materials

- 1 or 2 "Race to 20" game boards
- Playing pieces
- 1 die for every two children



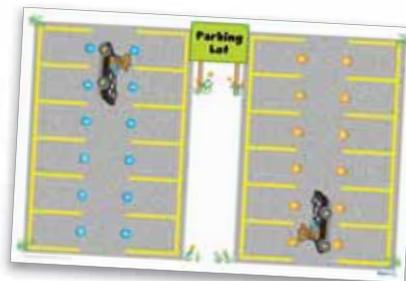
3 "Parking Lot"

The children place the dominoes face down on the floor or a table. The first child selects a domino, adds the dots, then "parks" the domino in the appropriate parking space.

If a child chooses a domino that equals the same value as one already on his or her board, he or she stacks it on top. The children take turns. The first child to fill all of his or her parking spaces wins, or the game may continue until both children have filled their spaces.

Materials

- 1 or 2 "Parking Lot" game boards
- Dominoes



4 Teacher's Choice

Prepare an activity that will provide the children with an opportunity to practice a skill from this unit.

5 Summative Assessment

Spread the labeled sheets of construction paper on a table. The children work together to solve the equations and sort the Equation Cards to match.

Note: There is no formal Summative Assessment this week. Observe the children as they work in this center and note mastery and/or areas of concern on the Unit 7, Week 17 Summative Assessment Checklist.

Materials

- Addition and Subtraction Equation Cards to represent 5-9
- Prepared construction paper for numbers 5 through 9
- Unit 7, Week 17 Summative Assessment Checklist

Week 18 Summary

This week the children will learn about number combinations and number bonds of 10. They will learn to distinguish odd and even numbers and will be introduced to arrays to 20, and how to use them as a way to count more easily and quickly. The week also includes a review of number bonds (in general), subitizing (seeing patterns), and arrays.

The children will also:

- Add and subtract to 10
- Practice greater than
- Create arrays using magnets
- Review the Commutative Property of Addition

Preparation

DAY 1

Prepare 60 black and 60 red construction paper strips. The children will use these to create chains to match math equations.

Prepare a set of 11 index cards by writing one of the following equations on each.

- $10 + 0 = 10$
- $9 + 1 = 10$
- $8 + 2 = 10$
- $7 + 3 = 10$
- $6 + 4 = 10$
- $5 + 5 = 10$
- $4 + 6 = 10$
- $3 + 7 = 10$
- $2 + 8 = 10$
- $1 + 9 = 10$
- $0 + 10 = 10$

You will also use a blank math mat and several connect cubes or other manipulatives.

DAY 2

You will need a clothes hanger and ten red or yellow plastic clothespins.

DAY 3

Collect examples of arrays used in everyday life such as an egg carton, muffin tin, and plastic muffin/cupcake container. You will also use a 12-pack of water bottles and 15 small circle magnets.

DAY 4

You will use the Ten-Frame, Dice, and Domino Number Representation Cards for 1 through 12. You will also need 8 magnets.

DAY 5

Activity Center 1 — Navigate classroom computers to *Starfall.com*.

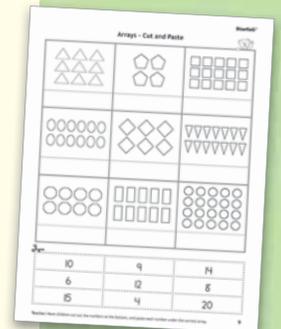
Activity Center 2 — Divide a set of Addition Equation Cards 1 through 10 so each pair of children has a set.

Activity Center 3 — Duplicate a copy of the Arrays Cut and Paste worksheet for each child. The children will need scissors and glue sticks.

Activity Center 4 — Prepare materials for this week's Teacher's Choice Activity.

Summative Assessment — The children will need 20 clothespins and a clothes hanger.

Record your observations as you watch the children work in this center on the Summative Assessment Checklist for Unit 7, Week 18.



Arrays Cut and Paste
Worksheet

DAY 1

DAY 2

Daily Routines

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Magic Math Moment

Make 10 objects

Greater than

Math Concepts

Number bonds of 10

Compare two numbers and determine which is greater than the other

Create combinations of ten using connect cubes

Review number bonds

Write equations for combinations of ten

Hanger activity for 5 and 10

Determine the equation to match a number sentence (Commutative Property of Addition)

Formative / Summative Assessment

Create 10-Chains to match equations

Write equations to match number sentences

Workbooks & Media

Starfall.com: Add & Subtract: "Make 10 Objects"

DAY 3

DAY 4

DAY 5

- Calendar
- Weather
- Number Line
- Place Value
- Hundreds Chart

Even and odd

Even and odd

Learning Centers

Starfall.com:

- Monthly Calendar
- Add & Subtract: "Make 10 Objects"
- "Make 10 Numbers"
- "Math Helpers"

Determine if a number is even or odd

Introduce

Arrays to 20: Patterns to count easily and quickly

Demonstrate arrays

Form arrays using magnets

Even numbers on the Number Line

Pair magnets to distinguish even and odd

Review subitizing and arrays

Practice seeing patterns to count

Match different kinds of number cards to play "Concentration"

Solve equations

Match numbers to arrays (Workbook page 9)

Distinguish arrays

Create arrays

Teacher's Choice

Math Melodies CD Track 36, "Yonder in the Pair, Pair Patch"

Summative Assessment: Create number combinations of 10 and write matching equations

1

2

3

4

5

Make 10 Objects**Materials** None

Navigate a computer with projection capabilities (or gather the children around a classroom computer) to *Starfall.com*: Add & Subtract: "Make 10 Objects." Allow the children to assist to complete the activity.

Operations & Algebraic Thinking

A.3 - Decompose numbers less than 11.

A.4 - For 1-9, find the number that makes 10.

Number Bonds of 10**1 "Missing Number Game"**

Gather the children in a semicircle on a rug or the floor. Say: **Let's play the "Missing Number Game."**

Distribute several connect cubes or other manipulatives to each child.

Review and practice the "Make 10 Objects" activity the children completed in today's Magic Math Moment. Have one child place 5 connect cubes on a blank math mat. Ask: **How many more cubes should we add to have a total of 10?** Write the equation $5 + ? = 10$ on the board.

Choose a volunteer to add cubes to total 10 while the class counts. Ask: **How many cubes did we add to total 10?** (Volunteers respond.) **Right, we added 5 more cubes. We started with 5 cubes and we added 5 more cubes to total 10.** Complete the equation on the board. Read: $5 + 5 = 10$.

Continue for the other combinations of 10.

Materials

- A large quantity of connect cubes or other math manipulatives
- 60 strips of black and 60 strips of red construction paper
- Math mat (blank)
- Prepared index cards

**Formative Assessment****Create a 10-Chain**

Say: **Today you will work with a partner to create a 10-chain. Each set of partners will choose an index card with an equation written on it. You and your partner will use paper strips to create a chain to match your equation.**

Explain: **You will use RED strips for the first number of your equation and BLACK strips for the second number of your equation.**

Demonstrate how to create a paper chain. Partners come forward to select an index card and the corresponding number of red and black strips.

When partners (or groups) finish their chains, assist them in attaching their index cards to them. Hang the chains from the ceiling of the classroom if possible.

You may create groups of 3 to work together to accommodate your class size.

Magic Math Moment

DAY

2

Greater Than

Materials

 None

Say: **Let's play "Greater Than." I will write two numbers on the whiteboard. Raise your hand if you know which number is greater.**

Choose a volunteer to circle the larger number. The class gives a thumbs-up to confirm or a thumbs-down if the volunteer chose incorrectly. Repeat as time allows.

Counting & Cardinality

CC.7 - Compare two numerals between 1 and 10.

Operations & Algebraic Thinking

A.3 - Decompose numbers less than 11.

A.4 - For 1-9, find the number that makes 10.

A.5 - Fluently add and subtract within 5.

Review Number Bonds

Materials

- Whiteboard, markers
- Ten red or yellow plastic clothespins
- Hanger

1 Introduce Hanger Activity to 5

Say: **We have been talking about number bonds. Number bonds are pairs of numbers that go together to form a new number.**

Indicate the hanger with five red plastic clothespins attached. Say: **Here is another way to show number bonds. This is a 5 hanger because it has 5 clothespins attached to it. We won't add more clothespins or take any clothespins away. Since it is a 5 hanger, it will always have 5 clothespins attached.**

Note: Equations should not be erased once written on the whiteboard. The object is to reinforce that each equation equals 5.

Move the clothespins to the right side of the hanger then slide one to the left. Ask: **How many clothespins are on the left? How many are on the right? We could use this 5 hanger to create an equation. What would the equation be?** ($1 + 4 = 5$) Write the equation on the whiteboard.

Slide another clothespin to the left. Ask:

- **How many clothespins are on the left now?**
- **How many are on the right?**
- **What would the equation be?**

A volunteer writes the equation $2 + 3 = 5$ on the whiteboard.

Slide another clothespin to the left. Ask:

- **How many clothespins are on the left?**
- **How many are on the right?**
- **What would the equation be?**

A volunteer writes the equation $3 + 2 = 5$ on the whiteboard.

Slide all the clothespins to the left. Ask:

- **How many clothespins are on the left?**
- **How many are on the right?**
- **What would the equation be?**

A volunteer writes the equation $5 + 0 = 5$ on the whiteboard.

2 Hanger Activity to 10

Say: **Let's make a change to the 5 hanger.** Add 5 additional red clothespins to the hanger.

Ask: **How many clothespins are there now? Right, 10! This is now a 10 hanger. We won't add any more clothespins or take any away. We will use the clothespins to discover how many different pairs of numbers we can add together to total 10.**

Move 5 clothespins to the left. Say: **There are 5 clothespins here. How many are on the other side?** (Volunteers respond.) **Right, there are 5. What would the equation be?** A volunteer writes $5 + 5 = 10$.

Erase the equation. Move 1 clothespin to the left. Say: **There is 1 clothespin on the left. How many clothespins are on the right? How did you know? What would the equation be?** A volunteer writes $1 + 9 = 10$ on the board. Do not erase the equation.

Move 2 clothespins to the left. Say: **Now there are 2 clothespins on the left. How many clothespins are on the right? How did you know? What would the equation be?** A volunteer writes $2 + 8 = 10$ on the board.

Continue until all the clothespins are on the left, and you have ten equations on the whiteboard.

Ask: **What do you notice about these equations?** Children should understand that each pair of numbers equals 10.



Formative Assessment

Write Equations for Ten

Distribute individual whiteboards and markers. Move 2 clothespins to the left of the hanger and 8 to the right. Ask: **How would this look in a number sentence or equation?** (Volunteers respond.) **Write the equation on your whiteboard. When you are finished writing hold up your whiteboard.**

Note: Most children will write this as an addition equation, but some children may write it as a subtraction equation. Discuss the various answers.

Repeat the above activity with several different number pairs.

Place 1 clothespin on the left and 9 on the right. Say: **Look carefully. There is 1 clothespin on the left and 9 on the right. What happens if I turn this hanger around?**

Turn the hanger to display 9 clothespins on the left and 1 clothespin on the right. Ask:

- **Are there still ten clothespins on the hanger?**
- **How did turning the hanger make it look different?**

Repeat with different configurations of 10 to demonstrate the Commutative Property of Addition.

Even and Odd

Materials

- Math Melodies
Track 36

Essential Question: How can we group objects to make counting them easier?

Say: **When there are two things that are the same, we say they are a pair. If I say you have a pair of arms, what does that mean?** (Volunteers respond.) **Right, that means you have two arms. What else do you have pairs of on your body?**

Continue: **Let's listen for other examples of pairs in this song. It's called "Yonder in the Pair, Pair Patch."** Play *Math Melodies* Track 36. The children may raise their hands when pairs of objects are mentioned in the song.

Explain: **A pair means two of something. Two is an even number. An even number means you can match objects and there won't be any left over.**

Select four children to come to the front of the classroom. Instruct them to pair up. Ask: **Are there any children left without partners?** (Volunteers respond.) **No, we have an even number of children. That means 4 is an even number.**

Select seven children to come to the front of the classroom. Instruct them to pair up. Ask: **Are there any children left without partners?** (Volunteers respond.) **Yes, there is one extra person. There is an odd number of children. That means 7 is an odd number.** Repeat as time allows.

Counting & Cardinality

A.2 - Count forward from a given number.

CC.6 - Identify odd and even numbers.

Operations & Algebraic Thinking

OA.1 - Identify, describe, or extend simple patterns.

OA.2 - Divide objects equally into groups.

Arrays up to 20

Essential Question: How can we group objects to make counting them easier?

1 Introduce Arrays

Say: **We have been talking about how patterns help us count faster. Today we will learn about another way to arrange objects to make them easier to count. They are called arrays. Say, arrays.** Children repeat, *arrays*.

Indicate *Backpack Bear's Math Big Book*, page 38.

Say: **Backpack Bear would like to show us the arrays he found.** Read page 36 and discuss the different examples of arrays.

Materials

- Backpack Bear's Math Big Book*, page 38
- Backpack Bear's Math Workbook #2*, page 8
- Examples of arrays (egg carton, muffin tin, cupcake or muffin container)
- 12-pack of water bottles
- 15 small circle magnets



Indicate the examples of arrays as you identify each. Say: **We can find arrays in many places, like an egg carton, a muffin tin, or a twelve-pack of water bottles. An egg carton has two equal rows of six, and a muffin tin has three equal rows of four. Can you think of other objects like this?**

2 Demonstrate Arrays

Say: **Let's pretend we are putting on a play, and we want to invite people to come see it. We must arrange the chairs in straight rows so the audience can watch the play.**

Clear an area of the classroom and choose six children to move their chairs to the area.

Say: **Here are six chairs. Let's arrange these chairs in rows so that each row has the same number of chairs. I can think of one way.** Demonstrate making three rows of two chairs. Ask:

- **How many rows are there?**
- **How many chairs are in each row?**

Explain: **This is an array. Say, array.** (Children repeat, *array*.) **Who can think of a different way to arrange the chairs?** Two volunteers work together to find a different way to arrange the chairs (two rows of three).

Ask: **Is there another way to arrange the chairs?** Allow the children to experiment, reminding them that there must be the same number of chairs in each row.

3 Use Magnets to Form Arrays

Place twelve magnets on the whiteboard in an unorganized way. Ask: **Can you tell how many magnets are on the board really quickly? Why not?** (Volunteers respond.) **Right, it is difficult to count them because they aren't organized in a pattern.**

Say: **Let's see how forming an array helps us count faster. I will form an array to help count the magnets.** Arrange the magnets into three rows of four. Ask:

- **How many magnets are in each row?**
- **How do you know each row has four magnets?**

At the end of each row write the number 4. Add $4+4=8$ and $8+4=12$.

Ask: **Who can think of a different way to arrange the magnets to form an array?** Volunteers arrange the magnets in different arrays. Different arrays for 12 include 4 rows of 3, 3 rows of 4, 2 rows of 6, and 6 rows of 2.

Demonstrate a non-example of an array such as two rows of ten with two left over. Ask: **Is this an array? Why not?** (Volunteers respond.) **Right, an array must have equal rows.** Repeat the activity using 15 magnets.



Formative Assessment

Find the Arrays

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 8.

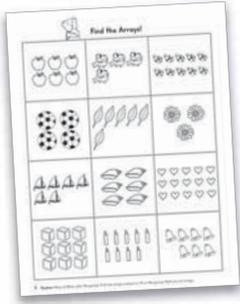
Note: If you have projection capabilities, project the workbook page as a guide.

Say: **The title of this workbook page is Find the Arrays! Look at the first box. Does the picture show an array? (Volunteers respond.) Yes, it is an array because both rows have the same number of apples. Since it is an array, use your crayons to color the apples.** The children do this.

Continue: **Look at the next box. Does it show an array of frogs? Why not? Right, the rows of frogs do not have the same number. Since this box does not show an array, make an X on it.** The children do this.

Explain: **Continue to look at one box at a time. If the box shows an array, you will color the pictures. If the box does not show an array, you will make an X on it.**

The children complete the remainder of the workbook page independently. Observe as they work and offer assistance if necessary.



Even and Odd

Materials

- 10 magnets

Essential Question: What does it mean if a number is even? Odd?

Say: **Today let's look for even numbers on the Number Line. Remember, an even number means you can make pairs and not have any left over. Who can find an even number between 1 and 10?** A volunteer does this.

Choose a different volunteer to count out the corresponding number of magnets and place them on a whiteboard.

Continue: **If (chosen number) is an even number we should be able to pair up all of the magnets and not have any left over.**

The volunteer checks to see if the number is even. Ask: **Is (chosen number) an even number?** Repeat for other volunteers and numbers.

Say: **Let's try looking for odd numbers. An odd number means after you make all of the pairs you can make, there will be one left over. Who can find an example of an odd number between 1 and 10?** A volunteer does this. Choose a different volunteer to count out the corresponding number of magnets and place them on a whiteboard.

Continue: **If (chosen number) is an odd number, after we make all of the pairs we can make, there will be one left over.**

Lead the children to understand that one is the most there can ever be left over, because if there were two or more, another pair could be made.

The volunteer checks to see if the number is odd. Ask: **Is (chosen number) an odd number?** Repeat for other volunteers and numbers.

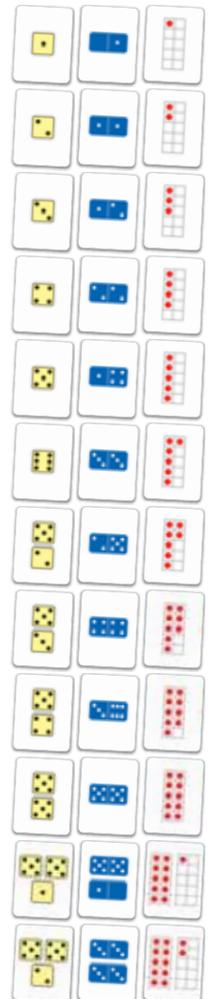
Counting & Cardinality

B.4a - Say number names in order, pairing each object with one number.

CC.6 - Identify odd and even numbers.

Operations & Algebraic Thinking

OA.2 - Divide objects equally into groups.



Subitizing and Array Review

Essential Question: How can we group objects to make counting them easier?

Materials

- Individual whiteboards, markers
- Number Representation Cards (Domino, Dice, and Ten-Frame) for 1-12
- Pocket chart
- 8 magnets
- Math bags

1 Subitizing, Seeing Patterns

Gather the children together with their whiteboards and markers.

Mix the Ten-Frame, Dice Cards, and Domino Cards together.

Say: **We have been talking about using patterns to help us count more quickly and easily. Let's see how fast we can count. Watch as I show you a card. I will hide it quickly, so watch carefully. Raise your hand if you know how many dots are on the card. Ready?**

Quickly flash a card and then put it behind your back. Choose a volunteer to tell how many dots there are on the card. Ask: **How did you know it was (number of dots)?** Repeat this several times.

2 Write That Number

Say: **Let's play "I can write that number." This time I will flash a card and then hide it quickly. You write the number on your whiteboard that tells how many dots you saw on the card and then show me. Ready?**

Repeat as time allows.

Instruct the children to put away their whiteboards and markers then gather around a pocket chart.

3 Concentration

Place the Ten-Frame, Dice, and Domino Cards face down in the pocket chart.

Say: **Let's play "Concentration." Turn over one card, then try to find another card with the same number represented on it.**

Choose a volunteer to begin. If the child makes a match, he or she removes the cards, gives them to you, and chooses the next volunteer. Play continues as time permits.



Create Arrays

Distribute math bags. Say: **Today you will get to create your own arrays. Arrays are a way to arrange objects so they are easier to count.**

Say: **I will write a number on the board. Use your connect cubes to create an array. Let's try one together.**

Write the numeral 8 on the board.

Say: **Here are eight magnets. What is one way to create an array using these eight magnets?** A volunteer creates an array. Ask:

- **What is another way to organize the magnets into an array?**
- **Are there any other ways to make an array?**
- **Why not?**

Note: Use this opportunity to show children how they can count by twos when checking the four rows of two.

The children remove connect cubes or counters from their math bags. They may work individually or with partners.

Write the numbers 4, 9, 10, 12, and 15 on a whiteboard one at a time. The children work to create arrays to match, using their counters or connect cubes.

Next, write 7 on the whiteboard. Instruct the children to create an array. Choose a volunteer to explain that he or she can't do this. Discuss why the children are not able to create an array for 7.

Learning Centers

1 Computer

The children explore:

- Monthly calendar
- Add & Subtract: "Make 10 Objects"
- Add & Subtract: "Make 10 Numbers"
- Add & Subtract: "Math Helpers"

Materials

- Computers navigated to *Starfall.com*

2 Equation Flash Cards

The children partner. Partner 1 flashes an Equation Card and partner 2 solves the equation. Then partner 2 flashes a card and partner 1 solves the equation.

When the partners finish, they switch Equation Cards with another pair of children and repeat.

Materials

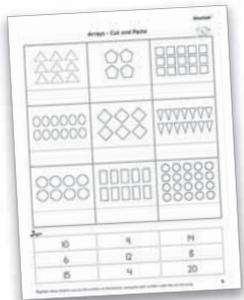
- Addition Equation Cards 1-10 divided so each pair of children has a set

3 Arrays

The children cut apart the boxes at the bottom of the workbook page, match the numerals to the corresponding arrays, and glue them in the dotted lines.

Materials

- Arrays Cut and Paste worksheet for each child
- Scissors, glue sticks



4 Teacher's Choice

Review or expand a skill from this unit according to the needs of your students.

5 Summative Assessment: Hanger Activity

One of the children arranges 10 clothespins in two groups on a hanger. The children write the corresponding equation on their whiteboards. (Example $3 + 7 = 10$)

They repeat the activity with each child taking a turn to arrange the clothespins.

Record your observations on the Summative Assessment Checklist for Unit 7, Week 18.

Materials

- Whiteboards, makers
- 10 Clothespins
- Hanger
- Unit 7 Week 18 Summative Assessment Checklist

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

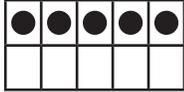
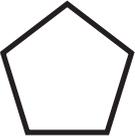
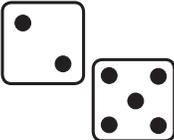
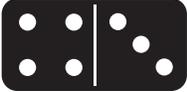
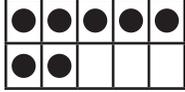
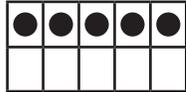
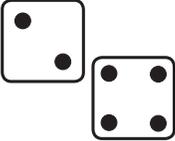
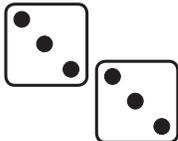
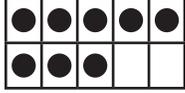
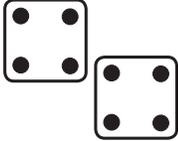
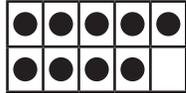
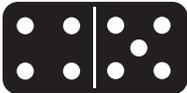
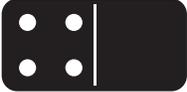
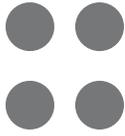
A.1 - Represent addition and subtraction in a variety of ways.

A.2 - Solve word problems with addition and subtraction within 10.

A.3 - Decompose numbers less than 11.

Name: _____

Number Pattern Review

5					
7					
6					
8					
9					
4					

Directions: Children trace the number at the start of each row, then color the boxes in that row that represent the number.

Arrays - Cut and Paste





10	9	14
6	12	8
15	4	20

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Teacher: Have children cut out the numbers at the bottom, and paste each number under the correct array.