

$$2 - 1 =$$

$$1 + 2 =$$



Review Addition & Subtraction

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Review Addition & Subtraction

Unit 10 • Overview

Frequently Asked Questions	442
Research	443
Unit 10 Summary	444
Standards & Benchmarks	445
Daily Routines	447

Week 23

Summary & Preparation	448
Review Addition	452
My Answer Is.....	455
Subtraction	457
Subtraction Equations	459
Learning Centers	460

Week 24

Summary & Preparation	462
Review Addition and Subtraction Facts	466
Creating Addition and Subtraction Equations	468
Plus and Minus	470
Addition and Subtraction Story Problems	473
Learning Centers	475

Frequently Asked Questions

Why is teaching estimation in kindergarten important?

For many children, estimation is a difficult concept. Kindergarten children want to be right, so if there are 18 objects, saying there are about 20 is not good enough! Although children are usually encouraged to calculate the correct answer, being able to estimate is a valuable skill. The ability to estimate shows that a child has good number sense. Children who have good number sense are able to use that skill to determine whether their answer to a math question is reasonable.

It is important for children to understand that estimation does not replace the need to produce accurate answers. However, teaching children to estimate helps them become critical thinkers and better understand expectations. Children also learn early on to use mental math in order to arrive at reasonable answers to problems.

In real life, estimation is part of our everyday experience. When shopping in the grocery store and trying to stay within a budget, for example, we estimate the cost of the items we place in our carts to keep a running total in our heads. For young children the ability to estimate helps them to determine how much they might accomplish in a given period of time, for example when the teacher informs children that they have only five more minutes to work or play before clean up time.

How do you prepare children to estimate?

The Common Core Standards require estimation skills at every grade level. In kindergarten, Starfall uses language with children that includes such words and phrases as *about*, *close*, *just about*, *a little more* (or *less*) *than*, and *between*. These concepts are introduced and reinforced throughout the Starfall Math Curriculum before the concept of estimation is introduced.

The intention of *Estimate with Backpack Bear*, a book included in the program, is to provide the children with many opportunities to practice their estimation skills in a variety of settings, and reinforce the fact that estimation is making smart guesses to find numbers that are close to the right answers.

Unit 10 Research

Estimation is a pervasive process in the lives of children. “How many steps from the classroom to the cafeteria?” “How long is one minute? Close your eyes and open them when you think one minute is up.” “How many jellybeans are in the jar?” “How many cups of water will it take to fill the bucket?” Without the ability to estimate reasonably accurately, life would be difficult. The most consistent conclusion reached by investigators of the development of estimation is that young children are not very skillful estimators. This conclusion was reached by researchers studying estimations of various properties, including distance, money, number of objects, and answers to math problems.⁽¹⁾ The difficulty young children have with estimation has been ascribed to various causes: mindless symbol manipulation, lack of number sense, and lack of relevant conceptual structures.

Little is known about the ability of children in early childhood to estimate the size of collections. Unlike their sense of small numbers, children’s sense of “large” numbers is not well defined. With small numbers—numbers they can relate to concrete examples and experiences—children have a well-developed sense of number size. For example, one is clearly distinct from, and clearly smaller than, two. With large numbers—numbers that they cannot relate to concrete examples and experiences—children have little or no sense of number size. As a result, they do not clearly distinguish among such numbers and may have great difficulty ordering them.⁽²⁾ Fuson and Hall hypothesized that younger children may have difficulty estimating the size of collections larger than five because they have not constructed numerical benchmarks. In their research, they found that many kindergartners appear to have an over-exaggerated mental image of ten and twenty, and some even had an over-exaggerated view of five.⁽³⁾ Through everyday experiences of counting collections of five, ten, and so forth, children gradually construct mental benchmarks that allow them to better gauge the size of collections of five and larger. Constructing a sense of number size is a gradual process that comes from using and thinking about numbers in everyday situations. In other words, it comes from relating numbers to personally meaningful experiences.

Research on using a number line from the 0 to 100 range with young children indicates a correlation

between number-line estimation and math achievement. In Siegler and Booth’s 2004 research, children were given sheets of paper showing a blank number line with only 0 at one end and 100 at the other end. They were asked to show where they thought different numbers (random numbers such as 17, 52, 6, 81, 96, 12, etc.) would fall on the line by marking the right location with a pencil. Construction of a linear representation of numbers seems crucial to mathematical development.⁽⁴⁾ Reliance on a linear representation with a given number range is related to the ability to learn answers to unfamiliar math problems in that range. Young children whose number-line estimation indicates a linear representation produce errors that are closer to the correct answer. Young children’s estimates become more accurate and linear with age and experience.

Starfall Math instruction is written in harmony with the children’s ways of learning. This requires sensitive observation and thoughtful questions at critical junctures (“How many pages do you think are in this book?” “Are there more boys than girls in our class?” “Which will take more time: walking to the gym or to the library?”) Children’s interests, ideas, and strategies should remain at the center of early childhood mathematics education.⁽⁵⁾ We encourage teachers to foster the development of children’s number sense in everyday situations and where appropriate (when an exact amount is not needed or in situations where only a quick look is possible), by encouraging children to estimate the size of collections. Look for opportunities to have children compare the relative sizes and differences in collections. “Your new neighbors have an eight-year-old boy and a six-year-old girl, who do you think is older?”

(1) Hecox, E, and Hagen, J. W., (1971) Estimates and Estimate-based Inferences in Young Children, *Journal of Experimental Child Psychology*, 11, 106-123.

(2) Baroody, A. J., with Coslick, R. T. (1998). *Fostering children’s mathematical power: An investigative approach to K-8 mathematics instruction*. Mahwah, NJ: Erlbaum.

(3) Fuson, Karen C., and James W. Hall. (1983) “The Acquisition of Early Number Word Meanings: A Conceptual Analysis and Review.” In *The Development of Mathematical Thinking*, edited by Herbert P. Ginsburg, pp. 49-107. New York: Academic Press.

(4) Siegler, Robert S. and Booth, Julie L. (2004) “Development of Numerical Estimation in Young Children,” *Child Development*, March/April 2004, Volume 75, Number 2, Pages 428 – 444.

(5) Clements, Douglas H. (1999) Playing math with young children. *Curriculum Administrator*, 34(4), 25- 28.

Unit 10 Summary

Time Frame: 10 days

In Unit 10 the children sharpen their addition and subtraction skills. They use strategies that were introduced in Units 8 and 9, such as using manipulatives (connect cubes, counters, fingers), referencing a number line, drawing tally marks or pictures, acting out a story, and using five-frames and ten-frames.

Essential Questions

(Starfall.Math.M.1) How can knowing the name and value of a penny, nickel, and dime help us in the real world?

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

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

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

(K.OA.A.2) What strategies can we use to solve word problems?

(K.OA.A.4) How can we use objects to show how to add one number to another to make ten?

(K.OA.A.5) How can practicing math facts help us quickly add and subtract?

Vocabulary

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

Horizontally

Strategies

Vertically

Enduring Understandings

Practicing math facts to five can help us add quickly.

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

We can use ten-frames to add one number to another to make ten.

We can use several different strategies to solve word problems: acting out, drawing pictures (story mats), and using manipulatives and ten-frames.

Adding coins together can help us in the real world.

Subtraction describes the process of separating from a whole, through problem solving and use of manipulatives.

Recommended Literature

1+1=5 and Other Unlikely Additions by David LaRochelle

Each Orange Had 8 Slices by Paul Giganti

Elevator Magic by Stuart J. Murphy

If You Were a Minus Sign by Trisha Speed Shaskan

The Action of Subtraction by Brian P. Cleary

The Doorbell Rang by Pat Hutchins

Tyrannosaurus Math by Michelle Markel

What's New at the Zoo? by Suzanne Slade

Standards & Benchmarks

Progress on the following standards and benchmarks will be made through the course of this unit. For your convenience, applicable learning outcomes are listed alongside each lesson in summary form.

Starfall Standards

Counting & Cardinality

- CC.3** Count backward from a given number.
- CC.4** Count to 100 by twos and by fives.

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.*
- 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.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.*



0

1

2

3

4



5



6

8

9

7

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 23 Summary

This week the children will review addition and subtraction strategies and practice using them to solve equations and story problems. They decide which operation (addition or subtraction) to use in solving story problems and write equations both vertically and horizontally. The children will also:

- Count by twos, fives and tens
- Sequence the numbers 0 through 11
- Represent equations using connect cubes

Preparation

DAY 1

Display *Backpack Bear's Math Big Book* pages 43 and 44, the Plus Poem and Strategies for Adding.

DAY 2

Prior to today's lesson, write each addition strategy on an index card and place them in Backpack Bear's backpack.

DAY 3

Display *Backpack Bear's Math Big Book* pages 45 and 46, the Minus Poem and Strategies for Subtraction.

DAY 4

The children will use manipulatives to create and solve equations for today's Formative Assessment.



DAY 5

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

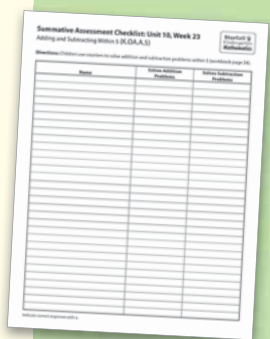
Activity Center 2 — The children will need a box or container of various colors of connect cubes to match the Addition Equation Cards.

Activity Center 3 — The children will use 1 or 2 “Backpack Bear’s Subtraction Train” game boards, 1 die per pair, and 20 connect cubes per player.

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

Summative Assessment — The children will complete page 24 in *Backpack Bear’s Math Workbook #2*. They will need counters or connect cubes, pencils, math bags, math mats and their workbooks.

Prepare a copy of the Summative Assessment Checklist for Unit 10, Week 23. Circulate as the children work in the different centers, and note each child’s progress.



Summative Assessment
Unit 10 - Week 23

DAY 1

DAY 2

Daily Routines

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

Magic Math Moment

Human Number Line

Word Problems

Math Concepts

Arrange 0 – 10 Number Cards in order

Review Addition Strategies

Review Addition

Practice using Addition Strategies

Solve addition equations

Use strategies to show 10

Three ways equations may be written

Formative / Summative Assessment

Write equations in three different ways

Solve equations and color by sum

Workbooks & Media

Workbook page 20



Starfall.com, Addition & Subtraction: Word Problems

Workbook page 21



DAY 3

DAY 4

DAY 5

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

"Ten Little Kittens"

"Ten Little Bears"

Learning Centers

Starfall.com:

- Monthly Calendar
- Add & Subtract: "Word Problems"
- Add & Subtract: "Subtract within 10."
- Add & Subtract: "Make 10 Objects"

Review Subtraction Strategies
Practice using Subtraction Strategies
Act out subtraction story problems

Dramatize a subtraction song
Match equations to answers

Form Equations with Cubes

Create and solve subtraction equations

Solve equations and color by answers

"Backpack Bear's Subtraction Train"

Starfall.com, Math Songs: "Ten Little Kittens"
Workbook page 22



Math Melodies Track 23, "Ten Bears in the Bed"
Workbook page 23



Teacher's Choice

Adding and Subtracting Within 5
Summative Assessment: Addition and Subtraction Within 5
Workbook p. 24



Human Number Line

Materials

- Number Cards 0-10

Distribute Number Cards 0-10 to 11 volunteers and instruct them to move to the front of the classroom.

Say: **Arrange yourselves in order, then sit on the floor and hold your Number Card under your chin.** Classmates assist as necessary.

Say: **This is a human number line. We will use this number line to help us answer plus 1 questions.**

Select a volunteer and say: (Volunteer's name) **stand behind the number 8. Class, what number will (Volunteer's name) stand behind to add one more? Right, (Volunteer's name) should move forward 1 number.** (The volunteer does this.) **What number is (Volunteer's name) standing behind now? Right, 9, so $8 + 1 = 9$.**

Continue to choose volunteers to stand behind the human number line and solve plus 1 equations.

Counting & Cardinality

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

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.



Review Addition

1 Review Strategies for Adding

Indicate *Backpack Bear's Math Big Book* page 43, the Plus Poem.

Read the poem and the children join you. Ask: **When do we use a plus sign? Yes, we use a plus sign when we add.**

Indicate the Strategies for Adding on page 44. Say: **Let's review the Strategies for Adding to see if we remember strategies we can use to help us add.**

Briefly review the addition strategies with the children.

2 Addition Equation Cards

Continue: **Today you will be Math Wizards! Watch as I flash an equation, and give a thumbs-up if you know the answer. Ready? (Flash a card.) When I count to 3 say the answer... 1, 2, 3.**

Repeat for several equations.

Say: **All of these equations are written vertically. (Indicate) Is vertically the only way we can write an equation?** Discuss.

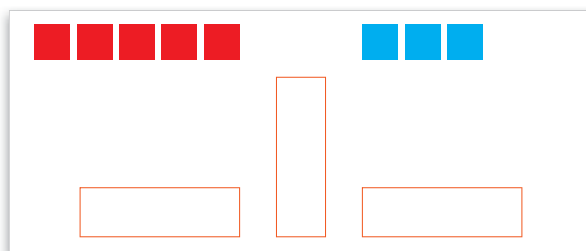
Materials

- Backpack Bear's Math Big Book*, pages 43 and 44
- Addition Equation Cards
- Whiteboards, markers
- Math bags
- Backpack Bear's Math Workbook #2*, page 20
- Pencils

3 Ways to Write an Addition Equation

Say: **Let's think of the different ways an equation can be written.**

Draw 5 red squares and 3 blue squares on a whiteboard, leaving a space between them. Draw 3 rectangular boxes under the cubes (see below).



Say:

- **An equation can be written horizontally.** Write $5+3=8$ in the first box.
- **An equation can be written vertically.** Write $5 + 3 = 8$ vertically in the middle box.
- **An equation can begin with the answer and have the problem follow it.** Write $8 = 5+3$ in the last box. Explain that this equation is also written horizontally like the first one, but it is written with the answer coming first.

Continue: **All three of these equations represent the same thing. When 5 and 3 are added together they always equal 8.**

4 Writing Equations

Distribute individual whiteboards, markers, and math bags.

Draw 2 blue cubes and 1 red cube on a whiteboard. Say: **Look at this addition problem. Use your connect cubes to create the addition problem that matches this drawing.**

Continue: **Now write the addition problem vertically, or up and down, on your whiteboard then hold it up.** The children do this.

Say: **Erase the problem and write it again horizontally then hold it up.** The children do this.

Say: **Erase the problem. This time write the answer first, then the problem.** The children do this.

Observe as the children create the addition problem and write the equations. Assist as necessary.

Repeat the above procedure using the equation $4 + 2 = 6$.

Note: If your class needs additional practice, demonstrate writing the equations the three different ways for another problem.

Say: **Now, listen to this story then use your red and blue connect cubes to create the problem. There are 5 large clouds in the sky and 2 small clouds. How many clouds are in the sky?** The children use their connect cubes to create the problem. Check their answers and discuss.

Draw 5 large clouds and 2 small clouds on a whiteboard. Give the following directions. Observe as the children write the equations, and assist as necessary.

Say: **Write the problem vertically on your whiteboard then hold it up.** (The children do this.) **Now erase the problem and write it horizontally, then hold up your whiteboard.**

Continue: **Here's the last one, ready? Erase the problem. Now, write the answer first, then the problem.**



Formative Assessment

Solve Addition Equations

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 20. Complete the first problem step-by-step with the children. They may complete the remainder of the page independently, or you may work with them to complete this page together as a group.

Modification: If there are only a small number of children who need help to successfully complete this workbook page, you may have the majority of the children complete this page independently, while you work with the children who need support to complete this page.



Word Problems

Materials

 None

Project *Starfall.com* Addition & Subtraction: "Word Problems Add To: Change Unknown," or gather the children around a classroom computer.

Navigate to a story problem. The children help choose the equations based on the information given.

For each question, volunteers explain their choices. Lead the children to discuss why the other choices do not fit the story problem.

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.

My Answer Is...

1 Review Strategies for Adding

Say: **Today let's practice all of the ways to show an addition problem. Backpack Bear has been learning the addition strategies, too!**

Write 10 on the whiteboard. Choose volunteers to check Backpack Bear's backpack and each remove one index card. Ask the following questions to demonstrate the corresponding strategies.

- **How can we show 10 with our fingers?**
The children show 10 fingers and you draw two hands with fingers raised on the whiteboard.
- **How can we show 10 using a ten-frame?** Draw a ten-frame on the whiteboard. A volunteer draws circles in all ten sections of the ten-frame.
- **How can we show 10 using counters?** A volunteer counts out 10 counters and the class counts along to confirm.
- **How can we show 10 using a number line?** Draw a number line on a whiteboard and add dots where the numerals 0 through 10 should be. Volunteers add the numerals to the number line.
- **Who can show a number sentence for 10 using the number line?**
A volunteer does this. Assist the volunteer as needed.
- **How can we show 10 using tally marks?** A volunteer does this.
- **How can we show 10 by using our heads, and counting on?** (Example: A volunteer says 8 then holds up 2 fingers, or draws 2 tally marks.)
- **How can we show 10 by drawing pictures?** A volunteer draws pictures of 10 objects.

Materials

- Addition strategies in Backpack Bear's backpack
- Backpack Bear's Math Workbook #2, page 21
- Individual whiteboards, markers
- Addition Equation Cards
- Number Cards 1-10
- Pencils and crayons
- Pocket chart
- Math mats
- Math bags
- Counters

- **How can we show 10 by acting it out?** Choose 10 children. Ask them to show an equation by creating two groups of children.
- **How can we show 10 by writing equations? Let's think of all the different equations that total 10.** Volunteers take turns writing equations on the board in any direction.

Review the different ways the children represented the answer 10.

2 Match the Equation

Select Addition Equation Cards with different equations but the same addends (Example: $1 + 8$ and $8 + 1$).

Distribute an Addition Equation Card to each child. The children find classmates with the Equation Cards that have the same addends.

Switch the Equation Cards around and repeat if time allows.



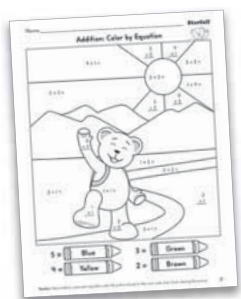
Formative Assessment

Color By Equation

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 21.

Explain to the children they are to add the numbers in each equation then color the sections using the color code. They may use the connect cubes in their math bags to solve the equations if needed.

Note: If necessary, complete one section as an example.



"Ten Little Kittens"

Project *Starfall.com*: Math Songs, "Ten Little Kittens," or gather the children around a computer to watch. They listen to determine if the song is an addition or subtraction song. Volunteers explain why.

Materials

- Starfall.com*

Subtraction

Essential Question: What strategies can we use to solve word problems?

Materials

- Backpack Bear's Math Big Book*, pages 45 and 46
- Backpack Bear's Math Workbook #2*, page 22
- Pencils, crayons

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.

1 Review Subtraction Strategies

Indicate *Backpack Bear's Math Big Book*, pages 45 and 46, the Minus Poem and Strategies for Subtraction.

Say: **Let's play a game to review strategies for the operation of subtraction. Watch as I write a problem on the whiteboard. I will use one of the strategies to solve it. As soon as you know which strategy it is, raise your hand. Ready?**

Write an equation on the board and begin to solve it using one of the strategies. As soon as children discover the strategy you are using, stop and allow a volunteer to explain which strategy is being used.

Repeat for each strategy.

2 Act Out Subtraction

The children listen to the story problems then volunteers act them out.

- *Story Problem #1*—Select 5 volunteers to come forward. Say: (Names of the 5 volunteers) **were building a sand castle together.** (Name 2 volunteers) **decided to play on the swings. How many children were left building the sand castle?** (3)
- *Story Problem #2*—Select 10 volunteers to come forward. Say: **Ten children were planting a garden. They all worked together, and they all stayed until the garden was planted. How many children planted the garden?** (10) **Right, 10! None of the children left.**
- *Story Problem #3*—Select 3 girls and 3 boys to come forward. Say: **Three girls and three boys were planning to go swimming. All of the boys decided not to go. How many children went swimming?** (3)



3 Draw to Solve a Problem

Say: **Now let's use the strategy of drawing pictures to solve a subtraction story.**

Draw 8 fish on a whiteboard. Say: **Let's pretend these fish are swimming. How many fish are there? Right, 8. (Cross out 5 fish.) The crossed out fish swam away. How many fish swam away? (5) How many fish are left? (3) How do you know? Who can write the equation to match this story problem on the whiteboard vertically? (A volunteer does this.) Who can write the equation horizontally?**

Draw 6 suns on a whiteboard. Ask: **How many suns are there? Let's pretend the clouds covered some of the suns. How many did the clouds cover? (A volunteer crosses out some of the suns.) How many suns are left? How do you know? Who can write the equation to match this story problem on the whiteboard vertically? (A volunteer does this.) Who can write the equation horizontally?**

Formative Assessment

Weather Subtraction

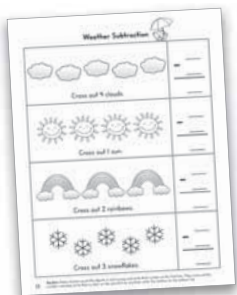
Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 22.

Note: This workbook page is designed to be completed together as a class. Project the page if possible for demonstration.

Say: **Raise your hand if you know how many clouds there are in the first problem. (A volunteer responds.) There are 5 clouds so let's write 5 in the first blank in the equation.** Demonstrate this.

Continue: **Look at the words under the picture of the clouds. They say "Cross out 4 clouds." Use a pencil or a crayon to do that. The equation says 5 minus (blank). We crossed out 4 of the clouds, so how many clouds did we take away? Yes we took away 4. Write 4 in the blank under the 5. (The children do this.) The equation says 5 minus 4 equals blank. How many clouds are left? There is 1 cloud left so 5 minus 4 equals 1. Write 1 in the last blank.**

Continue for the other problems on the page.



"Ten Bears in the Bed"

Play *Math Melodies* Track 23, "Ten Bears in the Bed." The children listen and sing along if they know the song.

Ask: **Is this an addition song or a subtraction song? Yes, it is a subtraction song. How did you know?**

Select 10 children to "dramatize" the song as you play it a second time. The class chimes in during repeated phrases.

Materials

- Math Melodies* Track 23

Counting & Cardinality

CC.3 - Count backward from a given number.

Operations & Algebraic Thinking

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

Subtraction Equations

Materials

- Backpack Bear's Math Workbook #2*, page 23
- Subtraction Equation Cards
- Pencil, crayons
- Pocket chart

1 Story Problems on *Starfall.com*

Project *Starfall.com* Addition & Subtraction: "Word Problems: Take From: Total Unknown" or gather the children around a classroom computer.

Navigate to a story problem. The children help create the equation based on the information given.

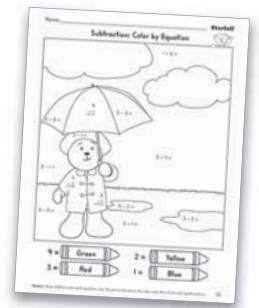
2 Match the Equation

Say: **Let's play a game called "Match the Equation." Each of you will receive a different subtraction equation. I'll write a number on the board. You look at your equation. If your equation equals the number on the board, place your Equation Card in the pocket chart.**

Distribute a Subtraction Equation Card to each child.

Write 3 on the board. The children with equations that equal 3 place their Equation Cards in the pocket chart.

Repeat with other numbers.



The children may use the connect cubes in their math bags to solve the equations if needed.

Formative Assessment

Color by Equation

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 23.

The children add the numbers in each equation, then color the sections using the color code. Provide the children with manipulatives for support.

Learning Centers

1 Computer

The children explore:

- Monthly calendar
- Add & Subtract: "Word Problems" (All links)
- Add & Subtract: "Subtract within 10" (bowling)
- Add & Subtract: "Make 10 Objects"

Children may navigate to other *Starfall.com* math activities after they have explored those suggested above.

Materials

- Computers navigated to *Starfall.com*

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.

2 Equations with Cubes

The children select Addition Equation Cards then combine two different colored sets of connect cubes to match the equation on the cards.

Materials

- Box of multicolored connect cubes
- Addition Equation Cards

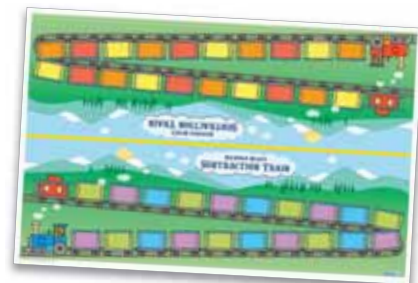
3 Backpack Bear's Subtraction Train

Place a cube on each car of both trains (not on the engine or caboose). The children take turns rolling a die, and removing the corresponding number of connect cubes.

The first child to uncover his or her whole train wins, or play continues until both players remove all of the connect cubes from their trains.

Materials

- 1 or 2 "Backpack Bear's Subtraction Train" game boards
- 20 connect cubes per player
- 1 die



4 Teacher's Choice

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

5 Summative Assessment: Adding and Subtracting Within 5

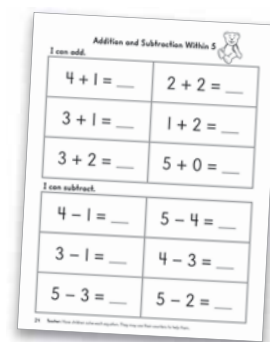
Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 24.

The children use their counters to help solve the problems then they write the answers.

Observe whether or not children can successfully add and subtract within 5 and record your observations on the Summative Assessment Checklist for Unit 10, Week 23.

Materials

- Backpack Bear's Math Workbook #2*, page 24
- Math bags
- Math mats
- Pencils
- Summative Assessment Checklist for Unit 10, Week 23



Week 24 Summary

This week the children will work to strengthen their skills by practicing addition and subtraction facts, creating equations, and learning key phrases that will help them determine which operation to use in order to correctly answer story problems. They will review coins, and practice adding and subtracting money.

The children will also:

- Create addition and subtraction problems
- Practice identifying plus and minus signs
- Count by twos, fives and tens
- Distinguish between addition and subtraction problems

Preparation

DAY 1

Select Addition and Subtraction Equation Cards within 5 and mix the cards to create a deck.

For today's lesson you will divide your class into 5 groups to play "Build the Tower." Number the children in each group. This will be the order of play. Each group will need a box of cubes in a variety of colors, 10 Addition Equation Cards and a math mat for each child.

Divide the class into 5 different groups to play "Disappearing Train Cube Subtraction." Number the children in each group. This will be the order of play. Each group will need 10 Subtraction Equation Cards and a math bag and a math mat for each child.

DAY 2

You will need a set of Number Cards 0 through 9 placed in a paper bag, and a plus and a minus sign in another paper bag for today's Magic Math Moment.

Prepare 3 index cards, one with a + (plus sign), one with a - (minus sign), and one with an = (equal sign). Use Number Cards to create the following sets:

- 1, 4, 5
- 2, 3, 5
- 1, 5, 6
- 4, 2, 6
- 1, 6, 7
- 5, 2, 7

The children will need pencils, scissors, and glue sticks.

DAY 3

Write the numbers +1, -2, +2, and -1 (repeated to fill all spaces) on a blank game spinner.

You will need a small amount of play dough for each child. You will also need a clear container or bucket and 10 small balls or other manipulatives.

Optional: Use a large demonstration penny, nickel and dime if available. If you do not have large demonstration coins available, draw the coins on a whiteboard.

DAY 4

You will need 2 index cards per child.

DAY 5

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

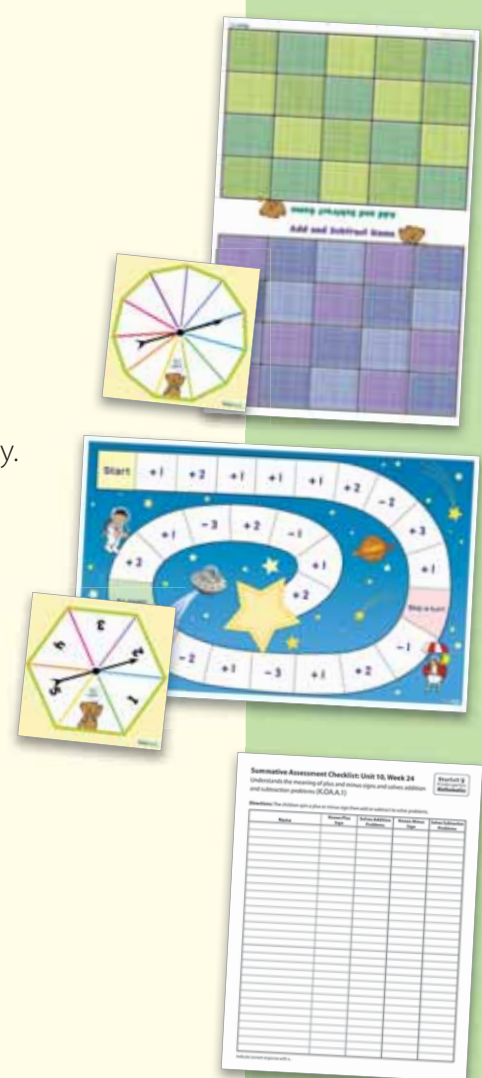
Activity Center 2 — The children will use Addition and Subtraction Equation Cards.

Activity Center 3 — You will need an “Add & Subtract” game board for each pair of children, 20 connect cubes for each child and a game spinner labeled with the numbers -1, -2, -3, -4, +1, +2, +3, +4, +5, and +6.

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

Summative Assessment — The children will use a “Reach to the Stars” game board, 10-20 connect cubes for each player (different colors) and a game spinner labeled 1-5.

Prepare a copy of the Summative Assessment Checklist for Unit 10, Week 24. You will assess the children’s knowledge and application of plus and minus signs.



Summative Assessment
Unit 10 - Week 24

DAY 1

DAY 2

Daily Routines

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

Magic Math Moment

Equation Flash Cards

“Plus and Minus”

Math Concepts

Distinguish plus and minus signs when solving equations

Distinguish plus and minus signs

Review Addition and Subtraction Facts

Add and subtract

“Build a Tower”

Create addition and subtraction equations

“Disappearing Train Cube Subtraction”

Human equations

Formative / Summative Assessment

Observe children playing addition and subtraction games

Use plus and minus signs to create equations

Workbooks & Media

Workbook page 25



DAY 3

DAY 4

DAY 5

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

Learning Centers

"My Coin Book" 0-10

Count by twos, fives and tens

Starfall.com:

- Monthly Calendar
- Add & Subtract: "Coin Book" 0-10

1

Create Plus and Minus Signs with play dough

Distinguish addition and subtraction words and phrases

Add and Subtract using coins

Introduce "The Bucket Game"

Draw plus and minus signs

Listen for word clues to solve Addition and Subtraction Story Problems

Flash Card Game

2

Use pictures to create and solve addition and subtraction money problems


Create addition and subtraction story problems by drawing pictures and writing equations

"Add & Subtract"


3

Starfall.com: "Add & Subtract," My Coin Book: 0-10"

Workbook page 27



Workbook page 28



Teacher's Choice

4

"Reach to the Stars"

Summative Assessment: Observe knowledge and application of plus and minus signs

5

Addition and Subtraction Equation Cards

Create a deck by mixing Addition and Subtraction Equation Cards (answers within 5).

Materials

- Addition and Subtraction Equation Cards within 5, mixed

Say: **Backpack Bear has a challenge for you! He mixed some addition and subtraction problems to try to trick you. He said you should really look to see if there is a plus or a minus sign! He would like you to tell if the problem is an addition problem or a subtraction problem. How will you know?**

Discuss the fact that the plus or minus sign tells whether to add or subtract.

Flash the cards. The children say “add” or “subtract” then volunteers give the answers.

Operations & Algebraic Thinking

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

A.5 - Fluently add and subtract within 5.

Review Addition and Subtraction Facts

Essential Question: How can practicing math facts help us quickly add and subtract?

Materials

- 5 containers of connect cubes in a variety of colors
- Addition Equation Cards (approximately 5 sets of ten mixed)
- Subtraction Equation Cards
- Math mats
- Math bags

1 “Build a Tower” Game

Briefly demonstrate “Build a Tower.”

The children work on their math mats. They take turns to draw Addition Equation Cards. They add the numbers then use connect cubes in two different colors to build the answer.

2 “Build a Tower Addition” Game

Divide the class into 5 groups. Number the children or establish the order in which they will play. Each group will need a box of connect cubes in a variety of colors and a math mat for each child.

The children will work on individual math mats.

- The first child draws an Addition Equation Card, adds the numbers, then uses two different colored connect cubes to “build” the answer.
- The second child draws an Addition Equation Card and does the same.
- Play continues until each child has 2 turns. They connect the cubes from both turns together to build towers.

Groups compare their towers to determine whose tower is the tallest.



Formative Assessment

“Disappearing Train Cube Subtraction” Game

Gather the children together and briefly demonstrate the “Disappearing Train Cube Subtraction Game.”

The children work on their math mats. They connect 20 connect cubes together. They then take turns to draw Subtraction Equation Cards, subtract the numbers and remove the corresponding connect cubes.

Divide the class into 5 different groups. Number the children or establish the order in which they will play. Each group will need 10 Subtraction Equation Cards, a math bag and a math mat for each child.

The children will work on individual math mats.

- Each child connects 20 cubes together to form a train.
- The first child in each group draws a Subtraction Equation Card, subtracts the number, then takes the corresponding number of cubes away from his or her train.
- Play continues until each child has two turns.
- If a child draws a card and does not have enough cubes to take away, he or she skips the turn and loses no cubes.

The groups compare their towers to determine whose tower is the shortest.

"Plus and Minus" Game

Draw a minus sign and a plus sign on the whiteboard and identify them to the children.

Say: **Let's play a game. I will touch one of these signs.**

You say plus if I touch the plus sign (indicate), or minus if I touch the minus sign (indicate). Ready? Touch the signs several times. Pretend you're going to touch one but don't, to add excitement to the game.

Choose two volunteers. Volunteer #1 will draw a plus or minus sign from the paper bag, and volunteer #2 will draw a Number Card from the other paper bag.

Create two teams (Example: girls and boys) and line the teams up side-by-side in two rows.

Each team in turn draws a sign and a Number Card and the team takes steps forward or backward to correspond to the number and sign chosen. The team that reaches the designated end point wins, or both teams may be winners.

Repeat with new teams and volunteers as time allows.

Materials

- Number Cards 0 through 9 in a paper bag
- Plus and minus sign in a paper bag

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.

Creating Addition and Subtraction Equations**1 Form an Equation**

Say: **Today we will create human equations!**

- Distribute the plus, minus and equal signs to three volunteers
- Distribute a set of Number Cards to three volunteers. (Example: 1, 4, 5) Number holders stand in order left to right: 1, 4, 5.
- Arrange the three number volunteers so there are spaces between them.

Say: **If you are holding a sign, place yourself between the numbers to form an equation.** Discuss why the minus sign is not used in this equation.

Ask: **What could we do to use the minus sign rather than the plus sign?** Rearrange the number holders to show 5, 1, 4.

Say: **If you are holding signs, find the correct place to stand to form this equation.**

Materials

- Prepared index cards (plus, minus, equal signs)
- Backpack Bear's Math Workbook #2, page 25
- Pencils, scissors, glue sticks
- Number Card Sets:
 - 1,4,5
 - 2,3,5
 - 1,5,6
 - 4,2,6
 - 1,6,7
 - 5,2,7

Classmates assist as necessary.

Repeat choosing different volunteers to hold the signs and remaining sets of numbers.

Note: Take opportunities to discuss different options of arranging sets of numbers such as $4 + 1 = 5$, $1 + 4 = 5$, and $5 = 1 + 4$.



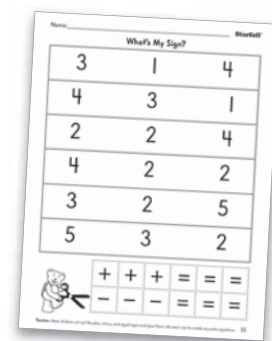
Formative Assessment

“What’s My Sign?”

Distribute *Backpack Bear’s Math Workbook #2* and instruct the children to turn to page 25. They cut apart the signs at the bottom of the page and glue them in the top section to create equations.

Note: There are more plus and minus signs than needed to complete the workbook page.

Modification: The children may write the correct signs first, then cut and glue the correct symbols over them.



Introduce Coin Book 0-10

Materials

 None

Navigate a computer with projection capabilities, or gather the children around a classroom computer navigated to *Starfall.com*: Add & Subtract: "My Coin Book: 0-10."

The children assist in navigating this activity in which they will distinguish addition and subtraction combinations to equal a featured number.

Note: Click the arrow to navigate to a different featured number.

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.5 - Fluently add and subtract within 5.

Money

M.1 - Identify the value of coins.

Plus and Minus

Essential Question: How can knowing the name and value of a penny, nickel and dime help us in the real world?

1 Plus or Minus Play Dough Activity

Distribute a small amount of play dough to each child.

Say: **Today you will make plus and minus signs with play dough.** The children do this and place both signs on their math mats.

Note: Instruct the children to press two pieces of play dough together where they intersect when making the plus sign.

Say: **I will say a word or a group of words. If the word or group of words is about addition, hold up your plus sign. If the word or group of words is about subtraction, hold up your minus sign. Ready?**

- How many in all?
- Plus
- Take away
- Join together
- How many are left?
- Minus
- Count on
- Add
- Count backwards
- More
- Subtract

Materials

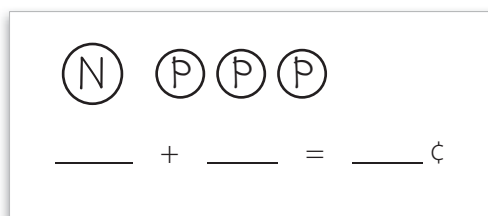
- Clear bucket or container
- Prepared game spinner
- Backpack Bear's Math Workbook #2*, page 27
- Small amount of play dough for each child
- Math mats (back side)
- Whiteboards, markers
- 20 small balls or manipulatives
- Coins (pennies, nickel, dime)
- Math bags
- Pencils

- Combine two sets
- All together
- Less than

2 Adding and Subtracting with Money

Gather the children in front of a classroom whiteboard. Say: **Watch as I draw some coins on the board.**

Draw circles on the board to represent a nickel and three pennies, with the first letter of the coin written inside (N for nickel, P for penny). Draw lines under each group to form an equation (see below).



Ask:

- **How much is a nickel worth?** A volunteer writes 5 on the line under the nickel.
- **How much are 3 pennies worth?** A volunteer writes 3 under the pennies.

Continue: **If a nickel is worth 5 cents we can start counting at 5 and count on. 5, 6, 7, 8. How much money is there in all?** (A volunteer writes 8.) **Right, 5 plus 3 equals 8.**

Repeat for a dime and two pennies.

Say: **Now let's go shopping. If coins are used to pay for something should we add or subtract? Yes, when you pay for something you subtract the coins from what you have.**

Draw 6 pennies. Say: **Sarah had 6 pennies. She bought some peanuts that cost 2 cents. How much money does Sarah have left?** (A volunteer crosses out 2 of the pennies.) **Yes, Sarah has 4 cents left because $6 - 2 = 4$.**

Draw 1 dime and 3 pennies. Say: **Jared had 13 cents. His brother borrowed a dime. How much money does Jared have left?** (A volunteer crosses out the dime.) **Jared has 3 cents left because $13 - 10 = 3$.**



Formative Assessment

Adding and Subtracting using Money

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 27.

Note: This page should be completed with the children. Project the page for demonstration if you have the capability.

Say: **Look at the first problem. In the first blank write the number that represents how much a nickel is worth. In the second blank write the number that represents how much two pennies are worth. Does the plus sign tell you to add the numbers together or to subtract? Right, a plus sign tells you to add.**

A volunteer writes the equation and the answer on the whiteboard.

Repeat for the remaining problems.

Note: If you do not have time to introduce "The Bucket Game," do so prior to learning center time on **Day 5**.

Say: **Today we will play "The Bucket Game." It will help us practice identifying plus and minus signs. Remember, the plus sign means to join two sets together, which makes a larger number. The minus sign means to take away so you end up with a smaller number.**

Place 10 balls in the bucket or container and reserve the others to use with addition problems. Choose two volunteers to demonstrate the game. The first child spins and determines if he or she will add or subtract, then adds or takes away the corresponding number of balls. The second child does the same.

They continue taking several turns adding and subtracting balls.

After the game has been demonstrated, volunteers take turns to spin and add or subtract balls.

Explain: **You will all play this game during Learning Centers!**



Magic Math Moment

DAY

4

Counting by Twos, Fives, and Tens

Divide the class into groups of 5.

Say: **When I give the signal practice counting by tens to 100 in your group. Ready, go!**

After a few seconds say: **Clap once if you can hear me.** (The children do this.)
Clap twice if you can hear me.

Say: **Now let's try counting by tens to 100 again all together.** Repeat with the children counting by:

- Fives to 30
- Twos to 20

Materials

 None

Addition and Subtraction Story Problems

Materials

- Backpack Bear's Math Workbook #2, page 28
- 2 index cards per child
- Pencils, crayons

1 Make Plus and Minus Signs

Distribute 2 index cards to each child. Say: **Use a pencil to draw a large plus sign on one index card and a large minus sign on the other.** The children do this.

Continue: **Now trace over the plus and minus signs with a dark crayon.**

2 Listen for Addition and Subtraction Clues

Say: **Listen to this story and see if you can tell if the story is an addition story or a subtraction story.**

Optional: Recall the activity in which the children listened for addition and subtraction words.

Say: **If you think you should add to solve the problem hold up your plus sign. If you think you should subtract to solve the problem hold up your minus sign. Let's practice.**

- **Four ladybugs were on a leaf. One more ladybug came. How many ladybugs were on the leaf altogether? Raise the plus sign if you should add to solve the problem, or raise the minus sign if you should subtract to solve the problem.**

Discuss why the correct answer is to add the numbers, and point out the word *altogether* is always a clue to use addition.

Counting & Cardinality

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

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

Operations & Algebraic Thinking

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

Repeat for the following story problems:

- 1 pear grew on a pear tree. Then 4 more pears grew. How many pears grew on the tree in all?
- Rachel had 5 pennies. She lost 1 penny on the sidewalk. How many pennies does Rachel have left?
- David's shirt has 5 buttons and his friend's shirt has 3 buttons. How many buttons do the shirts have altogether?
- Grace's dog had 4 dog treats. He ate 3. How many dog treats does Grace's dog have left?
- There were 5 flowers growing in a field. Susie picked 1 of the flowers. How many flowers are left?

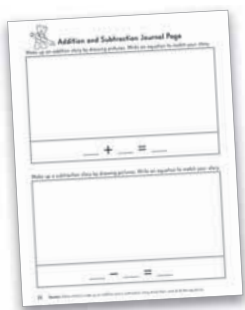


Formative Assessment

Addition and Subtraction Journal Page

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 28.

The children each create their own addition problem by drawing pictures and writing the matching equations. They then create a subtraction problem by drawing a picture and writing the matching equation.



Learning Centers

DAY

5

1 Computer

The children explore:

- Monthly calendar
- Add & Subtract: "Coin Book" 0-10

Children may navigate to other *Starfall.com* math activities after they have explored those suggested above.

Materials

- Computers navigated to *Starfall.com*

2 Flash Card Game

Distribute a set of Addition and Subtraction Equation Cards to each pair of partners.

Partner 1 flashes the Equation Cards to Partner 2. Together they agree on the answer. This continues until all of the Equation Cards have been solved.

The children mix the Equation Cards and repeat with Partner 2 flashing the Equation Cards to Partner 1.

Materials

- Addition and Subtraction Equation Cards (mixed and divided into a set for each pair of children in the group)

3 Add & Subtract

The children take turns spinning the spinner. For positive numbers, they add the corresponding number of connect cubes to their game boards.

For negative numbers, the children remove the corresponding number of connect cubes from their game boards, unless there are not enough connect cubes to remove.

The game ends when a child fills his or her entire game board, or until both children fill their game boards.

Materials

- "Add & Subtract" game board
- 20 connect cubes for each player
- Prepared game spinner (labeled with numbers +1, -2, +2, and -1 repeated)



4 Teacher's Choice

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

Counting & Cardinality

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

Operations & Algebraic Thinking

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

5 Summative Assessment: “Reach to the Stars”

Each player begins with 1 connect cube, and places their playing piece on Start. The players take turns to spin the spinner and move their playing pieces the corresponding number of spaces. They add or subtract connect cubes as indicated by the spaces they land on, trying to build towers as tall as they can. (See game directions.)

Observe the children’s knowledge and application of the plus and minus signs and record your observations on the Summative Assessment Checklist for Unit 10, Week 24.

Materials

- “Reach to the Stars” game board
- Playing piece for each child
- Game spinner labeled 1-5
- Several connect cubes (10-20, with different colors for each player)
- Summative Assessment Checklist for Unit 10, Week 24

Summative Assessment Checklist: Unit 10, Week 24

Understands the meaning of plus and minus signs and solves addition and subtraction problems (2.OA.A.3)

Standard 3
Mathematics

Student	Observed	Not Observed	Not Observed	Not Observed

