



Measurement

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Measurement

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Unit 13 Frequently Asked Questions

Why does the Starfall Math Program introduce time and temperature, since these are not included in the Common Core standards?

The Common Core standards are just that, a core of standards, or a baseline. Every state and district is encouraged to add standards to the Common Core list in order to ensure a well-rounded curriculum. Since the concepts of time and temperature appear in many state standards, Starfall has chosen to include them in its effort to produce the best possible kindergarten math curriculum.

Unit 13 Research

In a kindergarten classroom, many activities revolve around time. How long do we have before gym? When is snack? What day do we have music? Time is a difficult concept for young children to grasp. Introducing the concepts of clocks, seconds, minutes, and hours will help prepare them for future lessons of telling time. By participating in meaningful calendar activities, young children begin to understand that time is sequential. The sequences include yesterday, today, and tomorrow; morning, afternoon, and evening; the seasons; Sunday, Monday, Tuesday, and so on. Children also need to be able to conceptualize before and after, and think about future and past events, such as planning for the hundredth day of school or writing a class story about yesterday's field trip.⁽¹⁾ It is useful to occasionally time events such as "5 minutes until clean-up time", "Let's see if anyone can finish up before the 10 minute timer rings". Much of clock knowledge comes from everyday activities through informal experiences. Teachers can support these experiences by posting visual models of important times during the day that children can match to the real clock. Books can be read that include time concepts and time sequence.⁽²⁾ In the Starfall Math Curriculum, children are provided blank calendars each month that they can fill with important dates (holidays, birthdays, etc.).

Linear representations help children begin to understand and conceptualize that a day is a unit of time and to talk about it with increasing clarity. For example, to count the number of days they have been in kindergarten, children can add a link to a paper chain each day, or number a pattern of colored Post-it notes and place them on the classroom number line, or add a connect cube to a stack of cubes. The teacher can emphasize time-linked vocabulary, such as before, after, later, earlier, as the children add the new link. Picture schedules illustrating the schedule of class activities are often used, or a poster with photos of the day's activities in sequence can be helpful to young children. Displaying documentation of shared class events, such as field trips or class science projects of

planting beans or measuring the growth of a sweet potato vine, can lead to meaningful discussions that involve time-linked vocabulary (first day, third day, last week, etc.).⁽³⁾

Kindergarten children should also be introduced to standard units of measure to compare temperatures and to learn how to use a thermometer to measure temperature.⁽⁴⁾ They need to have experiences with hot, warm and cold things and hot, comfortable and cold weather. Children can examine thermometers and discuss their experiences with them (going to the doctor for a check-up, measuring outdoor and indoor air temperatures, controlling the thermostat on their furnaces and air conditioners, etc.). They can experiment with measuring the temperatures of the water after adding ice cubes and/or warm water to the water table or science center. Children can also record results as they continue to add ice or warm water. Teachers can place outdoor thermometers outside the classroom and have children record the temperature each day in the morning, noon, and end of the day.

(1) NCTM (National Council of Teachers of Mathematics). (2000). Principles and standards for school mathematics. Reston, VA

(2) McMillen, S., and Hernandez, B. (2008). Taking time to Understand Telling Time. *Teaching Children Mathematics*, 15 (4), 248 -255

(3) NAEYC & NCTM (National Council of Teachers of Mathematics). (2002). Early childhood mathematics: Promoting good beginnings. A joint position statement of NAEYC and NCTM. www.naeyc.org/about/positions/mathematics.asp

(4) Charlesworth, R. and Lind, K. (2013) *Math and Science for Young Children*. 7th ed, Wadsworth Publishing Company: Belmont, CA

Unit 13 Summary

Time Frame: 10 days

In Unit 13 the children will learn that there are different ways to measure a variety of attributes, such as length, height, capacity, and weight. They will also explore the concepts of time and temperature.

Essential Questions

(K.MD.A.1) What can we measure?

(K.MD.A.1-2) How can we use measurement to describe and compare objects?

(Starfall.Math.MD.1) Why is a calendar or a clock important?

(Starfall.Math.MD.4.b) How do you identify a thermometer and its use?

(Starfall.Math.E.2) Why is making predictions important?

Enduring Understandings

Measurement processes are used in everyday life to describe and quantify the world.

Measurement can be described using words and numbers.

Objects have distinct attributes that can be measured.

Measuring identifies how long things are, how much they weigh and how much they can hold.

Temperature tells whether something is hot or cold.

People use measurement to sequence events

The choice of measurement tools depends on the measurable attribute.

Vocabulary

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

Analog

Heavier

Measure

Shorter

Capacity

Length

Pan Balance

Stop Watch

Digital

Lighter

Scale

Thermometer

Estimate

Longer

Seasons

Weight

Recommended Literature

Is a Blue Whale the Biggest Thing There is?
by Robert Wells

Is a Paw a Foot?: All About Measurement by Kris Hirschmann

Me and the Measure of Things by Joan Sweeny

Measuring Penny by Loreen Leedy

Millions to Measure by David M. Schwartz

Super Sand Castle Saturday by Stuart J. Murphy

Unit 13 Standards & Benchmarks

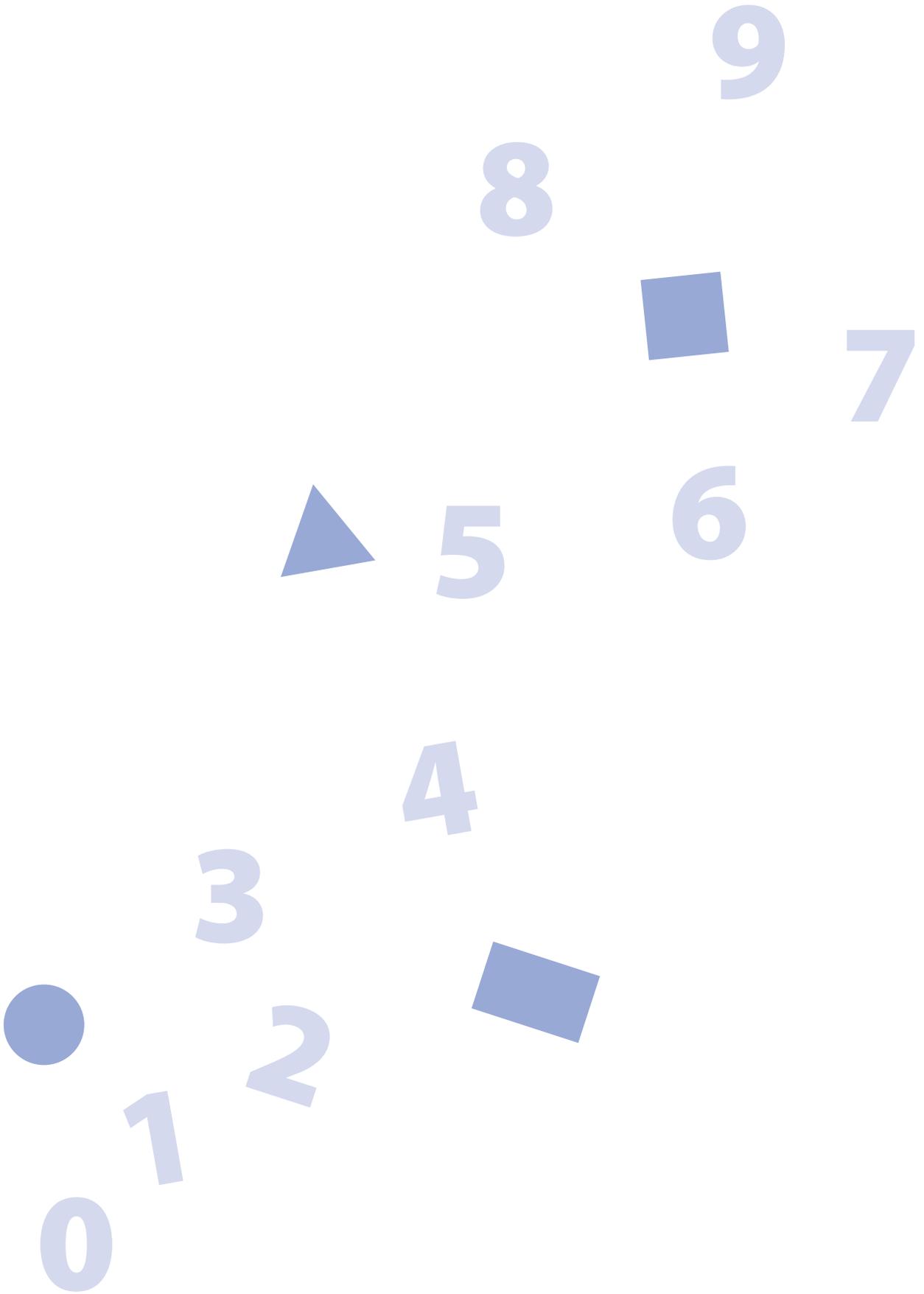
Progress on the following standards and benchmarks will be made through the course of this unit. For your convenience, applicable learning outcomes are listed alongside each lesson in summary form.

Starfall Standards

Counting & Cardinality	Measurement & Data
CC.1 Identify numerals out of sequence.	MD.1 Identify and use time measurement tools.
CC.4 Count to 100 by twos and by fives.	MD.4b Identify a thermometer and its use.
CC.5 Identify ordinal numbers.	

Common Core Standards

Counting & Cardinality	Inline Summary Form
A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	<i>Count forward from a given number.</i>
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.	<i>Say number names in order, pairing each object with one number.</i>
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.	<i>The last number counted tells the total number of objects.</i>
B.4c Understand that each successive number name refers to a quantity that is one larger.	<i>Each successive number refers to one more.</i>
Operations & Algebraic Thinking	Inline Summary Form
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.	<i>Solve word problems with addition and subtraction within 10.</i>
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 $5 = 4 + 1$).	<i>Decompose numbers less than 11.</i>
Measurement & Data	Inline Summary Form
A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	<i>Describe measurable attributes of objects.</i>
A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	<i>Compare two objects with a common measurable attribute.</i>
B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	<i>Classify, count, and sort objects.</i>



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 30 Summary

This week the children will be introduced to the concept of time and the importance of measuring time with calendars and clocks. They will compare and order events based on time and use appropriate vocabulary (days of week, months, yesterday, today, tomorrow). The first week of Unit 13 serves as a preview. Its emphasis is to identify the measurement of time. Mastery is not expected.

The children will also:

- Sequence events
- Recognize that a clock is used to tell time to the hour
- Distinguish the correct time measurement tool for a specific purpose

Preparation

DAY 1

Have the “Going to School” Sequence Cards available, and prepare sets of index cards by writing a numeral from 1 to 5 on each card. You will need enough sets for each child to have one numeral.

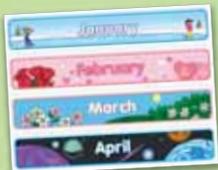
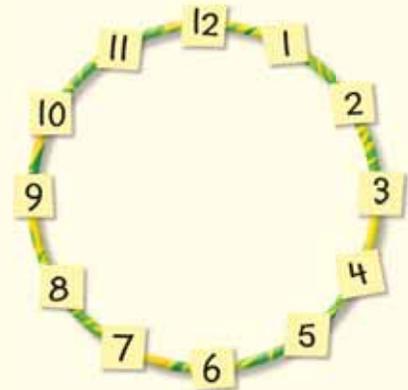
DAY 2

Duplicate a set of “Months of the Year” cards for use in today’s lesson.

Optional: Prepare a Hula Hoop with the numbers 1 through 12 attached around the rim to represent the hours on a clock.

DAY 3

Use the prepared Hula Hoop clock with numbers detached, and create construction paper hour and minute hands to fit inside. You may use a length of yarn and a large dot for the center to create a clock on the floor instead. You will also use a digital clock or the digital clock picture card.



DAY 4

The children will observe the numbers and spaces on a classroom (analog) clock.

You will use a clock, timer or stopwatch to designate a 20 minute time interval for the children to play. The children will use their math bags and math mats.

DAY 5

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

Activity Center 2 — Duplicate a “Washing the Dog - Sequencing Worksheet” and prepare a long strip of paper that will fit the six sequence boxes for each child.

Activity Center 3 — The children will create Kinderary calendars using *Backpack Bear's Math Workbook #2*, page 42. They will also need pencils, crayons, scissors and glue sticks.

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

Activity Center 5 — Prepare a copy of the Summative Assessment Checklist for Unit 13, Week 30. You will record your observations of the children showing times on a “clock.”



“Washing the Dog - Sequencing Worksheet”



Summative Assessment
Unit 13 - Week 30

DAY 1

DAY 2

Daily Routines

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

Magic Math Moment

Which takes longer?

Number order

Math Concepts

- Compare length of time to complete tasks
- Ways to measure time
- Determine which measuring tool to use
- Sequence numbers 1 – 5
- Sequence an event

- Concepts of time
- The Months of the Year
- Time order of days and months
- Numbers on a clock

Formative / Summative Assessment

Time concepts (longer and shorter)

Workbooks & Media

Math Melodies Track 15, "Months of the Year"

DAY 3

DAY 4

DAY 5

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

Learning Centers

60 Seconds in a Minute

Counting by fives (Increments on a clock)

Starfall.com:

- Monthly Calendar
- Geometry and Measurement: "Time,"
- Math Songs: "The Time Song," "Today is Monday," and "The Months of the Year"

1

Introduce Grandfather Clock (pendulum)

60 Minutes in an hour

Order of Numbers on a Clock

Hands on a clock

Introduce Hour Hand and Minute Hand

Use a clock, timer or stopwatch to measure play time

Types of clocks (digital and analog)

Estimate clean up time and compare to actual time (measured by a clock, timer or stopwatch)

Sequence an Event

"Washing the Dog" Sequencing Worksheet

2

Trace numbers and add hour and minute hands to a clock

Determine which activity takes longer

Calendar – Create a new month

Workbook p. 42



3

Math Melodies CD, Track 11

Workbook p. 41



Starfall.com: Math Songs, "The Time Song"

Teacher's Choice

4

Summative Assessment: Place hands on a clock and determine the time

5

Which Takes Longer?

Materials

- Estimate with Backpack Bear

Say: **Backpack Bear would like us to read some of his estimation book.** Indicate page 15, read the page and discuss it with the children. Repeat for page 19.

Say: **Let's play "Which Takes Longer?" Who can come to the front of the classroom and clap 10 times?** A volunteer does this.

Continue: **Who can walk from the front of the classroom to the back of the classroom?** A volunteer does this.

Ask: **Which takes longer? Raise your hand if you think it takes longer to clap 10 times.** (The children do this.) **Raise your hand if you think it takes longer to walk from the front of the classroom to the back of the classroom.** (The children do this.) **Let's try an experiment to find out which takes longer.**

Two volunteers perform the actions simultaneously. Discuss the results.

Choose two different volunteers, one with a short name and one with a long name. Repeat the above experiment having the two children write their names on a whiteboard at the same time. Discuss the results.

Counting & Cardinality

CC.5 - Identify ordinal numbers.

Measurement & Data

A.2 - Compare two objects with a common measurable attribute.

MD.1 - Identify and use time measurement tools.

Measuring Time

1 Ways to Measure Time

Say: **We have learned to measure how long objects are, how much objects weigh, and how much containers can hold. Today let's learn how to measure time.**

Indicate the Measuring Tools Cards displayed in a pocket chart.

Say: **These pictures each tell something about time.**

Discuss each Picture Card. Discussion questions might include:

- **For what do we use ____ ?**
- **How can a ____ help us?**
- **Can you find a ____ in our classroom?**

Materials

- Pocket chart
- Measuring Tools Cards: *digital clock, analog clock, watch, calendar, stopwatch*
- Prepared index cards
- "Going to School" Sequence Cards

2 Which Measuring Tool Would I Use?

Say: **Let's play "Which Measuring Tool Would I Use?" Listen carefully to the story then raise your hand when you know the answer to the question.**

Volunteers come to the pocket chart and hold the Picture Cards that represent the answers.

Say:

- **My friend's birthday is this month. I'm so excited! Which measuring tool would I use to count how many more days there are until my friend's birthday? Right, I would use a calendar.**
- **Coach would like to time us when we race to measure how fast we can run, but there are no clocks outside. Which measuring tool would Coach use to measure how fast we run? Yes, Coach would use a stopwatch.**
- **When the teacher says we have 1 hour before lunch, which measuring tool would we use to know when it is time for lunch? (clock or watch)**
- **You and your friend are going to the zoo. Your friend says you should wear something that tells what time it is. Which measuring tool would you wear? (watch)**
- **Which measuring tool would you use if you want a clock that has numbers and pointers or hands on it? (analog clock) **Note:** The children may select the correct clock without saying its name.**
- **Which measuring tool would you use if you want a clock that only has numbers on it and no hands that point to the numbers? (digital clock)**



3 Index Card Sequence Activity

Say: **Here are some index cards. Each index card has a number from 1 to 5 on it.**

Distribute index cards to five children and instruct them to stand in the front of the classroom. Continue: **Hold your index card so everyone can see it, and put yourselves in order from 1 to 5.** The children do this.

Touch each child on the head saying first, second, third, fourth, fifth.

Divide the remaining children into groups of 5 and distribute a set of index cards to each group. Say: **Place yourselves in order according to your numbers.**

When the children are in order, touch their heads as you and the class count the children in each group first, second, third, fourth, fifth.

Say: **Now exchange numbers with someone in your group and get in order again. The children do this and you count with the remaining children again.**

Gather the children and collect their index cards.



4 Sequence Event

Display the “Going to School” Sequence Cards in random order in a pocket chart. Identify and discuss each Sequence Card.

Say: **We do things in a special order. Think about what you do to get ready for school in the morning. Let’s put these Sequence Cards in the order we do these things to get ready for school.** Volunteers order the Sequence Cards.

Ask:

- **What would happen if you put on your shoes before you put on your socks?**
- **What if you went to school before you changed out of your pajamas?**

Allow the children time to imagine and enjoy discussing the consequences of performing these actions out of order.

If time allows, choose volunteers to take off one of their shoes and one sock to demonstrate what happens when they try to put the shoe on before the sock.

Ask: **What if you woke up at 9:00 but school started at 8:00?** (Volunteers respond.) **Right, you would be late! How could a clock help you get to school on time?**

Note: There is no formative assessment since this lesson is an overview.

Number Order

Materials

- Pointer

Say: **Let's take a look at the alphabet chart.**

- **Who can use the pointer to point to Aa?**
- **Who can point to Zz?**
- **Why could you find Aa and Zz so quickly?**

Explain: **Right, the letters in the alphabet are in order and you know that Aa is first, and Zz is last.**

Write the numbers 0-10 on the whiteboard. Ask:

- **Who can find the number 0? 10?** (Volunteers do this.)
- **Why were you able to find those numbers so quickly? Right, numbers come in order, too!**

Counting & Cardinality

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

Measurement & Data

MD.1 - Identify and use time measurement tools.

Concepts of Time

Essential Question: Why is a calendar or clock important?

Materials

- Math Melodies, Track 15
- Pocket chart
- Calendar Months Cards
- Classroom (analog) clock
- Optional: Hula Hoop with hour numbers attached
- Number Cards 1-12

1 Calendar

Say: **Lots of things come in a special order. We also do many things in a special order. Look at the calendar. What comes in a special order on the calendar?**

Explain: **The days of the week come in the same order every week. Let's name the days of the week in order together.** Do this.

2 Months of the Year

Say: **Something else on a calendar comes in a special order, the months of the year. Let's listen to this song. It will help us learn the months of the year in order.**

Play *Math Melodies*, Track 15, "Months of the Year." The children join in when they are asked to repeat the names of the months.

Indicate the Calendar Months displayed vertically in order in a pocket chart. Identify the months. Ask: **What do you see that helps tell the names of the months?** (words and pictures)

Say: **Let's play "I Spy." Ready? I spy the month when we celebrate Thanksgiving. Thanksgiving is a holiday that comes in the month of November. Say, November.** (Children repeat, *November.*) **Who can find the**



month of November? A volunteer does this. Classmates assist as needed.

Create "I Spy" questions for several other months.

Distribute the Calendar Months to 12 children. Say: **Let's work together to put the months of the year in order starting with January. Why should we start with January? Right, it is always the first month of the year. Raise your month card if you have January.** Continue until the months are sequenced. Classmates assist as needed.

If time permits (and you have enough children) redistribute the Calendar Months. Say the name of each month and instruct the children to arrange themselves in order.

Ask: **Why is it helpful to know the order of the months?** Children should understand that the order of the months is always the same. It repeats each year. This helps us anticipate and plan for birthdays, summer vacation, and holidays.

3 Numbers on a Clock

Draw a clock on a whiteboard or indicate the classroom clock or the Hula Hoop with the numbers 1 through 12 attached. Say: **Numbers on a clock have a special order too.**

Say: **The numbers on a clock tell us what time it is. What numbers do you see on the clock? Right, you see the numbers 1 through 12.**

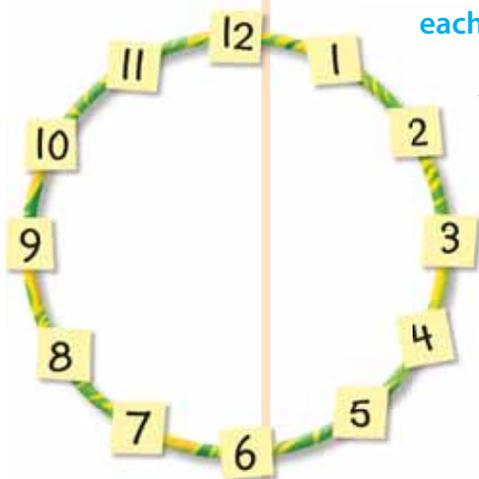
Distribute Number Cards 1-12 to volunteers. Say a number, and the child holding it matches it to the number on the clock. Repeat until each child has a turn.

Say: **Each number on a clock stands for an hour. Let's start at 1:00 and count how many hours are on the clock.** Do this.

Continue: **There are 12 numbers or 12 hours on the clock, but there are 24 hours in a day. How is that possible? (Volunteers respond.) Right, the hour hand on a clock points to each number 2 times every day.**

Continue: **Let's count the numbers starting at 1:00, but this time we will count them 2 times because the hour hand has to go around the clock 2 times each day to equal 24 hours.**

Ask: **How do you know if it is 10:00 in the morning or 10:00 at night? (Volunteers respond.) Exactly, in the morning it is light outside and at night it is dark.**





Formative Assessment

Longer or Shorter?

Partner the children and ask the following questions. Allow time for the partners to discuss their answers. At your signal, volunteers raise their hands to answer.

Ask:

- Which is longer, a day or a week?
- Which is shorter, a month or a day?
- Which is longer, a month or a year?
- Which is shorter, a minute or an hour?
- Which is longer, an hour or a day?
- Which is shorter, a minute or a year?

60 Seconds in a Minute

Indicate *Nursery Rhymes*, page 17. Encourage the children to say “Hickory, Dickory, Dock” along with you. Play *Math Melodies* CD Track 11 and sing the song together.

Indicate the picture of the clock on page 17. Say: **This is a grandfather clock. What do you see on this clock? (Volunteers respond.) The part that moves back and forth every second on this clock is called a pendulum. Say, pendulum.** (Children repeat, *pendulum*.)

Continue: **Each time the pendulum moves 60 times, a minute has passed. That tells the “big” or minute hand, when to move. Let’s count to 60 together.**

Instruct the children to watch the seconds hand on the classroom clock as they count to 60.

Say: **It took us about a minute to count to 60.**

Note: If the pendulum explanation is too confusing you may omit it.

Materials

- Starfall’s Selected Nursery Rhymes*, page 17
- Math Melodies* CD, Track 11

Measurement & Data

MD.1 - Identify and use time measurement tools.

Numbers on a Clock**1 Numbers on a Clock**

Draw a large circle on a whiteboard to represent a clock, or indicate the Hula Hoop or yarn circle.

Say: **We talked about the 12 numbers on a clock. On every clock, the 12 numbers are always in the same order.**

Place the 12 Number Card at the top of the circle, and distribute Number Cards 1-11 to volunteers.

Say: **Let’s create our own clock. Who has Number Card 1?** The child with Number Card 1 comes forward and places it in the proper place on the clock with your direction if necessary. Repeat for the numbers 2-11.

Materials

- Hula Hoop clock (with numbers detached) or length of yarn to create a clock on the floor
- Number Cards 1-12
- Hour and minute hand to fit inside the hula hoop or yarn circle
- Large construction paper dot for the center of the “clock”
- Digital clock or Digital Clock Picture Card
- Backpack Bear’s Math Workbook #2*, page 41
- Pencils

2 Hands of a Clock

Ask: **Who knows what is missing on this clock?** (Volunteers respond.)

Right, the clock needs two hands.

Draw or place a large dot in the center of the clock. Explain: **The hands on a clock are like pointers. They point to numbers. Each hand has a different job.**

Indicate the minute hand. Say: **The big hand has the hardest job. It is called the minute hand. Say, *minute hand*.** (Children repeat, *minute hand*.) **It moves around the clock every minute of every day. Maybe that is why the minute hand is the biggest!**

Place a minute hand on the clock pointing to 12.

Say: **The shorter or smaller hand is called the hour hand. Say, *hour hand*.** (Children repeat, *hour hand*.) **It moves from number to number every hour.**

Place an hour hand on 1.

Say: **The hour hand is pointing to 1. That means it is 1 o'clock. Who can move the smaller, or hour hand, to 2?** (A volunteer does this.) **Now it is 2 o'clock.**

Mix the numbers and the children continue to move the hour hand to represent the corresponding time.

3 Different Types of Clocks

Indicate the digital clock or digital clock Picture Card.

Say: **Here is another kind of clock. It shows time a different way. Lead the children to discuss how this clock is both like the clock they just created and how it is different.**

Explain: **This is called a digital clock. Say, *digital*.** (Children repeat, *digital*.) **On a digital clock the hour is displayed first, followed by the minutes.**

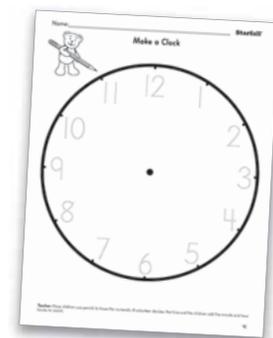


Formative Assessment

Draw a Clock

Distribute *Backpack Bear's Math Workbook #2* and instruct the children to turn to page 41. Say: **Use your pencil to trace the numerals.**

When they have finished tracing, a volunteer decides on a "time" (hour) for the clock. Draw a clock on the whiteboard and model the time by adding a minute hand first and then the hour hand. The children copy the clock on their workbook pages.



Counting By Fives

Materials

- Classroom clock
- Pointer

Indicate the classroom clock. Say: **We have learned that there are numbers on a clock. Let's name the numbers.** Use a pointer to indicate the numbers as you identify them.

Say: **Look at the space between the numbers. There are 4 little dots between each number, so when the minute hand goes from one number to the next, 5 minutes have passed. Let's count by fives to find out how many minutes pass as the minute hand goes from the 12 back around to the 12 again. Ready?** Count by fives as you point to each number.

Ask: **How far did we count? Right, we counted to 60! There are 60 minutes in 1 hour. Do you think it is faster to count each minute one at a time or to count by fives?**

Counting & Cardinality

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

Measurement & Data

MD.1 - Identify and use time measurement tools.

Hands on the Clock

Materials

- Bell or other signal
- Clock, timer, or stopwatch
- Math bags, math mats

1 Review Time

Project *Starfall.com*: Math Songs, "The Time Song," or navigate a classroom computer to the website, and have the children gather around it. Play the song once while the children listen. Play the song again and encourage them to sing along.

2 Play!

Distribute math bags and math mats to the children.

Say: **Today we are going to play! You will use your math mats and the materials in your math bags. Think of different activities or games you can play. You can even find other children to play with.**

Continue: **Let's see what time it is. It's (current time). You can play for 20 minutes. How will we know when 20 minutes is up?**

Explain that they can use the classroom clock to see what time play time starts and what time it will be 20 minutes later.

Write the time play will end on the board. Say: **At the end of 20 minutes you will hear a signal to stop and freeze.** Walk around the classroom to observe and assist if needed as the children play for 20 minutes. At the end of 20 minutes give the signal to stop.

3 Estimate Clean Up Time

Say: **Now we will estimate how long you think it will take you to clean up and come back to your places. Who can estimate how many minutes it will take to clean up?** Volunteers respond.

Write the estimates on a whiteboard. Say: **I will time you using a (clock, timer, or stopwatch). Remember, this is not a race to see how fast you can clean up. We want to see how long it takes for you to clean up nicely! Ready? Begin cleaning.**

Discuss the actual amount of time it took to clean up and compare it with the estimates.



Formative Assessment

Which Would Take Longer?

Say: **Listen to the names of two activities. Think about which of the two activities would take a longer time to do and which would take less time to do. Ready?**

Give the following choices, and the children determine which activity takes longer and which activity takes less time. They explain their answers.

Ask: **Would it take longer to...**

- **Clean up your bedroom or pick up a book**
- **Eat lunch or put on your pajamas**
- **Go to the zoo or play a game at home**
- **Write your name or write a story**

Discuss why it is important to know approximately how long an activity will take to complete.

Learning Centers

1 Computer

The children explore:

- Monthly calendar
- Geometry and Measurement: "Time"
- Math Songs: "The Time Song," "Today Is Monday," "The Months of the Year"

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

Materials

- Computers navigated to *Starfall.com*

2 Sequence an Event

The children cut apart the "Washing the Dog" sequencing worksheets and glue the boxes in order on long strips of paper. Then they color the pictures.

Materials

- "Washing the Dog" sequencing worksheet for each child
- Long strip of paper that will fit the 6 sequence boxes
- Pencils, crayons, scissors, glue

3 Create a New Month

The children get *Backpack Bear's Math Workbook #2* and turn to page 42. They cut apart the days of the week on the Kinderary page and glue them in the empty spaces at the top of the calendar.

The children trace the numbers and draw a picture to represent the month of "Kinderary."

Materials

- Backpack Bear's Math Workbook #2*, page 42
- Pencils, crayons, scissors, glue

4 Teacher's Choice

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

Counting & Cardinality

A.2 - Count forward from a given number.

Measurement & Data

MD.1 - Identify and use time measurement tools.



5 Summative Assessment

Place the minute hand in the Hula Hoop or yarn circle to point to the number 12. The children take turns to place the hour hand inside the Hula Hoop or circle pointing to another number. The others guess the time shown on the clock.

Observe the children as they play, and record your observations on the Summative Assessment Checklist for Unit 13, Week 30.

Materials

- Hula Hoop or yarn circle with numbers 1-12
- Minute hand (pointing to the number 12)
- Hour hand
- Summative Assessment Checklist for Unit 13, Week 30



Week 31 Summary

This week the children will be introduced to a variety of thermometers and learn the purpose for each. They will discover the various things that can be measured with thermometers. The children will review which people use specific measurement tools.

The children will also:

- Differentiate and make connections between hot and cold temperatures
- Classify items as hot or cold
- Review more than and less than
- Relate changes in a thermometer to changes in temperature

Preparation

DAY 1

How hot or cold is it? -----

Prepare a sentence strip that reads: How hot or cold is it?

You will need a cup of ice and a cup of room temperature to warm water.

DAY 2

Today you will use a Classroom ten-frame, red and blue magnets and a circle magnet. You will also use a large thermometer image, Four Seasons Cards, and Thermometer Picture Cards.



DAY 3

Prepare word cards: Body Temperature, Outdoor Temperature and Food Temperature. You will also need a dot magnet, a bag or a basket, a large thermometer and Temperature Scene Cards.

DAY 1

DAY 2

Daily Routines

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

Magic Math Moment

Counting by fives

How many make ten?

Math Concepts

Introduce *Thermometers*
 Measure temperature
 How hot or cold?
 Classify items as hot or cold
 Tools that measure temperature

Determine the number needed to total ten
 Review *Thermometers*
 Temperature in different seasons
 Reading a thermometer

Formative / Summative Assessment

Classify objects as hot or cold

Discuss Temperature Picture Cards/sequence coldest to hottest

Workbooks & Media

Workbook p. 43



DAY 3

DAY 4

DAY 5

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

Learning Centers

Thermometer "I Spy"

More than/less than riddles

Measurement Center/Activity Ideas

1

Uses of thermometers
Kinds of thermometers (food, candy, body temperature)

Solve more than and less than story problems
Measurement review
Match measuring tools to people who use them

Length/Height – Measure each other, order shortest to longest, order by hair length

2

Temperature Scene Picture Cards (Identify Scene and Changes in Temperature, and Categorize)

Groups determine measuring tool needed and explain why

Capacity – Predict capacity of a variety of containers

3

Weight – Weigh objects on different scales and compare, categorize items as heavier and lighter

4

Summative Assessment: Overview of measurement – explain how measuring tools are used

5

2 Hot and Cold

Introduce a cup of ice and a cup of warm water.

Ask: **Which cup is colder, or has a lower temperature?** Provide an opportunity for the children to feel the difference in the temperatures of the cups.

Draw 2 columns on the whiteboard and label one column “hot” and the other column “cold.”

Ask: **Does chicken noodle soup belong in the hot column or the cold column? To which column does ice cream belong?**

Volunteers suggest additional items to add to the list. Suggestions include: hot chocolate, French fries, yogurt, and pizza.

3 Categorizing Picture Cards

Display the Thermometer Picture Cards in a pocket chart. Discuss how each tool measures temperature. Remove the Picture Cards and mix them together with the other Measuring Tools Cards.

Display all of the Measuring Tools Cards and Thermometer Picture Cards face down in a pocket chart.

Say: **Let’s play a game. Here are pictures of all the tools we use to measure. Let’s see if we can find the pictures of the tools that measure temperature.**

A volunteer reveals a Picture Card. The class gives a thumbs-up if it can be used to measure temperature, or a thumbs-down if it can’t. The volunteer chooses the next volunteer and play continues until all of the Picture Cards have been revealed.

Optional: Use all of the Thermometer Picture Cards and as many or as few of the other Measuring Tools Cards as you would like. It is not necessary to use all of the Measuring Tools Cards.



Formative Assessment

Classify Hot or Cold

Distribute *Backpack Bear’s Math Workbook #2* and instruct the children to turn to page 43. The children will cut out the pictures of objects and glue them in the appropriate columns.

When they have finished, discuss which objects they classified as hot and which ones they classified as cold.



How Many to Make Ten?

Display a Classroom ten-frame on a whiteboard with 6 red magnets on it.

Ask: **How many blue magnets should we add in order to have a total of 10?** (Volunteers respond.) **Right, 4. Let's try it to see if we are correct.**

Choose a volunteer to add blue magnets as the class counts. Another volunteer writes the equation that represents the ten-frame ($6+4=10$).

Remove the magnets and place 3 red magnets in the ten-frame.

Ask: **How many blue magnets should we add in order to have a total of 10?** Volunteers respond. Choose a volunteer to add blue magnets as the class counts. Another volunteer writes the equation that represents the ten-frame ($3+7=10$).

Repeat with other combinations of 10.

Materials

- Classroom ten-frame
- Red and blue magnets

Counting & Cardinality

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

Operations & Algebraic Thinking

A.3 - Decompose numbers less than 11.

Measurement & Data

MD.4b - Identify a thermometer and its use.

Temperature and Seasons**1 Review Thermometers**

Review *Thermometers* by having the children identify each time they see a thermometer as you page through the book. Discuss the type of temperature each thermometer measures; air temperature, body temperature, food temperature, etc.

Say: **One kind of thermometer in this book measures air temperature. Air temperature doesn't stay the same all the time. It changes, and that's what causes the four seasons.**

2 Temperatures in Different Seasons

Display the Season Picture Cards on a whiteboard. As you ask the following questions, write the children's responses under the corresponding Picture Card.

Ask:

- **What does the temperature feel like in the fall?**
- **What kind of clothes might you wear in the fall?**

Repeat for winter, spring, and summer.

**Materials**

- Thermometers* by Steven Schutz
- Four large Seasons Picture Cards
- Large thermometer
- Circle magnet
- Thermometer Picture Cards

3

Reading a Thermometer

Indicate the large thermometer displayed on a whiteboard.

Say: **When it gets warmer the temperature goes up.** Illustrate this by moving the magnet to the top of the thermometer.

Say: **When it gets colder the temperature goes down.** Illustrate this by moving the magnet to the bottom of the thermometer.

Say: **Temperature changes during different times of day, too. Would the temperature be higher at lunchtime or bedtime? Why?**



Formative Assessment

What's the Temperature?

Divide the class into groups of 3. Distribute a Thermometer Picture Card to each group. Explain that each Picture Card has a scene and a thermometer displaying the temperature. The groups discuss what is happening in the pictures and what the temperatures are.

Give a signal to end the discussion. Each group:

- Presents its Picture Card to the class and explains what is happening.
- Reports the temperature.
- Moves the magnet to the corresponding temperature on the thermometer.

Collect the Thermometer Picture Cards as each group presents.

Line up the Thermometer Picture Cards in random order in a pocket chart. The children help sequence the cards from coldest to hottest.



Thermometer “I Spy”**Materials**

-
- Large thermometer

Indicate the large thermometer. Say: **Let’s play thermometer “I Spy.” Ready? I spy 40.** A volunteer points to the 40 on either side of the thermometer.

Repeat for several other numbers including negative 10 and negative 20.

Counting & Cardinality

CC.1 - Identify numerals out of sequence.

Measurement & Data

MD.4b - Identify a thermometer and its use.

Using Thermometers**Materials**

-
- Thermometers by Stephen Schutz
-
-
- Temperature Scene Cards
-
-
- Bag or basket
-
-
- Large thermometer
-
-
- Dot magnet
-
-
- Pocket chart
-
-
- Word Cards:
- Body Temperature, Outdoor Temperature, Food Temperature*

1 Uses of Thermometers

Say: **When we cook certain foods like ham or turkey, we need a cooking thermometer to tell when the food is cooked, or hot enough and safe to eat. What are some foods we need to cook to a hot temperature before we eat them?**

Refer to *Thermometers* page 19.

Choose a volunteer to move the dot magnet on the large thermometer to show what the thermometer would read for hot foods.

Say: **We use thermometers when we make candy, too. Most candy starts out as liquid and cools to a temperature that determines how solid the candy will be when it is done.** Give examples. (chocolate bars, caramels, fudge, hard candy)

Continue: **A thermometer also tells how cold things are. Many foods need to be kept cold in order to be safe to eat. That is why we keep foods in the refrigerator and freezer. What are some of those foods?**

2 Finding the Temperature

Choose a volunteer to move the dot on the thermometer to represent the thermometer reading for cold foods and then for frozen foods.

Ask: **What would happen to the temperature of ice cream if we did not keep it in the freezer?** A volunteer moves the dot on the thermometer.

Continue: **How do you think the ice cream would look if that happened? Right, it would melt!**

Refer to *Thermometers* page 15. Ask: **Can you think of a time when you have seen a thermometer like these?**

Explain: **This kind of thermometer can tell how hot or cold your body is. When you go to the doctor, the nurse might take your temperature. Or when you are sick, a grown up can take your temperature. When your temperature is over 98.6 it means that you have a fever and you might be sick.**

Display the large thermometer on the whiteboard.



Formative Assessment

Temperature Scenes

Say: **Let's play a game.**

Place the Temperature Scene Cards (iceberg, desert, 2 people at window, 2 boys in water, boy in boat) in a bag or basket.

Select volunteers to choose Temperature Scene Cards. The volunteers:

- Identify the scene and decide approximately what temperature it might be.
- Move the dot magnet up or down the thermometer to correspond to the change in temperature.

Note: ALL of the Temperature Scene Cards will be used for this activity.

Place the Word Cards: *Body Temperature*, *Outdoor Temperature*, and *Food Temperature* in the pocket chart, creating column headings.

Indicate each Temperature Scene Card individually. Volunteers place the cards in the correct columns and explain their choices.



More Than/Less Than Riddles

Materials

 None

Say: **Listen to these riddles then raise your hand if you know the answer.** Select a volunteer to answer each riddle and the class confirms. Volunteers may draw pictures on the whiteboard to solve the problems or check their answers.

Volunteers may draw pictures on the whiteboard to solve the problems or check their answers.

- **A friend had 5 apples. She lost one apple on her way home. How many is 1 apple less than 5 apples?**
- **It's Ben's birthday and he got 7 presents. Then a friend came and gave Ben one more present. How many is one more present than 7 presents?**
- **Jill had 10 cans of food. She gave one of the cans of food away. What is one can less than 10 cans of food?**
- **Backpack Bear put 8 pennies in his honey jar. His mom gave him one more penny to add to his honey jar. What is one more penny than 8 pennies?**

Operations & Algebraic Thinking

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

Measurement & Data

A.1 - Describe measurable attributes of objects.

MD.1 - Identify and use time measurement tools.

MD.4b - Identify a thermometer and its use.

Measurement Review

Materials

- Pocket chart
- Measuring Tools Cards
- People Who Measure Cards
- Measurement Sentence Strips

Essential Question: How can we use measurement to describe and compare objects?

1 Review People Who Measure

Say: **We have learned about tools we use to measure. Today let's talk about the people who use those tools.**

Display the People Who Measure Cards in a pocket chart.

Say: **These people must know how to measure to do their jobs. Look closely at the pictures. We see...**

- **Someone who sews and makes clothes**
- **A construction worker building something**
- **A man weighing a box to get it ready to mail**
- **A doctor weighing a baby**
- **A man packing things inside a box**
- **A coach timing some runners**
- **A little girl waking up for school**
- **A mom taking her children's temperatures**

- A meteorologist telling us what kind of weather we will have
- A dad cooking with his children

Continue: **I wonder which measuring tools these people need to do their jobs?**

Discuss which measuring tool each person would use.

2 Sentence Strip Activity

Display the 5 Measurement Sentence Strips.

Ask: **Do the people need to know...**

- how tall or long something is?
- how much something weighs?
- how much something will hold?
- what time it is?
- how cold or hot something is?

How tall or long is it? -----

How much does it weigh? -----

How much will it hold? -----

What time is it? -----

How hot or cold is it? -----



Formative Assessment

Which Measuring Tool?

Divide the class into 10 groups and distribute a People Who Measure Card to each group. The children discuss what is happening in the picture. They tell which measuring tools might be needed and explain why.

Gather the children together around the pocket chart.

Randomly place all the Measuring Tools Cards in the pocket chart.

Each group explains its Picture Card to the class. They choose the Measuring Tools Card that depicts the tools the person might use.

1 Measurement Center Activity Ideas

Rather than creating the traditional learning centers for **Day 5**, you will find a list of activities and centers you may incorporate to review the Measurement Unit.

Materials

- Computers navigated to Starfall.com

Measurement & Data

A.1 - Describe measurable attributes of objects.

MD.1 - Identify and use time measurement tools.

2 Length/Height

- The children measure each other from head to toe using yarn as the nonstandard form of measurement. They label index cards with their partner's names. The children use tape to attach the index cards to the pieces of yarn.

When the children have completed this activity, lay out the yarn pieces side-by-side on the floor. The children help order them from shortest to longest.

If possible, hang the yarn pieces from the ceiling or display them on a bulletin board.

- Discuss the children's hair length. Select several volunteers to stand in the front of the classroom. Another volunteer arranges the children in order from the shortest hair to the longest hair. If two children have the same hair length, they stand together. Repeat as time allows.

Materials

- Yarn
- Index card
- Pencil
- Scissors
- Tape

3 Capacity

Note: Consider setting up several different centers using a variety of containers.

The children make predictions about how many containers of a chosen material will fill a specific container. They write their predictions on sticky notes. The children work together to fill the container then compare the actual number of containers of materials to their predictions.

The children experiment, pouring and measuring different items using a variety of containers.

Materials

- Containers of different materials (rice, pasta, beans, etc.)
- Funnel
- Empty tubs
- Containers of different sizes
- Sticky notes

4 Weight

- The children weigh different items in a variety of ways. For example, if you have a food scale or bathroom scale, the children choose an item to weigh. They weigh it on the food scale or bathroom scale and record the number. They weigh the same item on a balance scale using cubes, and compare the two numbers.
- The children lay out the Word Cards heavier and lighter. They choose two items to hold in their hands then determine which item is heavier or lighter and place it under the correct heading. Encourage the children to take several items from one column and weigh them again to see which of the 2 heavier items is the heaviest.

Materials

- Different weighing tools such as a pan balance and scales
- Items to weigh
- Cubes
- Collection of classrooms items
- Word Cards: heavier, lighter

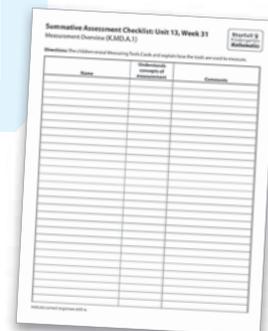
5 Overview of All Measurement

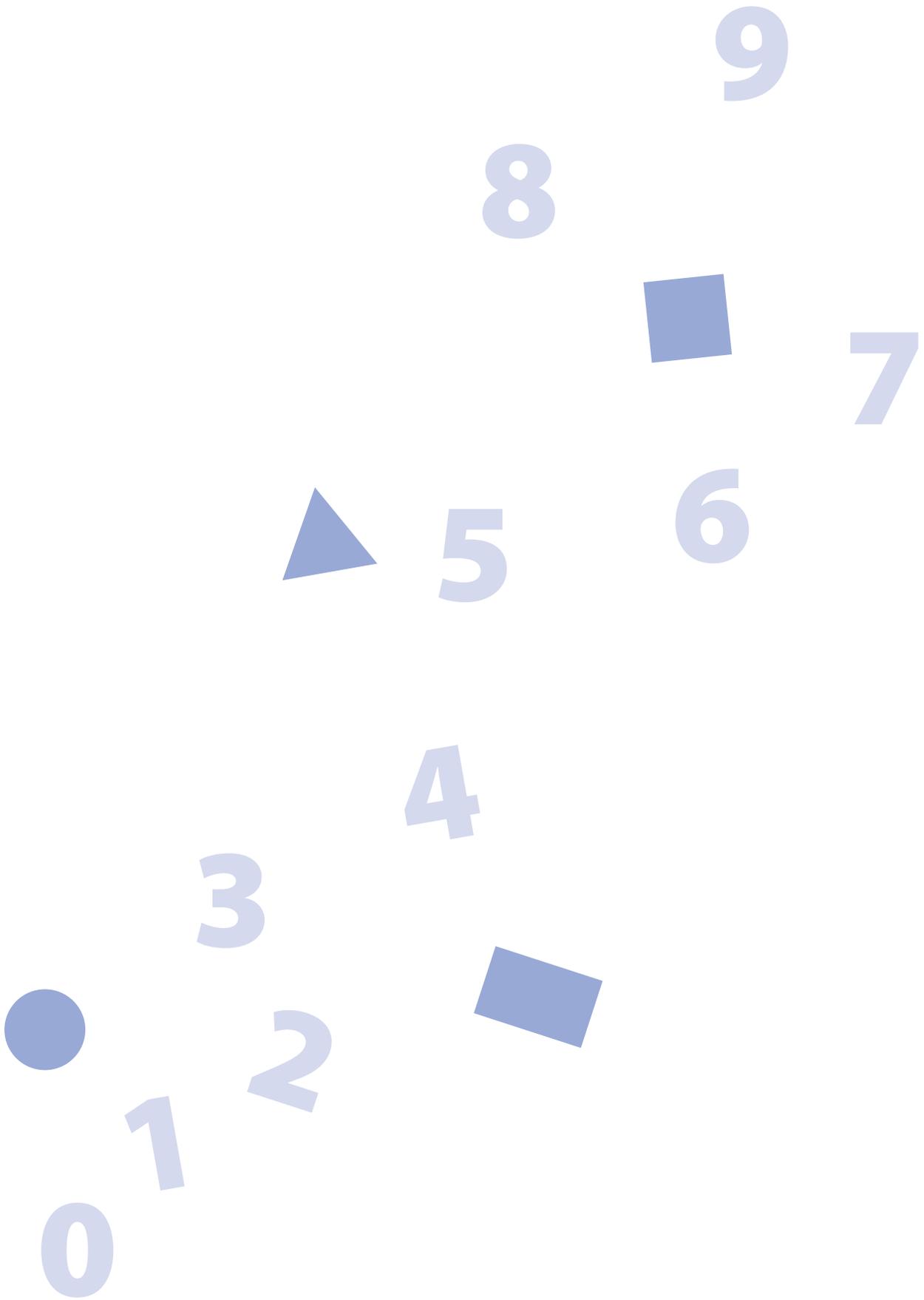
Place all of the Measuring Tools Cards face down in a deck. The first child spins, but before he or she can move his or her playing piece, the player reveals a card and tells how that measuring tool is used to measure. (Example: That would measure how much something weighs.)

Observe the children and record your observations on the Summative Assessment Checklist for Unit 13, Week 31.

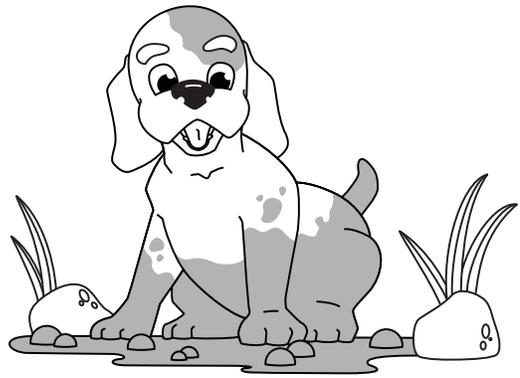
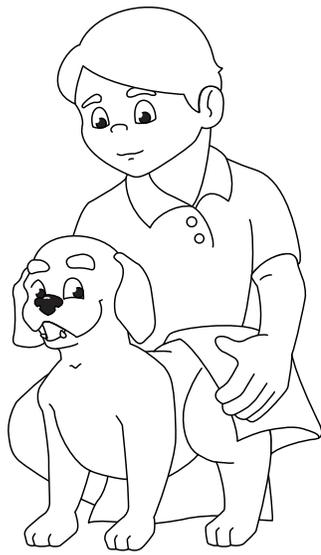
Materials

- "A Walk in the Park" Game Board
- Measuring Tools Cards
- Spinner with numbers
- Playing pieces
- Summative Assessment Checklist for Unit 13, Week 31





Washing the Dog - Sequencing Worksheet



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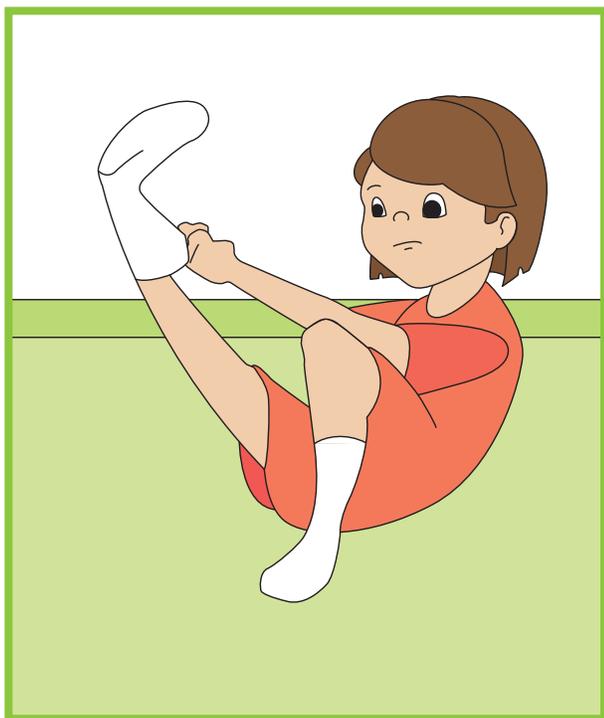


Teacher: Have children cut out the 5 pictures, then color them and glue them onto a paper in the correct sequence.

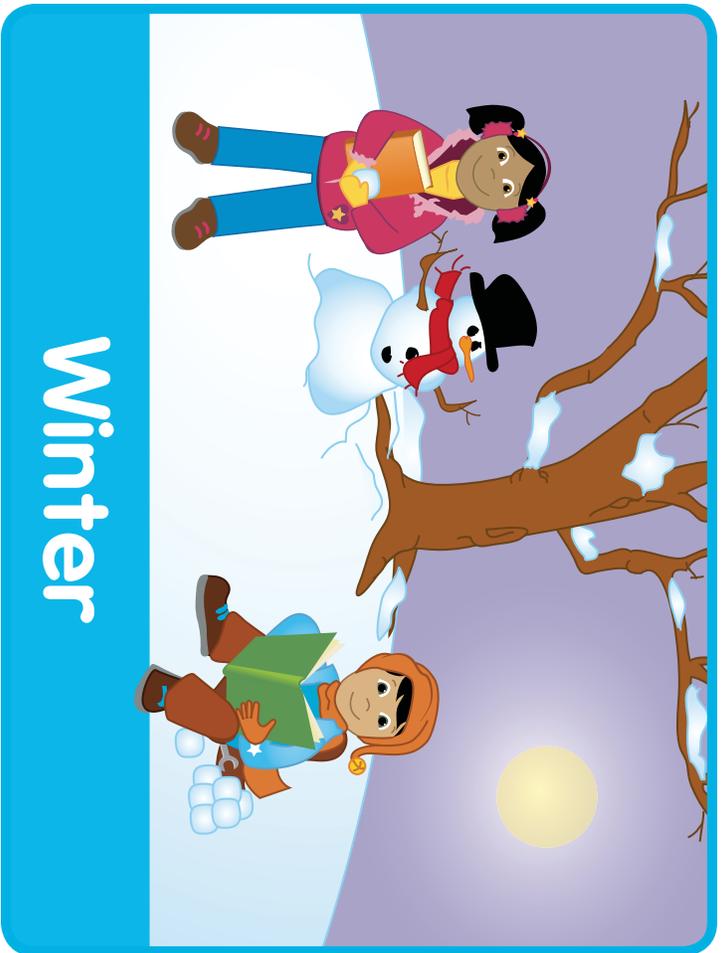
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Kindergarten
Mathematics

Sequence Cards
**Going To
School**

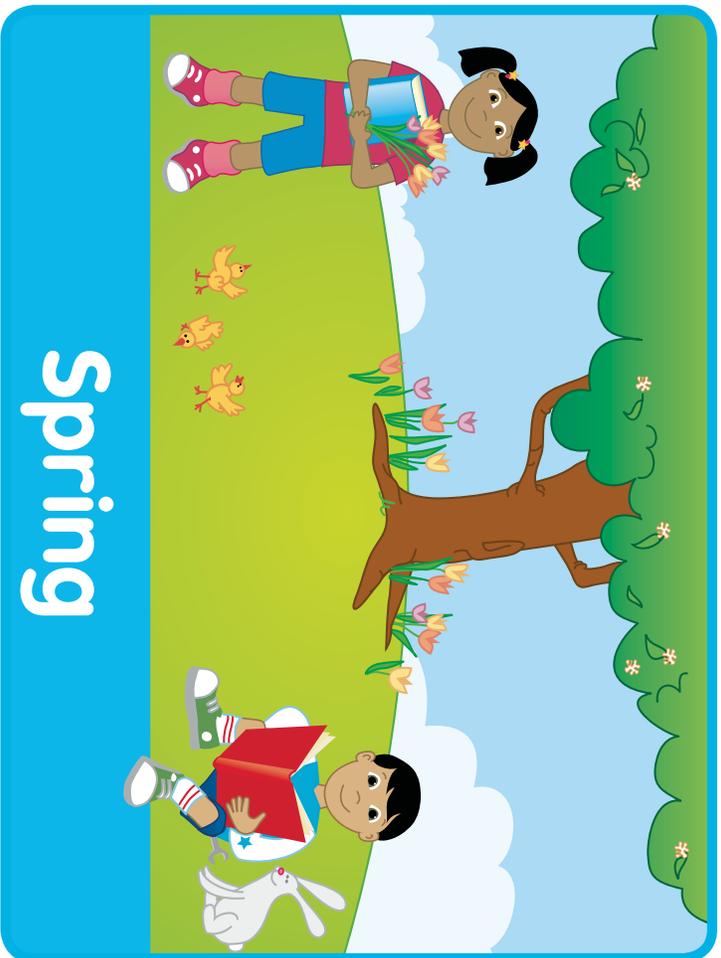
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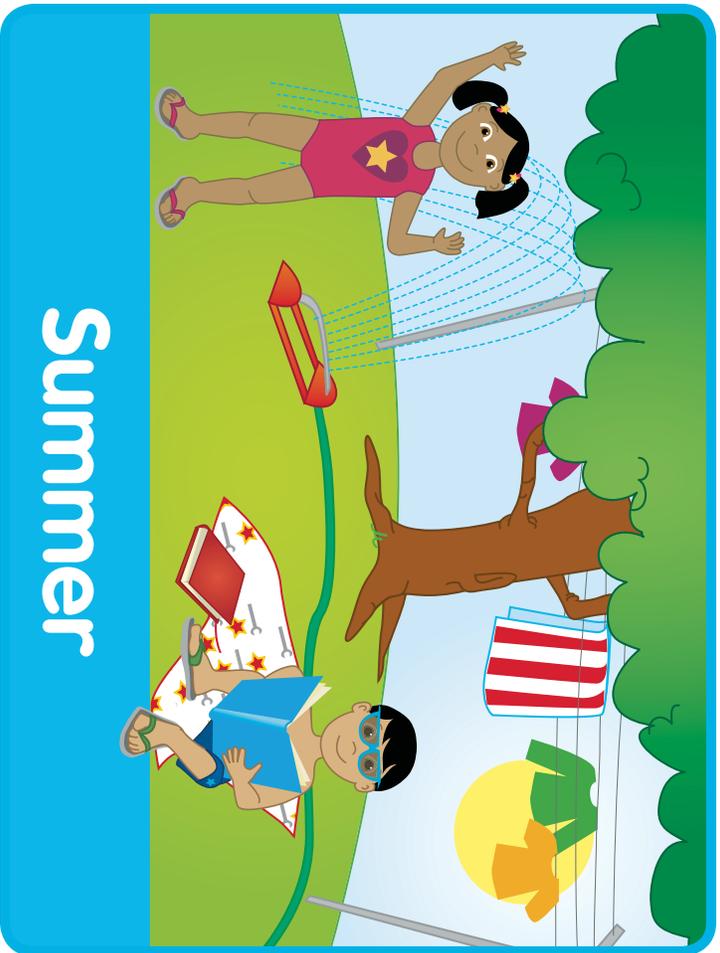




Winter



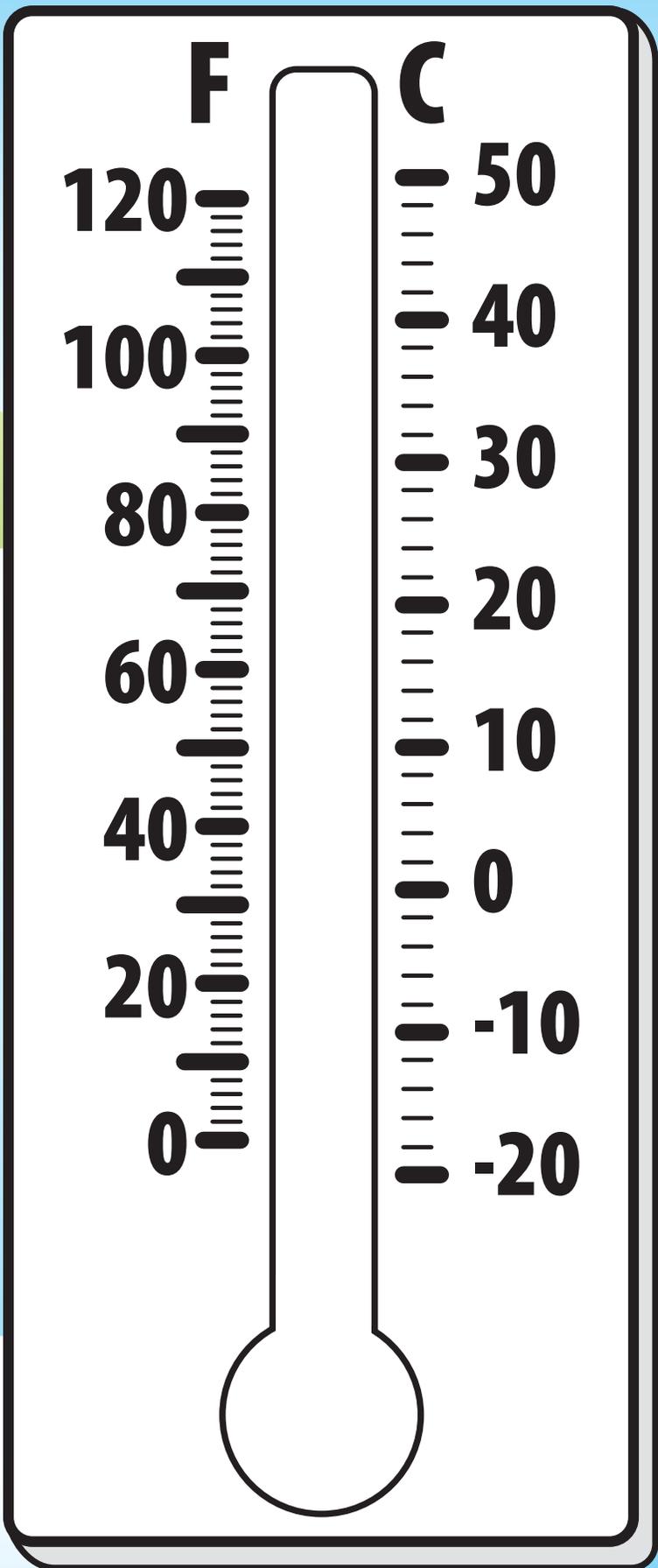
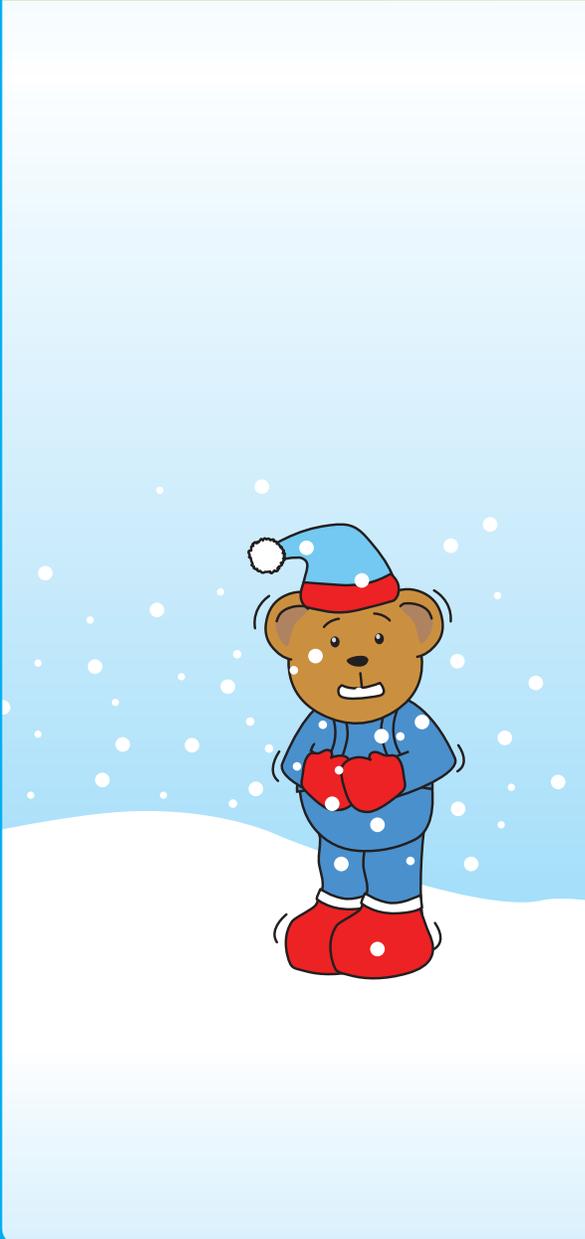
Spring

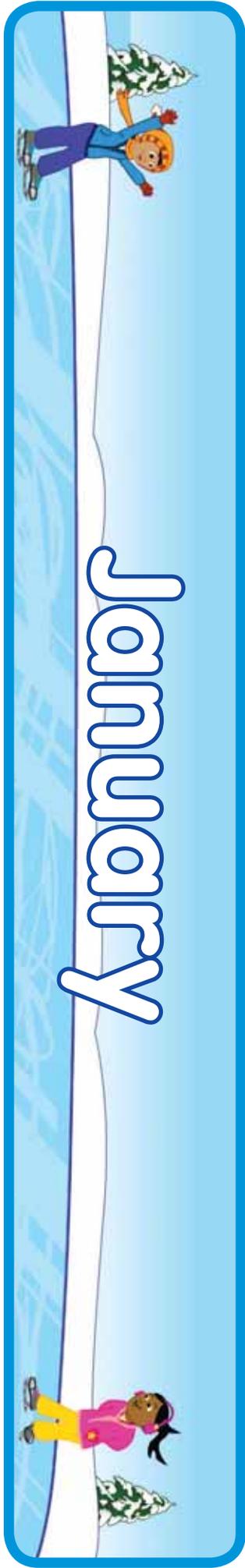
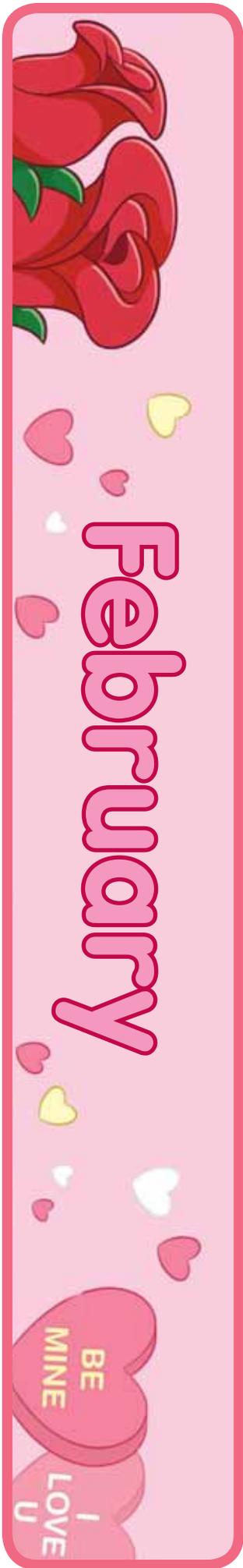
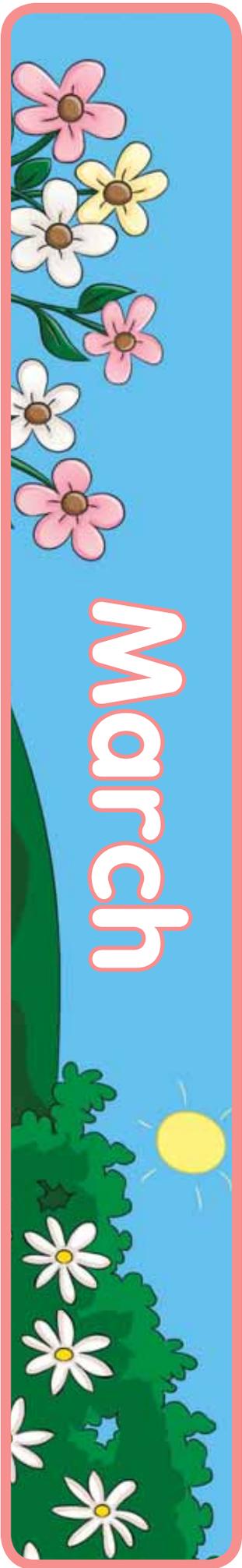


Summer



Fall







August



July



June



May



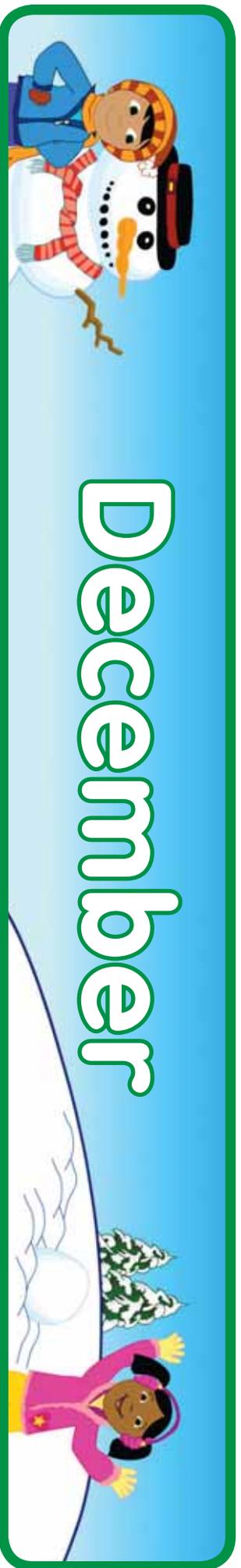
September



October



November



December