

**Lesson By Lesson Guide
Comparing and Measuring
(STC)**

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NC Essential Standards and Clarifying Objectives

An excerpt from the *Science as Inquiry Statement*, which accompanies the K-2 NC Essential Standards for Science:

“Students develop simple skills of observation, measurement and number sense as they actively participate in simple investigations. During investigations, students must have the opportunity to use tools such as magnifiers, thermometers, rulers, or balances to gather data and extend their senses. They must have ample time to talk about their observations and compare their observations with those of others. They should be encouraged to employ oral language, drawings and models to communicate results and explanations of investigations and experiments. In a cooperative learning environment, students learn that when people give different descriptions of the same thing, it is better to make new observations instead of debating who is correct. Students must always use appropriate safety procedures, including listening skills, when conducting simple investigations.”

For the purposes of Power Teacher Gradebook, please note SI refers to the *Science as Inquiry Statement*:

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

1.SI.1.4 Understand different calibrated devices may be used to measure distances and the lengths of objects of different sizes and shapes.

Essential Question for the Unit

How can we use measurement to compare likenesses and differences?

Pre-Unit Assessment

A formative assessment probe is not correlated to this unit however; Lesson 1 is a pre-unit assessment opportunity.

Lesson 1: Pre-Unit Assessment: Comparing How We Are Alike and Different

Students will discuss what it means to compare and measure as they observe each other to identify their similarities and differences, discuss and record their observations, and make comparisons using everyday objects.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

Focus Questions

How are we alike and different?

How can we measure our likenesses and differences?

Activity	Guiding Questions
<ul style="list-style-type: none">• Pair students with a partner and prompt students to observe and discuss how they are alike and different.• After a given amount of time, ask students to share their observations and complete the class chart "Ways We Are Alike and Different."• Prompt students to discuss their measurement tools as well.	<ul style="list-style-type: none">• When have you compared before? When have you measured before?• How did you compare? How did you measure?• Why were you comparing? Why were you measuring?• In what ways are you and your partner alike? Different?• Did you use any materials from the distribution center to help make comparisons? How did these materials help you make comparisons?

Science Content Words

Use these words when teaching the lesson:

-alike/similar

-different

-compare

-match

Integration Hints

- Students can look through magazines for pictures of familiar objects to group together by likenesses and differences.
- Students may also bring in pictures of their own families to compare and contrast.
- The class can maintain a height chart throughout the year to chart growth and compare and contrast student height.

Science Notebook Helper

Attach Record Sheet 1-A to science notebook.

Assessment Opportunities

This lesson is a pre-assessment of the knowledge students have of comparing and measuring. Use the science notebook activities to help you gauge a better understanding of each student's prior knowledge of content as well as the knowledge acquired through the lesson. Be sure to observe students throughout the lesson.

Lesson 2: Let's Make Body Cutouts

Students will build on their experiences in describing likenesses and differences from the first lesson as they continue to recognize various tools used for comparing and measuring. Students will trace each other to make body outlines, cut them out, compare similarities and differences among themselves using the cutouts, and arrange the cutouts in order from shortest to tallest.

*This lesson may take 2-3 class sessions of about 30 minutes each. Students may need to complete the drawings and cutouts during one session and complete the actual comparison discussion in following sessions. You may find it helpful for adult volunteers or responsible students from upper grades to assist with tracing and cutting the student cutouts. Consider grouping the cutouts in groups of 4 or 5 in a hallway display so students can interact with a small group of cutouts. Refer to the cutouts as *models*, because each cutout is a representation of an actual student in the class.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

Focus Question

How can we compare ourselves by using our bodies?

Activity	Guiding Questions
<ul style="list-style-type: none">• Prompt students to brainstorm ways to compare each other using their bodies. Record students' ideas on the "Ways to Compare Our Bodies Chart."• Tell students another way to compare their bodies is to make body cutouts.• Pair students with a partner. Prompt students to complete body cutouts that include hair, fingers, feet, clothes, etc, and color them if they have time.• Circulate the classroom and provide assistance as necessary. Be sure students' entire bodies are on the sheets of paper to be traced.• Call students back to together as a class and share their observations.• Direct students to form groups of four or five to order their body cutouts from shortest to tallest. This can be done as a class if there is time.	<ul style="list-style-type: none">• How would you describe your body cutout and compare it with your partner's?• Using your body cutouts how could you and your partner find out who is taller and who is shorter?

Science Content Words

-model

-match/matching

Integration Hints

- Students can use the height chart (if started) to help them see if they have ordered their cutouts from shortest to tallest correctly.
- Read *A Big Fish*, by Joanne and David Wylie or *People*, by Peter Spier to students for discussion.

Science Notebook Helper

Students can illustrate their body cutouts in their science notebooks and write words or sentences to explain how they made comparisons. Students may want to draw the body cutouts of their group and put them in order from shortest to tallest and label them with student names.

Assessment Opportunities

Are students grasping the concept of serial order from shortest to tallest? This concept was introduced in the Investigating Properties unit in Kindergarten.

Lesson 3: Matching Our Heights

Students will use adding machine tape to measure and match their heights. Students will order their adding tape from shortest to longest on a graph and discuss beginning and ending points.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

Focus Question

What are beginning and ending points?

Activity	Guiding Questions
<ul style="list-style-type: none">• Discuss with students they will collect information about their heights and record it on a graph.• Direct students to work with partners to match their partner's height with adding machine tape.• Prompt students to arrange their adding tapes (labeled with names) from shortest to tallest on the "Our Heights" chart.• Circulate the classroom and provide assistance as students are matching with the tape and constructing the graph.• Call the class together and prompt students to discuss how they knew where to start and stop when measuring their partner (beginning and ending points).	<ul style="list-style-type: none">• Can you think of a time that someone needed to find out how tall you were? Where were you?• Why did the person need to find out your height?• What did the person use to measure you?• How did you know where to begin/end measuring your partner's body?• Did everyone on your team use the same beginning and ending points on their partners?• Why is it important to use the same beginning and ending points?• What do you now know about yourself after using the adding machine tape?

Science Content Words

-beginning point

-ending point

Integration Hints

- Students can make a TALL book of labeled picture of tall objects, people, or animals.
- A "mystery tape box" can be filled with matched heights of students using adding tape. Students try to match the adding tape to the correct person it belongs to.
- Share *Once I Was Very Small* by Elizabeth Ferber as a read aloud or in the listening center.

Science Notebook Helper

Have students draw themselves in their notebooks and label themselves with a starting and ending point for using the adding tape.

Assessment Opportunities

Ask students if they recognize what a beginning and ending point are and how they used them in the activity. Make sure that students know how to [serial] order by height.

Lesson 4: Matching Lengths of Arms and Legs

Students will continue to use knowledge of beginning and ending points and apply this knowledge to explore the use of a common starting line when comparing on a representational bar graph.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

Focus Question

What is a common starting line?

Activity	Guiding Questions
<ul style="list-style-type: none">• Encourage students to choose a beginning and ending point as a class before they begin the activity.• Direct students to match their arms and legs (right or left, but the same one) using colored tape then compare their findings.• Guide students to create an "Arms/Legs" graph to order their team's arm and leg tapes from shortest to longest. Prompt students to record the name of the team member with the shortest and the longest arm and leg.• Circulate the classroom and provide assistance as students are comparing and arranging the tapes.• Call students together to share their graphs with the class and compare their findings with the "Our Heights" graph findings from lesson 3.• Lead students to understand what a common starting line is by using the red starting line on the graph.	<ul style="list-style-type: none">• Why would someone need to know the length of your arms or legs?• If you were buying clothes, would you need to know the length of arms and legs? Why?• How did you use the red starting line on the graph?• Is it important to have a common starting line? If yes, why?• How is the graph like your height graph? How is it different?• What information can you read from the graph?

Science Content Words

- beginning point
- ending point
- common starting line

Integration Hints

- Students can make clothes using old fabric for their body cutouts by using the measurements from their arms and legs.
- Students can make a graph showing the comparisons of arms and legs.
- Consider displaying the data both vertically and horizontally to show students they can draw the same conclusions from the same data displayed different ways.

Science Notebook Helper

Attach Record Sheet 4-A to science notebook as students complete. Students may need support with vocabulary to fill out the record sheet.

Assessment Opportunities

Observe that students use appropriate vocabulary to fill in the recording sheet. If students struggle with the concept of a common starting line, prompt them to think of a starting line in a race.

Lesson 5: Comparing Objects

*Students will practice matching beginning and ending points of larger and longer objects.
Students will make predictions about the relative size of classroom objects.*

*Blackline masters of long objects are found in the teacher guide at the end of Lesson 5.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

Focus Question

What is the difference between a guess and a prediction?

Activity	Guiding Questions
<ul style="list-style-type: none">• Guide students to use the "Comparing Long Objects" graph with pictures of the objects to be matched to establish a beginning and ending point for comparison.• Share a prediction with the class dealing with the type of clothes one would wear during a particular type of weather.• Lead students in a discussion about what a prediction is and prompt them to record their predictions of shortest and longest objects on Record Sheet 5-A.• Divide students into groups and assign an object. Direct students to determine the object's length and match its length with adding tape using beginning and ending points.• Call the class together for each group to place their adding tapes on the "Comparing Long Objects" graph. Prompt students to discuss how they determined the length of each object and how the object lengths compare to the lengths of their arms and legs.	<ul style="list-style-type: none">• How did you determine the length?• How does matching the length of something long compare with matching your arms, legs, or body?

Science Content Words

-guess

-prediction

Integration Hints

- As a class, find a way to measure trees, flowers, or other objects in nature and write about them.

Science Notebook Helper

Attach Record Sheet 5-A to science notebook.

Assessment Opportunities

Observe students throughout the lesson. Are they using a common starting line to make fair comparisons? Are students using comparative language such as *longer*, *shorter*, or *equal to*?

Lesson 6: Matching Distance

Students will practice measuring length by measuring distance of Flippers™.

*Introducing Flippers prior to the lesson for exploration [purposeful play] may help students focus on the purpose of the investigation.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

Focus Question

How can we measure distance?

Activity	Guiding Questions
<ul style="list-style-type: none">• Guide students to work with a partner to place the object on the "flipping graph" and draw a circle around it.• Direct students to practice flipping, and finally flip the object and circle where it lands.• Direct students to use adding tape to measure the distance the object flipped. Once they have completed their flips, guide students to look for someone with a longer adding tape and someone with a shorter adding tape.• Invite students to put their adding tape on a "flipping graph."	<ul style="list-style-type: none">• Why are some tapes longer or shorter than others?• What information do the tapes give you about the distance flipped?• How did the distance of your three flips compare?

Science Content Words

-distance

Integration Hints

- Read *How Much Is a Million?* By David M. Schwartz and discuss the concept of extremely long distances. Have students determine if the ways they have been measuring so far would work for measuring these types of distances.
- Students can measure the distance from one point to another in the classroom and mark compare them using the adding tape.

Science Notebook Helper

Have students draw a picture of the activity they completed today. Have them write a sentence (or words) to explain what they did.

Assessment Opportunities

Are students using a common starting line? Have they agreed to place the Flipper on, in front of, or behind the common starting line? Are students making the connection that the adding machine tapes represent the distances Flippers traveled?

Lesson 7: Using Our Feet to Measure

Students will quantify nonstandard units of measurement using their feet as nonstandard units.

*This lesson may be scheduled over 2 class sessions.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

Why do nonstandard units of measurement produce varied results?

Activity	Guiding Questions
<ul style="list-style-type: none">• Guide students to "walk and count" a strip of adding tape to see how much tape they will need to take five heel-to-toe steps.• Call the class together for students to share and place their tape on the "Comparing Feet" graph.• Point out that everyone's tape was put on the red common starting line, but that they are not all the same length even though each person took the same amount of steps. Prompt students to discuss possible reasons for this occurrence.• On the second day of the lesson, read aloud "The Very Big Umbrella" (available in Lesson 7 in the STC Teacher's Guide).• Invite students to think about and discuss what happened to Marcus and Kate as they were measuring the beach umbrella and the box.	<ul style="list-style-type: none">• What is the purpose of the red starting line?• Why do you think the strips are different lengths?• How did Kate and Marcus measure the umbrella and the box?• Why was the umbrella too big for the box?• How could Kate and Marcus solve the problem?

Science Content Words

Use words introduced in previous lessons.

Integration Hints

- Read *How Big Is a Foot?* By Rolf Myller and have students pick an object to measure with their feet and compare to other objects. Discuss with students ways that the measurements could be more consistent.
- Invite students to write a solution to the problem Kate and Marcus faced in the umbrella story.

Science Notebook Helper

Have students draw a picture of an object they measured with their feet and write a sentence about the length of the object.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if they are using the heel-to-toe method of measuring and if they are able to identify the reason for various lengths of the adding tape.

Lesson 8: Using Different Standard Units of Measure

Students will measure objects using various sets of standard units, such as spoons, stirrers, toothpicks, and pencils.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

Why do we get different measurements when we measure the same objects with different tools?

Activity	Guiding Questions
<ul style="list-style-type: none">• Introduce the various types of units (coffee stirrers, pencils, spoons, toothpicks, spoons) students will use to measure objects in the classroom.• Guide students to choose four objects in the classroom they want to measure.• Prompt students to record their prediction of length in terms of units on Record Sheet 8-A.• Direct students to measure the objects with the units then record the actual measurement. Circulate the classroom to provide assistance and to be sure at least two students measure each object.• Lead a class discussion so students have the opportunity to share their thoughts, observations, and discoveries with the class. Record ideas and observations on the "What Did You Find Out" chart.• Ask students to look at a partner's record sheet and discuss the length of the objects and what unit was used to measure the object. Then hold up various units of measurement for comparison and discuss the reason that results varied.	<ul style="list-style-type: none">• When you measured the same object as someone else, but with different units, were your results the same?• Were your results different? Why?• Does the record sheet let you know the length of objects?• Do you know what unit was used?• What does knowing the unit enable you to do?• Are all the units the same size?• Were your results the same as another student's results? Why do you think that happened?

Science Content Words

Use science content words introduced in previous lessons, as well as:

- prediction
- measurement (actual)

Integration Hints

- Ask students to draw themselves measuring in the lesson and write a sentence describing what they did.
- Students can revisit the measuring tapes which represent the lengths of their arms and legs. They can measure the lengths with the various standard units. For example, measuring an arm length with toothpicks first, then measuring the same arm length with spools another time will yield different measurement results.

Science Notebook Helper

Attach Record Sheet 8-A to science notebook. (Prediction and measurement are part of the student response.)

Assessment Opportunities

Be sure to observe students throughout the lesson. Are students applying their knowledge of beginning and ending points? Are they closing gaps/spaces between units of measure? Are students including the unit of measure when recording their data? For example, “The teddy bear is 28 spools long.”

Lesson 9: Measuring with a Standard Unit

Students will use a class standard unit of measure—a coffee stirrer—to quantify the lengths of objects.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

What is a standard unit of measure and how does it help us get consistent answers?

Activity	Guiding Questions
<ul style="list-style-type: none">• Guide students to use the same set of units, coffee stirrers, to measure objects.• Direct students to select a numbered strip that corresponds to numbered objects to measure. For example, #1 may direct students to a certain table to measure; #2 may direct students to measure the teacher’s desk, etc. Then students work with a partner to measure the objects with coffee stirrers by placing them end to end and counting.• Prompt students to match the length of the line of coffee stirrers with adding tape and glue the coffee stirrers to the tape. Then direct students to glue their tapes on the "Measuring with Coffee Stirrers" graph beginning on the red line.• Lead a class discussion so students can compare the objects measured and the results to find out which object took the most and fewest coffee stirrers.	<ul style="list-style-type: none">• Which object took the most/fewest coffee stirrers to measure?• Which objects took about the same number of coffee stirrers to measure?• What kinds of things do you do when measuring to help you make fair comparisons?• Why do you need to use the same standard unit when measuring?• How did writing the words "coffee stirrers" next to the number help you compare your results?• How have you used the red starting line?

Science Content Words

Use science content words introduced in previous lessons, as well as:

-standard unit

Integration Hints

- Have students use their body cutouts and arm and leg tapes and re-measure each using coffee stirrers. Students can compare the coffee stirrer lines with the original cutouts. For example, student pairs can select an arm length to measure. The first partner measures

using coffee stirrers. Then the second partner measures the same arm length with coffee stirrers. Since both partners measured the same arm length with a standard unit, the coffee stirrers, the measurement results should be consistent (or nearly consistent).

Science Notebook Helper

- Have students draw a picture of the object they measured with the coffee stirrers to represent the length. Have students write a sentence telling how many coffee stirrers it took to measure the object.
- Prompt students to write about the process of measuring, i.e. How to Measure. This would give students the opportunity to include science content words, such as beginning point and ending point, in their writing.

Assessment Opportunities

Be sure to observe students throughout the lesson. Are students using coffee stirrers consistently, end to end, with no spaces between them? Have they agreed upon a starting and ending point while measuring? Are students including a label when recording their results? For example, “The table is 32 coffee stirrers long.”

Lesson 10: Exploring with Unifix Cubes™

Students will measure objects using Unifix Cubes™ and compare the unit of measurement with that of coffee stirrers.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

How do Unifix cubes help us measure with more accuracy?

Activity	Guiding Questions
<ul style="list-style-type: none">• Introduce students to another unit of measure: Unifix Cubes.• Prompt students to compare the characteristics of the Unifix Cubes with those of the coffee stirrers.• Lead a class discussion to decide which unit of measure would be easier to use to measure the height of a door (stackable).• Invite students to use Unifix Cubes to measure objects in the room.• Call students together to share their discoveries and observations with the class as well as their ideas about the differences between the Unifix Cubes and the coffee stirrers.	<ul style="list-style-type: none">• Can you put the coffee stirrers end to end? Can you the Unifix Cubes end to end?• Are the coffee stirrers all the same size? Are the Unifix Cubes all the same size?• Can the coffee stirrers be hooked together? Can the Unifix Cubes be hooked together?• What was the longest/shortest object measured?

Science Content Words

Continue using science content words in previous lessons and encourage students to apply them in their discussions and descriptions.

Integration Hints

- Have students measure objects in the classroom using Unifix Cubes and record their measurements in a chart.
- Students can measure their bodies (or body cutouts) using Unifix Cubes and coffee stirrers and compare their findings.

Science Notebook Helper

Students draw, label, and write about their measurement investigation. They might include a Venn diagram to compare and contrast coffee stirrers and Unifix Cubes™.

Assessment Opportunities

Use strategies on pages 23-25 of the Student Assessment Strategies section of the teacher's manual. Be sure to observe students throughout the lesson. Use science notebook activities to check for understanding.

Lesson 11: Counting Large Numbers of Units

Students measure objects using Unifix Cubes grouped into tens.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

How does grouping the Unifix Cubes into groups of ten help us count and measure longer objects more easily?

Activity	Guiding Questions
<ul style="list-style-type: none">• Distribute and review Record Sheet 11-A: Predicting and Measuring with Unifix Cubes.• Direct students to choose four long objects in the classroom to measure and record their predictions of how many Unifix Cubes (in stacks of 10) they will need to measure the objects.• Guide students to measure the objects and record the results on the record sheet.• Lead a class discussion so students can discuss their discoveries with their partners and with the class as a whole.• Direct students to measure their coffee stirrer strips from Lesson 9 with Unifix Cubes and compare the difference in ease of measuring and results.	<ul style="list-style-type: none">• What was the longest/shortest object measured?• How did you count the Unifix Cubes to get your results?• How is measuring with the Unifix Cubes different from measuring with the coffee stirrers?• Which was easier to use? Why?

Science Content Words

Continue using science content words in previous lessons and encourage students to apply them in their discussions and descriptions.

Integration Hints

- Create a book called “Everything is 10 Cubes Long” that illustrates the various objects used to measure with the Unifix Cubes. Have students match pictures of groups of 10 Unifix Cubes with numerical numbers (10, 20, 30, etc.). Practice counting by 10 using flashcards, classroom materials, or snacks.

Science Notebook Helper

Attach Record Sheet 11-A to science notebook.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if students are using beginning and ending points, predictions, and the concept of counting by 10. Are students realizing that counting by 10 is more efficient than counting each, individual cube?

Lesson 12: Measuring the Height of the Teacher

Students will measure the height of the teacher using Unifix Cubes.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

Why do we need practice measuring?

Activity	Guiding Questions
<ul style="list-style-type: none">• Ask students to describe how they were able to tell which student was the tallest and which student was the shortest.• Then ask students what helped them make fair comparisons and how they were able to report their measurements during their experiments.• Guide students to guess what object represents the length of the adding tape (your own height).• Prompt students to predict your height then use Unifix Cubes to measure the height of the adding strip (you will need a few of these already made).• Circulate the classroom and provide assistance if needed.• During a class discussion, lead students to compare their measurements with other groups to determine how they are the same or why they may be different.	<ul style="list-style-type: none">• How are all of the tapes the same?• Are everyone's measurements the same? Why or why not?• How could you check your measurements?

Science Content Words

Continue using science content words in previous lessons and encourage students to apply them in their discussions and descriptions.

Integration Hints

- Have students compare their heights to the teacher's height and write a sentence about their observations such as "I am taller/shorter than _____."
- Have students use the Unifix cubes to record the growth of a plant.

Science Notebook Helper

Students can draw a picture of the teacher and write a sentence to explain how many Unifix Cubes tall she/he is.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if students place Unifix Cubes end to end, use beginning and ending points, count the Unifix Cubes by ones or tens, make relevant observations, and show knowledge of the necessary steps to use during experiment.

Lesson 13: Making a Measuring Strip

Students will make a measuring tool that represents 10 Unifix Cubes™.

*Blackline masters of measuring strips are available in the teacher guide at the end of Lesson 13.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Question

What are the advantages of using measuring strips?

Activity	Guiding Questions
<ul style="list-style-type: none">• Hold up a Unifix Cube stick (10 cubes) beside a paper measuring strip that is 10 cubes long and explain to students that a measuring strip is a measuring tool made up of units.• Prompt students to compare how the Unifix Stick and the measuring strip are alike and different, which would be easier to take with you, etc.• Guide students to make a simple, two-color pattern using 10 Unifix Cubes (AB pattern) and copy the pattern onto a paper strip using crayons.• Prompt students to use the paper strip to measure various objects in the room.• Call students together and discuss why the strip is easier to use than the Unifix Cubes.	<ul style="list-style-type: none">• What did you do with the units to find out the lengths of objects?• What made the units easy to use? Difficult to use?• Was one unit better than another? Why?• Which unit was the best for you to use? Why?

Science Content Words

-measuring strip

Integration Hints

- Read *The Very Hungry Caterpillar* by Eric Carle and have students use real fruits and objects from the book to measure with their measuring strips. Have students make a sequencing chart of each day of the week and the measurements they found.

Science Notebook Helper

Have students draw a picture of an object they measured with their measuring strip and write a sentence to describe the number of units it contained.

Assessment Opportunities

Be sure to observe students throughout the lesson.

Lesson 14: Measuring with a Measuring Strip

Students will use iteration (moving a unit of measure repeatedly while marking beginning and ending points) to measure objects longer than their measuring strip.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

Focus Questions

Why is it difficult to measure things that do not fit on your measuring tape?

What can you do to measure those objects?

Activity	Guiding Questions
<ul style="list-style-type: none">• Distribute Record Sheet 14-A and share the process students will follow to measure the four objects.• Direct students to predict how many units long an object is, measure the object using the measuring strip, and write the actual measurement on the record sheet.• Guide students to write the name of the object (or an illustration) on their record sheet and complete the same process for three additional objects.• Circulate the classroom and provide assistance.• Call students together to discuss the various ways they used the measuring strip to measure objects longer than the actual measuring strip.	<ul style="list-style-type: none">• How was using the measuring strip the same as using some of the other measuring units? How was it different?• How did you measure objects longer than your measuring strip?

Science Content Words

-iteration

Review:

-beginning point

-ending point

Integration Hints

- Read the book *Inch by Inch* by Leo Lionni and discuss how the book illustrates measuring. Have students measure things with small inchworms made out of pipe cleaners.
- Let students make a “Long Things” book at home with their parents as an extension activity. They can take their measuring strips home and have their parents help them

measure things around the house that are longer than the measuring strip and add them to their book.

Science Notebook Helper

Attach Record Sheet 14-A to science notebook.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if students match various size objects, use iteration, or count by ones, tens, or the number of strips. Use science notebook activities to check for understanding.

Lesson 15: Making a Measuring Tape

Students will make a measuring tape consisting of 100 units to measure longer objects.

*Blackline masters of measuring tapes are found in the teacher guide at the end of Lesson 15.

This lesson can cover two class sessions.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

1.SI.1.4 Understand different calibrated devices may be used to measure distances and the lengths of objects of different sizes and shapes.

Focus Question

Why is it easier to measure longer objects with longer measuring instruments?

Activity	Guiding Questions
<ul style="list-style-type: none">• Direct students to color 5 measuring strips red and 5 measuring strips blue.• Guide students to cut the 10 measuring strips and place them end to end, alternating colors and glue their long measuring tape to adding tape.• Invite students to measure long objects using their long measuring tape.• Gather students and invite them to discuss ideas such as how using the measuring tape is similar and different from using the measuring strips and what they can do with the measuring tape that they could not do with the measuring strip.• In session two, read aloud "The Long, Long Measuring Tool" to the class (available in Lesson 15 of the STC Teacher's Guide).• Use the prompts throughout the story to start discussion.	<ul style="list-style-type: none">• How was using the measuring tape different from using the measuring strip? How was it the same?• Did you discover anything you could do with the measuring tape that you could not do with the measuring strip?

Science Content Words

-measuring tape

Review:

-beginning point

-ending point

Integration Hints

- This lesson could be integrated into mathematics centers. Have students work with a parent volunteer to measure the school hallway, the lunchroom, etc as a center activity.

Science Notebook Helper

- Have students continue the story “The Long, Long Measuring Tool” by adding other objects that Keisha and Rachel may have decided to measure. They can illustrate and write a sentence for each object they add.
- Have students create a Venn diagram to compare and contrast a measuring strip and a measuring tape.

Assessment Opportunities

Be sure to observe students throughout the lesson.

Lesson 16: Using a Measuring Tape to Measure Distance

Students will measure the distance of a Flipper™ using a measuring tape. Students apply knowledge gained thus far to compare various methods used throughout the unit thus far.

*This lesson may cover two class sessions.

Clarifying Objectives

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

1.SI.1.4 Understand different calibrated devices may be used to measure distances and the lengths of objects of different sizes and shapes.

Focus Question

How have our measuring strategies changed since the beginning of the unit?

Activity	Guiding Questions
<ul style="list-style-type: none">• Tell students they will revisit the Flippers activity from Lesson 6. Encourage students to share how they used their Flippers to measure distance. After students share their thoughts, tell them they will use their measuring tapes from Lesson 15 to measure the distance of their flips.• Distribute Record Sheet 16-A and review it.• Guide students to determine a starting line and practice taking five or six practice flips before beginning activity.• Prompt students to make a prediction about the distance the Flippers will go from the starting line. Then tell students to flip their Flippers and use the measuring tape to measure the distance of the flip.• Prompt students to record the length of the flip and repeat the activity two or three times.• Call the class together and record the distance of the longest flips on the "Longest Flips with the Flippers" chart.• Lead students to compare the lengths of the flips from the chart.• During session two, invite students to share ideas to create a class story about	<ul style="list-style-type: none">• Whose flips were longest?• Whose flips were the same?• As you made more flips, how did your predictions compare with your actual results?• What types of things did we do to find out the length of objects before we began using the measuring strip?• How have our measuring strategies changed since the beginning of the unit?• What did we do to determine the length of the flips in the earlier lesson (Lesson 6)?• What did we find out in this lesson that we did not know before?• How did the measuring strip change the way we measured?

<p>their experiences matching and measuring the distance of flips.</p> <ul style="list-style-type: none">• Pose questions to guide the discussion of ideas and record thoughts from every student and guide the class to write and illustrate a "Big Book."	
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Science Content Words

-distance

Integration Hints

- Make a smaller copy of the “Big Book” for each student and have them illustrate the story themselves.
- Measure student jumps just like with the Flippers™.

Science Notebook Helper

Attach Record Sheet 16-A to science notebook.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if students are able to identify strategies they used to measure, recognize the changes in their measuring strategies, effectively apply measuring strategies, and gain more experienced predictions.

Lesson 17: Post-Unit Assessment

Students will revisit the activities from the unit as a final assessment.

Clarifying Objectives

1.SI.1.1 Understand that comparing involves observing and describing similarities and differences.

1.SI.1.2 Explain the importance of using beginning and ending points and placing units end to end when measuring.

1.SI.1.3 Understand the use of standard units produces consistent measurement results.

1.SI.1.4 Understand different calibrated devices may be used to measure distances and the lengths of objects of different sizes and shapes.

Focus Question

How have your ideas and feelings about comparing and measuring changed?

Activity	Guiding Questions
<ul style="list-style-type: none">• Direct students to determine one way they are like their partner and one way they are different from their partner using any materials from the distribution center (materials used throughout the unit for measuring).• Call the class together and allow students to share their thoughts and record the information on the "Ways We Are Alike and Different" chart.• Direct students to use Record Sheet 1-A (from Lesson 1) to draw a picture of themselves and their partner and draw a red circle around the part of the picture that shows one way they are alike and a blue circle around the part of the picture that shows one way they are different. Students will write (or dictate) one or two sentences describing each likeness and difference.	<ul style="list-style-type: none">• When have you compared before? When have you measured before?• How did you compare? How did you measure?• Why were you comparing? Why were you measuring?• What way are you and your partner alike? Different?• Did you use any materials from the distribution center to help make your comparisons?• How did these materials help you make comparisons?

Science Content Words

Continue using science content words in previous lessons and encourage students to apply them in their discussions and descriptions.

Integration Hints

This is an assessment lesson at the end of the unit. Consider completing an integrated hint from a previous lesson.

Science Notebook Helper

Attach Record Sheet 1-A to science notebook.

Assessment Opportunities

Be sure to observe students throughout the lesson to see if students' post assessments show greater detail than their pre-assessments, if they use measuring units for comparison, if they use beginning and ending points, and if they label the units in their measurements. Use science notebook activities to check for final understanding. Additional assessment ideas can be found in Section 5 of the teacher guide.