Grade 1

Unit 5: Measurement

TEAMBCPS
Office of
Mathematics PreK-12

The PreK-12 Mathematics curriculum focuses on problem solving, communication, and critical thinking in order to provide a foundation where every student reaches their potential to become a globally competitive, mathematically literate citizen.

About this Unit

This unit focuses on developing the ideas about linear measurement, telling time to the hour and half-hour, and partitioning a whole into equal parts and naming each part with a fraction. As students measure with a variety of units, they investigate the idea that different-sized units result in different measurements. Also, students use the visual appearance of clocks (digital and analog) to read and write times to the hour and half-hour. Students also partition circles and rectangles into two and four equal shares using the words halves, fourths, and quarters.

Understanding Length

Throughout Unit 5, students will work to build their understanding of what length is and how it can be measured. They will measure the length of different-sized units and compare lengths to determine which is longer. They will also learn that measurement can be applied to both objects and to distances. Students will discover how measurement is used to solve real-world problems.

Using Linear Units

The focus of Unit 5 is to develop a foundation of skills for accurate linear measurement. These skills include knowing where to start and stop when measuring and understanding how measuring tools must be lined up so that there are no gaps or overlaps. Other foundational skills include the ability to determine which dimension of a shape to measure in order to determine its length, measuring the shortest line from one location to another when determining distance, and understanding that many measurements are not reported in whole numbers. This final skill is critical because measurement is not the same as counting. Students will learn that accurate descriptions of length often involves words such as "a little more than ___", "a little less than ____", "between 15 and 16", or even "15 and a half cubes". These experiences with measurement may be some of the first experiences with quantities that are not whole numbers. Students will also learn that when one measures an object twice, or when two different people measure it, the same result should occur.

Students practice lining up tiles side by side as they measure the length of a book.

Challenges in Measurement

What happens when something is measured with small units versus large units?

This question is addressed throughout Unit 5 as students begin to see that measuring an object with cubes will result in a different count than when measuring the same object with paper clips. The idea that, when measuring a given object, "larger units result in smaller numbers" is an important one that many young learners fail to grasp. Within Unit 5, students will explore the notion that different-sized units will result in different counts, but it may not be until the concept is explored more fully within the second grade measurement unit that students begin to see the relationship between the size of a unit and the number of units needed to cover a given distance.

Where are the rulers?

During the first grade measurement unit, students are shown real measurement tools used by adults but they work with inch tiles when completing their measurement activities. The focus is not on learning how to read conventional measurement tools such as a ruler or yard stick. Research has shown that this focus is often confusing to young students who can read the numbers on the tools but don't fully understand what the numbers mean in the context of measurement. For that reason, the focus in Unit 5 is on learning to use consistent units (inch tiles) to measure accurately and build an understanding of the underlying mathematics involved in measurement.

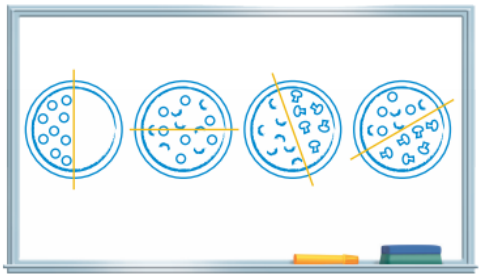
Learning to measure correctly is an important skill students learn in this unit.

Measuring lengths that are between whole numbers helps students to learn how to label partial units.

Students compare heights and lengths of objects.

What is a half?

Unit 5 introduces students to fractions. Students are first exposed to the concept of "half". Halves are introduced through connections with known concepts such as sharing something equally (e.g. candy bars, cookies). Students' first work with fractions involves drawing a line through a circle to show two equal parts and describe one portion of the circle as a half. They create half-and-half pizzas to increase their understanding of how a line can divide one circle in a variety of different ways but must cut the circle into two equal parts in order to represent half. In this unit students are starting to see that fractions are equal parts of a whole that must be equal. This can be a difficult concept to understand.



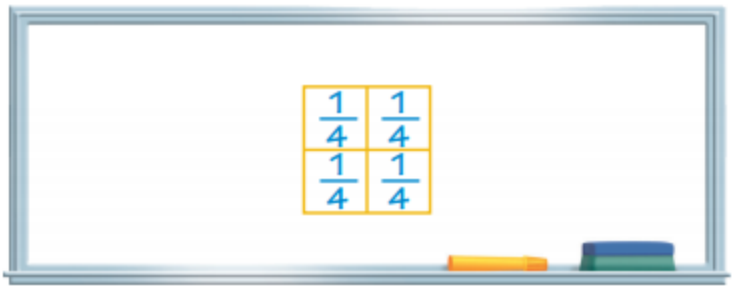
Students begin their work with fractions by creating half-and-half pizzas.

Designing Rugs

The work with fractions continues as students move from creating half-and-half pizzas to designing rugs. Students transfer their knowledge from halves of a circle to halves of a rectangle. This leads to students work with fourths.

Class discussions focus on fourths. Students name and describe shapes with more than one fourth shaded. Students begin to see two shaded fourths as a half. These early discussions with fractions help lay a foundation for understanding equivalencies in later grades.

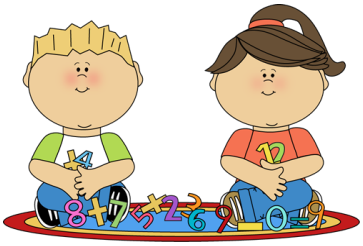
Students are able to manipulate a rectangle in different ways to create halves.



Class discussions focus on fourths and how to describe each fourth.

Helping Your Child at Home

- Ask your child to find things around the house which are longer or shorter than their teddy bear.
- Help your child find objects that are longer or shorter than their footprint.
- Measure distances around your home using your child's footprint.
- Create a wall chart for measuring height in your family.
- Use an analog clock to show the time to the hour and half-hour.
- Show your child the time on an analog clock and have them write what the time would look like on a digital clock.
- Talk with your child about specific times that activities occur- eating breakfast, going to school, dinner time, bed time, etc. Create a daily schedule board that includes both analog and digital clocks.



Visit These Websites for Interactive Math Activities

- Stop the Clock (http://www.oswego.org/ocsd-web/games/StopTheClock/sthec1.html)
Students identify time to the half hour

- Sid the Science Kid (http://pbskids.org/sid/fablab_crystalsrule.html)
Measure crystals with May

- Dinosaur Train (http://pbskids.org/dinosaurtrain/games/howbigareyou.html)
Measure the length of different dinosaurs

- Dinosaur Train (http://pbskids.org/dinosaurtrain/games/pineconepass.html)
Play dinosaur football and throw pinecones while measuring distance

- Curious George (http://pbskids.org/curiousgeorge/games/how_tall/how_tall.html)
Measure how tall objects are with Curious George

- Cross the River (http://www.harcourtschool.com/activity/cross_the_river/)
Help the man cross the river by using fractions.