Unit 6, Lesson 1

Midamos en mitades de pulgada

Standards

Building On	**2.MD.A.3**
Addressing	**3.MD.B.4**
Building Toward	**3.MD.B.4**

Instructional Routines

- What Do You Know about _____?

Goals

- Explain (orally) how to measure objects with a ruler marked with halves of an inch and express measurements to the nearest half-inch.

Student Facing Learning Goals

Midamos la longitud de algunos objetos del salón.

Lesson Purpose

The purpose of this lesson is for students to measure lengths that are fractions of an inch and relate these measurements to fractions on a number line.

Narrative

In grade 2, students learned how to measure lengths to the nearest inch. They also learned how to represent fractions on the number line in the previous unit.

In this lesson, students start by using an inch ruler to measure the length of objects. As students find objects whose length is not a whole number of inches, they consider how to partition the inches to get a more precise measurement. Students then partition a ruler to show halves of an inch and use the ruler to measure lengths to the nearest half of an inch. The *Lesson Synthesis* introduces students to **mixed numbers** as numbers that combine whole numbers and fractions less than 1.

Students use the rulers they make in this lesson again in future lessons.

Access for Students with Disabilities

- Engagement

Access for English Learners

- MLR2

Required Materials

Materials to Gather

- Materials from a previous activity: Activity 2

Materials to Copy

- Measure around the Room Template (1 copy for every 5 students): Activity 1

Lesson Timeline

Warm-up	10 min

Teacher Reflection Questions

In the last unit, students learned how to represent fractions with diagrams and number lines. In what ways

Activity 1	15 min
Activity 2	20 min
Synthesis Estimate	10 min
Actividad de cierre	5 min

did you see students applying that experience here?

Warm-up

10 min

¿Qué sabes sobre las pulgadas?

Standards

Building On	**2.MD.A.3**
Building Toward	**3.MD.B.4**

Instructional Routines

- What Do You Know about ____?

The purpose of this warm-up is to invite students to share what they know about inches. Later in the lesson, students will explore lengths that are not a whole-number of inches.

Student Task Statement

¿Qué sabes sobre las pulgadas?

Student Response

Sample responses:

- They are used to measure length.
- There are inch marks on rulers, yardsticks, and tape measures.
- They are shorter than feet.
- They are longer than centimeters.

Launch

- Display the question.
- *"¿Qué saben sobre las pulgadas?"* // "What do you know about inches?"
- 1 minute: quiet think time

Activity

- Record responses.

Activity Synthesis

- *"Las pulgadas son una unidad que usamos para medir la longitud. ¿Qué longitudes podríamos medir en pulgadas?"* // "Inches are a unit we use to measure length. What are some lengths that we could use inches to measure?" (the length of a shoe, the length of material for an art project, the height of a desk)

Activity 1

15 min

Midamos en el salón

Standards

Addressing	**3.MD.B.4**

In grade 2, students only measured the length of objects that were whole units and sometimes described lengths as "about 4 inches." The purpose of this activity is for students to learn that fractions of an inch can be useful for measuring the length of an object that is not exactly a whole number of inches.

Given a ruler marked with inches, students measure objects around the classroom. They may record measurements in whole inches even for objects whose length is not exactly a whole number of inches. In the Activity *Synthesis,* discuss the need for fractions of an inch to describe lengths more precisely (MP6).

The rulers from this activity are used in the next activity.

Access for Students with Disabilities

Engagement: Develop Effort and Persistence. Chunk this task into more manageable parts. Check in with students to provide feedback and encouragement after each chunk.
Supports accessibility for: Attention, Organization

Required Materials

Materials to Copy

- Measure around the Room Template (1 copy for every 5 students): Activity 1

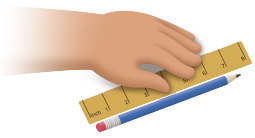
Required Preparation

- Make copies and cut out the rulers from the blackline master (5 rulers per page).

Student Task Statement

Usa la regla que te dio tu profesor para medir la longitud de algunos objetos del salón. Prepárate para discutir cómo razonaste.

objeto	longitud (pulgadas)



Launch

- Groups of 2
- Give each student a ruler.

Activity

- *"Usen su regla para medir la longitud de algunos objetos del salón. Trabajen con su compañero. Cada uno debe escoger 3 objetos"* // "Use your ruler to measure the length of objects in the room. Work with your partner. You should each choose 3 objects."
- 5–7 minutes: partner work time
- Monitor for students who find objects that are not exactly whole numbers of inches. Highlight the objects and their measurement in the synthesis.

Activity Synthesis

- Display the inch ruler and an object that wasn't exactly a whole number of inches. (Try to choose at least one object whose length is close to halfway between two whole inches.)

Student Response

Sample responses:

object	length (inches)
paper clip	1 inch
book	8 inches
pencil	6 inches
eraser	$1\frac{1}{2}$ inches

- *"¿Cuál es la longitud de este objeto?" //* "What is the length of this object?" (between 3 and 4 inches, more than 3 but less than 4, three-and-a-half inches)
- If needed, ask, *"¿Podríamos decir que la longitud de este objeto es (un número entero) pulgadas?" //* "Could we say that the length of this object is (a whole number of) inches?" (No, It's between 3 inches and 4 inches.)
- *"Necesitamos una forma de hacer que nuestras medidas sean más precisas. Vamos a pensar más acerca de esto en la siguiente actividad" //* "We need a way to make our measurements more precise. We'll think about this more in the next activity."

Activity 2

20 min

Partamos pulgadas en mitades

Standards

Addressing **3.MD.B.4**

The purpose of this activity is for students to partition the inches on a ruler to show half inches and then use their ruler to measure lengths to the nearest half of an inch.

The unpartitioned rulers from this activity are used in the next lesson.

MLR2 Collect and Display. Circulate to listen for and collect the language and numbers that students use as they measure objects. On a visible display, record numbers, words and phrases, such as *"siete mitades de pulgada", "*$\frac{7}{2}$*", "entre 2 y 3 pulgadas", "seis y media pulgadas", "*$6\frac{1}{2}$*" y "menos de 5 pulgadas" //* "seven half inches," "seven halves of an inch," "$\frac{7}{2}$," "between 2 and 3 inches," "six and a half inches," "$6\frac{1}{2}$," and "less than 5 inches." Invite students to borrow language from the display as needed, and update it throughout the lesson.

Access for English Language Learners

Advances: Conversing, Reading

Required Materials

Materials to Gather

- Materials from a previous activity: Activity 2

Required Preparation

- Each student needs a ruler from the previous activity.

Student Task Statement

Van a necesitar una regla de una actividad anterior.

1. Con su compañero, partan cada pulgada de la regla en mitades de pulgada.
2. Por turnos, usen la regla para medir las longitudes de algunos objetos del salón. Midan cada longitud a la mitad de pulgada más cercana.

objeto	longitud (pulgadas)

Student Response

Sample responses:

object	length (inches)
paper clip	$\frac{3}{2}$ inches
book	$5\frac{1}{2}$ inches
pencil	inches or 6 inches
eraser	$\frac{1}{2}$ inch

Launch

- Groups of 2
- *"¿Cómo podemos modificar nuestras reglas para medir longitudes que están entre dos números enteros de pulgadas?"* // "How could we adjust our rulers to measure lengths that are in between whole numbers of inches?" (We could fold each inch into smaller equal parts. We could partition each inch into halves.)

Activity

- *"Con su compañero, partan cada pulgada de una regla en mitades de pulgada. Decidan de quién será la regla a la que le harán la partición. Dejen la otra regla con pulgadas enteras"* // "Work with your partner to partition every inch on one ruler into halves of an inch. Decide whose ruler you'll partition. Leave the other ruler in whole inches."
- 2–3 minutes: partner work time
- *"Como en la actividad anterior, es posible que haya objetos que no estén alineados con ninguna de las marcas de la regla. ¿Cómo podrían anotar esas longitudes? Hablen acerca de esto con su compañero"* // "Just like in the last activity, you may have objects that don't line up with one of the marks on the ruler. How might you record those lengths? Talk to your partner about it." (Estimate how long the object is. Record the mark that is closest.)
- 1 minute: partner discussion
- Share responses.
- *"Con su compañero, escojan objetos para medir a la mitad de pulgada más cercana. Cada uno debe medir 3 objetos"* // "Work with your partner to choose objects to measure to the nearest half inch. You should each measure 3 objects."
- 5–7 minutes: partner work time
- Monitor for students who find measurements that are a whole number of inches and those that find measurements that include a whole number and a half inch.

Activity Synthesis

- Invite previously selected students to share.
- *"¿Cómo midieron la longitud de los objetos cuando la*

longitud quedaba entre dos marcas consecutivas de su regla?" // "How did you measure the length of objects when the length was in between the marks on your ruler?" (We recorded the mark that was closest. The length was right between 1 inch and $1\frac{1}{2}$ inches, so we estimated the length to be about $1\frac{1}{4}$ inches.)

- As needed, explain that when measuring to the nearest half inch, the result can be a whole number of inches. For example, if an object's length is closer to 3 inches than to 3 1/2 inches, its length to the nearest half inch is 3 inches (or $\frac{6}{2}$ inches).
- *"Guarden ambas reglas (en la que hicieron una partición para mostrar mitades de pulgada y en la que no) para la siguiente lección" //* "Save both rulers—the one you partitioned to show halves of an inch and the one that is not partitioned—for the next lesson."

Advancing Student Thinking

If the parts students partitioned aren't the same size, consider asking:

- *"Dime cómo partiste las pulgadas en mitades" //* "Tell me about how you partitioned the inches into halves."
- *"¿Cómo puedes asegurarte de que las mitades son del mismo tamaño?" //* "How could you make sure the halves are the same size?"

Lesson Synthesis

"Hoy usamos una regla para medir longitudes en pulgadas" // "Today we used a ruler to measure length in inches."

"¿En qué se parecen una regla y una recta numérica?" // "How is a ruler like a number line?" (The numbers go up as we move to the right. On both a number line and a ruler, each number has a location. On both, we can partition the wholes into halves.)

Display the length of one of the objects as a fraction greater than 1 and as a mixed number of inches (for example, $\frac{9}{2}$ inches and $4\frac{1}{2}$ inches).

"¿Cómo pueden estos dos números mostrar la misma longitud?" // "How could these two numbers show the same length?" (One tells us the number of whole inches and then how many half inches. The other tells us how many halves. They would be at the same location on the ruler, so they are the same length.)

*"Cuando anotamos la longitud en forma de fracciones que son mayores que 1, podemos escribir una fracción como $\frac{9}{2}$ o podemos usar un número que combina un número entero con una fracción menor que 1, como $4\frac{1}{2}$. Un número como este, que combina un número entero y una fracción menor que 1, se llama **número mixto**" //* "When we record the length in fractions that are greater than 1, we can record a fraction like $\frac{9}{2}$, or we can use a number that combines a whole number with a fraction less than 1, like $4\frac{1}{2}$. A number like this that combines a whole number and a fraction less than 1 is called a **mixed number**."

Suggested Centers

- Estimate and Measure (1–4), Stage 2: Centimeters, Inches, and Feet (Supporting)
- Target Measurements (2–5), Stage 1: Inches and Centimeters (Supporting)

Cool-down

5 min

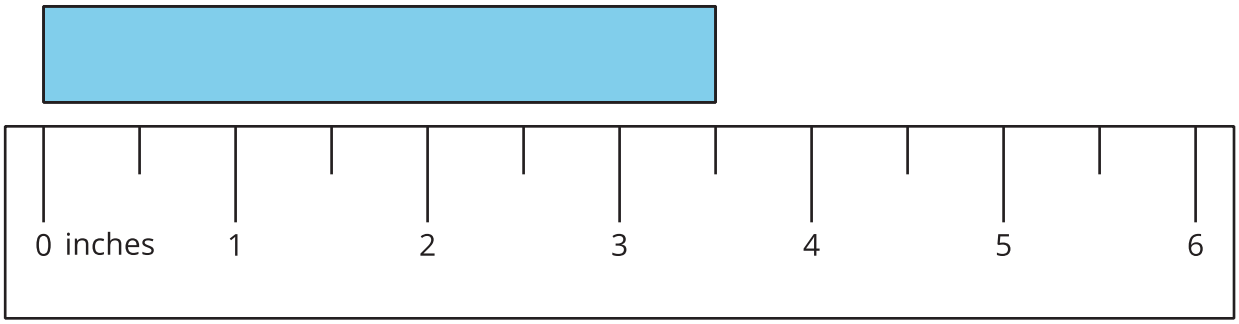
Longitud en mitades de pulgada

Standards

Addressing **3.MD.B.4**

Student Task Statement

¿Cuál es la longitud del rectángulo?



Student Response

$\frac{7}{2}$ inches or $3\frac{1}{2}$ inches

Responding to Student Thinking

Students record 2 inches or 3 inches for the length of the rectangle.

Next Day Supports
During the *Launch* of the next day's activity, have students discuss the meaning of the marks in between the whole-inch marks on the ruler shown in this *Cool-down* or on the rulers they created and used in this lesson.