



¿Qué es una milésima?

Standards

Addressing 5.NBT.A, 5.NBT.A.1

Goals

- Comprehend (in spoken language) the meaning of “one-thousandth” and that it can be represented in writing as $\frac{1}{1,000}$ or 0.001.
- Interpret (orally and in writing) diagrams that represent 0.1, 0.01, and 0.001.

Instructional Routines

- Estimation Exploration
- What Do You Know about ____?

Student Facing Learning Goals

- Demos sentido a las milésimas.

Lesson Purpose

The purpose of this lesson is for students to recognize the unit of thousandths in relationship to tenths and hundredths.

Narrative

In IM Grade 4, students studied decimal fractions with denominators 10 and 100. They represented tenths and hundredths with hundredths grids, number lines, and decimal notation.

In this lesson, students make sense of representations of tenths, hundredths, and thousandths with hundredths grid diagrams, fractions, and decimals. They also see relationships between these values, namely that a tenth of a tenth is a hundredth and a tenth of a hundredth is a thousandth. Students may use informal language to describe the relationship between decimals. For example, to get from 0.01 to .001 you add a zero in front of the one. This language supports students in sharing their developing understanding. Teachers should ask questions to help students develop more precise language to describe base-ten representations. For example, what does the extra 0 you wrote in .001 represent? They will have many opportunities to develop this understanding in upcoming lessons.

Access for Students with Disabilities

- Representation

Access for English Learners

- MLR7

Required Materials

Materials to Gather

- Chart paper: Activity 1
- Colored pencils, crayons, or markers: Activity 1

Materials to Copy

- Small Grids Handout (1 copy for every 1 students): Activity 1

Lesson Timeline

Warm-up

10 min

Teacher Reflection Questions

Why is it important to integrate students' lived experiences into the classroom community? How might



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

this integration empower students?

Warm-up

🕒 10 min

Exploración de estimación: Una pequeña pieza

Standards

Addressing 5.NBT.A

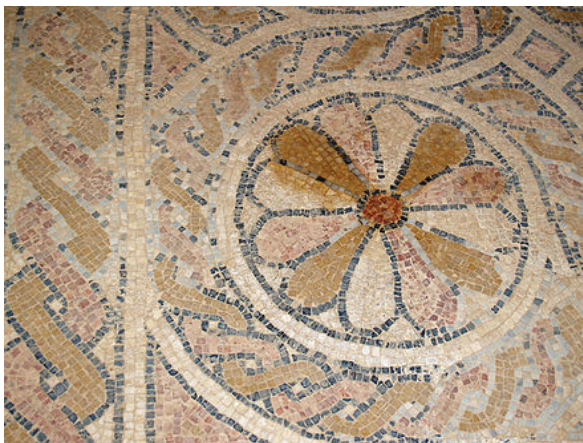
Instructional Routines

- Estimation Exploration

The purpose of this *Estimation Exploration* is to invite students to think about small fractions of a quantity in context. The mosaic pictured here is made up of many small square tiles. Square tiles are arranged in a complex pattern and are not identical in size but students can relate the denominator of a fraction giving the size of each tile, relative to the whole mosaic, to the total number of tiles making the mosaic. This helps them think of a fraction with a large denominator which prepares them to think about the fraction $\frac{1}{1,000}$ in this lesson.

Student Task Statement

¿Qué fracción de la imagen completa es 1 baldosa cuadrada?



Escribe una estimación que sea:

muy baja	razonable	muy alta

Launch

- Groups of 2
- Display the image.
- “¿Qué estimación sería muy alta?, ¿muy baja?, ¿razonable?” // “What is an estimate that’s too high? Too low? About right?”
- 1 minute: quiet think time

Activity

- “Discutan con su compañero cómo pensaron” // “Discuss your thinking with your partner.”
- 2–3 minutes: partner discussion
- Share and record responses.

Activity Synthesis

- “¿Cómo hicieron su estimación?” // “How did you make your estimate?” (I tried to estimate how many tiles made the whole picture and then used that as my denominator.)
- “En varias de las siguientes lecciones vamos a examinar números muy pequeños y a descubrir cómo representarlos” // “We will be investigating very

Student Response

Sample responses:



- too low: $\frac{1}{10,000}$ or less
- about right: $\frac{1}{3,000}$ to $\frac{1}{500}$
- too high: $\frac{1}{100}$ or more

small numbers and how to represent them in the next several lessons.”

Activity 1

 20 min

¿Qué sabes sobre los milésimos?

Standards

Addressing 5.NBT.A

Instructional Routines

- What Do You Know about ____?

In this activity, students to share what they know about one tenth and one hundredth, and consider what they might know about one thousandth. Students make a poster showing what they know about these numbers and then discuss the different representations they made. If students show tenths, hundredths or thousandths on a number line or with base ten diagrams, highlight these representations in the *Activity Synthesis*, as they are familiar from IM Grade 4.

This activity is meant to be an invitational opportunity for students to bring their lived experience into the math classroom. Consider taking a walk through the community where your students live and noticing places that decimals are seen and used. Take pictures or notes that capture the details of your observations. Be prepared to share these artifacts with students during the *Activity Synthesis*.

Access for Students with Disabilities

- *Representation: Develop Language and Symbols.* Synthesis: Maintain a visible display to record new vocabulary. Invite students to suggest details (words or pictures) that will help them remember the meaning of thousandths and the thousandths' connection to tenths and hundredths.
- *Supports accessibility for: Conceptual Processing, Memory*

Required Materials

Materials to Gather

- Chart paper: Activity 1
- Colored pencils, crayons, or markers: Activity 1

Materials to Copy

- Small Grids Handout (1 copy for every 1 students): Activity 1

Student Task Statement

1. ¿Qué sabes sobre 1 décimo?
2. ¿Qué sabes sobre 1 centésimo?
3. ¿Qué sabes sobre 1 milésimo?

Launch

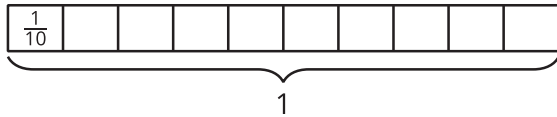
- Groups of 2
- Give students access to hundredths grids on the blackline master.
- Give students access to chart paper and colored pencils, crayons, or markers.
- “Con su compañero, hagan un póster que muestre lo que saben sobre estos números: 1 décimo, 1 centésimo y 1 milésimo” // “Work with your partner

Student Response

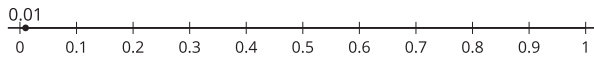
Sample responses:



1. There are ten $\frac{1}{10}$ s in 1. It's less than 1. I can also write it as 0.1.



2. $\frac{1}{100}$ is small. It's smaller than $\frac{1}{10}$. There are one hundred $\frac{1}{100}$ s in 1. There are ten $\frac{1}{100}$ s in $\frac{1}{10}$. I can also write it as 0.01. I can put it on the number line.



3. $\frac{1}{1,000}$ is really small. It's smaller than $\frac{1}{100}$. There are one thousand $\frac{1}{1,000}$ s in 1. It would take a long time to count to 1 by $\frac{1}{1,000}$ s. I wonder how to make a drawing of $\frac{1}{1,000}$ because there are so many of them in 1. I wonder if there's a coin that's worth a thousandth of a dollar.

to make a poster showing what you know about the numbers 1 tenth, 1 hundredth, and 1 thousandth."

Activity

- 6-8 minutes: partner work time
- Monitor for students who:
 - Represent the numbers with fractions.
 - Represent the numbers with decimals.
 - Represent the numbers with diagrams.

Activity Synthesis

- Invite students to share their posters.
- "¿Cuáles son algunas maneras de representar 1 décimo?" // "What are some ways to represent 1 tenth?" (I can write it as a fraction or a decimal. I can divide a rectangle into 10 equal pieces. I can put it on the number line.)
- "¿Qué fue retador al representar 1 centésimo con un dibujo o con un diagrama?" // "What was challenging about representing 1 hundredth with a drawing or diagram?" (It was hard to divide something into 100 equal pieces because that's a lot.)
- "¿Qué fue retador al representar 1 milésimo con un dibujo o con un diagrama?" // "What was challenging about representing 1 thousandth with a drawing or diagram?" (Dividing a rectangle into 1,000 pieces would take forever.)
- "En la siguiente actividad, vamos a hacer y a comparar dibujos de estos números" // "In the next activity we will make and compare drawings of these numbers."

Activity 2

15 min

Representemos números en un diagrama de centésimas

Standards

Addressing 5.NBT.A.1

The purpose of this activity is for students to represent tenths, hundredths, and thousandths with diagrams and decimals. The diagrams highlight the relationships between these quantities:

- There are 10 tenths in a whole.



- There are 10 hundredths in a tenth.
- There are 10 thousandths in a hundredth.

This relationship can be seen when numbers are written as decimals or fractions. When students see this common relationship between the decimal place values they look for and make use of structure (MP7).

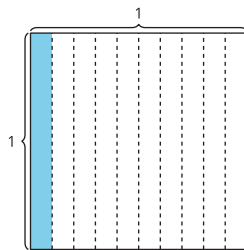
Access for English Language Learners

MLR7 Compare and Connect. Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask, “¿Qué tipos de lenguaje o de detalles adicionales les ayudaron a entender las presentaciones?” // “What kinds of additional details or language helped you understand the displays?”, “¿Tienen preguntas sobre el lenguaje o sobre algún otro detalle?” // “Were there any additional details or language that you have questions about?”, and “¿Alguien resolvió el problema de la misma manera, pero lo explicaría de otra forma?” // “Did anyone solve the problem the same way, but would explain it differently?”
Advances: Representing, Conversing

Student Task Statement

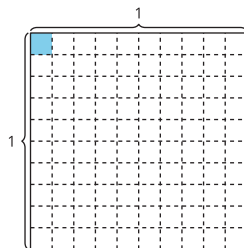
1. El cuadrado grande representa 1. Está dividido en 10 rectángulos de igual tamaño. ¿Qué número representa el rectángulo sombreado?

Explica o muestra tu razonamiento.



2. Cada parte del rectángulo del diagrama anterior ahora está dividido en 10 cuadrados pequeños de igual tamaño. ¿Qué número representa el cuadrado pequeño sombreado?

Explica o muestra tu razonamiento.



3. El cuadrado pequeño sombreado del diagrama anterior ahora está dividido en 10 rectángulos pequeños de igual tamaño. Uno de esos rectángulos pequeños está sombreado. ¿Qué número representa el rectángulo pequeño sombreado?

Explica o muestra tu razonamiento.

Launch

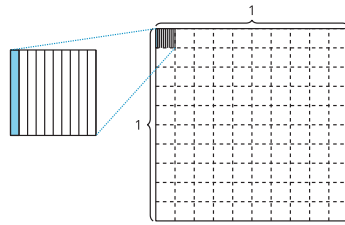
- Groups of 2
- “Hoy vamos a examinar algunos números muy pequeños” // “Today we are going to investigate some really small numbers.”

Activity

- 2 minutes: independent work time
- 8 minutes: partner work time

Activity Synthesis

- Display the last image.
- “¿Cuántos rectángulos pequeños sombreados hay en todo el cuadrado unitario? ¿Cómo lo saben?” // “How many of the tiny shaded rectangles are there in the whole unit square? How do you know?” (1,000, because there are 10 in the small square and 100 of those squares in the whole.)
- “De todo el cuadrado, ¿cuánto está sombreado?” // “How much of the whole square is shaded?” (There is one tiny rectangle shaded and there are 1,000 of those in the whole. So, $\frac{1}{1000}$ is shaded. There is $\frac{1}{10}$ of $\frac{1}{100}$ shaded. That’s $\frac{1}{10} \times \frac{1}{100}$. There is $\frac{1}{100} \div 10$ because the hundredth is divided into 10 equal pieces.)
- “El número $\frac{1}{1000}$ también se puede escribir en forma decimal como 0.001. De forma similar a la fracción, al número decimal lo llamamos ‘milésima’” // “The



number $\frac{1}{1000}$ can also be written in decimal form as 0.001. Like the fraction, we call it “thousandth.”

- “¿Cómo piensan que se podría escribir $\frac{4}{1000}$ como un número decimal?” // “How do you think you would write $\frac{4}{1000}$ as a decimal?” (0.004)

4. ¿Cómo piensas que se escribe $\frac{1}{1,000}$ como un decimal? Explica o muestra tu razonamiento.

fracción	decimal
$\frac{1}{10}$	0.1
$\frac{1}{100}$	0.01
$\frac{1}{1,000}$?

Student Response

1. $\frac{1}{10}$ or 0.1. Sample response: There are 10 columns so the shaded part is one tenth.
2. $\frac{1}{100}$ or 0.01. Sample response: There are 100 small squares in the whole so each one is $\frac{1}{100}$.
3. 1,000. Sample response: There are 10 of the tiny rectangles in each square and 100 squares in the whole. So that's $100 \times 10 = 1,000$ tiny rectangles in the whole.
4. Sample response: Maybe as 0.001 if the pattern for $\frac{1}{10}$ and $\frac{1}{100}$ of writing another 0 continues.

Lesson Synthesis

“Hoy representamos 1 décimo, 1 centésimo y 1 milésimo de distintas formas. ¿De qué formas pueden representar 1 centésimo?” // “Today we represented 1 tenth, 1 hundredth, and 1 thousandth in different ways. What are some different ways that you can represent 1 hundredth?” (as a fraction $\frac{1}{100}$, as a decimal 0.01, or with a drawing)

“¿De qué formas pueden representar 1 milésimo?” // “What are some different ways that you can represent 1 thousandth?” ($\frac{1}{1000}$, 0.001, or with a drawing, but it’s so small and there are so many of them in the whole that the drawing is not that helpful)

Suggested Centers

- Mystery Number (1–5), Stage 5: Six-Digit Numbers (Supporting)



- Greatest of Them All (1–5), Stage 3: Multi-Digit Numbers (Supporting)

Cool-down


🕒 5 min

Tema de diario: Una milésima

Standards

Addressing 5.NBT.A

Student Task Statement

 ¿Qué aprendiste sobre 1 milésima? ¿Qué te preguntas todavía sobre 1 milésima?

Student Response

Sample responses: One thousandth can be represented on a grid. It can be written as 0.001. It's really small. It is one tenth of one hundredth. I wonder if there is something smaller than 1 thousandth.

Responding to Student Thinking

Students have ideas to share with a partner.

Next Day Supports

After the *Warm-up* in the next lesson, pair students up to discuss their responses.

