Unit 4, Lesson 2

Características de una recta numérica

Standards

Addressing **2.MD.B.6, 2.NBT.A.2**

Goals

- Comprehend (in spoken and written language) the term “number line” refers to a diagram that represents numbers as lengths from 0 using equally-spaced tick marks or points.
- Describe (orally) the structure of a number line and explain how to revise a number line.

Instructional Routines

- Choral Count
- MLR8 Discussion Supports

Student Facing Learning Goals

Exploremos las características de una recta numérica.

Lesson Purpose

The purpose of this lesson is for students to identify and describe the defining features of a number line.

Narrative

In a previous lesson, students were introduced to number lines and represented the location of numbers with labeled tick marks and points within 20.

In the first activity, students each get a number and work together to decide how to place their numbers on a class number line, thinking about the importance of equal spacing and sequencing numbers from left to right. In the second activity, students analyze different student-created number lines and suggest revisions that should be made to make each number line a more accurate representation. Throughout the lesson, students deepen their understanding of the structure of the number line by attending to precision and thinking about the ways they can describe how to correct or improve a number line to others (MP3, MP6).

Access for Students with Disabilities

- Action and Expression

Required Materials

Materials to Gather

- String: Activity 1

Materials to Copy

- Class Number Line Cards (1 copy for every 30 students): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min

Teacher Reflection Questions

Reflect on who participated in class today. What assumptions are you making about those who did not participate? How can you leverage each of your students’

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

ideas to support them in being seen and heard in tomorrow's class?

Warm-up

10 min

Conteo grupal: Contemos de 5 en 5

Standards

Addressing **2.NBT.A.2**

Instructional Routines

- Choral Count

The purpose of this Choral Count is for students to practice counting by 5 and notice patterns in the count. These understandings help students develop fluency and will be helpful later in this lesson and future lessons when students show their thinking on the number line. When students notice patterns and explain why they think they occur based on their understanding of operations and the structure of ten, they look for and express regularity in repeated reasoning (MP7, MP8).

Student Response

Record 2 numbers in each row, starting a new row at 0, 10, 20, and so on.

Sample responses:

- The digit in the ones place changes from 0 to 5 over and over.
- All the numbers in the first column have a 0 in the ones place.
- All the numbers in the first column are a number we say when we count by 10.
- All the numbers in the second column have a 5 in the ones place.
- All the numbers in the second column increase by 10 when you go down the column.
- Numbers in a row have the same amount of tens.

Launch

- *"Cuenten de 5 en 5, empezando en 0"* // "Count by 5, starting at 0."
- Record as students count.
- Stop counting and recording at 100.

Activity

- *"¿Qué patrones ven?"* // "What patterns do you see?"
- 1–2 minutes: quiet think time
- Record responses.

Activity Synthesis

- *"¿Alguien puede describir el patrón con otras palabras?"* // "Who can restate the pattern in different words?"
- *"¿Alguien quiere compartir otra observación sobre por qué ocurre ese patrón aquí?"* // "Does anyone want to add an observation about why that pattern is happening here?" ($5 + 5 = 10$, so when you count by 5 two times you make a new ten.)

Activity 1

La recta numérica de todos

20 min
PLC Activity

Standards

Addressing **2.MD.B.6**

The purpose of this activity is for students to reason together about the relative position of numbers on the number line. Students place number cards on the number line, which is represented by yarn strung across the classroom. Students reason about where their number should be placed based on their understanding of the count sequence and by reasoning about the relative distance of numbers from 0 and each other. As more numbers are called, students revise their number locations to be more precise (MP6, MP7). Throughout the activity, encourage students to reflect on the length between numbers and whether it is an accurate representation of the number relationships.

It is recommended that students are called in a random order. This will provide students opportunities to revise their thinking about the position of their number when more information is added to the number line representation.

Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Some students may benefit from access to a blank number line with equally spaced tick marks on it. Students can then label the tick marks as the numbers are put on the number line to see the appropriate spacing and where the missing numbers lie.
Supports accessibility for: Organization, Visual-Spatial Processing

Required Materials

Materials to Gather

- String: Activity 1

Materials to Copy

- Class Number Line Cards (1 copy for every 30 students): Activity 1

Required Preparation

- Hang yarn across the classroom (yarn should be hung taut to resemble a line) for students to hang their number cards on.
- Create a set of number cards from the blackline master.
- Fold the number cards so they can be hung on the line.

Student Response

Sample responses:

- I placed 28 near the end, but not at the very end because I know its far from 0, but we need space for 29 and 30.
- 2 and 5 are right next to each other, but they should have more space in between them since some numbers are missing.

Launch

- Give each student a number card.
- It is not necessary to hand out all of the cards.

Activity

- *"Hoy van a crear una recta numérica entre todos para representar los números del 0 al 30"* // "Today, you are going to create a class number line

to represent the numbers from 0 to 30."

- *"Cuando los llame, ubiquen su tarjeta de números en la recta numérica"* // "When I call you, place your number card on the number line."
- Place the 0 card to demonstrate how to place a number on the string and to show where the number line begins.
- Invite students to hang their cards in a random order.
- When students place their numbers, ask:
  - *"¿Cómo decidieron dónde ubicar su número en la recta numérica?"* // "How did you decide where to place your number on the number line?"
  - *"¿Qué ajustes debemos hacerle a la recta numérica? ¿Por qué?"* // "What revisions do we need to make to the number line? Why?"
- Pause to check in and revise thinking as needed. If students need prompting for justifying their reasoning for number placement based on length, consider asking:
  - *"¿Qué tan cerca de ___ debe estar tu número?"* // "How close should your number be to ___?"
  - *"¿Tu número debe estar más cerca de ___ que de ___?"* // "Should your number be closer to ___ than ___?"

Activity Synthesis

- *"Las rectas numéricas representan la longitud de los números desde 0 y nos ayudan a ver qué tan cerca están los números entre sí"* // "Number lines represent the length of numbers from 0 and help us see how close numbers are to each other."
- *"¿Cómo ajustaron la ubicación de su número a medida que se agregaban más números?"* // "How did you adjust the location of your number as more numbers were added?" (Sometimes we had to make more room or move cards because the new number needed to fit in between numbers. The more numbers that were already on the number line, the easier it was to be precise.)
- *"Al examinar nuestra recta numérica, ¿qué ajustes finales se pueden hacer para que nuestra recta numérica sea más precisa?"* // "Looking at our number line, what final revisions could be made to make our number line more precise?"

Activity 2

15 min

Analicemos rectas numéricas

Standards

Addressing **2.MD.B.6, 2.NBT.A.2**

Instructional Routines

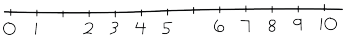
- MLR8 Discussion Supports

The purpose of this activity is for students to analyze number lines to determine whether they represent numbers within 10 as lengths from 0. Students analyze number line diagrams that do not have equal unit intervals or have tick marks that are not properly labeled. Students discuss what needs to be added or changed in order to make these number line diagrams accurate (MP3, MP6).

This activity uses *MLR8 Discussion Supports. Advances: speaking, conversing*

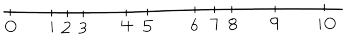
Student Task Statement

1. Recta numérica de Jada



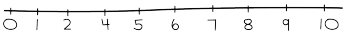
¿Cómo debe ajustar Jada su recta numérica?

2. Recta numérica de Andre



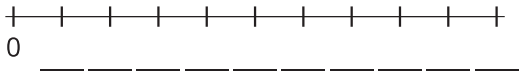
¿Cómo debe ajustar Andre su recta numérica?

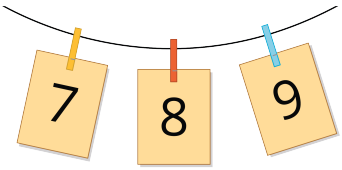
3. Recta numérica de Elena



¿Cómo debe ajustar Elena su recta numérica?

4. Completa los números para crear tu propia recta numérica.





Student Response

1. Sample response: Jada should revise the labels for 2–10. She skipped some tick marks so the numbers do not show the right lengths from 0.
2. Sample response: Andre should make sure the space between each tick mark is the same length.

Launch

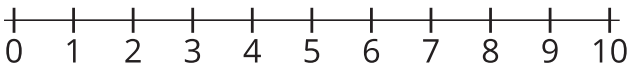
- Groups of 3

Activity

- *"A Jada, Andre y Elena les pidieron que crearan una recta numérica para representar los números del 0 al 10"* // "Jada, Andre, and Elena were asked to create a number line to represent the numbers from 0 to 10."
- *"Individualmente, examinen la recta numérica de cada estudiante. Piensen en una cosa que consideren que el estudiante hizo bien cuando representó los números del 0 al 10 y en una cosa que consideren que debe ajustar. Prepárense para compartir con su grupo"* // "Look at each student's number line on your own. Think of 1 thing you think the student did well when they represented 0–10 and 1 thing you think they should revise. Be prepared to share with your group."
- 90 seconds: independent work time
- *"Analicen cada recta numérica con su grupo"* // "Discuss each number line with your group."

MLR8 Discussion Supports

- Display sentence frames to support small-group discussion:
  - *"Una cosa que ____ hizo bien fue . . ."* // "One thing ____ did well was . . ."
  - *"Una cosa que ____ debe ajustar es . . ."* // "One thing ____ should revise is . . ."
- 5 minutes: small-group discussion
- *"Todos los estudiantes deben ajustar sus rectas*

3. Sample response: Elena should change 3–10. She forgot 3, so 4–10 show the wrong length.
4. 

numéricas. Para cada recta numérica, escriban qué deben hacer para arreglarla" // "All of the students need to revise their number lines. For each number line, write what they should do to fix it."

- 5 minutes: independent work time
- Monitor for students who explain why each diagram needs revising by describing the labels and the space between each number.

Activity Synthesis

- Display Jada's number line diagram.
- Select previously identified students to share how Jada should revise her number line.

MLR8 Discussion Supports

- Support student use of "length" to describe revisions. For example, revoice the student statement "the numbers are wrong" as "the numbers do not show the correct lengths from 0."
- Consider asking:
  - *"¿Qué cosas hizo bien Jada cuando representó los números del 0 al 10 en una recta numérica?"* // "What are some things Jada did well when representing the numbers 0–10 on a number line?" (All of the numbers were listed and are in order. She started with 0 and used tick marks. The tick marks are equally spaced.)
- If time permits, repeat for each diagram.

Advancing Student Thinking

If students say that a number line does not need revisions, provide students with a ruler and consider asking:

- *"¿En qué se parecen y en qué se diferencian la recta numérica de ____ y la regla?"* // "What is the same and what is different between ___'s number line and the ruler?"
- *"¿Cómo puedes usar la forma en que están espaciadas y numeradas las marcas de un regla para describir cómo puede ____ ajustar su recta numérica?"* // "How could you use the way the tick marks are spaced and labeled on a ruler to describe how ___ could revise their number line?"

Lesson Synthesis

"Hoy creamos nuestra propia recta numérica de la clase y analizamos rectas numéricas. ¿En qué debemos pensar cuando creamos una recta numérica para representar números?" // "Today we created our own class number line and analyzed number lines. What do we need to think about when creating a number line to represent numbers?" (We should use the same amount of space between each tick mark. We should make sure labels on tick marks show the right length from 0 and are the right length from each other. We can think about a ruler to check if the number line

makes sense.)

Suggested Centers

- Five in a Row: Addition and Subtraction (1–3) , Stage 6: Add within 100, with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

Cool-down

5 min

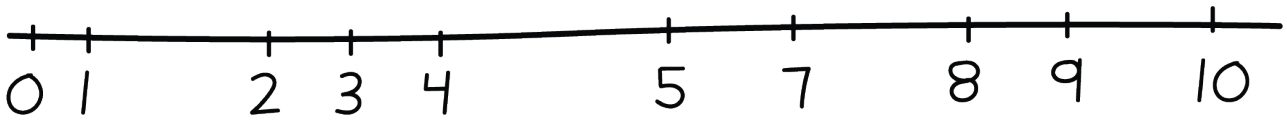
La recta numérica de Mai

Standards

Addressing **2.MD.B.6**

Student Task Statement

Mai hizo una recta numérica para mostrar los números del 0 al 10.



¿Cómo debe ajustar Mai su recta numérica?

Student Response

Sample responses:

- Mai should put the same amount of space between each number.
- Mai needs to label each tick mark with the numbers 0-10, including 6.

Responding to Student Thinking

Students write that Mai should have a tick mark and label for 6 or that she should use the same amount of space between each number, but they do not write both.

Next Day Supports
During the *Warm-up* of the next lesson, have a discussion about this *Cool-down*.