

Big Idea(s): *I want my students to understand that categorical data can be summarily communicated in a variety of ways, including graphs and fractions.*

State Standards: Constructs line plot, bar, line, and circle (pie) graphs to display collected or researched data.
Uses fractions to describe data.

Language of Instruction: Spanish

Grade Level: 4

Focus on the same big idea throughout each phase of the lesson cycle.

Stage of Lesson Cycle	
<p>Preview Stage – preparing students for success</p> <ul style="list-style-type: none"> • Preview ideas, concepts, and strategies in a non-verbal, physical or pictorial manner. • Practice academic oral language in target language. • Use highly comprehensible yet cognitively challenging activities. • Provide survival language via the curriculum. • Put students in heterogeneous groups. 	<p>Content Objectives – <i>Students will:</i> identify the characteristic that a specific group of students have in common and describe, in the form of a fraction, what portion of the entire class shares that characteristic.</p> <ul style="list-style-type: none"> • The leader (the teacher modeling it for the class several times and then student-volunteers) will choose students one at a time that share a particular characteristic, without identifying it. Volunteers will try to “guess” the characteristic by observing what the standing students have in common, e.g. ¿Es que son todas niñas? After each incorrect guess another student who shares that characteristic will be asked to stand. When the characteristic has been identified the remaining class members who share it will stand. If everyone who shares it has been chosen and three consecutive guesses are incorrect, the leader will identify the characteristic. The leader will write, and say aloud, the fraction of the class represented by those standing, e.g. “Tres veinte-ochavos son pelirrojos.” She/he will point to the parts (numerator, denominator) of the fraction as it is read while the students point to the characteristic. • Student grouping: Whole class • Differentiation: Students who are leaders can choose characteristics for which they already have vocabulary. Students sharing that characteristic will draw attention to it while the fraction is read aloud, i.e. point to their red hair. <p>Language Objectives: - <i>Students will:</i> use appropriate vocabulary and complete sentences to refer to particular characteristics and correct mathematical terminology: Tres veinte-ochavos llevan el color morado, o, Tres de los veinte-ocho en la case llevan ropa del color morado, etc.</p>

	<p><u>Vocabulary:</u></p> <ul style="list-style-type: none"> • El denominador, el numerador, la barra • Las fracciones: La mitad, el tercio, el cuarto, el quinto, el sexto, el séptimo, el octavo, el noveno, el décimo, • y los patrones para las fracciones usando denominadores mayores de 10: --avo, como vemos en onceavo, doceavo, Una parte de -- partes iguales
<p><u>Focused Learning Stage – making the connection between oral language and literacy</u></p> <ul style="list-style-type: none"> • Introduce literacy. • Readings available at many different levels in the target language. • Continued practice of oral academic and survival language, as well as literacy. • Use graphic organizers with text. • Guided reading or writing activities. 	<p><u>Content Objectives</u> – <i>Students will</i> construct bar fractions, using adding machine tape, to represent the fraction of students in the class who “fall into” a particular category.</p> <ul style="list-style-type: none"> • Strategies <ol style="list-style-type: none"> 1. Using paper strips cut to the same length in inches as the number of students in the class, the teacher will lead the students in folding and marking the paper in halves, fourths and eighths, thirds, sixths and twelfths, and fifths and tenths. 2. Each student will survey each other class member, using a previously-prepared* yes/no question. They will use the data from that survey to make fraction strips. Using a paper strip of the same length, each one will label and color the strip in the amount that represents the responses to his/her question. 3. The students will compare the results from their surveys to the fraction strips to construct meaningful mathematical observations of their data: e.g. Más de la mitad de la clase tiene una mascota; Casi tres tercios de la clase tienen hermanos en la casa. They will talk about the observations in their table groups and each student will share one observation, using his/her own data, with the class. They will then post the data-strips on the board. • Student-Grouping: Instruction will be whole-class, with the students sitting in heterogeneously-mixed groups of four.

	<ul style="list-style-type: none"> • Differentiation will occur as teacher moves from table to table demonstrating and modeling, and students at each table help one another. Additionally, each student will be using a self-created survey question that will be at his/her own language and developmental level. <p><u>Vocabulary:</u> La mitad, la media parte, un cuarto, un octavo, un tercio, una sexta, un doceavo, un quinto, un décimo, y cómo se dice la fracción cuando el nominador sea más de uno: tres cuartos, siete décimos, etc.</p> <ul style="list-style-type: none"> • <u>Language Objectives:</u> - <i>Students will</i> use complete sentences to ask and respond to questions of their classmates. e.g. ¿Tienes tú hermanos que viven contigo en casa? Sí. Tengo dos hermanos que viven conmigo en casa. • <i>Students will</i> state mathematical observations using complete sentences and appropriate fractional terminology, e.g. Aproximadamente dos quintos los niños en nuestra clase viven en apartamentos.
<p><u>Application Stage</u> – students demonstrate what they have learned</p> <ul style="list-style-type: none"> • Focus on independent use of skills and demonstration of understanding of big idea/lesson focus. • Provide differentiated activities for linguistically and academically heterogeneous groups. • Teachers can ask students to prepare an oral presentation/performance (pairs, small groups or whole class). • Students complete a real-world project or product. 	<p><u>Content Objectives</u> – <i>Students will:</i> Compare data collected from the class to data collected from a national survey.</p> <ul style="list-style-type: none"> • Student Grouping: Whole Class. Students working at heterogeneous table groups • Differentiation: Students can consult “word bank” charts that list commonly used words • Strategies: <ol style="list-style-type: none"> 1. The students will place “sticky notes” within circles drawn on the board to indicate their answers to the questions in each circle: ¿Todavía están vivos los cuatro abuelos? ¿Llevas lentes? ¿Comes frecuentemente los vegetales? ¿Piensas que son malos los cigarrillos? ¿Eres el hijo mayor en la familia? ¿Vives en el mismo estado en que te naciste?

	<ol style="list-style-type: none"> 2. The students will write sentences to indicate the data they see for each of the questions displayed on the board, for example, Tres de los veinte-siete en la clase llevan anteojos. 3. The students will compare the data that they see on the board to the national data and write a sentence that describes that comparison. For example, Hay más niños en esta clase que son los hijos mayores en su familias que vemos en la encuesta nacional. They will use strategies learned in the previous lesson to make the comparisons. 4. In their table groups, students will identify the data that is most surprising to them by stating that comparison aloud. <p>Language Objectives: - <i>Students will:</i></p> <ol style="list-style-type: none"> 1. Write full sentences that compare fractional data. 2. State, in full sentences, at least one specific comparison that represents personally significant information.
<p><u>Bridging Lesson:</u> Language of Instruction: English</p>	<p><u>Content Objectives:</u> <i>Students will:</i></p> <ol style="list-style-type: none"> 1. Gather data from other 4th Grade students. 2. Compare statistical information gathered from two separate groups of students in the forms of commonly-used fractions. 3. Evaluate the accuracy of comparisons using fractions. <p><u>Language Objectives:</u> <i>Students will:</i></p> <ol style="list-style-type: none"> 1. Ask questions of other students, using complete sentences and appropriate vocabulary. 2. Communicate mathematical observations using complete sentences and appropriate fractional terminology. 3. Discuss the accuracy of comparisons. <p><u>Grouping:</u> Heterogeneously mixed groups of four.</p> <p><u>Vocabulary:</u></p> <ol style="list-style-type: none"> 1. Denominator, Numerator, Fraction Bar 2. Fractions: half, third, fourth, fifth, sixth, eighth 3. Patterns for forming fractional amounts in English: 1st, 2nd, 3rd, th, etc

Materials:

Paper strips cut to the same length in centimeters as the number of students in the class.

Chart paper and handouts with the following questions:

Our family sat around the table to eat dinner last night.

All of the adults in my family have jobs outside of the home.

I have brothers and sisters who live in my house with me.

The television was on at my house last night.

We have a family pet.

I participated in team sports this week.

I have cousins who live in my city.

I walked or rode my bicycle to school today.

Strategies:

1. The students read the questions at their tables. They write “Yes” or “No” after each one. They share their responses to the each question and identify what fraction represents the number of students that responded, “yes.” Students share the fraction that represents the number of “yes” responses to the questions e.g. “ $\frac{3}{4}$ of our table has a pet”
2. Each table chooses one of the questions to use to poll the other students in the class. They go from table to table counting the number that responded, “Yes” to their question. They display the total for the class, in fractional form, on the chart paper.
3. They interview students from another class, using the same question, and display the data alongside the data from their own class.
4. Working together in table groups, and using the folded paper technique, each student will compare the data from his/her own class to the data from the other, e.g. “ $\frac{3}{4}$ of our class had the TV at home last night, but only $\frac{1}{2}$ of the students from Room 120 had it on.” They will write their comparisons on sentence strips and post them on the chart paper where that question is listed.
5. Students will read the statements and, as a table group, will decide if the statements are accurate.

