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| **Synopsis of high-quality task:**  This task requires students to add, subtract and compare fractions. Students discuss and reflect on whether the system is working for a group of native-Spanish, non-English speaking students and whether a change should be made to a dual language program in Boston Public Schools.  **Anticipated student time spent on task:** 1.5 hours  **Student task structure(s):** Individual work/partner work/group work |
| [**Math Content Standards and Practices:**](http://www.doe.mass.edu/frameworks/math/2017-06.pdf)  **5.NF.A.1 -** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.  **5.NF.B.5a -** Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.  **5.NBT.B.5 -** Fluently multiply multi-digit whole numbers using the standard algorithm.  **SMP1** Make sense of problems and persevere in solving them  **SMP3** Construct viable arguments and critique the reasoning of others  **SMP4** Model with mathematics |
| **Prior Knowledge:**  **5.NBT.B.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.  **5.NF.B.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. |
| **Connections to the real-world:**  Students are exploring the reality of schools with dual language instruction for language learners. |
| **Mastery Goals:**  Learning Objective:  Students will be able to answer 4 questions using the data from the classroom using multiplication and comparing fractions.  Language Objective:  Students will be able to read data sets in order to make comparisons and answer questions.  Students will be able to use math notation to provide written responses to assigned tasks.  Students will be able to listen and speak with a table partner to discuss the data sets and possible solutions to the question at hand. |
| **Instructional Tips/Strategies/Suggestions:**  In order to solve this task, the students will be ready to understand what a fraction means and how they can compare fractions using the same and different denominators. Students also need to know how they can solve multiplication by two digits problems.  Start a discussion about schools having different programs to best reach the needs of their students. Talk about dual language programs and how you will be investigating the data from such a school today. |
| **Instructional Materials/Resources/Tools:**  Include:   * Student handout |
| **Accessibility and Supports:**  **Potential sentence starters:**  I think my fraction is \_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_  The largest fraction is \_\_\_\_\_\_\_\_\_\_\_that corresponds to\_\_\_\_\_\_\_\_\_\_  **Key academic vocabulary:** numerator, denominator, proper, improper fraction, largest and smallest fraction. |

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| Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Sarah Greenwood school is a dual language (Spanish and English) K-8 grade school with 395 students. The district is now assigning English Language Learners to grades 3-6 at the school whereas before school administration would interview students to determine acceptance rates. This new process of assigning students caused a shift in the numbers of native Spanish- and native English-speakers over the past few years.  The following table shows the current numbers of students whose first language was Spanish and English.   |  |  |  | | --- | --- | --- | | Grade | Spanish as a First Language  (Number of Students) | English as a First Language  (Number of Students) | | Kindergarten | 64 | 20 | | 1st grade | 43 | 7 | | 2nd Grade | 40 | 8 | | 3rd grade | 33 | 14 | | 4th grade | 28 | 7 | | 5th grade | 40 | 11 | | 6th grade | 21 | 11 | | 7th grade | 14 | 9 | | 8th grade | 19 | 9 |     1) For each grade, determine the fractions of native English-speakers and Spanish-speakers that enrolled this year.      2) Compare the fractions to find which grade has the largest group of Spanish speakers.                3) Students at the Sarah Greenwood school receive half of their instruction in English and half in Spanish every day. Students receive 2 ½ hours instruction in English and 2 ½ hours instruction in Spanish. Calculate many hours the non-English speakers learn English in one school week (5 days), one school month (20 days), and in the entire school year (180 days).          4) Although there has been a change in the numbers of native Spanish- and native English-speakers over the years, there has not been a change in the number of hours of instruction given in English and Spanish throughout the school day. Do you think the number of hours of instruction given in English and Spanish should be changed or remain the same with half of the day in English and half of the day in Spanish? Explain.            Extension: Create a line graph to represent this school population. Make sure to label these categories and use different colors to represent them. Explain your thinking.     |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | |
| **Sample Student Work:**  Student work. Table with student population fractions has been filled out.  Student work. Found largest group of non-English speakers and number of hours of English and Spanish is taught.  Student work. Linear graph on English-speaking versus Spanish-speaking populations.  Student work. Explaining the graph.  Student work. Explaining the graph. |