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| **Synopsis of high-quality task:**  Exam schools are selective public high schools that aim to meet the needs of academically talented students. Not charter schools and not private schools, these selective public schools accept new students based on students’ grades and entrance exam scores. In this task, students will utilize data regarding exam schools in BPS to answer seven word problems. Students will also be asked to explain their thoughts on whether BPS should take measures so that the enrollment of students of color in exam schools will increase.  **Anticipated student time spent on task:** 45min to 1hr  **Student task structure(s):** Individual, partner, or group work |
| [**Math Content Standards and Practices:**](http://www.doe.mass.edu/frameworks/math/2017-06.pdf)  **5.NBT.B.5** Fluently multiply multi-digit whole numbers using the standard algorithm.  **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, the 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.NBT.B.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.  **SMP 1** Make sense of problems and persevere in solving them  **SMP 3** Construct viable arguments and critique the reasoning of others  **SMP 4** Model with mathematics |
| **Prior Knowledge:**  **4.NBT.B.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. |
| **Connections to the real-world:**  Students used the four operations to solve some problems using the data for the exam schools in Boston. |
| **Mastery Goals:**  Learning Objective:  Students will be able to:   * Use the data from exam schools to answer 7 questions using addition, subtraction, multiplication and division. * Read and interpret data sets in order to make comparisons and answer questions. * Use math notation to provide written responses to assigned tasks.   Language Objective:  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:**  Teacher should have a conversation about what an exam school is for those who are unfamiliar.  Exam schools are selective public high schools that aim to meet the needs of academically talented students. Not charter schools and not private schools, these selective public schools accept new students based on student's grades and entrance exam scores.  Teacher gives a mini lesson about solving word problems (looking for key words and translating them into expressions or equations).  Go through an example where you read through the problem and set up a *word equation* — that is, an equation that contains words as well as numbers.  Plug in numbers in place of words wherever possible to set up a regular math equation.  Use math to solve the equation.  Answer the question the problem asks.  Label each answer.  Students will work individually first and then in partners to complete the questions in the task.  At the end we discuss it with the whole group, highlighting key words and their meanings, as well as different approaches to solving the problems.  Over the past 3 years, Boston Public Schools (BPS) has taken a number of steps intended to increase access to BPS exam schools for student populations that are currently underrepresented at those schools, particularly Black and Latino students. A recent part of this effort has included an analysis of the current report card grading scale used for grade 5. A cross-functional team met to consider the current grading system and options for adjusting the current numeric 1-4 grading scale to address perceived disadvantages that a standards-based scale might present for BPS students applying to exam schools. As part of its work, the group surveyed grade 5 teachers to better understand current grading practices.   1. 10 students from Sarah Greenwood School are accepted to the 3 exam schools in Boston. If an equal number of students from the 73 middle schools in Boston are accepted, calculate the number of students that are accepted to the exam schools in total. 2. Seventy-three schools have 4 fifth-grade teachers. Determine the number of teachers that could participate in the grading survey. Calculate the number of teachers that would participate in the survey if each school had 11 fifth-grade teachers. Explain your reasoning for both answers. 3. Teachers must choose from 4 options when completing the survey. Option A is to keep the numbers 1-4, Option B is to exchange the numbers for letters A-F, Option C is to start the grading with letters this year, and Option D is to start the grading with letters next year. 156 teachers responded to the survey. If teachers voted equally for each option, determine the number of votes each option received. Then check your answer for reasonableness using estimation. 4. There were 1,562 students in attendance at the John D. O’Bryant School of Math and Science last year. 518 students of the student body identified as African-American/Black, and 523 student identified as Hispanic. If the other 73 schools have the same number of students in the race categories listed, calculate the number of students that are identified as African-American/Black or Hispanic. 5. Use the chart below to find out how many more students were enrolled in 9th grade than 7th grade at the Boston Latin School (***BLS***).  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Grade** | **7** | **8** | **9** | **10** | **11** | **12** | **Total** | | **District** | 3,340 | 3,316 | 4,189 | 3,553 | 4,024 | 4,006 | 22,428 | | **BLS** | 417 | 380 | 443 | 411 | 390 | 412 | 2,453 |   6. From the chart below compare the numbers in each grade from the district. Determine which grade has the greatest number of students at the ***district*** of Boston. Justify your answer.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Grade** | **7** | **8** | **9** | **10** | **11** | **12** | **Total** | | **District** | 3,340 | 3,316 | 4,189 | 3,553 | 4,024 | 4,006 | 22,428 | | **BLS** | 417 | 380 | 443 | 411 | 390 | 412 | 2,453 |   EXTENSION: Create a linear graph to represent the information in the chart for Boston Latin Academy. Make sure to label each category and explain your representation.  A blank x y chart.  Do you agree that Boston Public Schools (BPS) should take steps to increase enrollment in BPS exam schools for student populations that are currently under-represented at those schools, particularly Black and Latino students? Explain your reasoning. |
| **Accessibility and Supports:**  **Potential sentence starters:**  I think my answer is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because \_\_\_\_\_\_\_\_\_.  Based in this problem, my solution is.........because...........  The solution tells me that it has many ways to solve this problem such as.........  **Key academic vocabulary:** increase, populations, under-represented, analysis, a cross-functional team, grading, disadvantages, standards-based scale, survey. |

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| **Sample Student Work:**  **Student work, answering questions 1 and 2.**  **Student work. Answering question 3.**  **Student work. Answering questions 4 and 5.**  **Student work. Answering question 6.**  **Student work. Answering the extension.**  **Student work. Answering the extension.** |