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| **Synopsis of task:**  Students will use fraction and decimal knowledge to design and plan a specific garden. Students will use geometry skills to determine areas and arithmetic skills to plan specific seed purchases.  **Anticipated student time spent on task:** 2 class periods  **Student task structure(s):** Partner work |
| [**Math Content Standards and Practices:**](http://www.doe.mass.edu/frameworks/math/2017-06.pdf)    **7.NS.A** Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.  **7.G.A.1** Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.    **SMP1** Make sense of problems and persevere in solving them.  **SMP2** Reason abstractly and quantitatively**.**  **SMP6** Attend to precision. |
| **Prior Knowledge:**  **6.NS.B.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.  **6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. |
| **Connections to the real-world:**  This task requires students to measure the dimensions of a garden and calculate its area. Students will also have to choose dimensions to maximize area within a given perimeter and calculate fractional portions of a defined space. |
| **Mastery Goals:**  Learning Objective:  By the end of the lessons, students will be able to multiply fractions to determine successive portions, convert fractions to percentages, find dimensions to maximize potential area of a rectangle, and create a scale drawing.  Language Objective:  Students will be able to describe how to break up the garden into fractions by use of equal sized pieces. Students will be able to show how they found the area of each section of the garden. |
| **Instructional Materials:**  Student worksheet. |
| **Accessibility and Supports:**  **Potential sentence starters:**  I ended up dividing my garden into \_\_\_\_\_\_\_ equal pieces.  Dividing by \_\_\_\_\_\_ means making \_\_\_\_\_\_ equal pieces.  Denominator is how many \_\_\_\_\_\_\_\_\_\_\_ pieces it takes to make a \_\_\_\_\_\_\_\_\_.  **Key academic vocabulary:**  Denominator, Numerator, Ratio, Proportional |

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| Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Aunt Daisy’s Garden**  Aunt Daisy needs your help in designing her vegetable garden. Her plan is as follows:   * of her garden will be planted with corn * of the rest of her garden will be planted with hot peppers * of the rest of her garden will be planted with tomatoes * All of the area left in her garden will be planted with onions.   **Step 1**: Use fraction operations to determine the fraction of the area of the garden that is to be planted with each vegetable.  **Step 2**: Copy and fill in the table below showing the correct fraction (in its most simplified form) of the garden for each vegetable.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Vegetable | Corn | Hot Peppers | Tomatoes | Onions | | Fraction of  The  Garden Area |  |  |  |  |   **Step 3:**  Aunt Daisy is going to surround her garden with fencing. She has 98 feet of fence to use and is planning to make her garden in a rectangular shape. Aunt Daisy is very fussy about making sure each dimension of her garden is a WHOLE NUMBER length.  Determine what dimensions (length and width) Aunt Daisy’s rectangular garden should be to use all of the 98 feet of fencing to surround it, AND to have the largest possible area for planting vegetables inside of it. Show clearly how you determined what the dimensions, perimeter and maximum area of her garden will be. (Remember she wants whole number dimensions!)  **Step 4**: Based on the total area of Aunt Daisy’s garden, and the fractional sections you calculated in Step #1, copy and fill in the table below giving the actual square feet of space that each vegetable will get as well as the percent of the total area that it represents.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Vegetable | Corn | Hot Peppers | Tomatoes | Onions | | Square feet of garden space |  |  |  |  | | Percent of total garden space |  |  |  |  |   **Step 5:** On a piece of graph paper draw a scale drawing of the garden that you have designed for Aunt Daisy. Label each section of the garden with the type of vegetable that will be planted there as well as the fraction or percent that each area represents. Drawing must be proportionally correct. Provide a key for your scale.  **Extension (optional):**  Aunt Daisy is planning to make her famous corn salsa recipe which contains four ingredients…corn, tomatoes, onion, and hot peppers. Her recipe is easy to remember as the proportions of these four ingredients are as follows:  Corn to Tomatoes to Onion to Hot Peppers: 4 : 2½ : 1 : ¼  Copy and fill in a table that shows the corresponding amounts on would need to complete the recipe for the given amounts.   |  |  |  |  | | --- | --- | --- | --- | | Ingredient | Smallest Batch | Medium size batch | Largest Batch | | Corn | ¾ cup |  |  | | Tomato |  | 3 cups |  | | Onion |  |  |  | | Hot Peppers |  |  | 3/8 cup |   **Sample Student Work:**  **https://lh4.googleusercontent.com/XfhdePU8Ir_jKw-7gjFnGuULys2pQEIaIAhs7Nt_SluLb_GHq7CAN_qc8l3H9bdXJd_wSmh9Doj24zeyTwREs9eLXEOxEAo0SPQjxEzq8BGglrgNq8wrbgvAmT172oN1BHeWZL67**  **https://lh3.googleusercontent.com/ToJXVJ_7paQ7zY2m9WIAi7sDwhmPLUsL0d3aQc8l3ENaXsdWBEiwwncC-Ks2wTfFimKamNKVT35vfDyfjiYmEz9gaSPNg7JGYqhaMQyIpRAnlHLqhOGUDOh6y2GtLN4Pbj6L-3WT**  **https://lh6.googleusercontent.com/oJNeObqxoKNNlJUOpq3IVzOmv5QgVrLDT6W-NVlfupBNGWFXqCoxVoSNsuEOLhok3MnctfZI5qBsekndSeTFL6tOeqZlwC-hy-a2tTKsV-PIAnwUFVsVHPLQzY2mUSO27JiB-0k3** |