Line Plot- Bulk Candy
(Adding and Subtracting Fraction)

MAFS.5.NF.1.1: 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.

MAFS.5.NF.1.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

MAFS.5.NF.2.3: Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

MAFS.5.MD.2.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Teacher will give Bulk Candy Handout. Students will work individually to create a line plot. Then groups will collaborate to finalize a Line Plot together on a larger chart paper. They will then answer each word problem on chart paper that are posted around the room. Then teacher will discuss whole group to understand and misconceptions or errors.

Then students will work on question 1: *Suppose you took all the bags of candy that weighed $\frac{3}{4}$ pounds and combined them in one large bag. Write a numerical equation and draw a picture/model to show how you could find the total weight of the bag. Then find the total weight of the bag.*

Students are required to show two possible ways in which he or she can solve. They must include a picture or model to justify. Teacher will be looking for errors with either repeated addition or multiplication such as adding the denominators as well instead of keeping the denominator as fourths. A common model is either using the number line or modeling ¾'s. Students may not be able understand how the model illustrations the solution. They often model the answer after they find the solution.

Then students will work on question 2 without teacher: *Suppose you combined all the bags of candy that weighed one pound or more into a single bag. How much would this bag weigh? Write a numerical equation and draw a picture/model to show how you could find the total weight of the bag. Then find the total weight of the bag.*

Students must be able to first locate all of the fractions equal to or greater than 1. They need to include all of the bags, not just how many fractional amounts. Students are required to show two possible ways in which he or she can solve. They must include a picture or model to justify. Teacher will be looking for errors with either repeated addition or multiplication. When teacher reviews what the students did to answer this questions, the model may have errors that include not renaming fractions properly. Again, a common error is that students can model a solution, but they are unable to create and use the model accurately in order to locate the solution.

Once the second discussion has taken place, students will work on question 3 without teacher: *If the total of candy were to change to 16 ½ pounds, what could be some additional fractional amounts the students may have.*

Students must be able to calculate the total of the fractions renaming with like denominators. This is necessary so they can find a more accurate answer. Students can then choose the strategy of subtracting their sum from 16 ½ or continuously choose fractional amounts that add onto the total to equal 16 ½. Teacher will create a conversation about how to solve with numerically and with a model. Teacher will demonstrate that you do not need to start a number line at 0 to find or model how they reached a solution.

Possible Questions:
How does that drawing support your work?
Explain why you renamed your denominator?
Explain how you renamed your fraction?
Why did you choose that operation?
How did you prove that your answer was correct?
Can you think of another way to model how to find your solution?
What are some challenging steps that you faced as you were solving this problem?
What is another operation you could have used when solving this problem?
How do we know we are adding?
Why is it important to rename…?
Why do we order numbers on a line plot?
Why can we multiply ¾ by 4 and/or add ¾ four times?

Cameras would need to be at each group and towards the front of the room. The conversations will go from group to group and teacher to groups (whole group). When groups are collaborating, teacher will walk around the room making observations and asking questions.

(See Attached Handouts)