Splash! into Data – Elementary (Grades 4-5)

Introduction	In these activities, students will explore the data that they gathered with Splash! and apply it to various mathematical tasks.
Time	1 -2 class periods
Grade	4-5
Lesson Preparation	Students will have visited the Tsongas Industrial History Center to participate in the Power to Production program. Students gathered data from the waterwheel test on the Splash! app. For this activity, teachers can download the class's data at www.tihcsplash.org. Each student will need a copy of the class's Splash! data and the Splash! into Data worksheet. A document camera may be helpful for student sharing of ideas.
Vocabulary	Line Plot Bar Graph Efficient (Tier 2 word)
Anticipated Student Preconceptions/ Misconceptions	Students should know how make a line plot and a bar graph, as well as how to label each. Students may not have discussed the benefits and drawbacks to each type of data display.
Frameworks	Massachusetts Math Standards 4.MD.B Represent and interpret data. 4. Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, etc) Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.* This activity also addresses the following Mathematical Practice Standards MPS.3 Construct viable arguments and critique the reasoning of others. MPS.4 Model with mathematics MPS.5 Use appropriate tools strategically

Guiding Question	What are the benefits and drawbacks to different methods of displaying data? How can we determine if data is or is not reasonable?
Objectives	Students will be able to: • Compare and contrast the bar graph and the line plot and describe benefits and drawbacks to each. • Create their own bar graphs and line plots for different data sets. • Compare data from unlabeled sets to determine which wheel/ base combination most likely produced the data.

Activity	1. Students may work independently or with a partner. 2. Students will complete the worksheets for Speed Data and Strength Data. The Splash! data from the class trip, showing strength and speed results from one or more groups, should be displayed to help students determine which data set matches which wheel/ base combination 3. Be sure students write statements justifying why they matched each set of data with the wheel. 4. Ask students to determine which way of displaying the data they think is best. What are the benefits to using a bar graph? What are the benefits to using a line plot?
Assessment	Group discussion of data. Students can share their work with the class using a document camera if one is available.
Differentiated Suggestions	• Students can be provided with sentence frames, for example: I knew the _____ data set showed the ____ wheel because. • Review symbols for greater than, less than. • Use anchor charts showing line plot and bar graph. • Partner students strategically and allow them to support each other.

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Strength Data

Data Set 1

5	4	5	0	3	6	5	7	15	8
7	5	4	4	4	4	7	4	6	6

Make a bar graph showing the data in data set 1.

Make a line plot showing the data in data set 1.

Which graph do you think is more useful? _____

Give three reasons why you think this it is more useful.

1.
2.
3.

Compare data set 1 to your Splash! data. Which wheel/ base combination do you think is likely to have produced this data?

Why do you think this is the case? Use your class's Splash! data to support your answer.

Speed Data

Data Set 2

9.5	8	11	9	9	10	8	9	6	9
8	9	10	9	10	7	10	5	9	5

Make a bar graph showing the data in data set 2.

Make a line plot showing the data in data set 2.

Which graph do you think is more useful? _____
Give three reasons why you think this it is more useful.
1.
2.
3.

Compare data set 2 to your Splash! data. Which wheel/ base combination do you think is likely to have produced this data?

Why do you think this is the case? Use your class's Splash! data to support your answer.