Unit Title/Grade Level: 3rd Grade Environment Unit

Lesson Title: Recycling Graphs

Central Focus of the Learning Segment: How much does Golden Hill Elementary School recycle during lunch?

Standards:
3.MD.B.3 Measurement and Data; Represent and Interpret Data
Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.

W3.7 Conduct short research projects that build knowledge about a topic.

Learning Objectives: Students will be able to:
1. Create a scaled bar graph categorized by material (glass, plastic, cardboard, aluminum cans) using previously collected data on recycled bottles
2. Interpret graphs created through leveled-questions

Academic Language and Vocabulary: bar graph, recycle, data.

Prior knowledge: Students will have understanding of recycling, data collection, and an understanding of graphing data. Students were introduced to bar graphs during the previous lesson through brain pop jr. video on tally sheets and bar graphs.

Context for learning: This lesson is part of a 3rd grade integrated math and science unit on recycling and data collection/interpretation. This third grade class of 24 students contains 4 children with IEPs for ADHD, Learning Disabilities, and speech and language impairment. 1 Student has an orthopedic impairment which affects his fine motor skills, such as writing. 2 additional students are ELL learners.

Anticipated difficulties:
ADHD Learners may have difficulty attending to the task as this activity involves independent work and self-regulation. To alleviate these difficulties, students will be given the option to work in pairs, as well as teacher presence and assistance as needed.
LD Learners may, in addition to those difficulties presented for ADHD learners, have difficulty with interpreting and organizing data. Modified/partially completed graphs will be available to students who have difficulty and request them.
Speech and language disabled students should experience no specific difficulties, however, as part of whole-class option can work in pairs with peers.
English Language Learners should not experience specific difficulties as the academic language and concepts which may be foreign to them will have been
covered in previous lessons. However, such language will be posted on the wall via word wall or poster. **Physically disabled learners** will have difficulty constructing graph (such as using an incorrect scale, including incorrect information, etc.). Teacher will have dot stickers available to show data and peer helpers to assist in completing graph.

**Common Misconceptions:**
Students may partially or incorrectly complete graph, altering their interpretation of data. Teacher will frequently check for understanding and available for assistance if needed.

**Materials:**
Markers
Recycling data sheet (previously recorded)
Large sheets of white paper
Rulers
Dot stickers

**Motivation:**
Yesterday we got our hands dirty by collecting bottles from all of the recycling bins in the cafeteria to try to find out how much Golden Hill students recycle. We collected our data, but what is a good way let people know what we found? How can we go about showing them visually?
**Teacher will take suggestions (ex. Make posters, announce it over the loud speaker, put it in the newspaper)**

**Focus:** Graphical Representation of collected data using scaled bar graphs.

**Instructional Activity:**
“Today we will be creating a visual way to show the data we found by constructing bar graphs. Bar graphs can be used to see and compare findings about a certain topic.
By the end of the lesson, everyone will have created a bar graph then we will be able to use those graphs to answer some questions about how much Golden Hill students recycle.”
- As part of the data collection lesson previously implemented, teacher will have gathered class wide data on favorite ice cream flavor (as an example of data collection). Teacher will now use this data to demonstrate creation of a bar graph.
- Teacher will model creation of a bar graph on the chalk board, white board, or SmartBoard using different data, explaining how to label, categorize, and plot data on each type of graph. Teacher will also show examples of picture/bar graphs to students, and will leave them up as examples for the remainder of the lesson.
- Students will work independently.
- Students will use previously collected data of recycled bottles from the cafeteria to plot data on created bar graph categorized by bottle material (cardboard, plastic, glass, aluminum, etc).
**Differentiation:**
Students will have the opportunity to use partially completed graphs (such as already constructed axis, or pre-labeled graphs). Students with learning disabilities or physical impairments will have the option of using stickers or markers to complete graphs if they are having difficulty.

**Independent Practice:**
- Students will use their plotted data to answer teacher provided interpretation questions.

**Assessment:**
- Teacher will assess student understanding through evaluation of information on the generated graphs. Students must have titled their graph, correctly plotted data, and accurately labeled axis (by material).

- Teacher will assess understanding of interpretation of data through responses of questions.

Bloom’s Taxonomy Leveled questions for Assessment:

**Knowledge:**
Using information from your graph, order materials recycled from least to most.

**Comprehension:**
Which type of container is most used? Explain why you think this is the case (make a hypothesis).

**Application:**
What did you title your graph? Why?

**Analysis:**
Relate your graph to the data collection sheet. What does your graph show that your data collection sheet does not?

**Synthesis:**
How can we use this data and graph to encourage students to recycle?

**Explanation:**
If we had collected data on recyclables that were thrown into the trash bin, do you think your graph would look different? Support your prediction using knowledge about recycling.