

Mathematics:

High Quality Children's Literature

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Primary/ Junior Section 2

Dr. Dan Jarvis

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Summary:

Book Title: Lemonade for Sale

Author: Stuart J. Murphy

Illustrator: Tricia Tusa

ISBN: 0-06-446715-5

The Elm Street Kids' clubhouse is falling into disrepair and they need to earn money to fix it. To do so the children decide to open up a lemonade stand. The children work collaboratively to keep track of the amount of lemonade they sell each day, for one week, using a bar graph. Throughout the week they make predictions about how much lemonade they will sell based on yesterday's tally. Initially there is a steady increase in sales and the children are very pleased with their success. Towards the end of the week however, the children notice a considerable drop in sales and discover that there is a competition down the street, a juggler. After some problem solving the Elm Street Kids' ask to set up their lemonade stand beside the juggling act and their sales increase 'over the top'. At the end of the week the children earn enough money to fix their clubhouse. They are able to effectively visualize where and when the money was earned through the bar graph.

Grade Level and Strand:

Grade: 3

Strand: Data Management and Probability

Specific Curriculum Expectations:

- Collect and organize categorical or discrete primary data and display the data using charts and graphs, including vertical and horizontal bar graphs, with labels ordered appropriately along horizontal axes as needed.

- Read, describe, and interpret primary data presented in charts and graphs, including vertical and horizontal bar graphs.

Suggestions for Discussion Questions:

Before:

- Has anyone ever had a lemonade sale?
- What happens at a lemonade sale?
- What are some ways you could keep track of your lemonade sales and the money you earn?

During:

- On which day did the Elm Street Kid' sell the most lemonade?
- How many cups did they sell on Wednesday? Is that more or less than Tuesday?
- How can we find this information out?

After:

- Do you think the bar graph was a good tool to use?
- What do you think may have happened if the Elm Street Kids didn't keep track of their sales?
- Are there any other ways the Elm Street Kids' Club could have organized their data?
- What other kind of data could you organize using a bar graph?

Activity:



Direct Instruction Planning Format

1. Lesson Plan Information	
Subject/Course: Mathematics	Name: Erin LeClair & Victoria Wilson
Grade Level: 3	Date: January 16, 2009
Topic: Data Management - Bar Graphs	Time and Length of Period: 10:10-10:50am (40 minutes)

2. Expectation(s) and Learning Skills
The students will:
<ul style="list-style-type: none">- Collect and organize categorical or discrete primary data and display the data using charts and graphs, including vertical and horizontal bar graphs, with labels ordered appropriately along horizontal axes, as needed.- Read, describe, and interpret primary data presented in charts and graphs, including vertical and horizontal bar graphs.
Today, students will:
<ul style="list-style-type: none">- Collect and organize categorical or discrete primary data and display the data in a bar graph, with appropriate titles and labels and with labels ordered appropriately along horizontal axes.- Interpret and draw conclusions from data presented in bar graphs.

3. Pre-assessment
A. (i) Students
<ul style="list-style-type: none">• Have knowledge and understanding of attributes and representation.• Able to effectively sort and organize material.• Able to express ideas orally in a large group context.• Have worked in groups successfully and are continually honing their collaborative work skills.
(ii) Differentiation of content, process, and/or product (may be accommodations)

and/or modifications)

- P, K, and L may need visuals to assist with vocabulary.
- J and T must work in separate groups during application.

B. Learning Environment

- Students will gather on the carpet for introduction and instruction.
- Students will work in home groups throughout the classroom during the application period.

C. Resources/Materials

- Book: Lemonade for Sale by written Stewart J. Murphy and illustrated by Tricia Tusa
- A collection of crayons
- Chart paper
- Markers
- Rulers

4. Content (The What)

Teaching/Learning Strategies (The How)

A. Introduction (motivational steps/hook/activation of students' prior knowledge)

(7 Minutes)

Read Aloud: Lemonade for Sale

Prior to reading the book invite students to discuss the following questions.

- Has anyone ever had a lemonade sale?
- What happens at a lemonade sale?
- What are some ways you could keep track of your sales and the money you make?

Explain that in this book the characters use a very effective tool to keep track of their sales. Encourage students to pay close attention to this tool and the different characteristics of it.

B. Content for New Learning

B. Teaching/Learning Strategies for New Learning

(10 Minutes)

Bar Graph:

A graph consisting of horizontal or vertical bars that represent the

Students will create a bar graph as a whole group, using data collected from around the classroom.

- Give students a collection of crayons and ask them

<p>frequency of an event or outcome. There are gaps between the bars to reflect the categorical or discrete nature of the data.</p> <p>Introduce components of the bar graph; specifically the horizontal and vertical axes, the importance of labeling and a title.</p> <p>Explain to students how to transfer raw data onto the bar graph.</p> <p>Ensure students understand that qualified data is represented in the bar graph.</p>	<p>to sort them by colour.</p> <ul style="list-style-type: none">• Ask: “How would you construct a bar graph to represent the data we have collected about the colour of crayons in our classroom?”• Prompt students to conclude the bar graph must have vertical and horizontal axes, appropriate labels (colour of crayons and number) and title.• Using markers and chart paper construct an appropriate bar graph to represent this information.• When the bar graph is constructed, lay the paper on the carpet and ask students to transfer the raw data (the crayons) directly onto the paper.• Ask students to ‘read’ the graph by asking various questions about the colours. (ie – How many red crayons does our graph represent? How many blue crayons does our graph represent? Are there more yellow crayons than purple crayons? How do you know?)
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5. Consolidation/Recapitulation Questions (Check for understanding/scaffolded practice)

(5 Minutes)

- Ask: What must we always have on a bar graph?
- Conclude: Title, Labels, X, Y axes.
- Think of a time in your life that using a bar graph would help you to organize collected data?
- Explain that students will be working in small groups to create a bar graph which will represent the eye colour of their peers in the classroom.
- Take a poll and record the eye colour of students in the classroom on chart paper.
- As a whole group discuss how one would set a bar graph to record this information. The title may be ‘Eye Colour’, the x axis will indicate the eye colour, and the y axis will depict a number scale to represent the number of students. Raw data will then be imputed to represent the classroom poll.

6. Application (Moving from guided, scaffolded practice to increasingly independent practice and understanding / gradual release of responsibility)

(15 Minutes)

- Students will go to their tables and work collaboratively with peers to construct a bar graph to represent the class eye colour.
- Students must demonstrate an understanding of the components of the bar graph.
- Students will be asked to determine and record the following on a small sheet of paper to show understanding:
 - What eye colour is the most common in our class?
 - What eye colour is the least common in our class?
 - How many people have the same eye colour as you in our class?
- Instructor will be walking around during application time to answer questions and direct as needed.

7. Lesson Conclusion

(3 Minutes)

- Ask students to summarize their learning for this lesson.
- Remind students that bar graphs may be useful when representing collected data, and that they are often used in the 'real world', therefore it is important to understand how to create and interpret bar graphs.

8. Assessment (collection of data) / Evaluation (interpretation of data)

Checklist – to determine if student grasps the concept of representing data using a bar graph and proper construction of this graph (see below).

Observation – to view and record a student achievement of this task.

9. Teacher Candidate's Reflections on the Lesson

A. (i) Evidence of Student Learning Related to the Lesson Expectation(s)

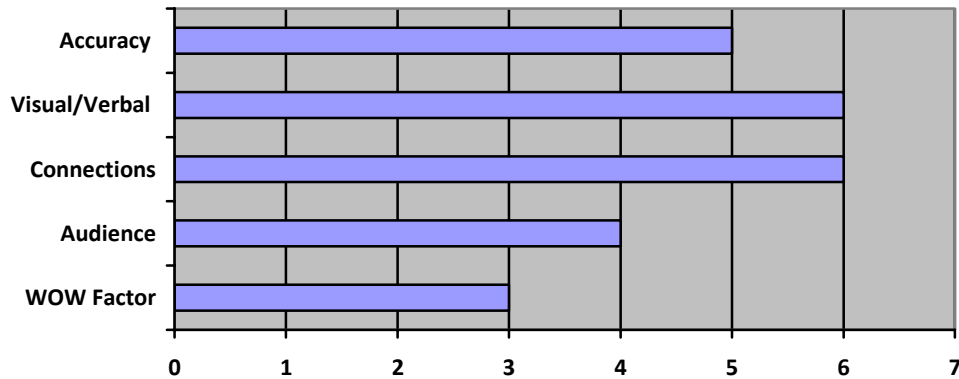
(ii) Next Steps for Student Learning Related to Lesson Expectation(s)

B. (i) Evidence of the Effectiveness of the Teacher Candidate
(ii) Next Steps Related to the Effectiveness of the Teacher Candidate

Assessment Tool for Lesson

Bar Graph Activity # 1	Wolfgang	Johnny	Kara	Olivia	Henry	Molly
Collaborates effectively with group						
Uses proper terminology						
Is able to apply data given into a bar graph						
Uses ruler to create graph						
Includes title						
Lables x and y axis						
Scale is appropriate						
Graph models data correctly						
Able to answer follow-up questions						

Critique of 'Lemonade for Sale':



Accuracy: 5/6

The children in the book refer to the graph as a 'bar graph' which is mathematically accurate. The bar graph presented is accurate in that the scale represented on the y axis includes zero and increases in equal increments. The days of the week are appropriately represented on the x axis. However, the x and y axis' are not qualified with labels and there is no title on the bar graph.

Visual and Verbal Appeal: 6/6

The illustrations are effective at enhancing the story and the corresponding text. They captivate the reader with vibrant colours and appealing characters. They demonstrate correct construction of bar graphs. The story unfolds through a clear, clean plot structure which engages the reader throughout.

Connections: 6/6

This is an excellent book for making meaningful connections. The characters successfully demonstrate how mathematics can be employed in real life situations such as earning money. T

Audience: 4/6

Though the book is great at exploring the bar graph there is little room for further development of graphing concepts. It is appealing to both males and females in a variety of cultures. The characters are diverse and therefore a more diverse audience may be drawn to this book and subsequently make connections.

The 'WOW' Factor: 3/6

This book relays to students that math is not a closed subject but rather engrained in our lives. However, it is lacking in rich connections and multifaceted problems which would enhance the learning. There is little room for further development of the concepts and does not go beyond the expected.

Self Assessment:

Assigned Grade: 19/20

Upon discussion we concluded that a grade of 19/20 best reflects the work presented in this assignment. All required components are completed in great detail to ensure the audience has a solid understanding of this high quality children's literature. The book and corresponding lesson are meant to be presented to students in a manner which is meaningful and intriguing. The strong connection to real life situations will make this book and lesson important to a diverse group of students. The questions created are relevant and include a number of higher order questions to encourage deeper thinking about the content being presented. The activity or lesson is clearly explained. It could easily be applied in a grade three classroom due to clear lesson expectations and corresponding assessment strategies. Finally, the critique of the book was based strictly upon the five categories suggested by Hellwig, Monroe and Jacob's as required.