

Title: George and Sam Save for a Present

By: Lesson Study Group 2

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Research Lesson Date: Tuesday, October 20, 2009 – Meet in Fair Hill Library 8:00 am – **Lesson Time: 10:00** am – 11:20 am

Lunch Break: 11:30 – 12:30

Post Lesson Conference 12:45 – 3:00

School: Fair Hill Elementary

Grade: 3rd Grade

Host Teacher: Hilary Harrison

Research Aim:

- Develop students' Algebraic Thinking in elementary grades, 3rd through 5th. Students will communicate their mathematical ideas, make connections, and generalizations.

Lesson Goal/Objectives:

- Students will organize information by exploring different representations (verbal, concrete/pictorial, tabular).
- Students will compare/contrast the efficacy of different representations through the use of a Venn diagram.

Relationship between this Lesson and Mathematics Content Standards for VA SOL:

- Math (3.24) Students will recognize a variety of patterns formed using concrete objects, numbers, tables, and pictures, and extend the pattern using the same or different forms (concrete objects, numbers, tables, and pictures).
- Language Arts (3.1) Students will use effective communication skills in group activities – a) Listen attentively by making eye contact, facing the speaker, asking questions, and summarizing what is said. b) Ask and respond to questions from teachers and other group members. c) Explain what has been learned.

<i>Lesson Flow: Instructional Activities</i>	<i>Anticipated Students' Responses (What are the anticipated misconceptions or barriers?)</i>	<i>Teaching Remarks (Conceptual supports or strategies for differentiation)</i>	<i>Key Points to Evaluate Student Learning (Probing Questions)</i>
<u>Materials Needed:</u> <ul style="list-style-type: none">• Mimio (or Smartboard)• Excel Graph Poster• White boards/dry erase	<u>Possible Questions posed by Students:</u> <ul style="list-style-type: none">• How long is a month?• How much money does	<ul style="list-style-type: none">• Students will have copy of problem worksheet at desks, however Teacher to project problem on Mimio	<ul style="list-style-type: none">• What is the value of each coin?• How much money does George have?

<p>markers for student groups</p> <ul style="list-style-type: none"> • Dime and Nickel for display on Mimio or Smartboard • Actual Dime, Nickel, and Piggy bank manipulatives for student use • Story problem worksheet in the 5-star Algebraic Connection format <p><u>Teacher Actions:</u></p> <p><i>Approximate time: 20 minutes</i></p> <ul style="list-style-type: none"> • Teacher to remind students that adults in room are “observers” only • Hand out problem worksheet to students. • Group students in pairs, 3’s, or 4’s (at teacher’s discretion) • Rethink the groups/sizes – smaller sized groups...assign jobs for each person in group (recorder, manipulative handler, time keeper, presenter) Note *all students will do work in their math journals, however the recorder will be the one who completes the final copy on construction paper. 	<p>each brother have?</p> <p><u>Other misconceptions:</u></p> <ul style="list-style-type: none"> • Student understanding of each coin’s value • Students may not understand that 1 dime equals 2 nickels • Separate scaffolded chart for students who may need the extra help • Hint Cards – on whiteboard rail in case students need Questions such as: Did you try a table? Are you keeping track of what George, Sam have left? What Mom has? Did you record days on your chart? 	<p>or Smartboard so students can view as teacher reads problem aloud. Problem to be read aloud more than once.</p> <ul style="list-style-type: none"> • A discussion on what are the “important words” in problem. These important words to be highlighted, underlined, or circled by students on their copy of worksheet. • Teacher to model or allow students to come to mimio or smartboard to move 1-2 coins (dimes/nickels) into boxes that will represent money saved by George and Sam • Students to use concrete materials (dimes/nickels) as they are solving problem 	<ul style="list-style-type: none"> • How much money does Sam have? • How are things changing as each brother puts his coin into the piggy bank? • Is there information here that can help you predict what is going to happen? • What steps are you doing over and over again? • How do you describe each step? • What are the different strategies used to describe what is happening in the problem? • How are these strategies the same and how are they different? • Is there a way to write a number sentence (expression) about what is happening in this problem? • If the amount of money (value) each boy has changes would the end result be the same? Why or why not? • Looking at this chart how can we/you describe what is happening? • Have you started to notice any patterns? •
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- Give worksheet only with just the problem – then give students a large sheet of construction paper for showing the strategy used – plan problem in math journal, then show final strategy/work on large paper
- Teacher read problem aloud as students follow
- Discuss “important words” – highlight, circle, underline “important words”
- Worksheets – Underline w/ teacher important words (red and blue pens)
- Teacher to have 2 students to act out question – using Mimio or Smartboard to model putting coins (dimes/nickels) into the banks– 1 or 2 coins only.
- Discuss briefly how to represent problem solving: pictures, words, tables, symbols, graphs
- Teacher to assign groups different problem solving strategies (i.e. group 1 – pictures, group 2 –

- Discussion how patterns are progressing
- possible way to teach – different strategy each day – then compare pictures/tables/words, etc. then on last day compare the different strategies.
- Talk about the math in the problem with students
- Teacher talk on how to keep organized as they work the problem – in beginning of lesson

numbers/symbols, etc)

- Teacher to hand out concrete manipulatives (dimes/nickels/banks, etc) to students' groups

Observation – Approximate time 15 minutes

- Teacher release students to solve problems – reminding students that the guests are “invisible”
- Teacher set timer for 15 minutes – if more time is needed teacher to reset timer additional 5 minutes
- Teacher to rotate through room observing and/or asking questions to guide students

Reflection

Approximate time – 30/40 minutes

- Teacher bring students back to seats
- Each student group to go to front and explain their strategy used, showing pictures, manipulatives, etc.
- Students not presenting will write the “presented” strategy in boxes on the 5-star worksheet
- After presentations are

<p>complete teacher to bring the Excel graph (poster form) and questions from teacher students to analyze graph</p> <ul style="list-style-type: none">• Students to circle the strategy they found most helpful in solving the problem			
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<ul style="list-style-type: none">• Compare strategies at the end...what is most effective for this problem?• Teacher –talk this is a lesson that may take a few days. Leave on a “cliff hanger” ...”Do you want to see how it is solved tomorrow?” Keep predictions – up for when revisit next day.			
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