Algebraic Reasoning - Solving One or Two-Step Real-World Problems - Tiered Activities

Lesson: Math , Grade(s) 5

Learn how to quickly solve word problems involving addition and subtraction. Organize story components into visual models that are easy to understand. This tiered lesson is designed using one website that uses different levels of difficulty as well as progressing levels for learning the process.

Duration: 45 Minutes

Lesson

Objectives

Students will:

- use real-world word problem websites to practice multi-step word problems.
- demonstrate the steps involved in completing multi-step word problems.
- defend their solutions, giving justifications for solutions and methods leading to the solutions.
- apply more than one operation to solve a word problem

Essential Questions

How do mathematical models shape our understanding of mathematics?

How can I use real-world word problem websites to practice multi-step word problems?

Warm-up Activity (Do Now)

1. Teacher will go to the website 'Thinking Blocks - Addition and Subtraction Word Problems" - This page shows the Table of Contents for the website. (http://www.thinkingblocks.com/ThinkingBlocks_AS/TB_AS_Main.html)
2. Model Part Whole - 1 Step - but first run through the main INTRODUCTION. (Students may choose to watch intro again when they are on their own.) (http://www.thinkingblocks.com/ThinkingBlocks_AS/TB_AS_Main.html)
3. Assign sections of the Table of Contents to the differentiated groups in the class.

Instructional Strategies (including Differentiation)

- Differentiation - tiered activities by readiness
- Differentiation - tiered activities by process
- Technology Integration - using the Internet

Student Activities

Background Knowledge: From ongoing lessons in Trailblazers that teaches multi-step problem solving strategies.

Resources Needed:

- Computers in classroom (or computer lab)
- Website bookmarked for Low Group - (Students Below Standard)
- Website bookmarked for Average Group- (Students Meeting Standard)
- Website bookmarked for High Group - (Students Exceeding Standard)
- Website is the same for all groups but students will do different assignments on the website.

Lesson

Sequence of Actions:

1. Warm-up activities

2. Students will be assigned to one of the tiered group activities according to how the teacher wants to designate the specific group. The websites will be bookmarked on the particular computer. The students will complete Thinking Block Concept assigned.

THINKING BLOCKS WEBSITE - for all groups (http://www.thinkingblocks.com/ThinkingBlocks_AS/TB_AS_Main.html)

Tiered Activity 1 - Students Below Standards:

1. Practice Set 1: Part/Whole with Two Parts - this was done as the teacher example but should be done again for this group

2. Practice Set 2: Part/Whole with ThreeParts

Tiered Activity 2 - Students Meeting Standards:

1. Practice Set 3: Compare Two Amounts - One Step

2. Practice Set 4: Compare Two Amounts - Two Steps

Tiered Activity 3 - Students Exceeding Standards:

1. Practice Set 5: Change - Two Steps

2. Practice Set 6: Compare Three Amounts - Multistep

Assessment of Student Learning

Observe students working, asking questions when appropriate, offering hints when appropriate

Lead closure discussion listening for correct strategies for solving multi-step word problems.

Assessment for the tiered groups is attached as a resource called 'Sample Assessment for Solving One or Two-Step Real-World Problems'. One problem was taken from each section from the website.

Optional assessment: The teacher may also choose to do the Challenge Problem (http://www.thinkingblocks.com/Challenge.html) with the students working in groups, completing the Challenge Problem on paper - where students will defend their solutions, giving justifications for solutions and methods leading to the solutions.

Closure/Summary

Lead closure discussion listening for correct strategies for solving multi-step word problems.

Lesson

If not chosen to do as an assessment the teacher may also choose to do the Challenge Problem (http://www.thinkingblocks.com/Challenge.html) with the students working in groups, completing the Challenge Problem on paper - where students will defend their solutions, giving justifications for solutions and methods leading to the solutions.

Teaching Tips
Thinking Blocks Develops Algebraic Reasoning Skills

Thinking Blocks is an engaging, interactive math tool developed by classroom teachers to help students learn how to solve challenging word problems. Using brightly colored blocks, students model the relationships among the components of each problem. With the help of a virtual tutor, students walk through a simple problem solving process and arrive at a solution. When building the models, students must identify the information that is given as well as information that is unknown. Identifying and solving for an unknown quantity is a key concept in algebra. Thinking Blocks encourages students to look beyond the surface to discover the concepts and relationships that are at the core of every math problem.

The problems also change each time one uses the website.

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In the classroom students can work individually in pairs. Suggestion would be to work in pairs and students keep a journal of how they solved the word problems.

Depending on student readiness:

- Some students might only complete one level
- Some students might begin at Level 2 or Level 3
- Some students can begin with Level 1 and work through as far as they choose

Standards Covered

MA.5.1 Numeric Reasoning
- MA.5.1.2 Operations
  - MA.5.1.2.29 Apply more than one operation to solve a word problem

Materials

For a closer look at the materials list below, log onto http://redclay.schoolnet.escholar.com

Resources:
1. Sample Assessment for Solving One or Two-Step Real-World Problems

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