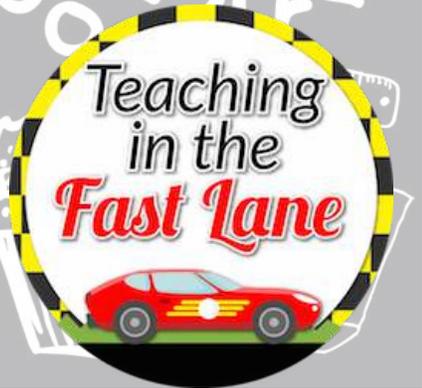


MULTI-STEP PROBLEM SOLVING Unit 4th Grade



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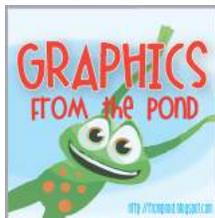


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TO The Teacher

Thank you for purchasing this resource! Within it you will find a complete unit for teaching the fourth grade standards for multi-step problem solving including pre-assessment, content vocabulary, daily warm-ups and exit tickets, daily lessons with student activities, and a post assessment.

While this unit is laid out over a seven day time span do not feel that you must rigidly stick to the timeline. As a teacher you know what is best for your students, and should follow your gut, as some classes may require more time to reach understanding of a concept.

To save on ink and decrease prep time, every page of this unit is created in black and white. To create a more colorful unit print or copy on color paper.

Standards

TEKS

4.4H solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders

4.5A represent multi-step problems involving the four operations with whole numbers using strip-diagrams and equations with a letter standing for the unknown quantity

CCSS

4.OA.B.4 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

ALL ABOUT This Unit

This unit is made up of unique elements that can be used independently or together to provide a complete unit of math instruction.

Content Vocabulary

Vocabulary for this multi-step problem solving unit is included in a few forms.

- Word wall cards make it easy to add your content vocabulary to your word wall
- The word and definition list make a great reference for student math notebooks and teachers alike
 - This list is included completed as well as with blank areas for definitions and examples
- Double-sided word and definition cards are great for review and small group remediation

Pre-Assessment and Student Standard Checklist

To be used as an informal assessment to check students' prior knowledge as well as determine any misconceptions. The data that you gather from this pre-assessment can be recorded on the Student Standards Checklists and used to set student learning goals, form small groups, or partner students based on ability. Checklists fit 11 students per page.

ALL ABOUT This Unit

DAILY WARM-UPS

Seven days of half-page daily warm-ups are provided along with answer keys. Each day has one standards-based question for students to think through their learning. A student tracking sheet is also included for students to record their own grow and glow areas. To save paper you may choose to project the warm up each day and have students complete their work in math notebooks.

EXIT TICKETS

Seven days worth of exit tickets and answer keys, with one question each, are included two to a page for easy copying. Each of the questions is based on how that standard is tested, providing a test bridge and exposing students to test style language. This serves to build familiarity with standardized testing without overwhelming students.

Exit tickets can be checked as a class, or by the teacher. A checklist of questions is included to track how students are doing on their exit tickets.

ASSESSMENT

An end of unit assessment is included to check for student mastery on the multi-step problem solving standards included. This assessment is meant to be used informally. While students should do their best work, it is best to not place too much importance on the test.

Daily Lessons

Seven daily lessons are included in this unit. Each lesson includes:

- Guiding question(s)
- Objectives
- List of necessary materials
- Overview of the lesson
- Student activity sheets when applicable
- Suggestions for small group activity

Day 1 Pre-assessment Problem Solving Strategy

Day 2 Determining Operations

Day 3 Writing Equations to Solve

Day 4 Creating Models for Solving

Day 5 Solving Multi-Step Problems

Day 6 Writing Your Own Multi-Step Problems

Day 7 Assessment

Content Vocabulary

Vocabulary for multi-step problem solving unit is included in a few forms.

- Word wall cards make it easy to add your content vocabulary to your word wall
- The word and definition list make a great reference for student math notebooks and teachers alike
 - This list is included completed as well as with blank areas for definitions and examples
 - TIP: print/copy definition list at 80% to fit perfectly in math notebooks
- Double-sided word and definition cards are great for review and small group remediation
 - To complete these cards print, fold along the dotted line with the word and definition on the outside, then tape or glue to secure the card.

equation

a mathematical statement, also known as a number sentence

strip diagram

a model in linear format to show number relationship
sometimes known as a tape diagram

unknown quantity

a part of an equation that is not known, represented by a letter or symbol

model

a visual representation of an equation used to represent a problem situation

MULTI-STEP PROBLEM SOLVING VOCABULARY

| | |
|-------------------------|---|
| equation | a mathematical statement, also known as a number sentence |
| strip diagram | a model in linear format to show number relationships sometimes known as a tape diagram |
| unknown quantity | a part of an equation that is not known, represented by a letter or symbol |
| model | a visual representation of an equation used to represent a problem situation |
| remainder | what is left over when finding the quotient |

equation

a mathematical statement, also known as a number sentence

strip diagram

a model in linear format to show number relationships, sometimes known as a tape diagram

unknown quantity

a part of an equation that is not known, represented by a letter or symbol

Answer Key

1 Derrick has \$1.25. His mom gave him \$2.50. He then went to the store and bought a candy bar for 75¢. How much money does Derrick have now?

\$3.00

2 There are 210 sugar cookies and 315 snicker doodles for sale at the bake sale. After one hour 57 cookies have been sold. How many cookies are left?

468 cookies

3 A class has 15 boys and 12 girls. Each student has a set of 8 markers. How many markers do they have altogether?

216 markers

4 Greg had 37 baseball cards, but gave three to his little sister. The remaining cards he puts on sale for \$5 each. If he sells all his cards how much money will he make?

\$170

5 Hanna has a full bag of dog food with 35 pounds of food and a partial bag with 13 pounds of food. If her dog eats six pounds of food a week, how long will the food she has last?

8 weeks

6 A box of cookies has 48 cookies in it. She ate 6 of the cookies, and is sharing the rest with her friends. If Shanna and her 6 friends each have the same number of cookies, how many cookies will Shanna have?

6 cookies

7 Tyler played violin for 27 minutes this week. He played for 25 minutes on Monday and 67 minutes on Wednesday. Write an equation to find V, the amount of time he played Wednesday.

$$27 + 25 + V = 119$$

8 Su's goal is to run 100 miles this year. In the first six months she ran 29 miles. In the next three months she ran 49 miles. Write an equation showing M, how many more miles she needs to run to reach her goal.

$$100 - 29 - 49 = M$$

9 Guy raised \$56 for his school to build a track. He raised \$29 from his family, \$168 from friends, and the rest from strangers. Create a model that shows a way to find \$, the amount of money Guy raised from strangers.

| | | |
|-----|-----|----|
| 129 | 168 | \$ |
| 456 | | |

10 The fourth grade at Elm Grove Elementary has 45 girls and 63 boys. Each of the students in the grade brings \$5 for their field trip. Create a model that shows \$, the amount of money the students bring combined.

| | | | | |
|-------|-------|-------|-------|-------|
| 45+63 | 45+63 | 45+63 | 45+63 | 45+63 |
| \$ | | | | |

DAILY WARM-UPS

Seven days of half-page daily warm-ups are provided along with answer keys.

Each day has two standards-based questions for students to think through their learning.

A student tracking sheet is also included for students to record their own grow and glow areas.

To save paper you may choose to project the warm up each day and have students complete their work in math notebooks.

Name _____

Multi-step Problems Solving

A group of twenty-two students gets into partner groups. Each set of partners is given twenty papers to complete. How many papers are given out?

Name _____

Multi-step Problems Solving

A group of twenty-two students gets into partner groups. Each set of partners is given twenty papers to complete. How many papers are given out?

DAILY WARM-UP ANSWER KEY

Name _____

MULTI-STEP PROBLEMS SOLVING

A group of twenty-two students gets into partner groups. Each set of partners is given twenty papers to complete. How many papers are given out?

$$22 \div 2 \times 20 = 220 \text{ papers}$$

MULTI-STEP
PROBLEM
SOLVING
DAY 2

Name _____

MULTI-STEP PROBLEMS SOLVING

Angela is buying shirts for each of her four kids. She gets each of her kids two shirts that cost \$8 each. How much money does Angela spend on shirts?

$$4 \times 2 \times 8 = \$64$$

MULTI-STEP
PROBLEM
SOLVING
DAY 2

Name _____

PERSONAL DAILY WARM-UP TRACKING SHEET

| | OPERATIONS TO SOLVE | Did I Get It correct? |
|--------------|--------------------------------|--------------------------------------|
| DAY 1 | | |
| DAY 2 | | |
| DAY 3 | | |
| DAY 4 | | |
| DAY 5 | | |
| DAY 6 | | |
| DAY 7 | | |

Exit Tickets

Seven days worth of exit tickets and answer keys, with one question each, are included two to a page for easy copying.

Each of the questions is based on how that standard is tested, providing a test bridge and exposing students to test style language. This serves to build familiarity with standardized testing without overwhelming students.

Exit tickets can be checked as a class, or by the teacher. A checklist of questions is included to track how students are doing on their exit tickets.

Exit Ticket
Day 1**Name** _____

The PTA bought sticker sets for students to wear during spirit week. They bought 26 packs of stickers. Each pack has 35 stickers in it. If each student received 5 stickers, how many students received stickers?

- a. 12 students
- b. 182 students
- c. 4,550 students
- d. 128 students

Multi-step Problem Solving

Exit Ticket
Day 1**Name** _____

The PTA bought sticker sets for students to wear during spirit week. They bought 26 packs of stickers. Each pack has 35 stickers in it. If each student received 5 stickers, how many students received stickers?

- a. 12 students
- b. 182 students
- c. 4,550 students
- d. 128 students

Multi-step Problem Solving

Exit Ticket Answer Key

| | |
|--------------|---|
| Day 1 | B |
| Day 2 | A |
| Day 3 | C |
| Day 4 | D |
| Day 5 | A |
| Day 6 | B |
| Day 7 | C |

DAILY LESSONS

Seven daily lessons are included in this unit. Each lesson includes:

- Guiding question(s)
- Objectives
- List of necessary materials
- Overview of the lesson
- Student activity sheets when applicable
- Suggestions for small group activity

DAY 1 Pre-assessment and
Problem Solving Strategy

DAY 2 Determining Operations

DAY 3 Writing Equations to Solve

DAY 4 Creating Models for Solving

DAY 5 Solving Multi-Step Problems

DAY 6 Writing Your Own Multi-Step Problems

DAY 7 Assessment

Pre-Assessment & PROBLEM SOLVING STRATEGY

Guiding Question

How can I show my prior knowledge of multi-step problem solving?

Materials

- Pre-assessment
- Anchor chart paper
- Word Problem Example

Learning Objective

We will use our prior knowledge of how to solve multi-step word problems.

We will develop a problem solving strategy.

- L** Begin by giving students the pre-assessment as a check for prior understanding.
- e** As a class create an anchor chart for your chosen problem solving strategy including the steps that students should follow to comprehend a word problem.
- S** Strategies may vary from school to school, and I would encourage you to build upon students' prior experiences with problem solving. I have included an example anchor chart on the next page for the **UBES** method, but do not feel the need to strictly stick to it if you or your students have a strategy that you prefer.
- S**
- O**
- n** Use the provided word problem to demonstrate the process.

Small Group Ideas

Using a set of multi-step word problems have students practice comprehending the problem and determining the steps they would take to solve them.

Anchor Chart Example

CUBES

problem solving strategy

C Circle all the numbers

U underline the question

B Box important information

E eliminate extra information

S solve with a plan and check

Joshua has \$13 to spend. He buys a candy bar for \$1.75 and a book for \$5.45. How much money does he have left to buy lunch?

Writing Equations to Solve

Guiding Question

How can I use an equation to show the steps to solve a multi-step problem?

Materials

- Anchor chart paper
- Word Problem Examples
- Writing Equations Scavenger Hunt

Learning Objective

We will write equations to show the steps used to solve multi-step problems.

L Begin by reviewing the problem solving strategy and how to determine the operations used to solve a problem using word problem #1. Then, talk to students and ask how to write an equation or multiple equations to find the solution to the problem. In most cases 4th grade standards do not involve order of operations, so students should write multiple equations to solve following the steps needed to solve the problem rather than writing equations with parentheses.

S Repeat this process with word problem #2.

O For practice, students will complete the Writing Equations Scavenger Hunt. To complete the scavenger hunt hang the multi-step problems around the classroom and give each student a recording sheet. Students will travel around the room finding word problems and record the necessary equations to solve them.

Small Group Ideas

Using multi-step word problems have students practice comprehending the problem and then listing the steps to solve. Have students trade their step "directions" with one another to solve and check.

Anchor Chart Example

Word Problem #1

A box of crackers has 60 crackers in it. Sheila ate half a box of crackers, and then her brother ate another 12 crackers. How many crackers are left?

1. multiply 60 by 3
2. add 12

$$60 \div 2 = 30$$
$$30 + 12 = 42$$

1. divide 60 by 2 to find half
2. then subtract 12

$$60 \div 2 = 30$$
$$30 - 12 = 18$$

Word Problem #2

Gracie has 12 toy cars. Her brother has 3 times as many toy cars as Gracie does. How many toy cars do Gracie and her brother have together?

Scavenger Hunt

Name _____

Search the room to find the multi-step word problems. For each problem write the equations and order that you would use to solve.

| | |
|----------|-----------|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 10 |

1

A spool of thread has 80 yards of thread. Harry uses half of the thread to sew a blanket and another 10 yards to make a pillow. How much more thread is there?

2

An airplane has 147 seats in it. There are 57 kids and 84 adults on board. How many empty seats are there?

3

There are three pies in a bake sale. The same sale has four times as many cakes as pies. How many cakes and pies are in the bake sale?

4

Gretchen's mom gave her \$20 to go to the movies. She buys a ticket for \$6.50, popcorn for \$4.50, and a drink for \$2.50. How much money does Gretchen have left?

5

A soccer team has 9 girls and 8 boys. Each of the players practices scoring 15 times against the coach. How many tries did the coach have to defend?

6

An adult movie ticket is \$8 for a new release. How much would it cost for 8 adult friends to see a movie if they have a coupon for \$10 off?

7

Sean makes 3 dozen cupcakes. He and his friends eat 8 cupcakes that night. How many cupcakes does he have left?

8

There are 55 girls and 44 boys in the school choir. They are taking vans that fit eight students each. How many students will there be in the van that isn't full?

9

Joy has a cookbook with 400 recipes in it. So far she has tried half of the recipes. She has plans to try another 17 recipes this month. After this month, how many recipes will there be left to try?

10

A cup of small candies contains 50 pieces. Nora has 6 cups of the candies. If she and her friends eat 75 pieces, how many pieces will she have left?

Answer Key Scavenger Hunt

Search the room to find the multi-step word problems. For each problem write the equations and order that you would use to solve.

| | |
|--|--|
| 1 $80 \div 2 - 10 = ?$ (30) | 2 $147 - 57 - 34 = ?$ (6) |
| 3 $4 \times 3 + 3 = ?$ (15) | 4 $20 - 6.5 - 4.5 - 2.5 = ?$ (6.50) |
| 5 $9 + 8 = 17$ $17 \times 15 = ?$ (255) | 6 $8 \times 8 - 10 = ?$ (54) |
| 7 $12 \times 3 - 8 = ?$ (28) | 8 $55 + 44 = 99$ $99 \div 8 = ?$ (12 r 3) |
| 9 $400 \div 2 - 17 = ?$ (183) | 10 $50 \times 6 - 75 = ?$ (225) |

Answer Key

1 A roll of wrapping paper costs \$2 and can wrap 12 presents. How much would it cost to buy enough wrapping paper to wrap 48 presents?

\$8.00

2 A pack of playing cards has 52 cards in it. A case of cards has 10 packs in it and costs \$15. How many cards could you get for \$30?

1,040 PLAYING CARDS

3 A shirt takes 3 yards of fabric to make, a pair of pants take 4 yards of fabric. How many yards of fabric would it take to make 3 sets of shirts and pants?

21 yards of fabric

4 A new student packet has 23 pages of information in it. A teacher places 100 pieces of paper into the copy machine and then makes three copies of the new student packet. How many pieces of paper does she have left?

31 Pieces of paper

5 A car can drive 200 miles on a single tank of gas. On the first day the car goes 126 miles, and on the second day it travels another 21 miles. How much further can the car go before needing to get gas?

61 miles

6 A roll of ribbon has 120 meters of ribbon. Rocky uses 19 meters to wrap gifts and puts the ribbon away. Her brother then uses another 17 meters to make a wreath. How much of the ribbon is left?

84 meters of ribbon

7 A book has 285 pages in it. She read 65 pages the first day she had the book and another 27 pages on the second day. Write an equation to find P, the number of pages she has left to read.

$$P = 285 - 65 - 27$$

8 Rachel has to practice soccer for 300 minutes this week. On Monday she practiced for 50 minutes and on Tuesday she practiced another 45 minutes. Write an equation to show P, how much longer she has to practice this week.

$$300 - 50 - 45 = P$$

9 Dan has \$14 to buy gifts. He spends \$3 on a gift for his mom and \$7 on his sister. Create a model that shows a way to find \$, the amount of money Dan has left to spend.

| | | |
|----|--|----|
| 3 | | \$ |
| 14 | | |

10 Alexia has 150 text messages per month. By the 25th she had used 105 of the messages. She plans to use the same number of messages each of the remaining 5 days. Create a model that shows M, the number of messages she can use each day.

| | | | | |
|---------|---|---|---|---|
| M | M | M | M | M |
| 150-105 | | | | |