

Teacher Edition

MATH 3



Fifth Edition



Part
1

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New to This Edition

71-72

Workbook pages 133-43

Lessons 71-72 Objectives

71-72.1 Plan an event by following the Engineering Design Process.
 71-72.2 Collaborate to generate a plan.
 71-72.3 Make a schedule for the event that includes cost and end times for each activity within the event.
 71-72.4 Prepare an advertisement for the event by using technology.
 71-72.5 Share the results.
 71-72.6 Support value use of time with data from the planned event.

Biblical Worldview Shaping

- Uses (BWS) Planning events is one of many applications where technology can use their time responsibly (71-72.4)

Digital Resources

- Instructional Aid 19 STEM Engineering Design Process
- Instructional Aid 37 Peer Feedback from Multiple Feedback Forms for each student
- Instructional Aid 38 STEM Activity—Planning an Event
- Video “Planning an Event”

Preparation

- Research the career and essential skills of an event planner to be prepared to guide the discussion.
- Research possible technology, including technology to create videos, promote forms, flyers, and brochures, that students can use to create their event invitations.
- Practice using each form of technology that will be available for student use, be prepared to guide them in its use.
- After printing Instructional Aid 37, cut the pages to separate the peer feedback forms.

Lesson Presentation (You may spend 2 class sessions covering Lessons 71-72, or you may present both lessons in 1 presentation.)

ENGAGE

Event Planning

Use a discussion to explain the cover of event planning.

- Discuss the education and experience needed to become an event planner.

INSTRUCT

Identifying the Problem

Use the Engineering Design Process to identify the problem to be solved.

- Explain that the Engineering Design Process can help the students solve a problem. Display Instructional Aid 19 and read aloud the steps and the questions or statements that accompany each step.
- Explain that the students will be planning an event that third-grade students would enjoy to go to an event.
- Direct attention to the job step of the Engineering Design Process.

Learning Target

Show the video “Planning an Event” and read aloud the learning target to introduce the lesson.

306 Chapter 8

STEM

Four STEM lessons—in Chapters 4, 8, 12, and 16—are intended to spark students’ interest as they collaborate to solve a problem through inquiry, active learning, and creativity by using the Engineering Design Process. STEM lessons may be used at any time following the lesson in which they are introduced and are excellent springboards for students to further investigate related topics.

115

Workbook pages 221-22

Lesson 115 Objectives

115.1 Define perimeter of a figure by using inches, feet, or yards.
 115.2 Find the perimeter of a figure by giving the perimeter side length when interpret the situation.
 115.3 Solve a perimeter word problem and creativity and problem solving.

Biblical Worldview Shaping

- Patterns (math) Math uses (BWS) ways to describe God’s creation and power in creating a world that has complex and creative patterns (115.2)

Printed Resources

- Visual 20 Perimeter Area
- Review Money RA

Digital Resources

- Instructional Aid 61 Computer Use the Money Perimeter Area Student
- Video “Perimeter Area”
- Game Perimeter Area

ENGAGE

Conversion Facts

Use the conversion facts to help the students remember each fact. Introduce the following conversion facts.

$28 \times 7 = 196$, $42 \times 7 = 294$

Theme

Use the internet keyword search of about the perimeter.

Learning Target

Read aloud the learning target to introduce the lesson.

INSTRUCT

Defining Perimeter

Use Visual 20 to help the students define perimeter.

490 Chapter 13

Perimeter

I will find the perimeter of a figure by using inches, feet, or yards.

Perimeter is the distance around a figure. It is the sum of the lengths of all the sides.

Perimeter of a rectangle

$P = 2L + 2W$

$P = 2(4) + 2(2)$
 $P = 8 + 4$
 $P = 12$

Perimeter of a square

$P = 4s$

$P = 4(3)$
 $P = 12$

Perimeter of a triangle

$P = s_1 + s_2 + s_3$

$P = 3 + 4 + 5$
 $P = 12$

Perimeter of a circle

$P = \pi d$

$P = 3.14 \times 4$
 $P = 12.56$

Perimeter of a regular polygon

$P = n \times s$

$P = 5 \times 3$
 $P = 15$

Perimeter of an irregular polygon

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6$

$P = 3 + 4 + 5 + 6 + 7 + 8$
 $P = 33$

Perimeter of a composite figure

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6 + s_7 + s_8$

$P = 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$
 $P = 52$

Perimeter of a complex figure

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6 + s_7 + s_8 + s_9 + s_{10}$

$P = 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12$
 $P = 75$

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Perimeter of an irregular polygon

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6$

$P = 3 + 4 + 5 + 6 + 7 + 8$
 $P = 33$

Perimeter of a composite figure

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6 + s_7 + s_8$

$P = 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$
 $P = 52$

Perimeter of a complex figure

$P = s_1 + s_2 + s_3 + s_4 + s_5 + s_6 + s_7 + s_8 + s_9 + s_{10}$

$P = 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12$
 $P = 75$

Perimeter of a circle

$P = \pi d$

$P = 3.14 \times 4$
 $P = 12.56$

Perimeter of a regular polygon

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$P = 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$
 $P = 52$

Perimeter of a complex figure

$P = s_1 + s_2 + s_3 + s_4$

Strategies

An effective teaching strategy is offered in bold for each topic in the flow of the lesson. These strategies may be used to sustain interest within and between the lessons and to heighten student comprehension of concepts.

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Workbook pages 127–32

Lesson 66 Objectives

66.1 Tell, write, and show time to the nearest minute.
 66.2 Tell and write time by using before or after the hour.
 66.3 Determine the elapsed time to the nearest interval.
 66.4 Solve an elapsed time word problem.

Printed Resources

- Visual 7: Time Measurement
- Student Manipulatives: Halley Clock
- Review pages 127–28

Digital Resources

- Instructional Aid 21: Time Before & After (for the teacher and for each student)
- Instructional Aid 32: Halley's Schedule (for the teacher and for each student)
- Link: Cliff Palace
- Link: Clock
- Game/Enrichment: Fact Review 26–60

Materials

- July Clock manipulative (or Visuals: Clock)

ENGAGE

Division Facts

Use guided instructions to help the students memorize multiplication facts.

Introduce the following division facts with 2 as a divisor to review memorized facts.

$12 \div 2 = 6$ $14 \div 2 = 7$ $16 \div 2 = 8$
 $18 \div 2 = 9$ $20 \div 2 = 10$ $22 \div 2 = 11$

INSTRUCT

Telling, Writing & Showing Time

Use clocks to tell, write, and show time to the nearest minute.

Before & After: Elapsed Time

I will write the time by using before and after.

Write each time 2 ways.

Match the elapsed time with the clock.

SPENDING CLASS SCHEDULE	
A. Math	8:00–8:30
B. Reading	8:30–9:30
C. Science	9:30–11:00
D. Review and PE	11:30–11:45
E. Lunch	11:45–12:15

Match the activities to the times.

A. Math	8:00–8:30	15. C	20 minutes
B. Reading	8:30–9:30	16. A	1 hour
C. Science	9:30–11:00	17. A	1 hour 20 minutes
D. Review and PE	11:30–11:45	18. A	30 minutes
E. Lunch	11:45–12:15	19. D	45 minutes

Write the elapsed time to solve the problems.

18. Halley and Marley started hiking at 2:00 p.m. They finished at 4:00 p.m. How long did Halley and Marley hike?
 They hiked for **2 hours, 0 minutes**.

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Determining the Elapsed Time: Solving Elapsed Time Word Problems

Guide the students as they use the following plan to determine the elapsed time to the nearest interval and solve word problems.

Read about the following word problem.

The ranger began leading the visitors on the guided nature walk at 7:30 a.m. They returned to the Visitor's Center at 8:00 a.m. How much time was spent on the nature walk?

Set the demonstration clock for 7:30. Show the hour elapsed by moving the clock hands around the clock. Count the hours and then skip count the minutes by 1s, 1 hour, 2 hours, 4 minutes, 10 minutes, and so on to 8:00 minutes.

DIFFERENTIATED INSTRUCTION

Determining the Time or Elapsed Time

Use an art activity to make a flower clock to tell time or determine the elapsed time.

Distribute a paper plate, construction paper, and a brass fastener to the students. Instruct the students to create a clock that is similar to their Halley Clocks. The students should first make the clock face which will be the center of the flower, by labeling the paper plate with numbers 1–12. Then direct the students to make 12 paper petals and attach them to the clock face at each labeled number. Instruct the students to label the petals for 12 on the left and label the center to skip count by 1s to label the minutes around the clock. 10, 15, ... Continue around the clock.

Direct students to make a minute hand and an hour hand, using the brass fastener to attach them to the center of the clock face. Guide students as they tell the time displayed on the clock and use the clock to show present or elapsed time.

Differentiated Instruction

Differentiated instruction has been enhanced and featured in specific lessons in each chapter for optimal use.

Financial Literacy

Financial literacy lessons are included to introduce students to concepts related to spending, saving, and giving.

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Solve.

1. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$ 2. $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$ 3. $\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$ 4. $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$

Answers: 1. 45, 2. 18, 3. 27, 4. 54

Write the related multiplication fact. Solve.

5. $\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$ 6. $\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$ 7. $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$ 8. $\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$ 9. $\begin{array}{r} 1 \\ \times 9 \\ \hline \end{array}$ 10. $\begin{array}{r} 9 \\ \times 1 \\ \hline \end{array}$ 11. $\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$ 12. $\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$

Answers: 5. 36, 6. 36, 7. 72, 8. 72, 9. 9, 10. 9, 11. 63, 12. 63

13. $7 \times 3 = 21$, $3 \times 7 = 21$, $8 \times 4 = 32$, $4 \times 8 = 32$, $6 \times 5 = 30$, $5 \times 6 = 30$

Solve. Complete the sentence to answer the question.

12. Robin has to make 5 stops in the park to do security checks. Each security check should take 8 minutes. How long should the checks take?

$5 \times 8 = 40$

The checks should take 40 minutes.

Mark the correct answer.

13. How should multiplication be used?

to honor myself instead of God
 to do my work well
 to make work easy for me but hard for someone else

REVIEW: Multiplication Facts

Solve.

14. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$ 15. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$ 16. $\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$ 17. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$ 18. $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$ 19. $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$

Answers: 14. 40, 15. 15, 16. 35, 17. 28, 18. 24, 19. 25

186 one hundred eighty-six Math 3

Using a Fact with 10 as a Factor

Use an array to help the students use a fact with 10 as a factor to solve a fact with 9 as a factor.

► Write "9 × 5 = ___" for display.

Explain that since 9 is close to 10, students can use 10 as a factor to help them multiply with 9 as a factor.

Explain that the first step is to think of 9 as 10 as they multiply the other factor. Then they subtract the other factor. (This strategy works because 9 times the factor is 1 fewer groups of that factor than 10 times the factor.)

Direct attention to the displayed equation. Guide the students as they multiply 10 × 5 and then subtract 5. Model the equation with the array as shown as you review each step.

$\begin{array}{r} 9 \times 5 = \underline{\quad} \\ 10 \times 5 = 50 \\ \quad \quad \quad - 5 \\ \hline 45 \end{array}$

Multiplying with 9

Use a kinesthetic activity to demonstrate a multiplication activity with 9.

Direct the students to hold up both hands with their palms facing away from them. Instruct the students to count 4 fingers (starting with their left pinky fingers) and fold down the fourth finger. The answer to the fact 4 × 9 will be represented by the remaining fingers: 3 fingers, a space where the folded-down finger is, and then 6 fingers for the answer 36. This procedure works with facts with 9 as a factor from 1 × 9 to 9 × 9.

$4 \times 9 = 36$

DIFFERENTIATED INSTRUCTION

Multiplying with 9

Use a kinesthetic activity to demonstrate a multiplication activity with 9.

Direct the students to hold up both hands with their palms facing away from them. Instruct the students to count 4 fingers (starting with their left pinky fingers) and fold down the fourth finger. The answer to the fact 4 × 9 will be represented by the remaining fingers: 3 fingers, a space where the folded-down finger is, and then 6 fingers for the answer 36. This procedure works with facts with 9 as a factor from 1 × 9 to 9 × 9.

$4 \times 9 = 36$

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► Continue the activity for 9 × 4, 9 × 8, and other facts with 9 as a factor. Encourage the students to apply the strategy mentally.

Use error analysis to identify and correct a mistake in multiplication.

Write the following problem and answer for display. Direct students to say whether they agree with the answer and, if not, to describe and correct the error.

$9 \times 7 = \underline{\quad}$
 $10 \times 7 = \underline{70}$
 $\quad \quad \quad - 9$
 $\quad \quad \quad \hline 61$

For students having difficulty using this strategy, remind them to always subtract the other factor since 10 × 7 is 1 more group of 7 than 9 × 7. $70 - 7 = 63$.

Error Analysis

Selected chapters include error analysis, a teaching strategy that allows students to identify and correct mistakes in mathematical procedures or computation.

Test Bank

A selection of test questions is available for each of the 19 tests.

Teacher Edition Features

LESSON PLAN OVERVIEW				
Chapter 5: ADDITION & SUBTRACTION OF 4- & 5-DIGIT NUMBERS				
PAGES	OBJECTIVES	RESOURCES	ASSESSMENTS	
Lesson 36 Rounding Hundreds to Add; Rounding to Estimate				
Teacher Edition 138-41	<p>36.1 Rename 10 hundreds as 1 one thousand.</p> <p>36.2 Add 4-digit numbers, renaming 10 hundreds as 1 one thousand.</p> <p>36.3 Estimate the sum by rounding to the nearest one thousand.</p> <p>36.4 Solve a word problem and interpret the solution.</p> <p>36.5 Explain how mathematical operations can help people find solutions to real-world problems.</p>	<p>Visuals</p> <ul style="list-style-type: none"> Place Value Kit (one thousands, hundreds, tens, ones) <p>Student Manipulatives</p> <ul style="list-style-type: none"> Place Value Kit (hundreds, tens, ones) <p>5-12 Print Theme*</p> <ul style="list-style-type: none"> 21: One Thousand, One Hundred, Tens, Ones 22: "Biggest Money" 23: "Number Tiles" 24: "Fact Fun Activities" 25: "Fact Review 53-68" 26: "Print page, Lesson 36" 	Review • Pg. 47-48	
Lesson 37 Rounding to Estimate; 4-Digit Addition				
Teacher Edition 142-45	<p>37.1 Add 4-digit numbers, renaming hundreds, tens, or ones.</p> <p>37.2 Estimate the sum by rounding to the nearest one thousand.</p> <p>37.3 Round 3- and 4-digit numbers to the nearest ten and the nearest hundred.</p> <p>37.4 Solve a word problem involving 3- or 4-digit addition.</p>	<p>Visuals</p> <ul style="list-style-type: none"> Place Value Pocket Chart Kit <p>Student Manipulatives</p> <ul style="list-style-type: none"> Place Value Pocket Chart Kit <p>5-12 Print Theme*</p> <ul style="list-style-type: none"> 19: 4-Digit Numbers 20: "Washington National Park" 21: "Rocky Mountain" 22: "Fact Fun Activities" 23: "Fact Review 53-68" 24: "Print page, Lesson 37" 	Review • Pg. 48-50	
Lesson 38 Comparing Numbers; Addition with Renaming				
Teacher Edition 146-49	<p>38.1 Compare 3- and 4-digit numbers by using $>$, $=$, or $<$.</p> <p>38.2 Add 4-digit numbers, renaming hundreds, tens, and ones.</p> <p>38.3 Solve an addition word problem and interpret the solution.</p> <p>38.4 Explain how comparing numbers helps people make decisions.</p>	<p>5-12 Print Theme*</p> <ul style="list-style-type: none"> 25: "Fact Fun Activities" 26: "Fact Review 53-68" 27: "Print page, Lesson 38" 	Review • Pg. 51-52	


Lesson plan overviews at the beginning of each chapter provide a consolidated view of the schedule, along with objectives, resources, and assessments for that chapter.

The chapter opener presents a chapter essential question and artwork that support the opening scenario and the biblical world-view shaping theme.

4 DATA

CHAPTER 4

How do tables, charts, and graphs help us understand God's world?



Chapter Objectives

- Analyze data represented in a table, chart, or graph.
- Solve a problem by using data represented in a table, chart, or graph.
- Complete a data table by using a math pattern.
- Represent data by creating a table or graph.
- Plot a point on a coordinate graph.
- Follow the beginning steps of science knowledge at fourth-grade paper level.
- Explain how tables, charts, and graphs help people understand God's world.

Materials

- One empty 10.9 oz plastic water bottle (for each group of students)
- At least 100 pieces of 1-in. by 1-in. index cards (30 per group of students)
- Chart paper
- A 10-in. piece of 1-in. PVC pipe for each group of students
- Scissors for each group
- 8 1/2 x 11 size paper (several sheets for each student)
- Scissors for each group of students
- Markers (sharpened pencils for drawing number lines between cards)
- Measuring tape or yardstick

Data 107

Chapter objectives outline the knowledge and skills students should gain by the end of the chapter.

