bju press

ELEMENTARY SUBJECT OVERVIEW

Math

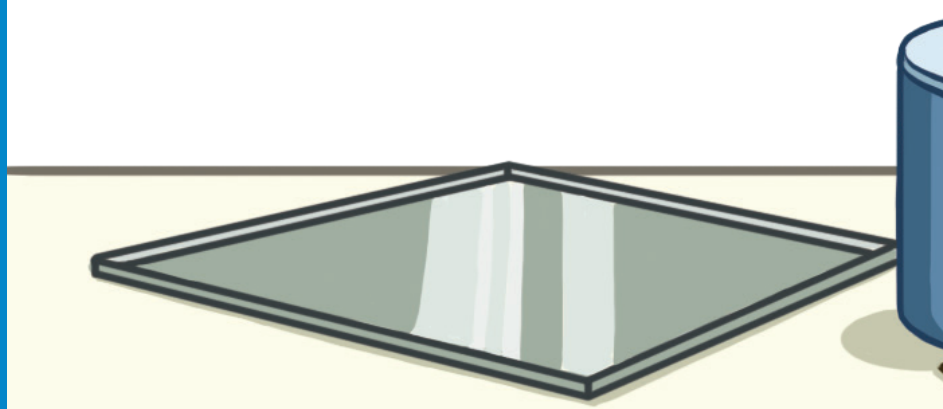
Contents

OUR VISION

To enable students to master foundational math skills by applying consistent reasoning to concrete and abstract models for the purpose of solving problems within the context of a biblical worldview.

GOALS

- To develop number sense through the progression from manipulatives to abstract representations
- To promote computational fluency and automaticity through consistent, strategic practice and spiral review
- To develop a foundation in number systems, fraction theory, algebra, geometry, and statistics
- To build grit and problem-solving skills through meaningful, authentic applications, including word problems and collaborative STEM experiences
- To make sense of mathematical concepts and applications in light of biblical principles



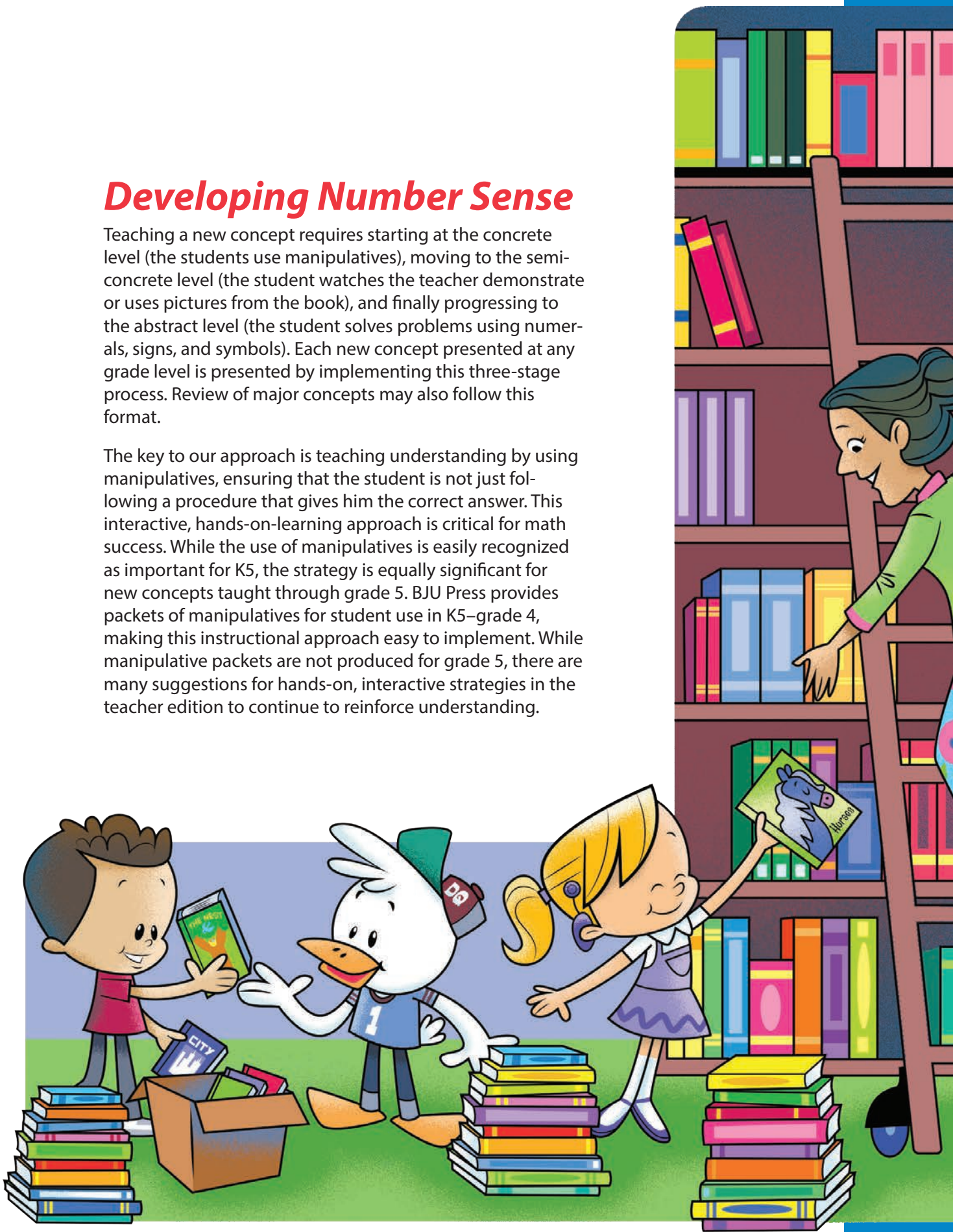
PROGRAM APPROACH

The BJU Press elementary school math program seeks to give students the solid foundation they need to use math for life. Our materials carefully progress from tangible representations to abstract concepts so that students not only understand mathematical practices but can choose the appropriate method to tackle a specific problem. Students will eventually be able to confront and solve problems using their mathematical skills, their individual life experiences, and logical reasoning. Using math is a key component of fulling the Creation Mandate. Our goal is to give students the skill sets they need to address real-world problems for the glory of God and the benefit of others.

Developing Number Sense

Teaching a new concept requires starting at the concrete level (the students use manipulatives), moving to the semi-concrete level (the student watches the teacher demonstrate or uses pictures from the book), and finally progressing to the abstract level (the student solves problems using numerals, signs, and symbols). Each new concept presented at any grade level is presented by implementing this three-stage process. Review of major concepts may also follow this format.

The key to our approach is teaching understanding by using manipulatives, ensuring that the student is not just following a procedure that gives him the correct answer. This interactive, hands-on-learning approach is critical for math success. While the use of manipulatives is easily recognized as important for K5, the strategy is equally significant for new concepts taught through grade 5. BJU Press provides packets of manipulatives for student use in K5–grade 4, making this instructional approach easy to implement. While manipulative packets are not produced for grade 5, there are many suggestions for hands-on, interactive strategies in the teacher edition to continue to reinforce understanding.



Promoting Fluency and Automaticity

Although problem solving is the primary goal of math instruction, it is also essential to develop accurate computation. This, of course, requires practice of basic math facts and skills. Every lesson has ample opportunity for review and practice in every piece of the program, including the teacher editions, student worktexts, reviews (grades 1–3) or activities (grades 4–5) books, Teacher Tools Online, and AfterSchoolHelp.com. The goal is accurate and quick recall of facts so that students may focus their time and energy on the main task of using math to solve problems in real life. Balance is the key.

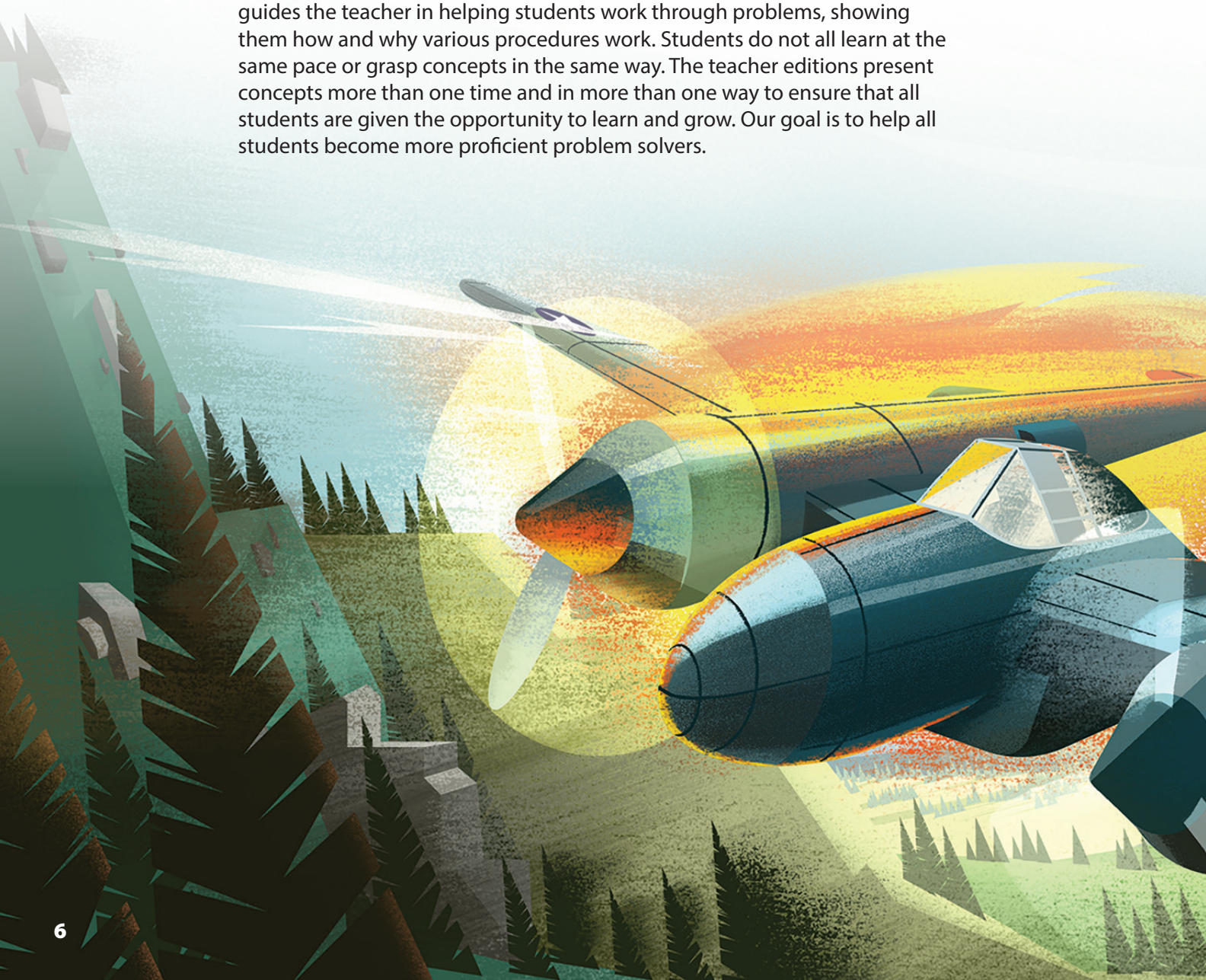
Developing Basic Foundations

The key to success in math is a strong foundation of number sense and comprehension of concepts. Students must have a thorough understanding of the mathematical processes and know how to use the processes to determine an accurate answer. While memorization is a key element in math, a student who tries to survive on memorization alone will struggle as higher-level skills are introduced. To excite students about learning math, we have designed a program that engages interest using age-appropriate, colorful themes and hands-on involvement for developing understanding and for enhancing mastery. Our math books use a format that focuses on a single main concept in each chapter. Greater levels of difficulty are added as understanding increases. Our worktexts are filled with colorful photographs and illustrations that picture the problems students are solving as well as the themes.

Building Grit and Skill

BJU Press elementary math for K5–grade 5 provides a framework for critical thinking through instruction in problem solving. Problem solving is the process of confronting a problem and then using one's knowledge, reasoning abilities, and experiences to reach a solution.

Math concepts are introduced through real-life problems that are encountered at home, at school, and in the community. Word problems pose application questions that students must work through—both in class and on their own. These activities model the skills necessary for becoming adept at problem solving. Furthermore, they enable students to see that math is more than just a subject in the classroom; it is found everywhere we go in life. Most teacher edition includes a "Teach for Understanding" section that guides the teacher in helping students work through problems, showing them how and why various procedures work. Students do not all learn at the same pace or grasp concepts in the same way. The teacher editions present concepts more than one time and in more than one way to ensure that all students are given the opportunity to learn and grow. Our goal is to help all students become more proficient problem solvers.



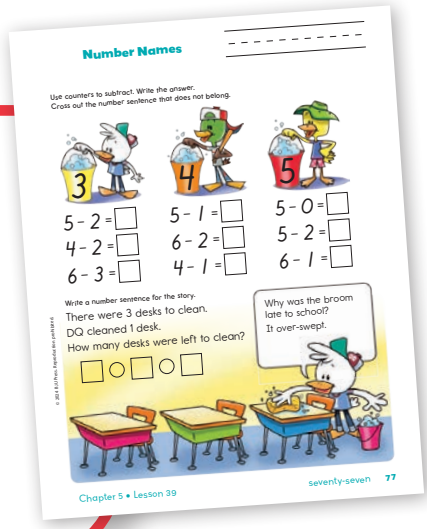
Making Sense of Concepts

God not only created the world but also created order that math seeks to define. Though creation has been tarnished by the Fall of man into sin, God's original design and consistency can be found in mathematical details, such as the symmetry of the peacock, the spirals of the nautilus shell, and the orbit of the planets around the stars. The orderliness of math points to the Creator of order. The BJU Press elementary math program integrates biblical content to cultivate a Christian worldview that will help students take their place in God's world. Each teacher edition guides the teacher in explaining math concepts through a biblical worldview, identifying Christian principles, highlighting Christian character traits, and pointing out that math is an important tool for making wise use of God's creation. God's world is a place that can be measured with numbers. And if we know how to use numbers, we can become very skilled at having the kind of dominion that helps others and glorifies God.

MATERIALS

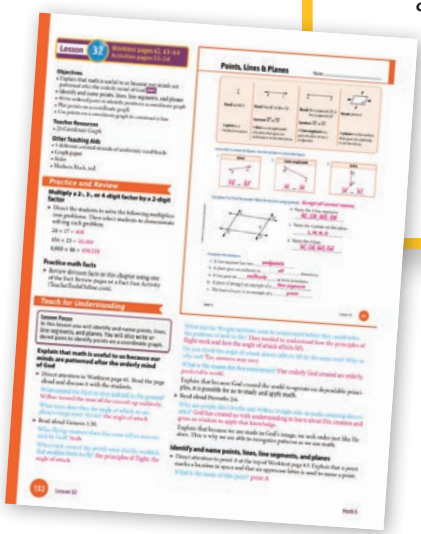
Student Worktext

Using age-appropriate content and colorful illustrations, each student worktext provides two pages of explanation and practice problems per lesson as well as a chapter review. Some worktexts also include STEM activities and an "Exploring Ideas" page.



Teacher Edition

The teacher edition for each grade contains full-color, reduced-size student pages with overprint answers. Each lesson opens with a list of objectives and with materials needed for that lesson. Additionally, each lesson typically includes suggestions for teacher-directed review, strategies for teaching new concepts, and answers.



Reviews & Activities

Reviews provide opportunities for extra practice that teachers may use for homework, assessment, or cumulative review. As students complete practice activities on the current lesson and spiral reviews of previous concepts, they take a crucial step toward gaining automaticity with the material. Review books are available for grades 1–5, with additional reviews available online.

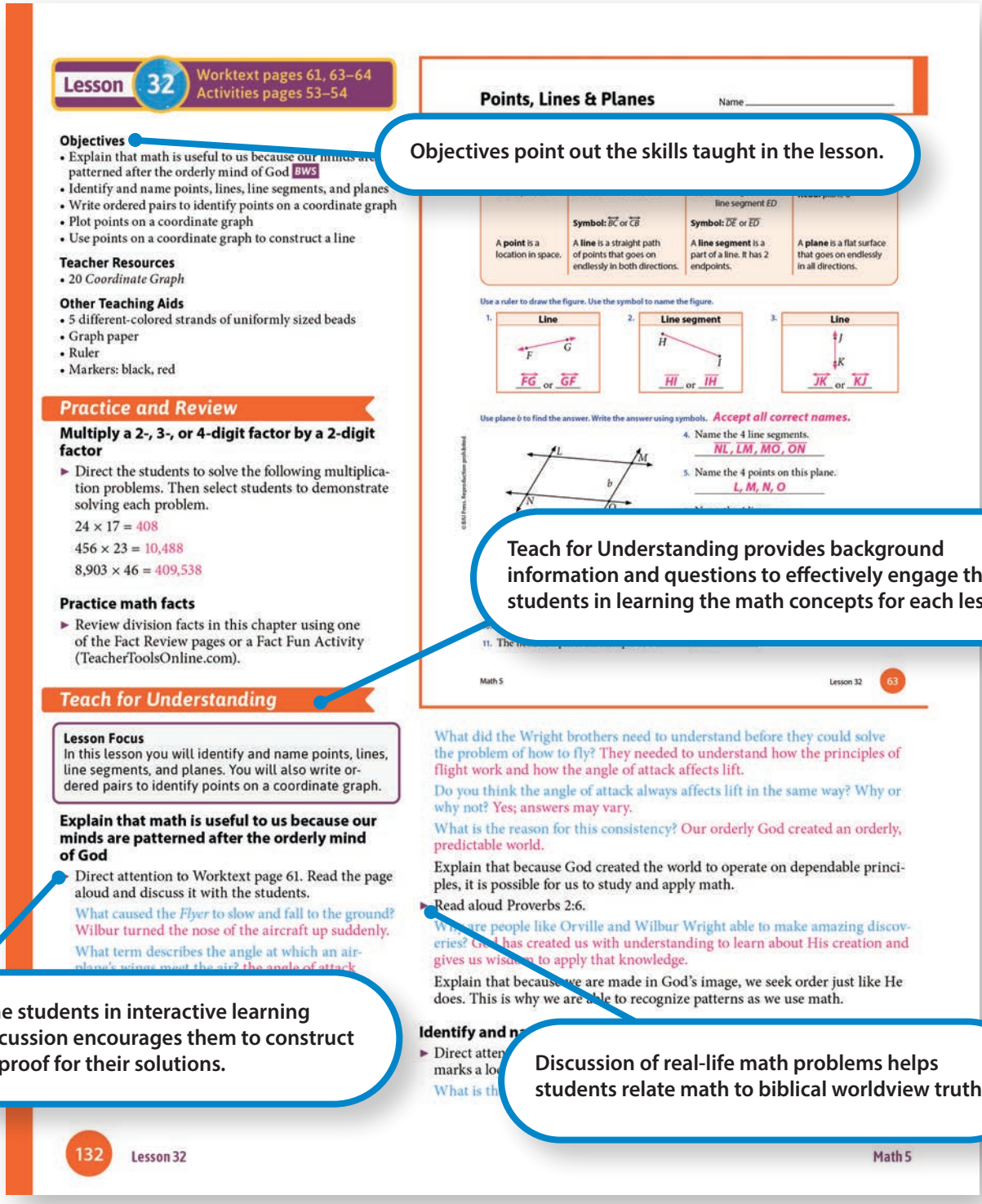
Visuals & Manipulatives Packets

To build and reinforce understanding, new concepts are introduced in each grade with the use of manipulatives. Both the teacher visuals packet and the student manipulatives packet include items such as pocket charts, number lines, paper coins and bills, rulers, workmats, counters, and geometric shapes, giving the students hands-on practice of the concept. Items may be prepared at the beginning of the school year or as needed for each chapter.

Assessments

Each assessments packet includes a test for each chapter. The assessments answer key is also available for each grade.

THE FEATURES *PAGE EXAMPLES*



Lesson 32 Worktext pages 61, 63–64 Activities pages 53–54

Objectives
- Explain that math is useful to us because our minds are patterned after the orderly mind of God BWS
- Identify and name points, lines, line segments, and planes
- Write ordered pairs to identify points on a coordinate graph
- Plot points on a coordinate graph
- Use points on a coordinate graph to construct a line

Teacher Resources
- 20 *Coordinate Graph*

Other Teaching Aids
- 5 different-colored strands of uniformly sized beads
- Graph paper
- Ruler
- Markers: black, red

Practice and Review

Multiply a 2-, 3-, or 4-digit factor by a 2-digit factor

▸ Direct the students to solve the following multiplication problems. Then select students to demonstrate solving each problem.

24 × 17 = 408

456 × 23 = 10,488

8,903 × 46 = 409,538

Practice math facts

▸ Review division facts in this chapter using one of the Fact Review pages or a Fact Fun Activity (TeacherToolsOnline.com).

Teach for Understanding

Lesson Focus
In this lesson you will identify and name points, lines, line segments, and planes. You will also write ordered pairs to identify points on a coordinate graph.

Explain that math is useful to us because our minds are patterned after the orderly mind of God

▸ Direct attention to Worktext page 61. Read the page aloud and discuss it with the students.

What caused the *Flyer* to slow and fall to the ground? Wilbur turned the nose of the aircraft up suddenly.

What term describes the angle at which an airplane's wings meet the air? the angle of attack

Points, Lines & Planes Name _____

		line segment *ED*	
	Symbol: $\overleftrightarrow{BC}$ or $\overleftrightarrow{CB}$	Symbol: $\overline{DE}$ or $\overline{ED}$	
A **point** is a location in space.	A **line** is a straight path of points that goes on endlessly in both directions.	A **line segment** is a part of a line. It has 2 endpoints.	A **plane** is a flat surface that goes on endlessly in all directions.

Use a ruler to draw the figure. Use the symbol to name the figure.

1. Line — $\overleftrightarrow{FG}$ or $\overleftrightarrow{GF}$
2. Line segment — $\overline{HI}$ or $\overline{IH}$
3. Line — $\overleftrightarrow{JK}$ or $\overleftrightarrow{KJ}$

Use plane *b* to find the answer. Write the answer using symbols. *Accept all correct names.*

4. Name the 4 line segments. NL, LM, MO, ON
5. Name the 4 points on this plane. L, M, N, O

Math 5 Lesson 32 63

What did the Wright brothers need to understand before they could solve the problem of how to fly? They needed to understand how the principles of flight work and how the angle of attack affects lift.

Do you think the angle of attack always affects lift in the same way? Why or why not? Yes; answers may vary.

What is the reason for this consistency? Our orderly God created an orderly, predictable world.

Explain that because God created the world to operate on dependable principles, it is possible for us to study and apply math.

▸ Read aloud Proverbs 2:6.

W[illegible]re people like Orville and Wilbur Wright able to make amazing discoveries? G[illegible] has created us with understanding to learn about His creation and gives us wisd[illegible] to apply that knowledge.

Explain that becaus[illegible]e are made in God's image, we seek order just like He does. This is why we are able to recognize patterns as we use math.

Identify and n[illegible]

▸ Direct atte[illegible] marks a lo[illegible]

What is th[illegible]

132 Lesson 32 Math 5

Objectives point out the skills taught in the lesson.

Teach for Understanding provides background information and questions to effectively engage the students in learning the math concepts for each lesson.

Involving the students in interactive learning through discussion encourages them to construct reasonable proof for their solutions.

Discussion of real-life math problems helps students relate math to biblical worldview truths.

Lesson 35 Worktext pages 69–70 Activities pages 59–60

Objectives
- Use a protractor to measure and draw angl
- Write an equation to find the unkn wn measure of angle in a pair of supplementary angles

Teacher Resources
- 24 *Measuring Angles* (for the teacher and for each student)

Other Teaching Aids
- Protractor (for the teacher and for each student)

Teacher resources or a list of materials are given at the start of each lesson.

Practice and Review

Solve 3-addend equations

▸ Write the following equations for displ y. Direct the students to write them on paper in vertic l form and solve them.

26 + 135 + 85 = 246

231 + 72 + 460 = 763

7.47 + 2.32 + 8.21 = 18.00

9.2 + 2.1 + 16.9 = 28.2

Write numbers in standard form

▸ Write the following numbers in word fo Choose students to read them aloud dents to write the standard form Remind them to write a 0 in plac value, to write a comma to separa to write a decimal point between w and decimals.

one hundred thirty-two thousand, eight hundred six
132,806

fifty-three and six hundred ninety-one thousandths
53.691

seventy-five million, eighty-one thousand, nineteen
75,081,019

eleven and fifteen hundredths 11.15

Practice and Review help to refresh concepts learned in previous lessons.

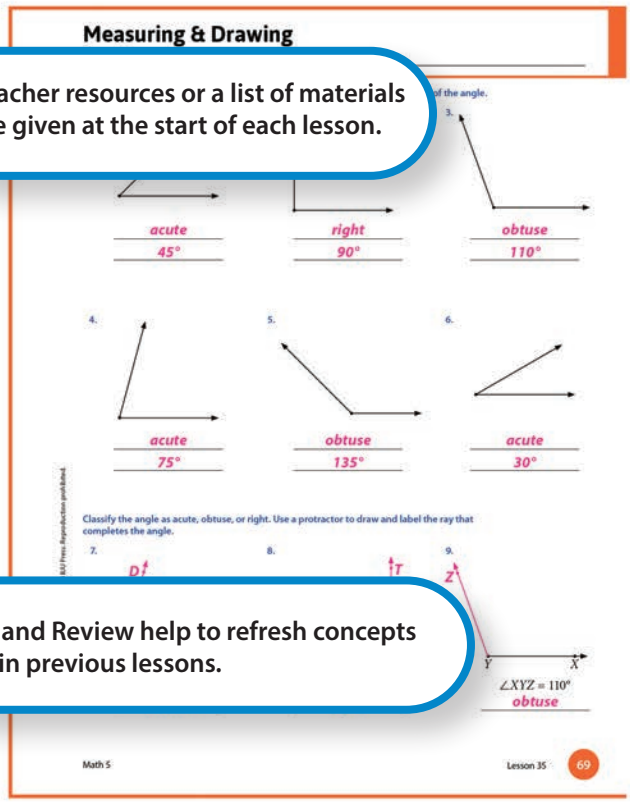
Teach for Understanding

Lesson Focus
In this lesson you will use a protractor to measure and draw angles, and you will write an equation to find the unknown measure of an angle in a pair of supplementary angles.

Lesson Focus prepares the students for what they will learn in the lesson.

Use a protractor to measure and draw angles

▸ Distribute the *Measuring Angles* page to each student and display your copy of the page. For problems 1–4, on 33



▸ Guide the students in measuring each angle. Point out that they will measure to the nearest degree, so it is important to position the protractor accurately. Demonstrate placing the center mark of the protractor over the vertex and then lining up the arrow of one ray with the line marked 0°. Emphasize the importance of rechecking that the center mark is aligned with the endpoint and that the ray is aligned with the 0° mark before continuing, then follow the scale from the 0° mark to the degree measurement where the other ray intersects the protractor.

Note that the angle in problem 4 has been tilted to give the student experience with determining which ray he will use as the base and which direction the angle is facing.

1. obtuse $\angle TUV = 135°$
2. acute $\angle IJK = 80°$
3. obtuse $\angle ABC = 155°$
4. acute $\angle LMN = 50°$

▸ Direct attention to problem 5. Explain that protractors can be used to draw angles of a specified measurement. Point out that the measurement of $\angle DEF$, which is yet to be drawn, equals 45°.

TYING IT ALL TOGETHER

STEAM

SCIENCE • TECHNOLOGY • ENGINEERING • ART • MATH

Chapter 1

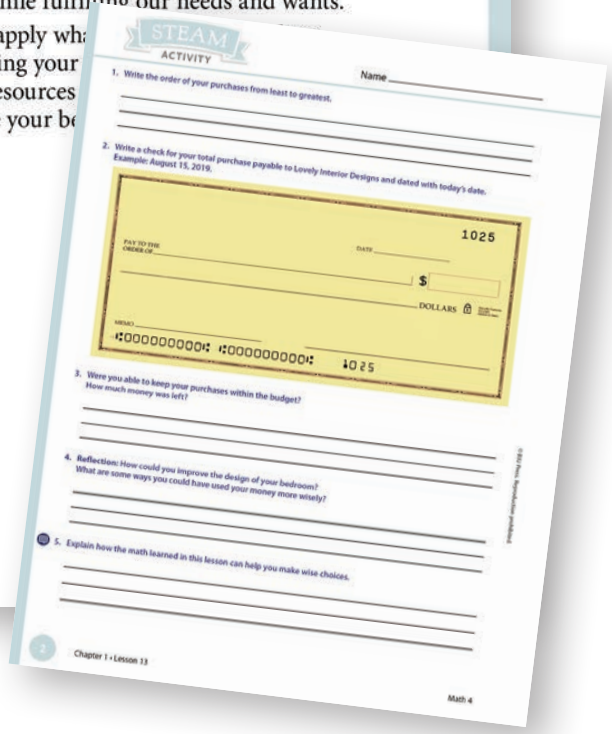
Designing Your Dream Bedroom

Interior decorators plan, design, and decorate spaces for their clients. They must consider function, safety, traffic flow, comfort, and style. They must also work within a budget.

Budgeting is an important skill for life. God calls us to be good stewards of our resources—our money, materials, and work potential. We often find that our plans exceed our resources. Math can help us budget to make wise choices and live within our resources while fulfilling our needs and wants.

In this chapter you will apply wh… …nd money to designing your … …isely use your resources … …ms to decorate your b… …udget.

Math 4


STEAM ACTIVITY

Name _____

1. Write the order of your purchases from least to greatest.

2. Write a check for your total purchase payable to Lovely Interior Designs and dated with today's date. Example: August 15, 2019.

1025

PAY TO THE ORDER OF _____ DATE _____ $ _____ DOLLARS

MEMO _____

⑆000000000⑆ ⑆000000000⑆ 1025

3. Were you able to keep your purchases within the budget? How much money was left?

4. Reflection: How could you improve the design of your bedroom? What are some ways you could have used your money more wisely?

5. Explain how the math learned in this lesson can help you make wise choices.

Chapter 1 • Lesson 13

Math 4

A variety of activities allows students to practice analytical thinking and see math at work in real-life contexts.

Chapter Review

Complete each subtraction sentence.



5 − 2 = ☐

= ☐

Reviews are included at the end of each Worktext lesson (in grades 1–3) and chapter (in all grades) to aid knowledge and understanding.

Circle the minus sign.
Draw a box around the equal sign.

\+ − × =

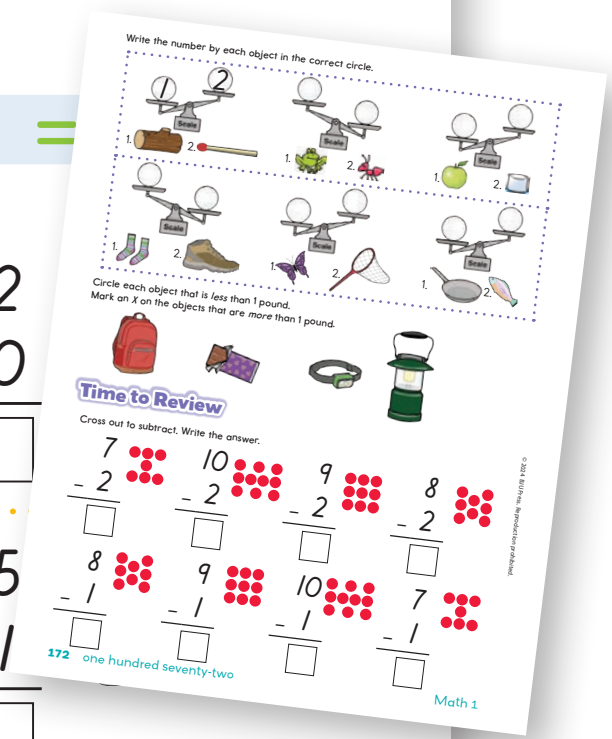
Cross out the bottles to subtract.

6 − 2 = ☐

2 − 0 = ☐

4 − 3 = ☐

5 − 1 = ☐



STUDENT EDITION

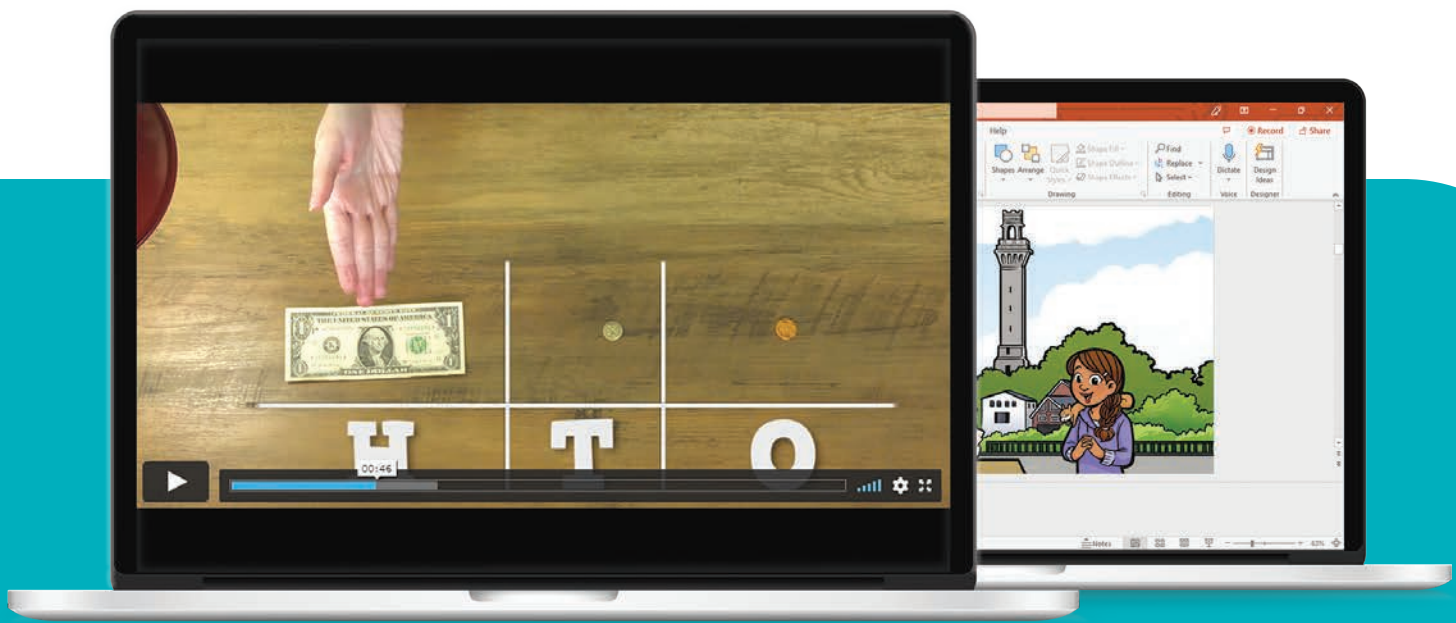
Technology Resources

Teacher Tools Online®

TeacherToolsOnline.com

Help your students gain foundations for math with age-appropriate resources that engage students in the fun of learning.

- Short videos offer counting songs, brief reviews of math terms, and more, to get students engaged and interested.
- Editable PowerPoint slides work through example problems and give opportunities for practice and review as a class.
- Searchable, projectable copy of the teacher editions, allows you to project answers to daily math activities and review them as a class.
- ExamView, available for Math 3–5, allows you to create customized quizzes and tests using a bank of questions that correlate with each chapter. You can edit and add questions and answers and instantly add multiple versions of tests to prevent cheating.



AfterSchoolHelp.com

Students need extra math practice? AfterSchoolHelp.com offers math-fact speed drills for elementary math students, as well as video tutorials and practice segments for Math 4 and Math 5.

Elementary Math materials are available for K5 and grades 1–5.
For a list of all grades, contact your Precept Sales Representative
at **preceptmarketing.com/rep** or visit **bjupress.com**.

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