

Arithmetic

Work-text

Fourth Edition

5

$l = 38 \text{ yd.}$

$w = 26 \text{ yd.}$

$A = l \times w$
 $A = 38 \times 26$
 $A = 988 \text{ sq. yd.}$

$$n - 3 = \frac{15}{5}$$

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Student Work-text

Arithmetic is...

- studying one aspect of the order of the real world and indirectly learning more about the God Who created the world using mathematics.
- learning to see the addition/multiplication tables as part of the truth/order that God has built into reality.
- knowing that there is a right answer.
- working hard to get the right answer.
- learning to go from the concrete to the abstract, from the particular to the general, from content to concept.
- learning to see relationships between one truth and another.
- learning to be precise/exact in thinking.
- learning to apply mathematics skillfully in order to function in daily life.
- learning to believe in absolutes ($2+2$ always equals 4).
- establishing the extremely important skill of learning things by memory.
- learning to be fast/accurate in thinking.
- seeing how things work together.
- being prepared.
- finishing the job.
- working at a set pace.
- participating in healthy competition.
- learning to be thorough, orderly, careful, alert, obedient, persistent, cooperative, honest.
- learning to master a received body of knowledge and apply it as one way to obey the command of Genesis 1:28 to subdue the earth/exercise dominion over it.

Teacher Edition

Arithmetic

Work-text

Fourth Edition

5

Judy Howe

Story Problem Solution Key
p. 397 to p. 418



abeka.

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Arithmetic 5

Fourth Edition

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Teaching Materials

Student Materials

Arithmetic 5 Work-text

Quizzes, Tests, & Speed Drills

Teacher Materials

Arithmetic 5

Teacher Edition

Quizzes, Tests, & Speed Drills Key

Curriculum

Addition Flashcards

Subtraction Flashcards

Multiplication Flashcards

Division Flashcards

Concept Cards 5–8

Rapid Calculation Drills B

Felt Fractional Circles

Arithmetic 3–8 Tables

and Facts Charts

Arithmetic 3–8 Charts

Teacher Information

Time Allotment

In the Abeka 5th grade curriculum, arithmetic is taught/practiced for 45–50 minutes.

Teaching Procedure

Arithmetic class begins with 10–15 minutes of *oral drill*.

The *written speed drill* follows oral drill. Speed drills are exchanged/checked; speed drills are recorded once a week as a quiz grade.

After a thorough review time, *new concepts* are introduced/practiced. The time allotted depends on the difficulty/newness of the concept.

Story problems are included in the Arithmetic 5 Curriculum to teach students to think/plan solving of problems by themselves.

The *Review/Boardwork* time includes a spiral review of important concepts/facts presented throughout the year. This review time helps students master the concepts/facts, and also provides opportunity for them to work at the chalkboard.

Additional Practice problems are included in each lesson.

Homework problems are included three times a week for Lessons 6–168.

Tests and Speed Drills

Four speed drills and either a test or a quiz are included in Student Quizzes, Tests, & Speed Drills for each week. Answers/point values are available in the Quizzes, Tests, & Speed Drills Key.

5 Lessons 78–102 DECIMALS pages 141–184

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7 Lessons 123–133 DIVIDING FRACTIONS pages 221–240

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- Dividing a mixed number by a fraction
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8 Lessons 134–152 GEOMETRY pages 241–274

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- Shapes
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- Concept of perimeter
- Perimeter of a rectangle
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9 Lessons 153–169 DIVIDING DECIMALS pages 275–306

- Dividing a decimal
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- Multiplying by powers of 10
- Dividing by powers of 10

Supplementary Exercises ... pages 307–349
Homework Lessons pages 350–382
Handbook pages 383–396

About the Text

Arithmetic 5 contains a variety of exercises involving new/review material in each lesson. The workbook includes 169 lessons (excluding tests), Supplementary Exercises, and Homework Exercises. The handbook at the end of the book contains facts, rules, and measures which are given throughout the workbook.

Although all new material is presented at top of a workbook page, the workbook is not designed to be used without a teacher.

Students need to *hear* a thorough explanation of each concept and *see* procedures demonstrated step by step by the teacher.

Arithmetic 5 Curriculum/Lesson Plans, available separately or as part of the Grade 5 Curriculum, and the Teacher Edition provide complete daily plans for teaching, reviewing, and testing. The Teacher Edition also includes solutions to all exercises in the text. *Student Quizzes, Tests, and Speed Drills* is correlated with the work-text.

Learning Objectives

- Recognize place value of numbers through billions.
- Know addition, subtraction, multiplication, and division facts and terminology. Carry in addition and borrow in subtraction. Multiply by one to four digits. Divide by one to three digits. Check/find missing numbers in addition, subtraction, multiplication, and division problems. Use casting out 9s to check answers.
- Solve story problems with one or more steps or with unnecessary information.
- Average numbers.
- Read/write Roman numerals.
- Estimate answers.
- Round off whole numbers, money, decimals, and mixed numbers.
- Use English and metric measures and convert measures within the same system. Solve measurement equations. Convert kilometers to miles and miles to kilometers.
- Know fraction terminology and how to work problems containing fractions. Add/subtract fractions with a common denominator or by having to find a common denominator. Recognize proper/improper fractions. Change mixed numbers to improper fractions/change improper fractions to mixed or whole numbers. Subtract fractions with borrowing. Write a remainder as a fraction. Multiply/divide fractions using cancellation. Round off mixed numbers.
- Factor whole numbers to find the greatest common factor.
- Find the least common multiple shared by two or more numbers.
- Understand the concept of probability.
- Write decimals as fractions. Add, subtract, multiply, or divide decimals. Compare decimals/order them from least to greatest. Rename decimals. Recognize terminating and repeating decimals. Learn common fraction-decimal equivalents. Round off to the tenth, hundredth, and nearest cent.
- Read a thermometer/learn temperature reference points. Understand and use negative temperatures. Convert from the Celsius scale to the Fahrenheit scale and from the Fahrenheit scale to the Celsius scale.
- Make correct change.
- Use the four axioms of algebra to solve equations.
- Read/draw pictographs, bar graphs, and line graphs. Plot points on a line graph.
- Read scale drawings.
- Understand the concept of percent.
- Recognize/draw geometric shapes and figures.
- Understand the concept of perimeter/use formulas to find the perimeter of rectangle and square.
- Understand the concept of area/use formulas to find area of rectangle and square.
- Find squares/square roots.

Arithmetic 5 Teacher Edition

For use with fourth edition of text

Author: J. Howe; Managing Editor: C. Sawtelle; Editorial Staff: A. Thayer

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Adding Whole Numbers

Note: *Arithmetic 5 TE* is coordinated with the *Arithmetic 5 Curriculum*. The Curriculum contains a list of materials needed, an outline for each lesson, and suggestions for oral drill/review.

Introduce the book. (3 min.)

- Have students look briefly at *Arithmetic 5*. Point out that each lesson is the front and back of 1 page. Have them notice boxes at top of most lessons. Boxes contain important facts, rules, examples. Have students locate *Handbook*, beginning on p. 383 of text. *Handbook* contains important rules/facts, according to topics, that are given in daily lessons. Students should use *Handbook* when studying for tests/for locating needed facts. Students turn to homework (hmwk) section, beginning on p. 350 of text. After 1st week of school, students are assigned hmwk 3 days per week. Hmwk section is arranged by lesson numbers. *Students recopy the problems and work on notebook paper.* Hmwk is used to reinforce concepts/skills taught at school and to encourage responsibility.

Introduce place value and addition.

(15 min.) **Exercise (Ex.) 1–3**

- Arith Chart 1:** Briefly review ones' to thousands' places.
- Concept Card 1:** Students give value of each digit.

Note: A listing of information on each concept card is given in card set. Keep that list with your *Arithmetic 5 Curriculum* to help you prepare for each day.

- A** **Note:** See *Arithmetic 5 Curriculum* for information to be written on chalkboard (ckbd) each day. Students give values of circled digits.
- Concept Card 11:** Teach terms in an addition problem.
- B** Work/check 1st problem for students. Be sure students understand concept of carrying. Students explain how to work/check 2nd problem as you do it on chalkboard (ckbd). Many students find it necessary to write their carrying numbers.

Facts:

- Arithmetic** is the science of numbers.
- The six basic operations of arithmetic are *notation, numeration, addition, subtraction, multiplication, and division*.
- Notation** is the art of writing numbers. **Numeration** is the art of reading numbers.
- The Arabic numeration system uses base 10. The ten digits are 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. The placement of each digit determines its value.
- Addition** is the process of putting like numbers together.
- The numbers added together are called **addends**, and the answer is the **sum**.
- The order of the addends may be changed without changing the sum ($6 + 3 = 3 + 6$).
- To find the sum, add downward. To check, add upward.

thousands
hundreds
tens
ones

In 5,326, the digit 5 has a value of 5,000. In 6,253, the digit 5 has a value of 50.

$$\begin{array}{r} 156 \text{ addend} \\ 387 \text{ addend} \\ +295 \text{ addend} \\ \hline 838 \text{ sum} \end{array} \quad \begin{array}{r} 838 \\ 156 \\ 387 \\ +295 \\ \hline 838 \end{array}$$

$$\begin{array}{r} 84 + 62 + 34 = 180 \\ \text{addends} \quad \quad \quad \text{sum} \end{array}$$

Class Practice

(Green-lettered problems are additional practice.)

1. Write the ten Arabic digits in the blanks.

1 2 3 4 5 6 7 8 9 0

2. Write the value of each red digit.

a. 3,216	b. 9,487	c. 6,004	d. 7,582	e. 5,419
<u>200</u>	<u>9,000</u>	<u>4</u>	<u>80</u>	<u>5,000</u>
f. 8,925	g. 2,726	h. 4,973	i. 9,148	j. 7,356
<u>20</u>	<u>700</u>	<u>3</u>	<u>9,000</u>	<u>300</u>

3. Write the correct terms beside each number in a. Work all the problems. (For additional practice, see Supplementary Exercises pp. 307–311.)

a. 23 <u>addend</u>	b. 23	c. 49	d. 14	e. 95	f. 78
<u>+47</u> <u>addend</u>	42	<u>+58</u>	19	<u>+72</u>	24
<u>70</u> <u>sum</u>	<u>+87</u>	<u>107</u>	<u>+21</u>	<u>167</u>	<u>+54</u>
	<u>152</u>		<u>54</u>		<u>156</u>

g. $75 + 25 + 63 = \underline{163}$ h. $38 + 42 + 15 = \underline{95}$ i. $44 + 53 + 9 = \underline{106}$

It is fine for them to do so and will probably help to eliminate mistakes. However, encourage students to remember carrying numbers in their head if possible.

- Instruct students to read **information (info) box at top of page**. One student may read aloud while others read silently.
- Class answers Ex. 1–3. Choose students to read answers to Ex. 1–2. Send students to ckbd to work/explain Ex. 3.

Note: Many practice problems are given for each section. A problem with a green letter before it is considered additional practice/optional. Ex. 2–4 contain optional problems. If time permits, do them in class. **However, most students receive adequate practice without doing those problems.** If optional problems are not done in class, they can be assigned as extra work for students who are struggling with concepts.

Introduce place value and addition.

(cont.) **Ex. 4**

- Send students to ckb to work/explain Ex. 4.

Introduce story problems. (12 min.) **Ex. 5**

- Read story problem 5a. Teach these 6 questions as one procedure for working story problems.

What does the story problem tell us?

What does the story problem ask us?

Are there any clue words or rules that help us solve the problem?

Are there any missing facts?

Are there any numbers that are not needed?

What process should we use to solve this problem?

- C** Read story problem 5a again and the explanation given under Ex. 5. Use setup on ckb to help with explanation. Tell students that story problem *answers* need labels written in cursive. They should use neat spacing as they work on notebook paper. The number answer should be circled and clue word written/underlined if there is one in the problem. **The full answer also should be written in text.**

Note: Students use notebook paper for story problems. You may choose to let students use same sheet for 1 week before you collect it. In this case students need to be careful not to lose/misplace their story problem answer sheets.

- Students read/work story problems 5b–c. Circulate around classroom to assist students who need help.

Review/Boardwork (8 min.) **Ex. 6–7**

Ex. 6, counting by 4s, helps students learn their 4 mult. table. Recognize students who finish required problems in Ex. 7. Praise them for their

4. Add and check.

$\begin{array}{r} 85 \\ +27 \\ \hline 85 \end{array}$	$\begin{array}{r} 107 \\ +39 \\ \hline 107 \end{array}$	$\begin{array}{r} 101 \\ +59 \\ \hline 101 \end{array}$	$\begin{array}{r} 134 \\ +56 \\ \hline 134 \end{array}$	$\begin{array}{r} 120 \\ +29 \\ \hline 120 \end{array}$	$\begin{array}{r} 135 \\ +79 \\ \hline 135 \end{array}$
---	---	---	---	---	---

$\begin{array}{r} 81 \\ +25 \\ \hline 81 \end{array}$	$\begin{array}{r} 163 \\ +29 \\ \hline 163 \end{array}$	$\begin{array}{r} 234 \\ +78 \\ \hline 234 \end{array}$	$\begin{array}{r} 131 \\ +27 \\ \hline 131 \end{array}$	$\begin{array}{r} 130 \\ +14 \\ \hline 130 \end{array}$	$\begin{array}{r} 134 \\ +12 \\ \hline 134 \end{array}$
---	---	---	---	---	---

5. Study the first problem and solve the other two problems. Story problems should be solved neatly on your notebook paper. (For additional practice, see Supplementary Exercises, pp. 344–349.)

- a. The book of Psalms in the Bible contains 150 chapters, and Proverbs contains 31 chapters. How many chapters do *both* books contain?

Setup: $\begin{array}{r} 150 \\ + 31 \\ \hline 181 \end{array}$ *chapters, both books*

- b. Miss Wheeler has 17 boys and 15 girls in her Sunday school class. How many children are in the class? **32 children**

- c. Miss Wheeler told the class about a trip she took to a Christian camp. On the way to camp, she traveled the side roads but took the interstate highway on her return trip. It took her 538 miles to get to camp and 479 miles to get home. How many miles did she travel in all? **1,017 miles in all**

Study to show thyself approved unto God, a workman that needeth not to be ashamed, rightly dividing the word of truth. —2 Tim. 2:15

Review

6. Count by fours from 4 to 84.

<u>4</u>	<u>8</u>	<u>12</u>	<u>16</u>	<u>20</u>	<u>24</u>	<u>28</u>
<u>32</u>	<u>36</u>	<u>40</u>	<u>44</u>	<u>48</u>	<u>52</u>	<u>56</u>
<u>60</u>	<u>64</u>	<u>68</u>	<u>72</u>	<u>76</u>	<u>80</u>	<u>84</u>

7. Add.

$\begin{array}{r} a. 27 \\ 83 \\ +96 \\ \hline 206 \end{array}$	$\begin{array}{r} b. 48 \\ 93 \\ +37 \\ \hline 178 \end{array}$	$\begin{array}{r} c. 142 \\ 59 \\ +619 \\ \hline 820 \end{array}$	$\begin{array}{r} d. 307 \\ 452 \\ +94 \\ \hline 853 \end{array}$	$\begin{array}{r} e. 98 \\ 57 \\ +76 \\ \hline 231 \end{array}$	$\begin{array}{r} f. 237 \\ 658 \\ +483 \\ \hline 1,378 \end{array}$
$\begin{array}{r} g. 16 \\ 23 \\ +18 \\ \hline 57 \end{array}$	$\begin{array}{r} h. 9 \\ 5 \\ +7 \\ \hline 21 \end{array}$	$\begin{array}{r} i. 27 \\ 15 \\ +93 \\ \hline 135 \end{array}$	$\begin{array}{r} j. 68 \\ 25 \\ +48 \\ \hline 141 \end{array}$	$\begin{array}{r} k. 95 \\ 58 \\ +23 \\ \hline 176 \end{array}$	$\begin{array}{r} l. 804 \\ 932 \\ +687 \\ \hline 2,423 \end{array}$

hard work on 1st day of fifth grade. Encourage students to work rapidly each day to finish their boardwork problems.

Note: Review is a daily part of each lesson.

Students work independently in workbook while teacher goes around room, giving individual help/making sure all students are working diligently. Assign students review problems to work at ckb. Each student needs to go to ckb during each arithmetic class. Sometimes you may want to let a whole row work the same problem at ckb. Of course, only one student explains the problem to class.

Name _____

Date _____

Introduce subtraction. (10 min.)**Ex. 1–3**

- **Concept Card 12:** Teach terminology.
- **B** Subtract/check problems for class explaining borrowing process. Students may write the borrowing numbers above minuend. Encourage students to remember borrowing numbers without writing them.
- Students read **box**. Be sure students understand what is in box each day. Sometimes students should explain information in own words. **Make it a daily practice to go over box material carefully.**
- Students do Ex. 1–3. (Remember that problems following a green letter are optional.) Several students may work at ckbd. Encourage students to work neatly in workbook or at ckbd. Circulate around classroom to check each student's work. Use your red pen to spot-check certain answers on worksheet.

Subtracting Whole Numbers**Facts:**

1. **Subtraction** is the mathematical process of taking a like number away.
2. The number being subtracted is the **subtrahend**. The subtrahend is subtracted from the **minuend**. The answer is the **difference**.
3. To check a subtraction problem, add the subtrahend and the difference. The sum should be the minuend.

$$\begin{array}{r} 132 \text{ minuend} \\ - 46 \text{ subtrahend} \\ \hline 86 \text{ difference} \\ + 46 \\ \hline 132 \checkmark \end{array}$$

Borrow 1 ten from 3 tens to get 12 ones. Borrow 1 hundred from 1 hundred to get 12 tens.

$$\begin{array}{r} 15 - 9 = 6 \leftarrow \text{difference} \\ \uparrow \quad \uparrow \\ \text{minuend} \quad \text{subtrahend} \end{array}$$

Class Practice

1. Write the correct terms beside each number in *a*. Work all the problems. (For additional practice, see Supplementary Exercises, pp. 312–315.)

a. $\begin{array}{r} 258 \\ -143 \\ \hline 115 \end{array}$	$\begin{array}{l} \text{minuend} \\ \text{subtrahend} \\ \text{difference} \end{array}$	b. $\begin{array}{r} 608 \\ -403 \\ \hline 205 \end{array}$	c. $\begin{array}{r} 973 \\ -162 \\ \hline 811 \end{array}$	d. $\begin{array}{r} 329 \\ -106 \\ \hline 223 \end{array}$	e. $\begin{array}{r} 855 \\ -234 \\ \hline 621 \end{array}$	f. $\begin{array}{r} 797 \\ -625 \\ \hline 172 \end{array}$
---	---	---	---	---	---	---

2. Subtract. Borrow when necessary.

a. $\begin{array}{r} 34 \\ -16 \\ \hline 18 \end{array}$	b. $\begin{array}{r} 72 \\ -29 \\ \hline 43 \end{array}$	c. $\begin{array}{r} 54 \\ -12 \\ \hline 42 \end{array}$	d. $\begin{array}{r} 342 \\ -139 \\ \hline 203 \end{array}$	e. $\begin{array}{r} 671 \\ -290 \\ \hline 381 \end{array}$	f. $\begin{array}{r} 478 \\ -329 \\ \hline 149 \end{array}$
--	--	--	---	---	---

g. $\begin{array}{r} 65 \\ -27 \\ \hline 38 \end{array}$	h. $\begin{array}{r} 46 \\ -37 \\ \hline 9 \end{array}$	i. $\begin{array}{r} 94 \\ -14 \\ \hline 80 \end{array}$	j. $\begin{array}{r} 601 \\ -180 \\ \hline 421 \end{array}$	k. $\begin{array}{r} 265 \\ -173 \\ \hline 92 \end{array}$	l. $\begin{array}{r} 506 \\ -452 \\ \hline 54 \end{array}$
--	---	--	---	--	--

3. Subtract and check.

a. $\begin{array}{r} 432 \\ -168 \\ \hline +264 \\ \hline 432 \end{array}$	b. $\begin{array}{r} 149 \\ -87 \\ \hline +62 \\ \hline 149 \end{array}$	c. $\begin{array}{r} 326 \\ -188 \\ \hline +138 \\ \hline 326 \end{array}$	d. $\begin{array}{r} 541 \\ -463 \\ \hline +78 \\ \hline 541 \end{array}$	e. $\begin{array}{r} 200 \\ -198 \\ \hline +2 \\ \hline 200 \end{array}$
--	--	--	---	--

Discuss story problems. (10 min.) **Ex. 4**

- Review 6 questions from Lesson (L) 1 curriculum used to guide students as they do story problems. As a class, work Ex. 4. Teach students to read carefully and plan how to solve story problems. Help students to visualize story problems in order to understand them better. Several students can work story problems at ckbd while others are working at their seats.

Review addition. (5 min.) **Ex. 5**

- C** Students explain how to add/check.
- Students do Ex. 5.

Review/Boardwork (10 min.) **Ex. 6–8**

Students should work/explain problems on ckbd. Students at their seats should check problems as they are explained. (Optional problems may be in either class practice or review. Students should strive to do all review problems, but they should do problems without a green letter 1st to make sure they do a variety of problems. After those problems are finished, they should do problems following a green letter.)

4. Solve these story problems.

- a. The Sears Tower in Chicago, Illinois, is 1,454 feet high. The Empire State Building in New York City, New York, is 1,250 feet high. How many feet higher is the Sears Tower than the Empire State Building? **204 feet higher**
- b. Nathan received a 327-page book about World War II from his Aunt Elizabeth. He has 39 pages left to read. How many pages has he read? **288 pages**



5. Add and check.

$$\begin{array}{r} 1,646 \\ 328 \\ 416 \\ +902 \\ \hline 1,646 \end{array}$$

$$\begin{array}{r} 7,905 \\ 1,387 \\ +6,518 \\ \hline 7,905 \end{array}$$

$$\begin{array}{r} \$120.53 \\ \$13.95 \\ 67.08 \\ +39.50 \\ \hline \$120.53 \end{array}$$

$$\begin{array}{r} 113,798 \\ 92,974 \\ 12,326 \\ + 8,498 \\ \hline 113,798 \end{array}$$

$$\begin{array}{r} 114 \\ 88 \\ 19 \\ + 7 \\ \hline 114 \end{array}$$

Review

6. Write the value of each red digit.

a. 9,307

7

b. 6,482

400

c. 4,915

4,000

d. 3,612

2

e. 8,764

60

f. 2,944

40

g. 1,095

1,000

h. 7,524

4

i. 5,823

20

j. 6,400

6,000

7. Write the answers.

$$\begin{array}{r} 936 \\ 255 \\ +849 \\ \hline 2,040 \end{array}$$

$$\begin{array}{r} 3,306 \\ -1,917 \\ \hline 1,389 \end{array}$$

$$\begin{array}{r} 2,396 \\ -1,409 \\ \hline 987 \end{array}$$

$$\begin{array}{r} \$9.86 \\ 7.29 \\ +9.55 \\ \hline \$26.70 \end{array}$$

$$\begin{array}{r} 301 \\ -169 \\ \hline 132 \end{array}$$

8. Write the missing numbers.

a. $16 - \underline{9} = 7$

b. $5 + \underline{9} = 14$

c. $\underline{18} - 9 = 9$

d. $\underline{25} + 9 = 34$

e. $73 - \underline{45} = 28$

f. $\underline{60} - 15 = 45$

g. $100 - 16 = \underline{84}$

h. $87 + 25 = \underline{112}$

i. $72 - \underline{53} = 19$

j. $35 + \underline{17} = 52$

k. $\underline{49} - 31 = 18$

l. $\underline{19} + 49 = 68$

Introduce multiplication. (10 min.)**Ex. 1**

- **Concept Card 13:** Teach terms. You may want to point out that 1st factor is sometimes called a multiplicand and 2nd factor a multiplier. Be sure students understand that if 2nd factor has more than 1 non-zero digit, there are partial products. The number of non-zero digits in 2nd factor determines number of partial products.

- Multiply 1st problem for class. Be sure students understand carrying process. Stress to students the importance of knowing mult. tables well. If a student has not mastered them, be sure he spends extra time on tables until he knows them completely. If students wish, allow them to write the carrying numbers. However, encourage students to learn how to carry in their head.

Work 2nd problem for students. The 2nd partial product must begin in tens' place since we are multiplying by a tens' digit. Students can leave ones' place empty or put a 0 in ones' place. If carrying numbers are written when 2nd factor is more than 1 digit, carrying number must be marked out after it is used.

- Students read **box**. Students do Ex. 1. If students are doing well with mult., allow several students to work at ckbd. They should explain each problem to class. If any problem is not put on ckbd, teacher or students should call out answers so class can check work.

Note: To be sure every student gets to work at ckbd, an entire row or several students can work the same problem at ckbd. If a student works a problem at ckbd, he can just copy answer in workbook.

Multiplying Whole Numbers

Facts:

1. **Multiplication** is a quick way to put equal numbers together.
2. The numbers being multiplied are the **factors**. Sometimes the factors are called the multiplicand and the multiplier. The answer is the **product**. The order of the factors may be changed without changing the product ($6 \times 3 = 3 \times 6$).
3. If the multiplier has two non-zero digits, the problem will have two **partial products**.

$$\begin{array}{r}
 27 \text{ factor (multiplicand)} \\
 \times 51 \text{ factor (multiplier)} \\
 \hline
 27 \text{ partial product} \\
 + 135 \text{ partial product} \\
 \hline
 1,377 \text{ product}
 \end{array}$$

Class Practice

1. Write the correct terms beside each number in *a* and *k*. Work all the problems. (For additional practice, see Supplementary Exercises, pp. 316–318.)

$ \begin{array}{r} a. \ 324 \\ \times \ 6 \\ \hline 1,944 \end{array} $	$ \begin{array}{r} \text{factor} \\ \hline \text{factor} \\ \hline \text{product} \end{array} $	$ \begin{array}{r} b. \ 582 \\ \times \ 5 \\ \hline 2,910 \end{array} $	$ \begin{array}{r} c. \ 694 \\ \times \ 4 \\ \hline 2,776 \end{array} $	$ \begin{array}{r} d. \ 749 \\ \times \ 6 \\ \hline 4,494 \end{array} $	$ \begin{array}{r} e. \ 832 \\ \times \ 5 \\ \hline 4,160 \end{array} $
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$ \begin{array}{r} f. \ 2,329 \\ \times \ 4 \\ \hline 9,316 \end{array} $	$ \begin{array}{r} g. \ 6,058 \\ \times \ 5 \\ \hline 30,290 \end{array} $	$ \begin{array}{r} h. \ 9,485 \\ \times \ 3 \\ \hline 28,455 \end{array} $	$ \begin{array}{r} i. \ 6,599 \\ \times \ 6 \\ \hline 39,594 \end{array} $	$ \begin{array}{r} j. \ 2,947 \\ \times \ 4 \\ \hline 11,788 \end{array} $
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$ \begin{array}{r} k. \ 432 \\ \times \ 45 \\ \hline 2160 \\ +1728 \\ \hline 19,440 \end{array} $	$ \begin{array}{r} \text{factor} \\ \hline \text{factor} \\ \hline \text{partial product} \\ \hline \text{partial product} \\ \hline \text{product} \end{array} $	$ \begin{array}{r} l. \ 578 \\ \times \ 23 \\ \hline 1734 \\ +1156 \\ \hline 13,294 \end{array} $	$ \begin{array}{r} m. \ 653 \\ \times \ 52 \\ \hline 1306 \\ +3265 \\ \hline 33,956 \end{array} $	$ \begin{array}{r} n. \ 973 \\ \times \ 44 \\ \hline 3892 \\ +3892 \\ \hline 42,812 \end{array} $	$ \begin{array}{r} o. \ 831 \\ \times \ 63 \\ \hline 2493 \\ +4986 \\ \hline 52,353 \end{array} $
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$ \begin{array}{r} p. \ 3,206 \\ \times \ 52 \\ \hline 6412 \\ +16030 \\ \hline 166,712 \end{array} $	$ \begin{array}{r} q. \ 5,325 \\ \times \ 46 \\ \hline 31950 \\ +21300 \\ \hline 244,950 \end{array} $	$ \begin{array}{r} r. \ 9,425 \\ \times \ 53 \\ \hline 28275 \\ +47125 \\ \hline 499,525 \end{array} $	$ \begin{array}{r} s. \ 4,752 \\ \times \ 16 \\ \hline 28512 \\ +4752 \\ \hline 76,032 \end{array} $	$ \begin{array}{r} t. \ 3,724 \\ \times \ 37 \\ \hline 26068 \\ +11172 \\ \hline 137,788 \end{array} $
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■ ■ ■ SUPPLEMENTARY EXERCISES ■ ■ ■

Addition Fact Families

(No two-digit addition is included.)

One Family

$$\begin{array}{r} 0 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +0 \\ \hline \end{array}$$

Two Family

$$\begin{array}{r} 0 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +0 \\ \hline \end{array}$$

Three Family

$$\begin{array}{r} 0 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +0 \\ \hline \end{array}$$

Four Family

$$\begin{array}{r} 0 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +0 \\ \hline \end{array}$$

Five Family

$$\begin{array}{r} 0 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ +0 \\ \hline \end{array}$$

Any number plus zero is that number.

Six Family

$$\begin{array}{r} 0 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ +0 \\ \hline \end{array}$$

The order of the addends may be changed without changing the sum. For example, $3 + 4 = 4 + 3$.

Seven Family

$$\begin{array}{r} 0 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ +0 \\ \hline \end{array}$$

Eight Family

$$\begin{array}{r} 0 \\ +8 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ +0 \\ \hline \end{array}$$

Nine Family

$$\begin{array}{r} 0 \\ +9 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ +8 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ +2 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ +1 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ +0 \\ \hline \end{array}$$

Lesson

6

Homework Problems (Problems are done on notebook paper.)

$$\begin{array}{r} 1. \ 987 \\ \ 329 \\ \ 652 \\ +878 \\ \hline 2,846 \end{array}$$

$$\begin{array}{r} 2. \ 6,320 \\ -5,387 \\ \hline 933 \end{array}$$

$$\begin{array}{r} 3. \ 6,857 \\ \ \ \ \ 9 \\ \hline 61,713 \end{array}$$

$$\begin{array}{r} 4. \ 683 \\ \ \ \ 25 \\ \hline 17,075 \end{array}$$

$$5. \ 7 \overline{)53,263} \begin{array}{l} 7,609 \end{array}$$

6. $24 \div 3 = 8$

7. $8 \times 7 = 56$

8. $12 - 3 = 9$

9. $32 + 21 = 53$

10. Place commas correctly and read the number 5,000,700,601.

11. Use digits to write six billion, two hundred fifteen million, eighty-four. **6,215,000,084**12. Mrs. Wilson weighed 187 pounds before she lost 20 pounds.
How much does she weigh now? **167 lb.**

Lesson

8

Homework Problems

$$\begin{array}{r} 1. \ 932 \\ \ 568 \\ +224 \\ \hline 1,724 \end{array}$$

$$\begin{array}{r} 2. \ 1,000 \\ - \ 628 \\ \hline 372 \end{array}$$

$$\begin{array}{r} 3. \ 932 \\ \ \ \ 416 \\ \hline 387,712 \end{array}$$

$$\begin{array}{r} 4. \ 53 \\ \ \ \ 78 \\ \hline 4,134 \end{array}$$

$$5. \ 9 \overline{)10,000} \begin{array}{l} 1,111 \text{ r.1} \end{array}$$

6. $49 \div 7 = 7$

7. $6 \times 9 = 54$

8. $49 + 34 = 83$

9. $100 - 24 = 76$

10. Place commas correctly and read the number 37,206,090,301.

11. Use digits to write twenty-four billion, thirty-three. **24,000,000,033**12. Average 120 miles, 250 miles, 60 miles, and 150 miles. **145 mi.**

Lesson

10

Homework Problems

$$\begin{array}{r} 1. \ 57 \\ \ 29 \\ \ 65 \\ \ 43 \\ +19 \\ \hline 213 \end{array}$$

$$\begin{array}{r} 2. \ 2,083 \\ -1,692 \\ \hline 391 \end{array}$$

$$\begin{array}{r} 3. \ 5,926 \\ \ \ \ \ 7 \\ \hline 41,482 \end{array}$$

$$\begin{array}{r} 4. \ 483 \\ \ \ \ 565 \\ \hline 272,895 \end{array}$$

$$5. \ 81 \overline{)7,452} \begin{array}{l} 92 \end{array}$$

6. Write the digit in the tens' place in 3,278. **7**7. Use digits to write eighteen billion, fifty-four thousand, six. **18,000,054,006**8. Average 13; 15; 12; 10; and 15. **13**9. Kyle read 29 pages and then read 33 pages more. How many pages did he read?
62 pages

Story Problem Solution Key

Les. 1, p. 2, ex. 5

b.
$$\begin{array}{r} 17 \\ +15 \\ \hline 32 \end{array}$$
 children

c.
$$\begin{array}{r} 538 \\ +479 \\ \hline 1,017 \end{array}$$
 miles in all

Les. 2, p. 4, ex. 4

a.
$$\begin{array}{r} 1,454 \\ -1,250 \\ \hline 204 \end{array}$$
 feet higher

b.
$$\begin{array}{r} 327 \\ -39 \\ \hline 288 \end{array}$$
 pages

Les. 3, p. 6, ex. 2

a.
$$\begin{array}{r} 72 \\ \times 6 \\ \hline 432 \end{array}$$
 cookies

b.
$$\begin{array}{r} \$3.17 \\ \times 12 \\ \hline 634 \\ +317 \\ \hline \$38.04 \end{array}$$

Les. 4, p. 8, ex. 3

b. $20 \times 2 = 40$ hours $\begin{array}{r} \$11.45 \\ \times 40 \\ \hline \$458.00 \end{array}$

Les. 5, p. 10, ex. 5

a.
$$\begin{array}{r} 2,549,627,000 \\ +2,420,962,000 \\ \hline 4,970,589,000 \end{array}$$
 total barrels

b.
$$\begin{array}{r} 259 \\ -37 \\ \hline 222 \end{array}$$
 employees left

Les. 6, p. 12, ex. 3

a.
$$\begin{array}{r} \$6.00 \text{ each doughnut} \\ 6 \overline{) \$3.60} \\ \underline{-36} \\ 00 \\ \underline{-00} \\ 0 \end{array}$$

b.
$$\begin{array}{r} 17 \\ \times 9 \\ \hline 153 \end{array}$$
 marbles

c.
$$\begin{array}{r} 49 \\ 13 \\ 3 \\ 7 \\ +21 \\ \hline 93 \end{array}$$
 items in all

d.
$$\begin{array}{r} 69^\circ \\ +23^\circ \\ \hline 92^\circ \text{F} \end{array}$$

Les. 7, p. 13, ex. 4

a. $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45$ sum
(Have students notice that 1 and 9 group together to make 10. This is true also of 2 and 8, 3 and 7, and 4 and 6.)

b. $7 \times 8 \times 9$
 56×9
504 product of 1st row

$4 \times 5 \times 6$
 20×6
120 product of 2nd row

504
 -120
 $\hline 384$ greater