This free download includes three lessons from

# Math 5

## LightUnit 503

The course consists of ten LightUnit workbooks (501-510).

Following the lessons are corresponding pages from the Teacher's Guide.

### Course description:

Sunrise Math 5 teaches new skills and concepts in incremental, continuously reviewed steps. Concepts are tested only after being reviewed for five days or more. Use Christian Light's Math Diagnostic Test to place students new to the curriculum.

Along with general fifth-grade math skills of reducing, carrying and borrowing with fractions, multiplying and dividing decimals, and applying the four operations to increasingly complex problems, Math 5 continues building a foundation for later geometry and algebra. The themes in the story problems relate to Christian ministries around the world.

The course consists of ten LightUnits and two Teacher's Guides.

CHRISTIAN LIGHT EDUCATION

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# Contents

# Kenya – The Land of the Luo

"Ding-a-ling!" Josinter's father rang the bell on his bike so the people ahead of him would move out of his path. Josinter and her brother Alfayo sat on the seat over the back wheel of their father's bike. Alfayo hung on to the little handle behind the bike seat and Josinter hung onto Alfayo. "Hurry, or we'll be late for school," Josinter urged her father. "I don't want to be caned by the headmaster!"

Josinter eyed the sun, which was beginning to get hot as it does every day in Kenya. Dry season makes every day hotter than usual. "Do you see any clouds?" she wondered aloud to Alfayo.

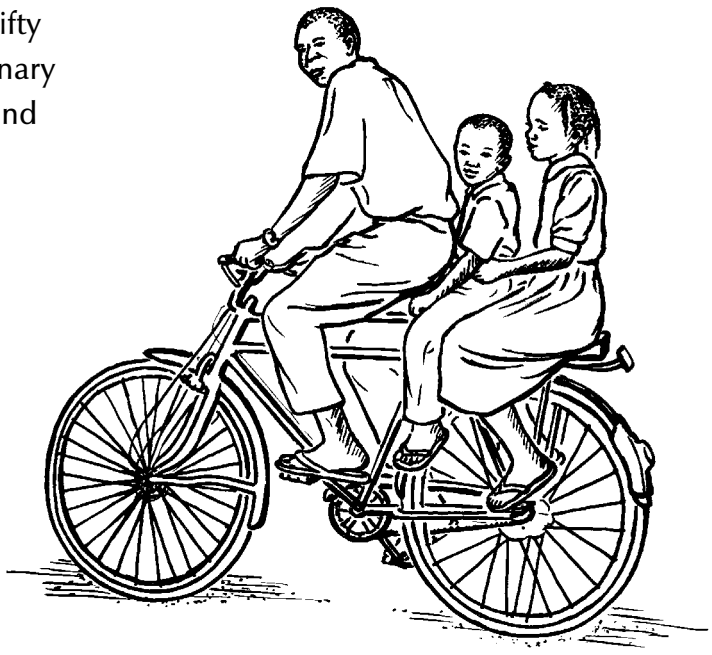
"I see just some tiny ones over there," Alfayo replied, "but they sure are pretty!"

Josinter agreed, "Those clouds are really nice. They are a sign that rainy season may begin soon." Both children closed their eyes as a whirlwind stirred up a fountain of dust, making it difficult to see.

"Here we are," said Father. "Have a nice day." The children jumped off the bike and, according to custom, shook Father's hand goodbye. They were grateful to be able to go to school. Some of their friends' parents could not afford to buy schoolbooks and uniforms for their children.

Josinter and Alfayo are from the Luo tribe of Kenya. Kenya is in eastern Africa. Although they have much less than you and your friends, they are quite content with what they have.

Amish Mennonite Aid (AMA) has mission headquarters in Kisumu near beautiful Lake Victoria. Seven missionary families live in the compound, totaling about fifty people. In this LightUnit, you will meet missionary Ruth, who lives with her family in the compound and often visits families such as Josinter and Alfayo's.



AMA's main goal is planting churches in Kenya. Already seven churches have been started in surrounding areas. However, many more could be established if there were more workers and funds. Maybe someday God will call you to go help spread the Gospel to the friendly Kenyans.

Speed Drill 1

# 1 Division With 0 in the Quotient

Math 4

In division, the divisor is sometimes greater than the number we bring down. We can't divide, so we put 0 in the quotient and bring down again before dividing.

$$\begin{array}{r} 105\text{ R }3 \\ 7\overline{)738} \\ \underline{7\downarrow\downarrow} \\ 038 \\ \underline{35} \\ 3 \end{array}$$

**Solve.**

**1. a.** $5\overline{)509}$ **b.** $6\overline{)4{,}921}$ **c.** $3\overline{)319}$

## Subtracting a Mixed Number From a Whole Number

Math 4

You cannot subtract a fraction from nothing.

$$\begin{array}{r} 8 \\ -\ 2\frac{3}{5} \\ \hline \end{array}$$

I cannot subtract $\frac{3}{5}$ from nothing. I must borrow from 8.

Cross out *8* and write *7*.

You are subtracting fifths, so change the 1 you borrowed to $\frac{5}{5}$ and write it above the fraction.

$$\begin{array}{r} {\scriptstyle 7}\not{8}\ \frac{5}{5} \\ -\ 2\frac{3}{5} \\ \hline \end{array}$$

Now you can subtract.

$$\begin{array}{r} {\scriptstyle 7}\not{8}\ \frac{5}{5} \\ -\ 2\frac{3}{5} \\ \hline 5\frac{2}{5} \end{array}$$

**Borrow from the whole number before you subtract.**

**2. a.** $\begin{array}{r} 5 \\ -\ 1\frac{1}{8} \\ \hline \end{array}$ **b.** $\begin{array}{r} 4 \\ -\ 2\frac{7}{12} \\ \hline \end{array}$ **c.** $\begin{array}{r} 6 \\ -\ 3\frac{5}{8} \\ \hline \end{array}$ **d.** $\begin{array}{r} 9 \\ -\ 2\frac{1}{12} \\ \hline \end{array}$

**Read these numbers to your teacher.**

△**3.** 185,246,010,015 28,000,000,486,520 42.008 5,800.040 67.2

## We Remember

**Circle the most sensible measurement.**

**4.** Thickness of a dictionary — 2 feet — 2 yards — 2 inches

**5.** Distance across a parking lot — 20 miles — 20 yards — 20 feet

**Write the missing numerator.**

**6.** **a.** $\frac{3}{4} = \frac{\quad}{12}$ **b.** $\frac{5}{6} = \frac{\quad}{24}$ **c.** $\frac{1}{3} = \frac{\quad}{21}$ **d.** $\frac{5}{12} = \frac{\quad}{36}$

**Round to the nearest 100 to estimate.**

**7.** **a.** estimate 458 + 1,236 + 72

_____ + _____ + _____ = _____

**b.** estimate 834 – 482

_____ – _____ = _____

**Round to the nearest ten.**

**8.** **a.** 58 _____ **b.** 195 _____ **c.** 3,649 _____

**Round to the nearest hundred.**

**9.** **a.** 1,495 _____ **b.** 2,936 _____ **c.** 759 _____

**Complete this function chart.**

**10.**

| yards | 1 | 4 | | 10 | | 11 | 5 |
|---|---|---|---|---|---|---|---|
| feet | 3 | | 27 | | 18 | | |

**Circle all the numbers by which each is divisible.**

**11.** **a.** 26

2 6 9

**b.** 35

3 5 7

**c.** 63

3 7 9

**d.** 60

3 5 9

**Round to the nearest whole number.**

**12.** **a.** 69.962 _____ **b.** 35.035 _____ **c.** 63.37 _____ **d.** 60.9 _____

**13.** Seven missionary families live near one another in Kisumu. There are a total of 49 people. What is the average number of people in each missionary family?

Answer: _____

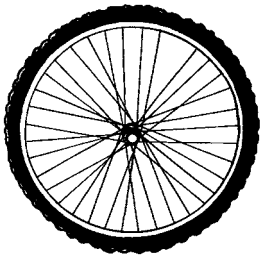
**14.** Usually animals are not fenced in Kenya. In the Kisuma area 39 animals were killed in one year while crossing the road. One-third of the animals were goats. How many goats were killed crossing the road?

Answer: _____

**Round to the nearest whole number to estimate.**

**15. a.** estimate 14.31 × 1.9 **b.** estimate 6.079 × 8.95

_____ × _____ = _____ _____ × _____ = _____



**Complete the sentences. Answer the questions.**

**16.** Alfayo took the wheel off his bike to replace some spokes. The spokes go from the center of the wheel to the outside edge. Each spoke is 12 inches long. The diameter is _____ inches, and the radius is _____ inches. Alfayo figured out that the circumference is 90 inches. Is Alfayo correct? _____ Why or why not? _____

**Round to the nearest dollar.**

**17. a.** $18.35 _____ **b.** $6.51 _____ **c.** $9.49 _____

**Identify the pattern mentally. Then fill in the blanks.**

**18.** 1, 3, 9, 27, _____, _____, _____

**Write these numbers.**

**19.** Twenty-nine trillion, five hundred eighty-six billion, thirty-nine million, forty thousand, seven hundred _____

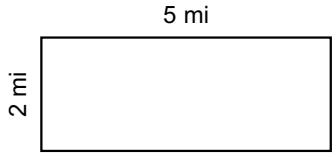
**20.** Six hundred forty-nine trillion, five hundred eight million, three hundred seventy-five thousand, one hundred twenty-two _____

**Use the graph at the bottom of page 60 to answer the question.**

**21.** How much taller is the resin tree than the poison arrow? _____

**Write the formula. Use it to find the area.**

**22. a.**




**b.**

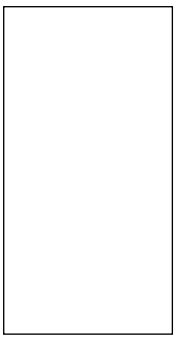

Many Kenyans are hungry for the Gospel.

**Copy and solve. Check, using the checking method of your choice.**

**23.** 93 + 48 + 75 + 62

△**24.** Circle the checking method that you used.

**adding up** **addends that equal 10** **digit sums**



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**25. a.** $5\overline{)42,515}$ **b.** $6\overline{)624}$ **c.** $3\overline{)642}$ **d.** $2\overline{)4,985}$

**26. a.**
$$\begin{array}{r} 10 \\ -\ 2\frac{2}{3} \\ \hline \end{array}$$

**b.**
$$\begin{array}{r} 9 \\ -\ 2\frac{3}{5} \\ \hline \end{array}$$

**c.**
$$\begin{array}{r} 3.93 \\ 8.23 \\ 9.02 \\ +\ 7.16 \\ \hline \end{array}$$

**d.**
$$\begin{array}{r} 52.40 \\ 163.20 \\ 9.00 \\ +\ \ 3.16 \\ \hline \end{array}$$

Speed Drill 2

# 2 Using Common Denominators to Add or Subtract

You have been finding the missing numerator to make equal fractions. Sometimes you will need to make equal fractions before you can add or subtract.

$$\frac{3}{4} = \frac{?}{24}$$

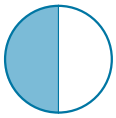
So far, you have added and subtracted fractions and mixed numbers that already have like denominators. When two fractions have the same denominator, we say they have **common denominators.** It is easy to add or subtract $\frac{1}{8}$ and $\frac{3}{8}$ because the common denominator is 8, and all we have to do is add or subtract the numerators.

But what about a problem like this?

Ruth used $\frac{1}{2}$ cup of water and $\frac{1}{3}$ cup of oil for a cake she was making. How much liquid did she use in the cake?

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

We cannot add halves and thirds because the parts (denominators) are different sizes.

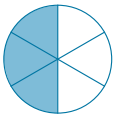


$\frac{1}{2} = \frac{}{6}$

$+ \quad \frac{1}{3} = \frac{}{6}$

$? \quad ?$

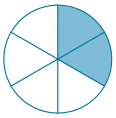
But we can change both fractions to equal fractions with common denominators. Let's use the common denominator 6 because 6 is a multiple of both 2 and 3.



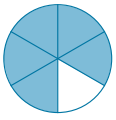
$\frac{1}{2} = \frac{3}{6}$

$2 \times ? = 6$
$2 \times 3 = 6$
Multiply the numerator by the same number. $1 \times 3 = 3$

Ruth used $\frac{5}{6}$ cup of liquid in her cake.



$+ \quad \frac{1}{3} = \frac{2}{6}$



$= \frac{5}{6}$

$3 \times ? = 6$
$3 \times 2 = 6$
Multiply the numerator by the same number. $1 \times 2 = 2$

Since the denominators are the same we can add.

Two kinds of Kenyan bread are chapatis and mandazis. Chapatis are like round, thick, juicy tortillas. Mandazis are like doughnuts with no hole in the center.

**Before you add or subtract, write the missing numerators. The common denominators are given for you. Add or subtract.**

$\frac{1}{2} = \frac{\quad}{4}$

| | | | | |
|---|---|---|---|---|
| | $\frac{1}{2} = \frac{\quad}{6}$ | $\frac{3}{4} = \frac{\quad}{4}$ | $\frac{3}{4} = \frac{\quad}{4}$ | $8\frac{2}{3} = \frac{\quad}{9}$ |
| **1.** | **a.** $+\ \frac{2}{3} = \frac{\quad}{6}$ | **b.** $+\ \frac{1}{2} = \frac{\quad}{4}$ | **c.** $+\ \frac{1}{2} = \frac{\quad}{4}$ | **d.** $-\ 7\frac{1}{9} = \frac{\quad}{9}$ |

**Read these numbers to your teacher.**

△**2.** 2,000,000,001 792,013,005,480,006 10,586,132,479 -30 -41

## *We Remember*

**Write each as a two-place decimal.**

**3. a.** 112.7 _____ **b.** 7.8 _____ **c.** 54 _____

**Round to the nearest whole number.**

**4. a.** 142.7 _____ **b.** 75.3 _____

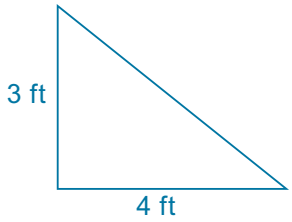
**Change the mixed numbers to improper fractions.**

**5. a.** $2\frac{2}{9} =$ _____ **b.** $6\frac{3}{4} =$ _____ **c.** $3\frac{1}{12} =$ _____ **d.** $1\frac{11}{24} =$ _____

**Find the area of the triangle.**

**6.** _____

_____




**Write the ratio.**

**7.** Kenya has a total of about 40 inches of rainfall in 12 months.
What is the ratio of inches to months? _____

*Lesson 2*

## + − × ÷ Skill Builders

**8.** **a.** $1 - \frac{3}{4}$ **b.** $1 - \frac{11}{20}$ **c.** $6 - 2\frac{3}{8}$ **d.** $6 - 4\frac{3}{4}$ **e.** $\frac{1}{3} + \frac{2}{3}$

Write remainders as fractions.

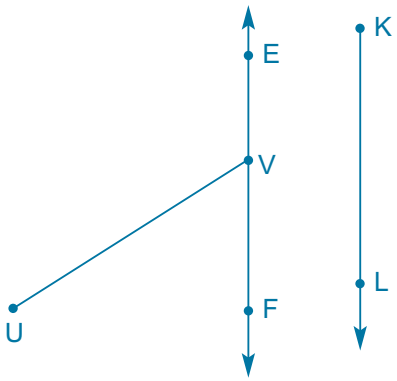
**9.** **a.** $6\overline{)3,943}$ **b.** $8\overline{)4,027}$ **c.** $691 \times 483$ **d.** $6,742 - 3,258$

**Use letters and symbols to write the names.**

**10.** Ray _____

**11.** Line segment _____

**12.** Line _____




**Fill in the blanks.**

**13.** Line _____ is parallel to _____.

**14.** The point of intersection is _____.

**15.** Is $\overline{UV}$ perfendicular to $\overleftrightarrow{EF}$? _____

**Write < or > .**

**16.** **a.** 5 ☐ -4 **b.** -9 ☐ 0 **c.** -15 ☐ 9 **d.** -11 ☐ -12

**Write the decimal for each fraction and mixed number.**

**17.** **a.** $\frac{5}{10}$ _____ **b.** $2\frac{51}{100}$ _____ **c.** $4\frac{125}{1000}$ _____

**18.** **a.** $\frac{35}{100}$ _____ **b.** $\frac{265}{1000}$ _____ **c.** $6\frac{3}{10}$ _____

**19.** From Amish Mennonite Aid headquarters in Kisumu, Pastor Mark travels 34.4 km to church services in Kasongo. Pastor Lester drives 12.9 km to get to the church in Ahero. How much farther does Pastor Mark drive than Pastor Lester?

Answer: _____

**20.** "Haircuts: 15 shillings," read Silas. Leaning his bike against a mango tree, he stepped under the roof of the barber shop for a haircut. If Henry, the barber, gave 12 haircuts in one day, how much money did he receive?

Answer: _____

**Write whether the following items are *more* or *less* than a foot.**

**21.** Length of your coat sleeve _____

**22.** Height of a cup _____

**23.** Length of a pencil _____

**24.** Length of a cell phone _____

**Write these decimals.**

**25.** One and four hundred nine thousandths _____

**26.** Ten and eight-thousandths _____

**Write the missing numerators. Then add or subtract.**

| | | | |
|---|---|---|---|
| | | $6\frac{4}{9} = \frac{\quad}{9}$ | $\frac{2}{3} = \frac{\quad}{6}$ |
| | $\frac{3}{4} = \frac{\quad}{12}$ | $\frac{3}{4} = \frac{\quad}{28}$ | $3\frac{1}{3} = \frac{\quad}{9}$ | $\frac{5}{6} = \frac{\quad}{6}$ |
| **27.** | **a.** $+\ \frac{2}{3} = \frac{\quad}{12}$ | **b.** $-\ \frac{2}{7} = \frac{\quad}{28}$ | **c.** $+\ 1\frac{7}{9} = \frac{\quad}{9}$ | **d.** $+\ \frac{1}{3} = \frac{\quad}{6}$ |

Speed Drill 3

# 3 Simplifying Expressions in the Right Order

When simplifying expressions, we follow a special order to do the math. We always work from left to right. First we do all the multiplication and division. Then we do the addition and subtraction.

If we want to show a different order than the usual rules, we must use parentheses around the parts to be done first. So, now the right order is:

1. Do what is in parentheses ( ).
2. Do the multiplication and division from left to right.
3. Do the addition and subtraction from left to right.

$2 \times (3 + 4) - 2$

$2 \times 7 - 2$

$14 - 2$

$12$

1. ( )
2. × and ÷
3. + and –

**Simplify these expressions. Remember, do what is in parentheses first.**

**1. a.** $6 \div 2 \times 7 - 4$ **b.** $5 \times (5 + 3) \times 7$ **c.** $9 \times (2 \times 5) - (8 - 2)$

## Squares and Square Roots to 12

Multiplying a number by itself is called squaring a number. Notice why.

4 squared = ?

$4 \times 4 = 16$

The answer to such a problem is the **square.** The square of 4 is 16.

The factor that is multiplied is the **square root.**

The square root of 16 is 4 and can be written like this: $\sqrt{16} = 4$.

**Solve.**

**2. a.** 4 squared = _____ **b.** 2 squared = _____ **c.** 6 squared = _____

**3. a.** $\sqrt{4}$ = _____ **b.** $\sqrt{36}$ = _____ **c.** $\sqrt{64}$ = _____

## We Remember

**Simplify these expressions. Remember, do what is in parentheses first.**

**4. a.** 13 – 10 ÷ 2 + 9 **b.** (6 + 3) + (32 ÷ 8) **c.** 64 ÷ 8 × 7 – 5

**Write the missing numerators. Add or subtract.**

**5. a.** $\frac{5}{6} = \frac{\ }{6}$, $\frac{1}{2} = \frac{\ }{6}$, $+\ \frac{2}{3} = \frac{\ }{6}$

**b.** $\frac{8}{9} = \frac{\ }{18}$, $-\ \frac{5}{6} = \frac{\ }{18}$

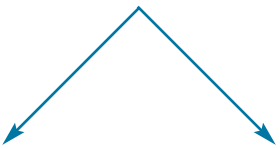
**c.** $3\frac{3}{4} = \frac{\ }{8}$, $+\ 7\frac{5}{8} = \frac{\ }{8}$

**d.** $\frac{5}{9} = \frac{\ }{9}$, $\frac{4}{9} = \frac{\ }{9}$, $+\ \frac{1}{3} = \frac{\ }{9}$

**Write** *obtuse, acute,* **or** *right* **to name each angle.**

**6. a.** _____

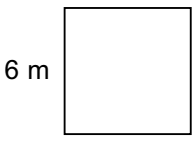
**b.** _____



**c.** _____

**Write the formula. Use it to find the area.**

**7.**



## + − × ÷ Skill Builders

**Check your work by whichever method you choose when you see a box with a check mark.**

☑

**8. a.**
$$\begin{array}{r} 43.003 \\ -\ 5.019 \\ \hline \end{array}$$

**b.** $-4\frac{13}{18}$ (7)

**c.** $-1\frac{6}{7}$ (3)

**d.** $4\overline{)36,381}$

**Write the name of the place of each circled digit.**

**9.** 762,349,(7)26,010,483 _____

**10.** (8)9,317,572,500 _____

**11.** 25(4).035 _____

**12.** 0.(1)2 _____

**13.** 3,112,02(3),000,211 _____

In Kenya water is drawn from a well or carried from rivers or stagnant ponds.

**14.** Dysentery is a disease caused by impure drinking water. Many children in Kenya miss classes because of dysentery. On Monday, 65 students at Josinter's school were absent. Yesterday, 72 were missing, and today 85 are sick. Find the average number of students absent on each of the 3 days.

Answer: _____

**15.** Mr. Omondi was tired from his day as a bike taxi driver. He drove an old man 8 km to market. Then he hauled a chair 6 km. Next he took a man 10 km to the bicycle repair shop. His last trip was to take a woman with a live chicken 4 km. What was the average length of Mr. Omondi's bike trips that day?

Answer: _____

**Order these decimals from largest to smallest.**

**16.** 3.2 3.3 3.6 _____ _____ _____

**17.** 3.62 3.23 3.32 _____ _____ _____

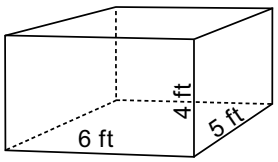
**Circle all the numbers by which each is divisible.**

**18.** **a.** 32 **b.** 81 **c.** 40

2 4 6 8 3 5 9 4 8 9 10

**Find the volume.**

**19.** _____




**Find the fraction of each number.**

**20.** **a.** $\frac{1}{7}$ of 21 is ____ **b.** $\frac{1}{11}$ of 44 is ____ **c.** $\frac{1}{5}$ of 20 is ____

**Write whether the following items are *more* or *less* than a centimeter.**

**21.** Length of a paper clip _____

**22.** Thickness of a pencil lead _____

**23.** Length of a pencil _____

**Write these numbers.**

**24.** Nine trillion, seven hundred twenty-eight billion, four hundred sixty-five million, three _____

**25.** Three hundred twenty-nine trillion, eight hundred seventy-six million, five hundred forty-three thousand, twenty-one _____

**Solve.**

**26.** **a.** 5 squared = _____ **b.** $\sqrt{100}$ = _____ **c.** $\sqrt{64}$ = _____

# Introduction

CLE Sunrise Math is built on the thesis that most children can learn, understand, and master mathematics concepts. It seeks to relate math to everyday life and to make it practical. We believe that mathematics should help students achieve the ultimate goal—loving, serving, and bringing glory to God.

CLE Sunrise Math introduces concepts in incremental steps. This allows the student to master each increment of a skill before advancing to the next step. Thus he does not face entire lessons or chapters on a single concept but meets several simple concepts simultaneously. Each increment easily becomes a part of his "big picture," not only because it is small but also because it fits with what he has already learned.

The only way a student will retain what he has learned is by consistent, systematic review. CLE Sunrise Math uses a system of continuous review. Instead of having a grand review at the end of the year, a large part of every day's work is review. The goal is mastery, not just exposure.

## Course Materials

Items in italics are available from CLE.

### Teacher:

→ *Teacher's Guides for Math 500* (501-505 and 506-510)

→ *Answer Keys for Math 501-505, Math 506-510*

→ *Multiplication and Division Flash Cards*

### For each student:

→ *LightUnits 501-510*

→ *Elementary Math Reference Chart* and *Intermediate Math Reference Chart* for each student or small group of students

→ Rulers with millimeters, centimeters, meters, inches, feet, and yards

→ Protractor for each student (the smallest ones work best)

## The LightUnits

Each LightUnit from Math 502-510 features a different part of the world where math is used in everyday life. Page 1 of each LightUnit introduces the LightUnit theme with a story.

### Lessons 1-16

1. **Title Bars.** Each lesson begins with a title bar that directs students to do their daily speed drill or mastery drill.

   **Speed Drills.** Since fact learning is essential for mastery, Sunrise Math includes regular speed drills. Students have one minute to complete as many facts as they can. Then they score their drill and write the score above the drill.

   **Mastery Drills.** Mastery drills include facts that should be memorized. These facts cover basic measurement equivalents in the U.S. and metric systems, geometry facts and calendar facts. These drills need not be timed, but you may time them if you wish for an incentive.

2. **Teaching the Lesson** New material is introduced at the beginning of each lesson, right after the speed drill or mastery drill reminder. Students should be able to work through most new material on their own with occasional help from the teacher. A large Teacher Check circle indicates that the material is more difficult and that you may need to formally teach that lesson.

   **Refresher Lessons.** This symbol indicates that the concept was originally taught in Math 400.

3. **We Remember.** This review ensures mastery of previously taught skills and concepts. Students should need little help in this section.

4. **Fascinating Discoveries.** These occasional enrichment activities expose students to new concepts. There is no review or testing of these activities—they're *just for fun!*

### Lesson 17: Fascinating Discoveries

The last lesson in each LightUnit is designed to broaden the student's exposure to math. If you need to shorten the school year, skip these lessons.

### Quiz 1, Quiz 2, and LightUnit Test

Sunrise Math tests concepts only after they have been reviewed for five days or more. Tests and quizzes are cumulative. Quiz 1 is in Lesson 5, Quiz 2 is in Lesson 10, and the test is Lesson 16 in every LightUnit.

## Symbols Used in the LightUnits

***Teacher Check.*** Used before quizzes and tests, and anywhere else the child must obtain the teacher's initials before proceeding.

△ ***Teacher Aide Check.*** Used with exercises that need to be checked by the teacher or teacher's aide. The child may continue working beyond this symbol even if the exercise has not yet been checked.

☆ ***Optional Activity***. The student should check with the teacher as to whether to do exercises marked with a star.

***Refresher Lesson.*** This concept was taught in Math 400 and appears again in Math 500.


***Story Problem.***

***We Remember*** – The daily review section continuously reviews skills and concepts.

**?** . . . ***Mental Math*** – Exercises in which the student works mentally and writes down only the answers.

**+ - ÷ ×** ***Skill Builders*** – Mixed computation practice.

***Fascinating Discoveries*** – Optional activities, usually found in Lessons 5, 10, and 17.

## Grading a LightUnit

**LightUnit Grade.** To obtain a final LightUnit grade, average the two quiz grades and any other optional grades. Add this average to the LightUnit Test grade and divide by two. This average will be the final grade for the LightUnit.

Example: Quiz 1 – 96%
Quiz 2 – 98%
Average – 97%
Test score – 93%
Average – 95%
LightUnit score is 95.

**Scores Below 80.** If a student scores 75-79% on a LightUnit Test, he may review the concepts he is weak in. Verify that he knows the material by quizzing him or giving a remedial assignment.

If a student scores 70-74%, have him restudy for the test and take the Alternate LightUnit Test located in Appendix C.

If a student scores 70% or below, have him do a thorough review of the LightUnit before taking the Alternate LightUnit Test or have him redo the entire LightUnit and then take the Alternate LightUnit Test. For both scenarios, if the student scores between 75-100% on the Alternate LightUnit Test, record the score for the LightUnit as 80%.

If all controls are followed but the student consistently fails to achieve 80%, consider underlying causes. What is the student's natural ability? Can he be expected to achieve 80% or above? These students may need to be evaluated by a trained person or to have one-on-one assistance.

## Math Reference Charts

The *Elementary* and *Intermediate Math Reference Charts* are portable, durably laminated glossaries. They are filled with definitions, diagrams, equivalent measures, geometry, common abbreviations, etc. The elementary chart contains a full set of multiplication facts through the 9s. Students can work more independently when they can look up information as needed. The reference chart is a tool that will help them achieve this goal.

## The Appendixes

Take time to become familiar with the appendixes in this teacher's guidebook.

**Appendix A: Math 400 Skills Index** tells you where in Math 400 each skill is introduced.

**Appendix B: Math 500 Scope and Sequence** gives an overview of the whole course. Many states require homeschoolers to submit a scope and sequence of the course they plan to study.

**Appendix C: Alternate LightUnit Tests** cover the same concepts as the regular LightUnit Tests, but in a different order. They may be photocopied and used when a student needs to retake a test for any reason.

**Appendix D: Math 500 Skills Index** tells you where in Math 500 each skill is introduced.

**Appendix E: Extra Practice Sheets** provide reinforcement for concepts in LightUnit 501.

**Appendix F: Math Reference Charts** are reproduced here for the teacher's benefit.

## *Lesson 1 pp. 2-5*

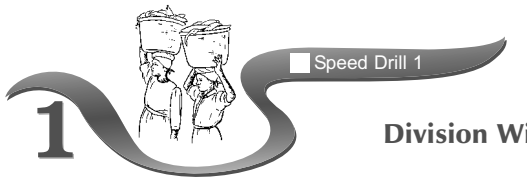
### *Lesson Preparation*

- LightUnit 503 for each student

### *Drill*

- Do Speed Drill 1 and mark the number correct.

△**Teacher Aide Check.** Listen to each student read the numbers.




### Division With 0 in the Quotient

Math 4

In division, the divisor is sometimes greater than the number we bring down. We can't divide, so we put 0 in the quotient and bring down again before dividing.

$$\begin{array}{r} 105\text{R}3 \\ 7\overline{)738} \\ \underline{7\downarrow\downarrow} \\ 038 \\ \underline{35} \\ 3 \end{array}$$

**Solve.**

1. a. $5\overline{)509}$ = 101R4 (5; 09; 5; 4)
   b. $6\overline{)4{,}921}$ = 820R1 (48; 12; 12; 1)
   c. $3\overline{)319}$ = 106R1 (3; 19; 18; 1)

### Subtracting a Mixed Number From a Whole Number

Math 4

You cannot subtract a fraction from nothing.

$$8 - 2\tfrac{3}{5}$$

I cannot subtract $\frac{3}{5}$ from nothing. I must borrow from 8.

Cross out *8* and write *7*.

You are subtracting fifths, so change the 1 you borrowed to $\frac{5}{5}$ and write it above the fraction.

$$\begin{array}{r} {\not 8}^{\,7}\tfrac{5}{5} \\ -\,2\tfrac{3}{5} \end{array}$$

Now you can subtract.

$$\begin{array}{r} {\not 8}^{\,7}\tfrac{5}{5} \\ -\,2\tfrac{3}{5} \\ \hline 5\tfrac{2}{5} \end{array}$$

**Borrow from the whole number before you subtract.**

2. a. $4\tfrac{8}{8} - 1\tfrac{1}{8} = 3\tfrac{7}{8}$
   b. $3\tfrac{12}{12} - 2\tfrac{7}{12} = 1\tfrac{5}{12}$
   c. $5\tfrac{8}{8} - 3\tfrac{5}{8} = 2\tfrac{3}{8}$
   d. $8\tfrac{12}{12} - 2\tfrac{1}{12} = 6\tfrac{11}{12}$

**Read these numbers to your teacher.**

△3. 185,246,010,015 28,000,000,486,520 42.008 5,800.040 67.2

2

### *Teaching the Lesson*

#### Division With 0 in the Quotient

Just as zeros hold place values when multiplying large numbers, they also hold place values in quotients. The basic steps of long division remain the same.

#### Subtracting a Mixed Number From a Whole Number

Train students to cross out the whole number and write the new whole number first. Then write the fraction representing one and subtract.

△**Teacher Aide Check on pages 2 and 5.**

**Lesson 1**

## We Remember

**Circle the most sensible measurement.**

**4.** Thickness of a dictionary — 2 feet — 2 yards — (2 inches)

**5.** Distance across a parking lot — 20 miles — (20 yards) — 20 feet

**Write the missing numerator.**

**6. a.** $\frac{3}{4} = \frac{\mathbf{9}}{12}$ **b.** $\frac{5}{6} = \frac{\mathbf{20}}{24}$ **c.** $\frac{1}{3} = \frac{\mathbf{7}}{21}$ **d.** $\frac{5}{12} = \frac{\mathbf{15}}{36}$

**Round to the nearest 100 to estimate.**

**7. a.** estimate 458 + 1,236 + 72

**500** + **1,200** + **100** = **1,800**

**b.** estimate 834 – 482

**800** – **500** = **300**

**Round to the nearest ten.**

**8. a.** 58 **60** **b.** 195 **200** **c.** 3,649 **3,650**

**Round to the nearest hundred.**

**9. a.** 1,495 **1,500** **b.** 2,936 **2,900** **c.** 759 **800**

**Complete this function chart.**

**10.**

| yards | 1 | 4 | **9** | 10 | **6** | 11 | 5 |
|---|---|---|---|---|---|---|---|
| feet | 3 | **12** | 27 | **30** | 18 | **33** | **15** |

**Circle all the numbers by which each is divisible.**

**11. a.** 26 — (2) 6 9 **b.** 35 — 3 (5) (7) **c.** 63 — (3) (7) (9) **d.** 60 — (3) (5) 9

**Round to the nearest whole number.**

**12. a.** 69.962 **70** **b.** 35.035 **35** **c.** 63.37 **63** **d.** 60.9 **61**

**3**

### *Tips for Struggling Students*

➔ If a student still has trouble with the steps of long division, have him complete a division problem as you watch. Find out what his problem is. Is he not keeping his place values lined up? Is he not dividing correctly? Is he not subtracting correctly? Does he not understand how to compare his remainder with his dividend before repeating the steps? It is important that students master the steps of long division at this stage so they are not further confused when they begin to work with division by more than one digit.

➔ Make sure students remember how to change a number like 7 into $6\frac{5}{5}$ to subtract fractions. They need to look at the other fraction in the problem to determine which denominator to use for the improper fraction (whole number) they borrowed.

### *Board Work*

Divide.

$4\overline{)831}$ = **207R3**

$3\overline{)1,142}$ = **380R2**

$2\overline{)818}$ = **409**

$7\overline{)747}$ = **106R5**

Subtract.

$3 - 2\frac{3}{4} = \mathbf{\frac{3}{4}}$

$7 - 6\frac{1}{5} = \mathbf{\frac{4}{5}}$

$8 - 3\frac{7}{10} = \mathbf{4\frac{3}{10}}$

$5 - 3\frac{5}{6} = \mathbf{1\frac{1}{6}}$

***Lesson 1***

**13.** Seven missionary families live near one another in Kisumu. There are a total of 49 people. What is the average number of people in each missionary family?

$$7\overline{)49}\quad 7,\ 49,\ 0$$

Answer: **7 people**

**14.** Usually animals are not fenced in Kenya. In the Kisuma area 39 animals were killed in one year while crossing the road. One-third of the animals were goats. How many goats were killed crossing the road?

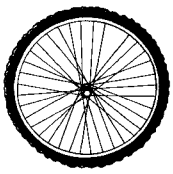
$$3\overline{)39}\quad 13,\ 3,\ 9,\ 9,\ 0$$

Answer: **13 goats**

**Round to the nearest whole number to estimate.**

**15. a.** estimate 14.31 × 1.9 **b.** estimate 6.079 × 8.95

**14** × **2** = **28** **6** × **9** = **54**



**Complete the sentences. Answer the questions.**

**16.** Alfayo took the wheel off his bike to replace some spokes. The spokes go from the center of the wheel to the outside edge. Each spoke is 12 inches long. The diameter is **24** inches, and the radius is **12** inches. Alfayo figured out that the circumference is 90 inches. Is Alfayo correct? **no** Why or why not? **24 × 3 = 72 inches**

**Round to the nearest dollar.**

**17. a.** $18.35 **$18.00** **b.** $6.51 **$7.00** **c.** $9.49 **$9.00**

**Identify the pattern mentally. Then fill in the blanks.**

**18.** 1, 3, 9, 27, **81**, **243**, **729**

**Write these numbers.**

**19.** Twenty-nine trillion, five hundred eighty-six billion, thirty-nine million, forty thousand, seven hundred **29,586,039,040,700**

**20.** Six hundred forty-nine trillion, five hundred eight million, three hundred seventy-five thousand, one hundred twenty-two **649,000,508,375,122**

**4**

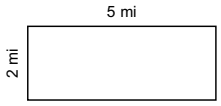
## *Teacher Notes:*

***Lesson 1***

**Use the graph at the bottom of page 60 to answer the question.**

**21.** How much taller is the resin tree than the poison arrow? **5 meters**

**Write the formula. Use it to find the area.**





Many Kenyans are hungry for the Gospel.

**22. a.** $A = l \times w$
$A = 5 \times 2$
$A = 10 \text{ mi}^2$

**b.** $A = s^2$
$A = 3 \times 3$
$A = 9 \text{ cm}^2$

**Copy and solve. Check, using the checking method of your choice.**

**23.** 93 + 48 + 75 + 62

$$\begin{array}{r} {\scriptstyle 1\phantom{00}} \\ 93 \\ 48 \\ 75 \\ +\,62 \\ \hline 278 \end{array}$$

△**24.** Circle the checking method that you used.

**adding up** **addends that equal 10** **digit sums**

## + − × ÷ *Skill Builders*

**25. a.** $5\overline{)42,515}$ → 8,503; 40; 25; 25; 15; 15; 0

**b.** $6\overline{)624}$ → 104; 6; 24; 24; 0

**c.** $3\overline{)642}$ → 214; 6; 4; 3; 12; 12; 0

**d.** $2\overline{)4,985}$ → 2,492R1; 4; 9; 8; 18; 18; 5; 4; 1

**26. a.** $10\frac{3}{3} - 2\frac{2}{3} = 7\frac{1}{3}$

**b.** $8\frac{5}{5} - 2\frac{3}{5} = 6\frac{2}{5}$

**c.**
$$\begin{array}{r} {\scriptstyle 1\,1} \\ 3.93 \\ 8.23 \\ 9.02 \\ +\,7.16 \\ \hline 28.34 \end{array}$$

**d.**
$$\begin{array}{r} {\scriptstyle 1\phantom{00}\;1} \\ 52.40 \\ 163.20 \\ 9.00 \\ +\;\;3.16 \\ \hline 227.76 \end{array}$$

**5**

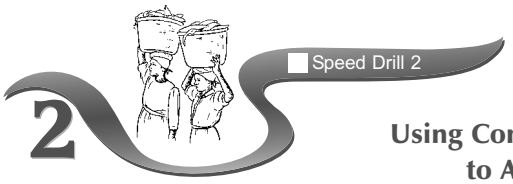
## *Teaching the Lesson*

## *Lesson 2 pp. 6-9*

### *Lesson Preparation*

### *Drill*

- Do Speed Drill 2 and write the number correct at the top of the drill.




**Using Common Denominators to Add or Subtract**

You have been finding the missing numerator to make equal fractions. Sometimes you will need to make equal fractions before you can add or subtract.

$\frac{3}{4} = \frac{?}{24}$

So far, you have added and subtracted fractions and mixed numbers that already have like denominators. When two fractions have the same denominator, we say they have **common denominators.** It is easy to add or subtract $\frac{1}{8}$ and $\frac{3}{8}$ because the common denominator is 8, and all we have to do is add or subtract the numerators.

But what about a problem like this?

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

Ruth used $\frac{1}{2}$ cup of water and $\frac{1}{3}$ cup of oil for a cake she was making. How much liquid did she use in the cake?

We cannot add halves and thirds because the parts (denominators) are different sizes.

$\frac{1}{2} = \frac{}{6}$

But we can change both fractions to equal fractions with common denominators. Let's use the common denominator 6 because 6 is a multiple of both 2 and 3.

$\frac{1}{3} = \frac{}{6}$

? ?

Ruth used $\frac{5}{6}$ cup of liquid in her cake.

$\frac{1}{2} = \frac{3}{6}$

2 × ? = 6
2 × 3 = 6
Multiply the numerator by the same number. 1 × 3 = 3

$\frac{1}{3} = \frac{2}{6}$

3 × ? = 6
3 × 2 = 6
Multiply the numerator by the same number. 1 × 2 = 2

$= \frac{5}{6}$

Since the denominators are the same we can add.

Two kinds of Kenyan bread are chapatis and mandazis. Chapatis are like round, thick, juicy tortillas. Mandazis are like doughnuts with no hole in the center.

6

### *Teaching the Lesson*

**Using Common Denominators to Add or Subtract**

Fractions with different denominators cannot be added or subtracted. Students may have forgotten how to find the missing numerator to make equivalent fractions. Review this skill thoroughly if needed.

**△Teacher Aide Check on page 7.**

***Lesson 2***

**Before you add or subtract, write the missing numerators. The common denominators are given for you. Add or subtract.**

$\frac{1}{2} = \frac{2}{4}$

$\frac{1}{2} = \frac{3}{6}$ $\quad \frac{3}{4} = \frac{3}{4}$ $\quad \frac{3}{4} = \frac{3}{4}$ $\quad 8\frac{2}{3} = \frac{6}{9}$

**1. a.** $+\ \frac{2}{3} = \frac{4}{6}$ $\quad \frac{7}{6} = 1\frac{1}{6}$

**b.** $+\ \frac{1}{2} = \frac{2}{4}$ $\quad \frac{5}{4} = 1\frac{1}{4}$

**c.** $+\ \frac{1}{2} = \frac{2}{4}$ $\quad \frac{7}{4} = 1\frac{3}{4}$

**d.** $-\ 7\frac{1}{9} = \frac{1}{9}$ $\quad 1\frac{5}{9}$

**Read these numbers to your teacher.**

△**2.** 2,000,000,001 $\quad$ 792,013,005,480,006 $\quad$ 10,586,132,479 $\quad$ -30 $\quad$ -41

## *We Remember*

**Write each as a two-place decimal.**

**3. a.** 112.7 **112.70** $\quad$ **b.** 7.8 **7.80** $\quad$ **c.** 54 **54.00**

**Round to the nearest whole number.**

**4. a.** 142.7 **143** $\quad$ **b.** 75.3 **75**

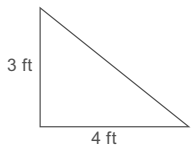
**Change the mixed numbers to improper fractions.**

**5. a.** $2\frac{2}{9} = \frac{20}{9}$ $\quad$ **b.** $6\frac{3}{4} = \frac{27}{4}$ $\quad$ **c.** $3\frac{1}{12} = \frac{37}{12}$ $\quad$ **d.** $1\frac{11}{24} = \frac{35}{24}$

**Find the area of the triangle.**

**6.** $3 \times 4 = 12$

$12 \div 2 = 6$ ft$^2$




**Write the ratio.**

**7.** Kenya has a total of about 40 inches of rainfall in 12 months.
What is the ratio of inches to months? **40 : 12**

**7**

## *Tips for Struggling Students*

➔ For students who are weak in the area of finding equivalent fractions, review the steps to finding the missing numerator:

First, decide what was done to the first denominator to get the second. (By what number was the first denominator multiplied to get the second denominator?)

Then, multiply the first numerator by the same number to fill in the missing numerator.
Example: $\frac{1}{2} = \frac{?}{6}$

The denominator 2 is multiplied by 3 to get the denominator 6. So, multiply 1 by 3 to get 3 for the second numerator. The equivalent fraction is $\frac{3}{6}$.

△**Teacher Aide Check.** Listen to each student read the numbers.

## *Board Work*

$\frac{3}{4} = \frac{}{4}$
$-\ \frac{1}{2} = \frac{}{4}$
$\frac{1}{4}$

$\frac{1}{3} = \frac{}{12}$
$\frac{2}{3} = \frac{}{12}$
$+\ \frac{3}{4} = \frac{}{12}$
$\frac{21}{12} = 1\frac{9}{12} = 1\frac{3}{4}$

$\frac{5}{6} = \frac{}{6}$
$+\ \frac{2}{3} = \frac{}{6}$
$\frac{9}{6} = 1\frac{3}{6} = 1\frac{1}{2}$

$\frac{6}{7} = \frac{}{14}$
$-\ \frac{3}{14} = \frac{}{14}$
$\frac{9}{14}$

***Lesson 2***

## + − × ÷ *Skill Builders*

**8.** **a.** $\begin{array}{r} \cancel{1}\frac{4}{4} \\ -\ \frac{3}{4} \\ \hline \frac{1}{4} \end{array}$ **b.** $\begin{array}{r} \cancel{1}\frac{20}{20} \\ -\ \frac{11}{20} \\ \hline \frac{9}{20} \end{array}$ **c.** $\begin{array}{r} 5\cancel{6}\frac{8}{8} \\ -\ 2\frac{3}{8} \\ \hline 3\frac{5}{8} \end{array}$ **d.** $\begin{array}{r} 5\cancel{6}\frac{4}{4} \\ -\ 4\frac{3}{4} \\ \hline 1\frac{1}{4} \end{array}$ **e.** $\begin{array}{r} \frac{2}{3} \\ +\ \frac{1}{3} \\ \hline \frac{5}{3} = 1\frac{2}{3} \end{array}$

Write remainders as fractions.

**9.** **a.** $6\overline{)3,943}$ → $657\frac{1}{6}$ (36, 34, 30, 43, 42, 1) **b.** $8\overline{)4,027}$ → $503\frac{3}{8}$ (40, 2, 0, 27, 24, 3)

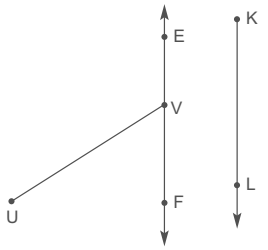
**c.** $\begin{array}{r} \overset{3}{\cancel{7}}\overset{}{\cancel{2}} \\ 691 \\ \times\ 483 \\ \hline 2073 \\ 55280 \\ 276400 \\ \hline 333,753 \end{array}$ **d.** $\begin{array}{r} 6\,\overset{13}{\cancel{7}}\,\overset{1}{\cancel{4}}2 \\ -\ 3,258 \\ \hline 3,484 \end{array}$

**Use letters and symbols to write the names.**

**10.** Ray $\overrightarrow{KL}$ OR $\overrightarrow{FE}$, $\overrightarrow{EF}$, $\overrightarrow{VE}$, $\overrightarrow{VF}$

**11.** Line segment $\overline{UV}$ OR $\overline{VU}$

**12.** Line $\overleftrightarrow{EF}$ OR $\overleftrightarrow{FE}$




**Fill in the blanks.**

**13.** Line EF OR FE is parallel to $\overrightarrow{KL}$.

**14.** The point of intersection is V.

**15.** Is $\overline{UV}$ perpendicular to $\overleftrightarrow{EF}$? no

**Write < or > .**

**16.** **a.** 5 [>] -4 **b.** -9 [<] 0 **c.** -15 [<] 9 **d.** -11 [>] -12

**Write the decimal for each fraction and mixed number.**

**17.** **a.** $\frac{5}{10}$ 0.5 **b.** $2\frac{51}{100}$ 2.51 **c.** $4\frac{125}{1000}$ 4.125

**18.** **a.** $\frac{35}{100}$ 0.35 **b.** $\frac{265}{1000}$ 0.265 **c.** $6\frac{3}{10}$ 6.3

**8**

***Teacher Notes:***

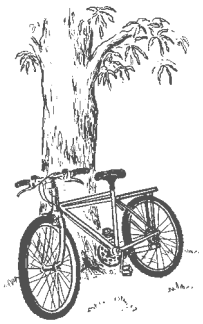
***Lesson 2***

**19.** From Amish Mennonite Aid headquarters in Kisumu, Pastor Mark travels 34.4 km to church services in Kasongo. Pastor Lester drives 12.9 km to get to the church in Ahero. How much farther does Pastor Mark drive than Pastor Lester?

$$\begin{array}{r} {}^{3}{}^{1} \\ 3\not{4}.4 \\ -\ 12.9 \\ \hline 21.5 \end{array}$$

Answer: **21.5 km**

**20.** "Haircuts: 15 shillings," read Silas. Leaning his bike against a mango tree, he stepped under the roof of the barber shop for a haircut. If Henry, the barber, gave 12 haircuts in one day, how much money did he receive?



$$\begin{array}{r} {}^{1} \\ 15 \\ \times\ 12 \\ \hline 30 \\ 150 \\ \hline 180 \end{array}$$

Answer: **180 shillings**

**Write whether the following items are *more* or *less* than a foot.**

**21.** Length of your coat sleeve **more**

**22.** Height of a cup **less**

**23.** Length of a pencil **less**

**24.** Length of a cell phone **less**

**Write these decimals.**

**25.** One and four hundred nine thousandths **1.409**

**26.** Ten and eight-thousandths **10.008**

**Write the missing numerators. Then add or subtract.**

| | | | |
|---|---|---|---|
| | | $6\frac{4}{9} = \frac{4}{9}$ | $\frac{2}{3} = \frac{4}{6}$ |
| $\frac{3}{4} = \frac{9}{12}$ | $\frac{3}{4} = \frac{21}{28}$ | $3\frac{1}{3} = \frac{3}{9}$ | $\frac{5}{6} = \frac{5}{6}$ |
| **27. a.** $+\ \frac{2}{3} = \frac{8}{12}$ | **b.** $-\ \frac{2}{7} = \frac{8}{28}$ | **c.** $+\ 1\frac{7}{9} = \frac{7}{9}$ | **d.** $+\ \frac{1}{3} = \frac{2}{6}$ |
| $\frac{17}{12} = 1\frac{5}{12}$ | $\frac{13}{28}$ | $10\frac{14}{9} = 11\frac{5}{9}$ | $\frac{11}{6} = 1\frac{5}{6}$ |

**9**

## *Teacher Notes:*

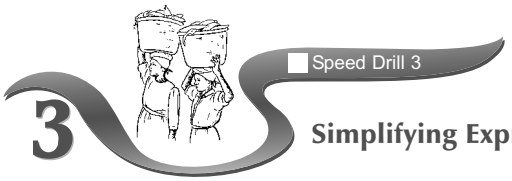
## *Lesson 3 pp. 10-13*

### *Lesson Preparation*

- Numerous small items such as pennies or macaroni to illustrate squaring numbers.

### *Drill*

- Do Speed Drill 3 and write the number correct.




### Simplifying Expressions in the Right Order

When simplifying expressions, we follow a special order to do the math. We always work from left to right. First we do all the multiplication and division. Then we do the addition and subtraction.

If we want to show a different order than the usual rules, we must use parentheses around the parts to be done first. So, now the right order is:

1. Do what is in parentheses ( ).
2. Do the multiplication and division from left to right.
3. Do the addition and subtraction from left to right.

$2 \times (3 + 4) - 2$
$2 \times 7 - 2$
$14 - 2$
$12$

1. ( )
2. × and ÷
3. + and –

**Simplify these expressions. Remember, do what is in parentheses first.**

**1. a.** $6 \div 2 \times 7 - 4$
**3 × 7 – 4**
**21 – 4**
**17**

**b.** $5 \times (5 + 3) \times 7$
**5 × 8 × 7**
**40 × 7**
**280**

**c.** $9 \times (2 \times 5) - (8 - 2)$
**9 × 10 – 6**
**90 – 6**
**84**

### Squares and Square Roots to 12

Multiplying a number by itself is called squaring a number. Notice why.

4 squared = ?

$4 \times 4 = 16$

The answer to such a problem is the **square.** The square of 4 is 16.

The factor that is multiplied is the **square root.**

The square root of 16 is 4 and can be written like this: $\sqrt{16} = 4$.

**10**

### *Teaching the Lesson*

#### Simplifying Expressions in the Right Order

Students must remember two things about simplifying expressions. 1) **Always** work from left to right. 2) **Order** is very important! Review the correct order of operations given on page 10 of the LightUnit.

#### Squares and Square Roots to 12

To square a number, we multiply it by itself. To find the square root, think of what number, multiplied by itself, will equal the number given. Review the squares of the numbers from 1 to 12. Students should remember these from their multiplication tables.

***Lesson 3***

**Solve.**

**2. a.** 4 squared = **16** **b.** 2 squared = **4** **c.** 6 squared = **36**

**3. a.** $\sqrt{4}$ = **2** **b.** $\sqrt{36}$ = **6** **c.** $\sqrt{64}$ = **8**

## *We Remember*

**Simplify these expressions. Remember, do what is in parentheses first.**

**4. a.** 13 – 10 ÷ 2 + 9
**13 – 5 + 9**
**8 + 9**
**17**

**b.** (6 + 3) + (32 ÷ 8)
**9 + 4**
**13**

**c.** 64 ÷ 8 × 7 – 5
**8 × 7 – 5**
**56 – 5**
**51**

**Write the missing numerators. Add or subtract.**

$\frac{5}{6} = \frac{5}{6}$

$\frac{1}{2} = \frac{3}{6}$

**5. a.** $+\ \frac{2}{3} = \frac{4}{6}$
$\frac{12}{6} = 2$

**b.** $\frac{8}{9} = \frac{16}{18}$
$-\ \frac{5}{6} = \frac{15}{18}$
$\frac{1}{18}$

**c.** $3\frac{3}{4} = \frac{6}{8}$
$+\ 7\frac{5}{8} = \frac{5}{8}$
$10\frac{11}{8} = 11\frac{3}{8}$

$\frac{5}{9} = \frac{5}{9}$

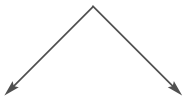
$\frac{4}{9} = \frac{4}{9}$

**d.** $+\ \frac{1}{3} = \frac{3}{9}$
$\frac{12}{9} = 1\frac{3}{9} = 1\frac{1}{3}$

**Write *obtuse, acute,* or *right* to name each angle.**

**6. a.** acute

**b.** obtuse



**c.** right

**Write the formula. Use it to find the area.**

**7.** $A = s^2$
$A = 6 \times 6$
$A = 36\ m^2$


**11**

### *Tips for Struggling Students*

➔ Use small items such as pennies or macaroni to illustrate the squares of 2, 3, 4, etc. Then reverse the exercise to illustrate square roots. Have students divide the items from the squares into two piles of two, three piles of three, four piles of four, etc.

### *Board Work*

Simplify these expressions.

| $3 \times (2 + 5) + 3$ | $8 + (5 – 2) \times 4$ | $7 – 3 \times 2 + 4$ | $(10 – 4) \times 3 \div 2$ |
|---|---|---|---|
| **$3 \times 7 + 3$** | **$8 + 3 \times 4$** | **$7 – 6 + 4$** | **$6 \times 3 \div 2$** |
| **$21 + 3$** | **$8 + 12$** | **$1 + 4$** | **$18 \div 2$** |
| **24** | **20** | **5** | **9** |

***Lesson 3***

## + − × ÷ *Skill Builders*

**Check your work by whichever method you choose when you see a box with a check mark.**

☑

**8. a.** $\begin{array}{r} 3\,12\,9\,9\,1 \\ \not{4}\not{3}.\not{0}\not{0}3 \\ -\ 5.0\,1\,9 \\ \hline 37.984 \end{array}$

**b.** $\begin{array}{r} 6 \\ \not{7}\,\frac{18}{18} \\ -4\frac{13}{18} \\ \hline 2\frac{5}{18} \end{array}$

**c.** $\begin{array}{r} 2 \\ \not{3}\,\frac{7}{7} \\ -1\frac{6}{7} \\ \hline 1\frac{1}{7} \end{array}$

**d.** $4\overline{)36{,}381}$ = 9,095R1

36
3
0
38
36
21
20
1

**Write the name of the place of each circled digit.**

**9.** 762,349,726,010,483 **hundred millions**

**10.** 89,317,572,500 **ten billions**

**11.** 254.035 **ones**

**12.** 0.12 **tenths**

**13.** 3,112,023,000,211 **millions**

In Kenya water is drawn from a well or carried from rivers or stagnant ponds.

**14.** Dysentery is a disease caused by impure drinking water. Many children in Kenya miss classes because of dysentery. On Monday, 65 students at Josinter's school were absent. Yesterday, 72 were missing, and today 85 are sick. Find the average number of students absent on each of the 3 days.

$\begin{array}{r} {\scriptstyle 1} \\ 65 \\ 72 \\ +\ 85 \\ \hline 222 \end{array}$

$3\overline{)222}$ = 74

21
12
12
0

Answer: **74 students**

**15.** Mr. Omondi was tired from his day as a bike taxi driver. He drove an old man 8 km to market. Then he hauled a chair 6 km. Next he took a man 10 km to the bicycle repair shop. His last trip was to take a woman with a live chicken 4 km. What was the average length of Mr. Omondi's bike trips that day?

$\begin{array}{r} 8 \\ 16 \\ 10 \\ +\ 4 \\ \hline 28 \end{array}$

$4\overline{)28}$ = 7

28
0

Answer: **7 km**

**12**

## *Teaching the Lesson*

***Lesson 3***

**Order these decimals from largest to smallest.**

**16.** 3.2 3.3 3.6 **3.6** **3.3** **3.2**

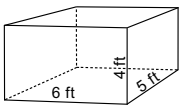
**17.** 3.62 3.23 3.32 **3.62** **3.32** **3.23**

**Circle all the numbers by which each is divisible.**

**18.** **a.** 32 ② ④ 6 ⑧ **b.** 81 ③ 5 ⑨ **c.** 40 ④ ⑧ 9 ⑩

**Find the volume.**

**19.** **6 × 5 × 4 = 120 ft$^3$**




**Find the fraction of each number.**

**20.** **a.** $\frac{1}{7}$ of 21 is **3** **b.** $\frac{1}{11}$ of 44 is **4** **c.** $\frac{1}{5}$ of 20 is **4**

**Write whether the following items are *more* or *less* than a centimeter.**

**21.** Length of a paper clip **more**

**22.** Thickness of a pencil lead **less**

**23.** Length of a pencil **more**

**Write these numbers.**

**24.** Nine trillion, seven hundred twenty-eight billion, four hundred sixty-five million, three **9,728,465,000,003**

**25.** Three hundred twenty-nine trillion, eight hundred seventy-six million, five hundred forty-three thousand, twenty-one **329,000,876,543,021**

**Solve.**

**26.** **a.** 5 squared = **25** **b.** $\sqrt{100}$ = **10** **c.** $\sqrt{64}$ = **8**

**13**

## *Teaching the Lesson*

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