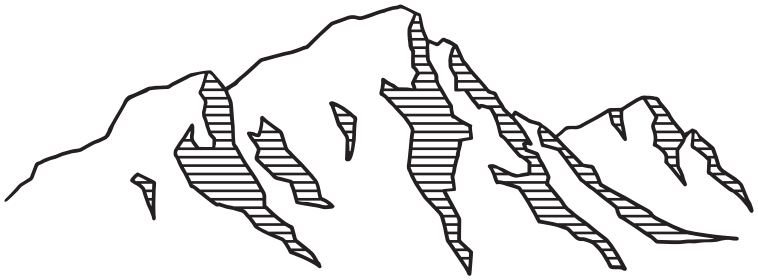
The CHARLOTTE MASON

ELEMENTARY ARITHMETIC

SERIES PLACEMENT GUIDE



IN WHICH BOOK SHOULD I START?

While it's difficult for a written test to determine whether a child possesses a true understanding rather than a mechanical working of the math concepts presented, these questions can serve as a guide in determining placement within The Charlotte Mason Elementary Arithmetic Series.

1. Look through the six groups on the following pages and select one that you think your student will be able to work with confidence, ease, and understanding.

2. Sit with your student and present each problem in that group orally or in writing, so you can accurately discern that child's comfort level with the arithmetic concepts. Students may work answers either orally or in writing.

3. Make note of the point at which your student demonstrates a lack of confidence, ease, or understanding.

4. Check the Placement Key on the final page and look for the corresponding point on the chart to see where to begin in the series.

Note: There are no prerequisites for beginning Book 1 other than the child's maturity/readiness to begin formal lessons, usually around age 6 or 7.

GROUP A

Manipulatives, or concrete objects, may be used to find the answers in this group. (Answers are given in the gray boxes.)

1. Have your child read these numbers as you write them: *51* (fifty-one), *4* (four), *73* (seventy-three), *12* (twelve), *89* (eighty-nine), *16* (sixteen), *30* (thirty), *41* (forty-one), *95* (ninety-five), *28* (twenty-eight).

2. Have your child write these numbers in a column on grid paper, keeping the proper place value, while you dictate: eleven (*11*), sixty-four (*64*), eight (*8*), thirteen (*13*), fifty-seven (*57*), twenty (*20*).

3. Write the number *18*. Ask your child to tell how many in the tens place and how many in the units place. (1 ten and 8 units)

4. Write the number *70*. Ask your child to tell how many in the tens place and how many in the units place. (7 tens, 0 units)

5. Count out 7 beads, buttons, or pennies and have your child show three different ways to make 7. (for example, 7 + 0, 1 + 6, 2 + 5, 3 + 4)

6. Tiffany read 3 pages aloud and her mother read 5 pages aloud. How many pages did they read aloud in all? (8 pages, because 3 + 5 = 8)

7. Daria has 18¢ and her brother has 37¢. How much have they altogether? (55¢, because 18 + 37 = 55)

8. Gabe has 24 colored pencils and 32 regular pencils. How many pencils has Gabe in all? (56 pencils, because 24 + 32 = 56)

9. Sadie and Carl must blow up 45 balloons for the birthday party. They have already blown up 29 balloons. How many more should they blow up? (16 balloons, because 45 – 29 = 16 or 29 + 16 = 45)

10. Simone had 64¢. After spending 24¢, how much had she remaining? (40¢, because 64 – 24 = 40 or 24 + 40 = 64)

GROUP B

Manipulatives, or concrete objects, should not be used to find the answers in this group. (Answers are given in the gray boxes.)

1. Have your child read these numbers as you write them: *361* (three hundred sixty-one), *740* (seven hundred forty), *912* (nine hundred twelve).

2. Point to the number *912*. Ask your child to tell how many in the hundreds place and how many in the tens place. (9 hundreds and 1 ten)

3. Have your child write these numbers in a column on grid paper, keeping the proper place value, while you dictate: four hundred seventy-three (*473*), thirty-four (*34*), five hundred sixteen (*516*), nineteen (*19*), eight hundred nine (*809*).

4.
  372
+ 219
  591

5.
  826
− 538
  288

6. What is 7 × 100? (700)

7. What is 8 × 1000? (8,000)

8. How many 5s in 30? (6)

9. How many 3s in 12? (4)

10. How many gum balls at 5¢ each can you buy for 45¢? (9 gum balls)

GROUP C

Answers should be written, or dictated for the parent to write, unless otherwise noted. Manipulatives, or concrete objects, should not be used to find the answers in this group. (Answers are given in the gray boxes.)

1. Have your child read these numbers as you write them: *4,039* (four thousand thirty-nine); *2,761* (two thousand seven hundred sixty-one); *9,580* (nine thousand five hundred eighty).

2. Have your child write these numbers in a column on grid paper, keeping the proper place value, while you dictate: three thousand two hundred (3,200); seven thousand five hundred twelve (7,512); one thousand forty-five (1,045).

3. A museum library has 647 handicraft books and 1,053 art books. How many books does it have altogether?

   647
   + 1053
   1700 books

4. 7346
   − 2283
   5063

5. 16
   × 7
   112

6. 28
   × 29
   812

7. $5\overline{)\$18.70}$ → \$3.74

8. $3\overline{)\$21.15}$ → \$7.05

9. If you have 24 dollars and want to give $\frac{1}{4}$ away, how much would you give? (\$6)

10. If a person drinks 4 cups of water, how many ounces of water is that? (32 oz.)

11. If you have 18 inches of string and cut it into 3 equal parts, how long will each part be? (6 inches)

GROUP D

Answers should be written, or dictated for the parent to write, unless otherwise noted. Manipulatives, or concrete objects, should not be used to find the answers in this group. (Answers are given in the gray boxes.)

1. Have the student write the following as a number sentence then use parentheses to find the solution:

   If a day and night are 24 hours and you sleep 8 hours, have lessons for 3 hours, eat for 1 hour, and play outside for 3 hours, how many hours remain?

   24 – (8 + 3 + 1 + 3) = 24 – 15 = 9 hours

2. Have your child read these numbers as you write them:

   31,487 (thirty-one thousand four hundred eighty-seven)

   70,004 (seventy thousand four)

   617,912 (six hundred seventeen thousand nine hundred twelve)

3. Have your child write these numbers in a column on grid paper, keeping the proper place value, while you dictate: five hundred fifteen thousand, two hundred ten (515,210); nine hundred sixty-three thousand, one hundred twenty-eight (963,128); four hundred thirty-one thousand, four hundred ninety-eight (431,498)

4. Mercury is the smallest planet in our solar system, with a circumference of 15,329 kilometers. Earth's circumference is 40,030 kilometers. Mercury is smaller by how many kilometers? (24,701 kilometers)

5. Mercury's circumference is 15,329 kilometers and Mars's circumference is 21,297 kilometers. What is their combined total circumference? (36,626 kilometers)

6. An adult panda can eat 138 pounds of bamboo each week. How many pounds of bamboo can a panda eat in 250 weeks? (34,500 pounds)

7. How many square inches are in a square foot? (144 square inches)

8. A cookie sheet has a length of 17 inches and a width of 14 inches. What is the area of the cookie sheet in square inches? (238 sq. in.)

9. If one apple tree produces 90 apples, another apple tree produces 103 apples, and a third apple tree produces 86 apples, what is the average number of apples produced per tree? (93 apples)

10. If you are to divide 486 by 18, what numbers may they be rounded to in order to estimate the answer? (500 and 20)

11. Round 1,412 to the nearest hundred. (1,400)

12. A library needs to organize 2,380 books. If each shelf holds 34 books, how many shelves will they need? (70 shelves)

13. 5,432 ÷ 97 (56)

14. What is $\frac{1}{10}$ of 20? (2)

15. What is $\frac{1}{100}$ of 1,200 (12)

16. Which is larger, $\frac{1}{10}$ or $\frac{1}{100}$ of 500? ($\frac{1}{10}$)

17. Write the following fractions as decimals and decimals as fractions: $\frac{7}{10}$; 41/100; 0.29; 0.97

    (0.7 or .7; 0.41 or .41; $\frac{29}{100}$; $\frac{97}{100}$)

18. Convert to centimeters. How many centimeters are there in —? 20 mm; 5 m; 2 m 16 cm (2 cm; 500 cm; 216 cm)

19. A sketchbook has 60 pages. Each page is 20 cm wide by 25 cm long. How many square centimeters of paper were used to make the sketchbook? (500 sq cm × 60 = 30,000 sq cm)

20. A bento box is 20 cm long, 10 cm wide, and 4 cm deep. How many cubic centimeters is that? (800 cubic centimeters or 800 cc)

21. A farmer has a corn crib 12 ft. wide, 16 ft. long, and 10 ft. high. How many cubic feet of space has it? (1,920 cu. ft.)

GROUP E

(Answers are given in the gray boxes.)

1. **Dictate** the following while your student writes on the slate:

   six-ninths ($\frac{6}{9}$)

   five-eighths ($\frac{5}{8}$)

   eleven-nineteenths ($\frac{11}{19}$)

   seven-sixteenths ($\frac{7}{16}$)

   nine-tenths ($\frac{9}{10}$)

2. **The following examples** are to be given orally:

   What is the denominator in $\frac{7}{16}$? (16)

   What is the nominator in $\frac{5}{8}$? (5)

   What is the denominator in $\frac{6}{9}$? (9)

   What is the denominator in $\frac{11}{12}$? (12)

   What is the nominator in $\frac{8}{15}$? (8)

3. **To be taken orally:**

   Think $\frac{1}{5}$ of each of the following numbers, and then tell $\frac{3}{5}$ of each:

   25 ($\frac{3}{5}$ of 25 = 15)

   40 ($\frac{3}{5}$ of 40 = 24)

   65 ($\frac{3}{5}$ of 65 = 39)

4. **Have the student write** the following as mixed decimals or decimals as you say them orally:

   six hundred seven and three-tenths (607.3)

   twelve-hundredths (0.12)

   thirty-nine and seven thousandths (39.007)

5. **Multiply** the following by 10, 100, and 1,000:

   $7.45 ($74.50, $745.00, $7,450.00)

   0.31 (3.1, 31, 310)

6. **Divide** the following by 10, 100, and 1,000:

   0.6 (0.06, 0.006, 0.0006)

   5.9 (0.59, 0.059, 0.0059)

7. **Write** on the slate and ask what the understood denominator is of each of the following:

   0.048 (1000)

   0.1 (10)

   0.75 (100)

8. **Add or subtract** the following:

   A canister of loose tea contains 4.2 oz. of tea, while a box of tea bags contains 1.27 oz. of tea. How much more tea is in the loose tea canister? (2.93 oz.)

   6.02 + 0.3 + 0.079 = (6.399)

9. **Using a scale** of 1 inch = 10 feet, determine the measurements on a plan for the following:

   a park bench that measures 4 ft. by 2 ft. (0.4" by 0.2")

Using the same scale, determine the following measurements when:

a geo-dome climber has a footprint of 1.8" by 2.1" on the plan. (18 ft. by 21 ft.)

10. **Find the value** of the following, estimating first to ensure accuracy in placing the decimal point:

    It takes Sophie 7.9 minutes to run a kilometer. At this rate, how long will it take her to run 5.5 km? (43.45 minutes)

    Rounding to the nearest cent, how much will Jason pay if he puts 1.32 gallons of gas in his moped at a cost of $3.42 per gallon? ($4.51)

11. **Divide** the following:

    $12.60 ÷ $0.45 (28)

    0.3 ÷ 0.005 (60)

12. **Round** the following:

    $35.81 to the nearest dollar ($36)

    27,196 to the nearest ten-thousand (30,000)

    4:12 to the nearest quarter-hour (4:15)

13. If you know the diameter of a bicycle tire, how could you use pi to find the tire's circumference? (Multiply the diameter by pi.)

14. **Find the GCM** of 6, 15, 48 (3)

15. **Find the factors** of 54. (1, 2, 3, 6, 9, 18, 27, 54)

16. **What is a prime number** or prime? (A number that has no factors other than 1 and itself.)

17. **What prime factors** multiplied together will produce 88? ($2 \times 2 \times 2 \times 11$)

18. **Joe has two spools** of paracord he wants to divide into equal lengths with nothing left over. One spool holds 32 yards of cord and the other holds 60 yards. What is the longest length the pieces of cord can be in yards? (4 yards)

19. **Find the LCM** of the following: The nature club hikes Laurel Trail once every 9 days and the park ranger hikes it every 5 days. If they both hiked Laurel Trail today, how many days until they hike it again on the same day? (45 days) 9, 6, and 20 (180)

20. **Change the following fractions** to twelfths:

    $\frac{1}{2}$ ($\frac{6}{12}$)

    $\frac{3}{4}$ ($\frac{9}{12}$)

    Reduce to lowest terms:

    $\frac{4}{6}$ ($\frac{2}{3}$)

    $\frac{21}{24}$ ($\frac{7}{8}$)

21. **Convert** the following improper fractions to mixed numbers:

    $\frac{11}{4}$ ($2\ \frac{3}{4}$)

    $\frac{9}{9}$ (1)

    $\frac{18}{5}$ ($3\ \frac{3}{5}$)

    Turn the following mixed numbers into improper fractions:

$2\frac{1}{2}$ ($\frac{5}{2}$)

$7\frac{9}{10}$ ($\frac{79}{10}$)

$1\frac{5}{8}$ ($\frac{13}{8}$)

22. Convert between fractions and decimals:

0.9 ($\frac{9}{10}$)

16.03 ($16\frac{3}{100}$)

$\frac{1}{4}$ (0.25)

$3\frac{7}{8}$ (3.875)

23. Solve the following, reducing as necessary:

$\frac{3}{4} + \frac{5}{6}$ ($\frac{19}{12}$ or $1\frac{7}{12}$)

$\frac{7}{10} - \frac{2}{5}$ ($\frac{3}{10}$)

24. Solve the following, reducing as necessary:

$2\frac{5}{6} + 4\frac{1}{2}$ ($7\frac{1}{3}$)

$9 - 4\frac{2}{3}$ ($4\frac{1}{3}$)

GROUP F

(Answers are given in the gray boxes.)

1. To be taken orally:

How many are:

$\frac{1}{4} \times 3$? ($\frac{3}{4}$)

$2 \times \frac{3}{7}$ ($\frac{6}{7}$)

$4 \times \frac{1}{2}$ (2 4

$\frac{1}{4} \times 6 =$ (1 $\frac{1}{2}$)

2. Cancel as many times as possible before finding the value of the following:

$\frac{2}{3} \times 18$ (12)

$\frac{5}{8} \times 40$ (25)

$\frac{9}{11} \times 77$ (63)

$\frac{7}{12} \times 36$ (21)

3. Multiply, canceling first whenever possible.

$24 \times 3\frac{5}{6}$ (92)

$10 \times 7\frac{1}{2}$ (75)

$15 \times 3\frac{3}{10}$ (49 $\frac{1}{2}$)

$18 \times 1\frac{4}{9}$ (26)

4. Compare the following fractions:

$\frac{1}{3}$ and $\frac{1}{9}$ ($\frac{1}{3}$ is 3 times $\frac{1}{9}$; $\frac{1}{9}$ is $\frac{1}{3}$ of $\frac{1}{3}$)

$\frac{1}{2}$ and $\frac{1}{4}$ ($\frac{1}{2}$ is 2 times $\frac{1}{4}$; $\frac{1}{4}$ is $\frac{1}{2}$ of $\frac{1}{2}$)

$\frac{1}{6}$ and $\frac{1}{24}$ ($\frac{1}{6}$ is 4 times $\frac{1}{24}$; $\frac{1}{24}$ is $\frac{1}{4}$ of $\frac{1}{6}$)

5. Multiply the following, simplifying when necessary:

$\frac{1}{6} \times \frac{3}{8}$ ($\frac{1}{16}$)

$\frac{10}{11} \times \frac{2}{5}$ ($\frac{4}{11}$)

$\frac{9}{14} \times \frac{7}{8}$ ($\frac{9}{16}$)

$\frac{1}{2} \times \frac{4}{5} \times \frac{5}{8}$ ($\frac{1}{4}$)

6. Multiply the following, converting the final answer to a mixed number.

$\frac{3}{5} \times 3\frac{1}{2}$ (2 $\frac{1}{10}$)

$\frac{6}{7} \times 1\frac{3}{4}$ (1 $\frac{1}{2}$)

$\frac{7}{10} \times 5\frac{5}{6}$ (4 $\frac{1}{12}$)

$\frac{8}{9} \times 2\frac{5}{8}$ (2 $\frac{1}{3}$)

7. Multiply the following, simplifying the result.

$1\frac{2}{3} \times 4\frac{4}{5}$ (8)

$6\frac{1}{4} \times 3\frac{3}{5}$ (22 $\frac{1}{2}$)

$5\frac{1}{3} \times 4\frac{1}{2}$ (24)

$2\frac{1}{2} \times 2\frac{2}{3}$ (6 $\frac{2}{3}$)

8. Multiply the following fractions by their reciprocal.

$\frac{5}{6}$ (1)

$\frac{4}{9}$ (1)

$\frac{7}{10}$ (1)

$\frac{3}{5}$ (1)

9. **Divide** the following, simplifying the results.

   How many $\frac{2}{3}$ lb. packages can be made from 16 lb. of cheese? (24 packages)

   $11 \div \frac{3}{8}$ ($29\ \frac{1}{3}$)

   $48 \div \frac{7}{10}$ ($68\ \frac{4}{7}$)

   How many times is 6 contained in $\frac{3}{4}$? (8)

10. **Solve** the following, simplifying the results.

    If you divide $\frac{1}{2}$ a stick of pepperoni equally among 3 pizzas, how much pepperoni will each pizza receive? ($\frac{1}{6}$ stick)

    $\frac{7}{8} \div 9$ ($\frac{7}{72}$)

    $\frac{4}{5} \div 20$ ($\frac{1}{25}$)

    $\frac{5}{9} \div 4$ ($\frac{5}{36}$)

11. **Solve** the following, simplifying the results.

    Willow read 6 books in $3\ \frac{3}{4}$ days over vacation. On average, how much did Willow read each day? ($1\ \frac{3}{5}$ books)

    If it rains 4 inches in $1\ \frac{1}{2}$ hours, how much rain does it average per hour? ($2\ \frac{2}{3}$ in.)

    $22 \div 3\ \frac{2}{3}$ (6)

    $15 \div 4\ \frac{5}{6}$ ($3\ \frac{3}{29}$)

12. **Give in simplest form** the ratio of the following:

    25 to 5 (5 to 1 or 5:1)

    18 to 6 (3 to 1 or 3:1)

    16 to 32 (1 to 2 or 1:2)

    12 to 15 (4 to 5 or 4:5)

13. **Convert** to like units before expressing the following ratios in simplest form.

    15 minutes to 2 hours (1:8)

    4 quarts to 12 pints (2:3)

    2000 mg to 1 gram (2:1)

    4 in. to 4 yd. (1:36)

14. **Compare** the following ratios.

    Which ratio is greater:

    $\frac{3}{10}$ or $\frac{5}{12}$ ($\frac{5}{12}$)

    $\frac{5}{6}$ or $\frac{2}{3}$ ($\frac{5}{6}$)

    Which ratio is lesser:

    $\frac{7}{18}$ or $\frac{2}{7}$ ($\frac{2}{7}$)

    $\frac{2}{3}$ or $\frac{9}{10}$ ($\frac{2}{3}$)

15. **Give the equivalent ratio.**

    A biscuit recipe has a ratio of 200 g milk to 300 g flour. If the recipe is halved, how much milk to flour are needed? (100 g:150 g)

    If the recipe is tripled, how much milk to flour is necessary? (600 g:900 g)

    Give the equivalent ratio using the next higher term of:

    $\frac{3}{4}$ ($\frac{6}{8}$)

    $\frac{9}{15}$ ($\frac{18}{30}$)

    $1\ \frac{11}{20}$ ($\frac{22}{40}$)

16. The following should be given orally. Convert between decimals and percents.

    0.75 (75%)

    0.425 (42.5%)

0.09 (9%)

3% (0.03)

61% (0.61)

17. The following should be given orally. Convert between percents and fractions.

10% ($\frac{1}{10}$)

75% ($\frac{3}{4}$)

$\frac{2}{5}$ (40%)

$\frac{1}{20}$ (5%)

18. Add or subtract the following.

Leonie has completed 90% of her chores, what percent remains? (10%)

If 71% of the earth's surface is covered in water, what percent is covered in land? (29%)

12% + 38% (50%)

75% + 6% (81%)

19. Solve the following.

60% of the Beale family has hiked Rattlesnake Ridge. If there are 5 people in the family, how many have made the hike? (3 people)

250% is how many times 100%? ($2\ \frac{1}{2}$)

Allen wants to expand his dog run by 175%. How many times larger will it be? ($1\ \frac{3}{4}$ times)

Littleport has seen a decrease in new homes built this year by 50%. If 62 homes were built last year, how many were built this year? (31 homes)

20. Solve the following.

80% of 50 (40)

12.5% of 26 (3.25 or $3\ \frac{1}{4}$)

3% of 200 (6)

35% of 20 (7)

21. Find the total of the following.

A paperback book costs 25% less than the same book in hardcover. If a hardcover costs $29, what is the cost of its paperback equivalent? ($21.75)

The Nature Study group increased its enrollment by 40%. If it began with 15 members, how many members has it now? (21 members)

What is 60 increased by 55%? (93)

What is 2,100 decreased by 33%? (1,407)

22. Find the following percents.

$75 is what percent of $200? (37.5%)

12" is what percent of 60"? (20%)

300 is what percent of 400? (75%)

$84 is what percent of $150? (56%)

PLACEMENT KEY

If this key places your student partway through a book, we recommend that you back up a few pages earlier than listed—to a section where your student feels confident—and start there to build positive momentum.

If your student worked with confidence, ease, and understanding	Start in The Charlotte Mason Elementary Arithmetic Series at
Group A	
none	Book 1, the beginning
#1–2	Book 1, the beginning
#1–6	Book 1, page 71, Eleven through Nineteen
#1–10	Book 2, the beginning
Group B	
none	Try Group A
#1–3	Book 2, page 133, Addition with Larger Numbers
#1–4	Book 2, page 173, Subtraction with Larger Numbers
#1–5	Book 2, page 193, Formal Introduction of Multiplication
#1–10	Book 3, the beginning
Group C	
none	Try Group B
#1–2	Book 3, page 39, Addition with Larger Numbers
#1–3	Book 3, page 59, Subtraction with Larger Numbers
#1–4	Book 3, page 81, Multiplication
#1–6	Book 3, page 133, Division
#1–8	Book 3, page 165, Fractions
#1–9	Book 3, page 183, Weights and Measures
#1–11	Book 4, the beginning

Group D	
none	Try Group C
#1	Book 4, page 51, Subtraction within 10,000
#1–3	Book 4, page 59, Addition within 100,000
#1–5	Book 4, page 79, Multiplication
#1–6	Book 4, page 91, Introduction to Area
#1–8	Book 4, page 98, Drawing Plans to Scale
#1–9	Book 4, page 122, Rounding
#1–11	Book 4, page 126, Dividing by Tens
#1–13	Book 4, page 141, Short Division with a Remainder
#1–16	Book 4, page 154, Decimals with Numeration and Notation
#1–17	Book 4, page 165, Weights and Measures
#1–18	Book 4, page 207, Metric Measures of Area
#1–19	Book 4, page 216, Shapes
#1–21	Book 5, the beginning

Group E	
none	Try Group D
#1–3	Book 5, p. 39, Numeration and Notation of Decimals
#1–6	Book 5, p. 65, Addition and Subtraction of Decimals
#1–8	Book 5, p. 70, Fractions of Inches: Tenth-Inch
#1–9	Book 5, p. 84, Multiplication of Decimals
#1–10	Book 5, p. 92, Division of Decimals
#1–11	Book 5, p. 110, Approximations and Rounding
#1–12	Book 5, p. 124, Measurement by Decimals
#1–13	Book 5, p. 134, Measures of Numbers
#1–14	Book 5, p. 140, Factors
#1–15	Book 5, p. 159, Prime Numbers
#1–18	Book 5, p. 176, Multiples
#1–20	Book 5, p. 206, Improper Fractions and Mixed Numbers
#1–21	Book 5, p. 220, Turning Fractions into Decimals
#1–22	Book 5, p. 226, Addition and Subtraction of Fractions
#1–23	Book 5, p. 236, Addition and Subtraction of Fractions — Mixed Numbers
#1–24	(beyond Book 5)

Group F	
none	Try Group E
#1-3	Book 6, p. 51, Comparing Fractions
#1-5	Book 6, p. 70, Multiplication of a Fraction by a Mixed Number
#1-7	Book 6, p. 77, Division of Fractions
#1-8	Book 6, p. 79, Division of a Whole Number by a Fraction
#1-11	Book 6, p. 105 Division of a Fraction by a Fraction
#1-12	Book 6, p. 136, Finding Ratios of Different Units
#1-13	Book 6, p. 140, Comparing Ratios
#1-14	Book 6, p. 144, Equal Ratios or Proportion
#1-15	Book 6, p. 149, The Golden Ratio
#1-16	Book 6, p. 161, Converting between Percents and Fractions
#1-17	Book 6, p. 165, Additional Exercises, Table of Equivalents
#1-18	Book 6, p. 170, Percents Less Than and Greater Than 100%
#1-19	Book 6, p. 172, Finding the Percent of a Number
#1-20	Book 6, p. 176, Finding Totals with Percents
#1-21	Book 6, p. 181, Finding What Percent a Number is of Another Number
#1-22	(beyond Book 6)