

**BERNARDS TOWNSHIP PUBLIC SCHOOLS
BASKING RIDGE, NEW JERSEY**

FRAMEWORK FOR COMPUTATIONAL FLUENCY

GRADE 5

Summer 2008

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In order to develop students' math skills, the mathematics curriculum should include a balance and connection between conceptual understanding and computational fluency. "Fluency refers to having efficient, accurate and generalizable methods (algorithms) for computing that are based on well-understood properties and number relationships" (Principles and Standards for School Mathematics, p.144). Developing a conceptual understanding of mathematical reasoning is essential. Students need to acquire computational fluency in order to be successful problem solvers.

Not all students develop automatic recall of basic facts at the same time. However, teachers should work with students so that each student acquires an understanding of several computational strategies and implements them appropriately with the goal of gaining automaticity with basic facts and computational algorithms. For example, a focus in the primary grades is to master computational fluency with addition and subtraction facts through twenty. Students should develop multiplication and division fact power between third and fourth grade.

Algorithms are important tools that help students become fluent and flexible in computing. In addition to the algorithm instruction provided in *Everyday Mathematics*, students should learn the appropriate "traditional" algorithm. In order to facilitate a smooth articulation of the teaching of the "traditional" algorithms, Grade 2 teachers are responsible for teaching the multi-digit addition algorithm with regrouping, Grade 3 teachers are responsible for teaching the multi-digit subtraction algorithm with regrouping, Grade 4 teachers are responsible for teaching the multi-digit multiplication algorithm, and Grade 5 teachers are responsible for teaching the long division algorithm. Sometimes students bring the "traditional" algorithms from home and introduce them

into the instructional setting at various other times during the course of the school year. Teachers should allow the students to utilize the “traditional” algorithm (even if the timing is not congruent with that listed above) as long as the student demonstrates an understanding of and competency with the algorithm itself. As always, teachers should encourage the students to practice a variety of appropriate computational algorithms as the use of various algorithms will increase the students’ computational fluency. On an individual student basis, teachers can also make suggestions for use of a particular algorithm for those students who appear to lack fluency with computational algorithms.

The *Framework for Computational Fluency (FCF)* provides a variety of materials to use in addition to the materials already provided in *Everyday Mathematics*. Teachers should use the *FCF* book for developing and practicing computational fluency and basic facts prior to accessing other math resources. Teachers can utilize the *FCF* book in a variety of ways. The pages in the booklet are organized by grade level, however teachers are free to use pages from other units or grade levels to differentiate instruction in order to better meet the needs of the learners. The activities in the booklet can be used in place of or along with a Math Message or the Mental Math and Reflexes. They can be used as practice or as assessment, timed or not timed. Teachers are encouraged to present *FCF* worksheets via the Smartboard with students using slates and/or notebooks to record their work. For ease of implementation some of the pages are aligned with the lessons in *Everyday Mathematics*. Each grade level within the *FCF* has a sheet that aligns the *FCF* pages with the *Everyday Mathematics* lessons.

References

- Bell, J., et al. (2007). *Everyday mathematics the University of Chicago School of Mathematics project: Teacher's lesson guide*. Chicago, IL: McGraw Hill Wright Group.
- National Council of Teachers of Mathematics (NCTM) (2006). *Curriculum focal points for prekindergarten through grade 8 mathematics*. Retrieved July 8, 2008, from <http://www.nctm.org/focalpoints.aspx?linkidentifier=id&itemid=270>
- National Council of Teachers of Mathematics (NCTM) (2000). *Principles and standards for school mathematics*. Reston, VA: The National Council of Teachers of Mathematics, Inc.
- Primary mathematics textbook 1A/B*. (2007). Singapore: Marshall Cavendish Education.
- Primary mathematics textbook 2A/B*. (2007). Singapore: Marshall Cavendish Education.
- Primary mathematics textbook 3A/B*. (2007). Singapore: Marshall Cavendish Education.
- Primary mathematics textbook 4A/B*. (2007). Singapore: Marshall Cavendish Education.
- Primary mathematics textbook 5A/B*. (2007). Singapore: Marshall Cavendish Education.

Traditional Long Division Algorithm (use after lesson 4.4)

Objectives: TSWBAT divide whole numbers by a single digit and two-digit divisors using the traditional long division algorithm.

Key Activities

Students solve division problems, record their work with paper and pencil, and share strategies. Students use ballpark estimates to check whether their answers are reasonable. Students will practice using the traditional long division algorithm to solve problems.

Materials

- Paper and pencils
- Slates and expo markers

Key Concepts and Skills

- Share solution strategies for finding the quotient of division problems
- Explain the traditional long division method's steps
- Estimate quotients by changing the divisors to "friendly" numbers

Key Vocabulary

Dividend, divisor, quotient

Mental Math and Reflexes

Pose pairs of problems similar to the following:

$$30 \div 3 = ?$$

$$? = 600 \div 30$$

$$46 \div 2 = ?$$

$$? = 120 \div 5$$

$$3000 \div 60 = ?$$

Math Message

Amy is 127 days older than Bob. How many weeks is that?

I. Teaching the Lesson

➤ Math Message Follow-Up

Ask volunteers to share their solution strategies aloud.

➤ Introduce the Traditional Long Division Algorithm (Single digit divisor)

1. Model the Math Message problem using the traditional long division algorithm.
2. Propose the following problem on the board: 5 people need to share \$765 evenly. How much should each person get?
3. Draw lines to separate the digits in the dividend. Work left to right. Begin in the left column.
4. Think of the 7 in the hundreds column as 7 \$100 bills to be share by 5 people. Each person gets 1 \$100 bill. There are 2 \$100 bills remaining.
5. Trade the 2 \$100 bills for 20 \$10 bills. Think of the 6 in the tens column as 6 \$10 bills. That makes $20 + 6 = 26$ \$10 bills.
6. If 5 people share 26 \$10 bills, each person gets 5 \$10 bills. There is one \$10 bill remaining.
7. Trade the one \$10 bill for ten \$1 bills. Think of the 5 on the ones column as five \$1 bills. That makes $10 + 5 = 15$ \$1 bills.
8. If 5 people share 15 \$1 bills, each person gets 3 \$1 bills.
9. If 5 people shared \$765 evenly each would receive \$153.

➤ **Solving Additional Division Problems**

Write problems like the following on the board.

$$378 \div 9 =$$

$$768 \div 4 =$$

$$531 \div 3 =$$

$$165 \div 5 =$$

$$2628 \div 6 =$$

$$2196 \div 2 =$$

Have students work on the problems on their slates. Remind them to check whether each answer is reasonable by making a ballpark estimate.

➤ **Introduce the Traditional Long Division Algorithm (Two-digit divisor)**

Have partners work together to solve the following problems.

$$240 \div 30 =$$

$$165 \div 15 =$$

$$3518 \div 32 =$$

$$3096 \div 12$$

Suggested Implementation Guide for Framework for Computational Fluency
Teachers should feel free to implement pages at their own professional discretion.

Unit 1: Number Theory

Lesson	Title	Supplemental Materials
1.1	Introduction to the Student Reference Book	
1.2	Rectangular Arrays	
1.3	Factors	
1.4	The Factor Captor Game	
1.5	Divisibility	
1.6	Prime and Composite Numbers	
1.7	Square Numbers	
1.8	Unsquaring Numbers	
1.9	Factor Strings and Prime Factorizations	

Unit 2: Estimation and Computation

Lesson	Title	Supplemental Materials
2.1	Estimation Challenge	
2.2	Addition of Whole Numbers and Decimals	
2.3	Subtraction of Whole Numbers and Decimals	
2.4	Addition and Subtraction Number Stories	
2.5	Estimate Your Reaction Time	
2.6	Chance Events	
2.7	Estimating Products	
2.8	Multiplication of Whole Numbers and Decimals	5-1, 5-2, 5-23
2.9	The Lattice Method of Multiplication	
2.10	Comparing Millions, Billions, and Trillions	

Unit 3: Geometry Explorations and the American Tour

Lesson	Fractions	Supplemental Materials
3.1	Introduction to the American Tour	
3.2	American Tour Population Data	
3.3	Exploring Angle Measures	
3.4	Using a Protractor	
3.5	Using a Compass	
3.6	Congruent Triangles	
3.7	Properties of Polygons	
3.8	Regular Tessellations	
3.9	Angles of Polygons	
3.10	Solving Problems Using the Geometry Template	

Unit 4: Division

Lesson	Title	Supplemental Materials
4.1	Division Facts and Extensions	
4.2	The Partial Quotient Division Algorithm	5-3, 5-4
4.3	American Tour: Finding Distances on a Map	omit
4.4	Partial Quotients Algorithm Strategies	5-3, 5-4
4.5	Division of Decimal Numbers	5-26
4.6	Interpreting the Remainder	
4.7	Skills Review with First to 100	

Unit 5: Fractions, Decimals and Percents

Lesson	Title	Supplemental Materials
5.1	Fraction Review	
5.2	Mixed Numbers	
5.3	Comparing and Ordering Fractions	5-5, 5-6
5.4	Two Rules for Finding Equivalent Fractions	
5.5	Fractions and Decimals: Part 1	5-27, 5-28,
5.6	Fractions and Decimals: Part 2	
5.7	Fractions and Decimals: Part 3	
5.8	Using a Calculator to Convert Fractions to Percents	5-29, 5-30
5.9	Bar and Circle Graphs	
5.10	The Percent Circle: Reading Circle Graphs	
5.11	The Percent Circle: Making Circle Graphs	
5.12	American Tour: School Days	omit

Unit 6: Using Data; Addition and Subtraction of Fractions

Lesson	Title	Supplemental Materials
6.1	Organizing Data	
6.2	Natural Measures of Length	
6.3	Stem - and - Leaf Plots for Hand and Finger Measures	
6.4	Mystery Plots	
6.5	Sample Size and Sound Conclusions	
6.6	Analysis of Sample Data	
6.7	American Tour: Climate	
6.8	Using a Slide Rule to Add and Subtract Fractions	
6.9	Clock Fractions and Common Denominators	
6.10	Quick Common Denominators	

Unit 7: Exponents and Negative Numbers

Lesson	Title	Supplemental Materials
7.1	Exponential Notation	
7.2	Exponential Notation for Powers of 10	5-21, 5-22, 5-24, 5-25
7.3	Scientific Notation	
7.4	Parentheses in Number Sentences	
7.5	Order of Operations	
7.6	American Tour: Line Graphs	
7.7	Using Negative Numbers	
7.8	Addition of Positive and Negative Numbers	
7.9	Subtraction of Positive and Negative Numbers	
7.10	Using a Slide Rule to Add and Subtract	
7.11	Calculator Practice: Working with Negative Numbers	

Unit 8: Fractions and Ratios

Lesson	Title	Supplemental Materials
8.1	Review: Comparing Fractions	
8.2	Adding Mixed Numbers	5-9, 5-10
8.3	Subtracting Mixed Numbers	5-7, 5-8, 5-11, 5-12
8.4	Calculator Practice: Computation with Fractions	
8.5	Fractions of Fractions	5-16, 5-17
8.6	An Area Model for Fraction Multiplication	
8.7	Multiplication of Fractions and Whole Numbers	
8.8	Multiplication of Mixed Numbers	5-13, 5-14, 5-15
8.9	Finding a Percent of a Number	5-31, 5-32, 5-33, 5-34, 5-35
8.10	Relating Fractional Unit to the Whole	5-36, 5-37
8.11	American Tour: Rural and Urban	
8.12	Fraction Division	5-18, 5-19, 5-20

Unit 9: Coordinates, Area, Volume, and Capacity

Lesson	Title	Supplemental Materials
9.1	<i>Hidden Treasure: A Coordinate Game</i>	
9.2	Coordinate Graphs: Part 1	
9.3	Coordinate Graphs: Part 2	
9.4	Areas of Rectangles	
9.5	The Rectangle Method for Finding Area	
9.6	Formulas for the Area of Triangles and Parallelograms	
9.7	Earth's Water Surface	
9.8	Volume of Rectangular Prisms	
9.9	Volume of Right Prisms	
9.10	Capacity: Liter, Milliliter, and Cubic Centimeter	

Unit 10: Using Data; Algebra Concepts and Skills

Lesson	Title	Supplemental Materials
10.1	Pan-Balance Problems	
10.2	Pan-Balance Problems with Two Balances	
10.3	Algebraic Expressions	
10.4	Rules, Tables, and Graphs: Part 1	
10.5	American Tour: Old Faithful's Next Eruption	
10.6	Rules, Tables, and Graphs: Part 2	
10.7	Reading Graphs	
10.8	Circumference of a Circle	
10.9	Area of Circles	

Unit 11: Volume

Lesson	Title	Supplemental Materials
11.1	Review of Geometric Solids: Part 1	
11.2	Review of Geometric Solids: Part 2	
11.3	Volume of Cylinders	
11.4	Volume of Pyramids and Cones	
11.5	Finding Volume by a Displacement Method	
11.6	Capacity and Weight	
11.7	Surface Area	

Unit 12: Probability, Ratios, and Rates

Lesson	Title	Supplemental Materials
12.1	Factor Trees	
12.2	Choices, Tree Diagrams, and Probability	
12.3	American Tour: Ratio Exploration	
12.4	Ratios of Parts to Wholes	
12.5	Number Models for Ratio Number Stories	
12.6	Finding Your Heart Rate	
12.7	Collecting, Graphing, and Interpreting Data	
12.8	Finding Your Cardiac Output	

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 1

Multiply.

a. $78 \times 40 =$

b. $65 \times 89 =$

c. $53 \times 24 =$

d. $246 \times 70 =$

e. $508 \times 32 =$

f. $760 \times 87 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 2

Multiply.

a. $1257 \times 30 =$

b. $4008 \times 70 =$

c. $6229 \times 13 =$

d. $3424 \times 25 =$

e. $1075 \times 73 =$

f. $8207 \times 46 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 3

Divide.

a. $94 \div 30 =$

b. $577 \div 90 =$

c. $88 \div 49 =$

d. $96 \div 34 =$

e. $397 \div 47 =$

f. $192 \div 38 =$

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 4

Divide.

a. $650 \div 50 =$

b. $820 \div 42 =$

c. $2624 \div 32 =$

d. $5821 \div 63 =$

e. $7801 \div 48 =$

f. $3008 \div 25 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 5

Add. Give each answer in its simplest form.

a. $\frac{7}{8} + \frac{3}{4} =$

b. $\frac{2}{3} + \frac{4}{9} =$

c. $\frac{4}{5} + \frac{3}{10} =$

d. $\frac{3}{4} + \frac{7}{12} =$

e. $\frac{5}{6} + \frac{2}{3} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 6

Add. Give each answer in its simplest form.

a. $\frac{1}{6} + \frac{3}{4} =$

b. $\frac{5}{9} + \frac{1}{2} =$

c. $\frac{1}{2} + \frac{3}{5} =$

d. $\frac{2}{5} + \frac{3}{4} =$

e. $\frac{9}{10} + \frac{1}{6} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 7

Subtract. Give each answer in its simplest form.

a. $\frac{7}{8} - \frac{3}{4} =$

b. $\frac{9}{10} - \frac{1}{2} =$

c. $\frac{11}{12} - \frac{2}{3} =$

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

e. $1\frac{1}{10} - \frac{3}{5} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 8

Subtract. Give each answer in its simplest form.

a. $\frac{1}{2} - \frac{1}{5} =$

b. $\frac{7}{12} - \frac{3}{8} =$

c. $\frac{3}{4} - \frac{3}{10} =$

d. $1\frac{1}{5} - \frac{2}{3} =$

e. $1\frac{1}{10} - \frac{1}{6} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 9

Add. Give each answer in its simplest form.

a. $2\frac{3}{4} + 1\frac{1}{8} =$

b. $1\frac{5}{12} + 3\frac{1}{3} =$

c. $3\frac{7}{10} + 2\frac{2}{5} =$

d. $3\frac{7}{12} + 1\frac{3}{4} =$

e. $1\frac{4}{5} + 2\frac{7}{10} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 10

Add. Give each answer in its simplest form.

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

b. $2\frac{3}{8} + 2\frac{1}{6} =$

c. $1\frac{2}{5} + 5\frac{3}{4} =$

d. $3\frac{1}{2} + 2\frac{7}{9} =$

e. $2\frac{3}{10} + 2\frac{1}{6} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 11

Subtract. Give each answer in its simplest form.

a. $3\frac{7}{8} - 1\frac{1}{2} =$

b. $5\frac{4}{5} - 2\frac{1}{10} =$

c. $4\frac{5}{6} - 2\frac{7}{12} =$

d. $5\frac{11}{12} - 1\frac{3}{4} =$

e. $4\frac{1}{9} - 2\frac{2}{3} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 12

Subtract. Give each answer in its simplest form.

a. $4\frac{1}{2} - 1\frac{4}{9} =$

b. $5\frac{5}{9} - 3\frac{1}{2} =$

c. $4\frac{5}{8} - 3\frac{3}{12} =$

d. $6\frac{1}{4} - 4\frac{5}{6} =$

e. $5\frac{3}{10} - 2\frac{1}{6} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 13

Find the equivalent measures.

a. $\frac{5}{6}$ day = _____ h

b. $\frac{11}{20}$ min = _____ s

c. $\frac{3}{4}$ ft = _____ in.

d. $\frac{1}{4}$ gal = _____ qt

e. $\frac{2}{5}$ km = _____ m

f. $\frac{3}{10}$ m = _____ cm

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 14

Write each of the following in compound units.

a. $2\frac{2}{5}$ m = 2 m _____ cm

b. $3\frac{7}{8}$ km = _____ km _____ m

c. $2\frac{1}{4}$ h = _____ h _____ min

d. $5\frac{1}{2}$ days = _____ days _____ h

e. $6\frac{3}{4}$ kg = _____ kg _____ g

f. $2\frac{1}{8}$ lb = _____ lb _____ oz

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 15

Find the equivalent measures.

a. $2\frac{1}{4}$ years = _____ months

b. $4\frac{1}{3}$ hours = _____ min

c. $3\frac{1}{5}$ m = _____ cm

d. $5\frac{1}{6}$ min = _____ s

e. $1\frac{1}{20}$ km = _____ m

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 16

Multiply:

a. $\frac{3}{7} \times \frac{1}{2} =$

b. $\frac{1}{3} \times \frac{3}{8} =$

c. $\frac{4}{5} \times \frac{3}{10} =$

d. $\frac{5}{8} \times \frac{6}{7} =$

e. $\frac{1}{6} \times \frac{2}{3} =$

f. $\frac{2}{9} \times \frac{1}{8} =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 17

Solve the following.

a. Mr. Bouton bought $\frac{3}{4}$ lb of candy. He ate $\frac{1}{3}$ of it. How much candy did he eat?

b. A rectangle measures $\frac{1}{5}$ ft by $\frac{2}{3}$ ft. Find the area of the rectangle.

c. Tara spent $\frac{5}{6}$ of her money on shoes and $\frac{1}{4}$ of the remainder on a purse. What fraction of her money did she have left?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 18

Divide.

a. $\frac{2}{9} \div 3 =$

b. $\frac{3}{8} \div 4 =$

c. $\frac{3}{7} \div 6 =$

d. $\frac{7}{8} \div 5 =$

e. $\frac{1}{9} \div 7 =$

f. $\frac{3}{4} \div 9 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 19

Solve the following.

a. Mr. Simpson used $\frac{3}{5}$ lb of dirt for his garden in 3 days. If he used the same amount each day, how much dirt did he use each day? Keep your answer in pounds.

b. A piece of ribbon has a length of $\frac{1}{2}$ yd. It is cut into 5 equal pieces. What is the length of each piece in yards?

c. Ms. Peters had a huge CD collection. She kept $\frac{1}{3}$ of it and divided the rest equally among her 4 best friends. What fraction of the CDs did each of her friends receive?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 20

Solve the following.

a. A barrel is $\frac{4}{5}$ full of water. If 40 gal of water are needed to fill the tank completely, find the **capacity** of the barrel.

b. Mrs. Jones had \$360. She used $\frac{2}{3}$ of it to buy an electric fan. She also bought a tea set for \$80. How much money did she have left?

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 21

1. Multiply.

a. $.03 \times 10 =$

b. $.009 \times 10 =$

c. $2.9 \times 10 =$

d. $.321 \times 10 =$

e. $6.015 \times 10 =$

f. $412.8 \times 10 =$

2. Multiply.

a. $.09 \times 20 =$

b. $3.2 \times 40 =$

c. $4.63 \times 60 =$

d. $22.9 \times 80 =$

e. $12.4 \times 90 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 22

1. Complete the following table.

Number	X 10	X 100	X 1000
3.004			
8.19			
20.4			

2. Multiply.

a. $6.166 \times 100 =$

b. $100 \times 5.201 =$

c. $0.072 \times 1000 =$

d. $1000 \times 4.86 =$

3. Find the missing numbers.

a. $2.68 \times \underline{\hspace{2cm}} = 26.8$

b. $\underline{\hspace{2cm}} \times 0.8 = 8$

c. $1.042 \times \underline{\hspace{2cm}} = 104.2$

d. $\underline{\hspace{2cm}} \times 1.43 = 1430$

e. $4.125 \times \underline{\hspace{2cm}} = 4125$

f. $\underline{\hspace{2cm}} \times 3.95 = 395$

g. $6.9 \times \underline{\hspace{2cm}} = 690$

h. $\underline{\hspace{2cm}} \times 0.731 = 731$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 23

Multiply.

a. $0.34 \times 300 =$

b. $6.8 \times 400 =$

c. $64.5 \times 6000 =$

d. $32.08 \times 7000 =$

e. $3.24 \times 9000 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 24

1. Divide.

a. $6 \div 10 =$	b. $0.05 \div 10 =$
c. $1.2 \div 10 =$	d. $20.5 \div 10 =$
e. $239 \div 10 =$	f. $0.58 \div 10 =$

2. Divide.

a. $3.7 \div 20 =$

b. $5.34 \div 60 =$

c. $82.08 \div 90 =$

d. $29.61 \div 70 =$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 25

1. Complete the following table.

Number	$\div 10$	$\div 100$	$\div 1000$
203			
8			
58			
1458			

2. Divide.

a. $54 \div 100 =$

b. $20.3 \div 100 =$

c. $3.4 \div 100 =$

d. $3400 \div 1000 =$

e. $73 \div 1000 =$

f. $2 \div 1000 =$

3. Find the missing numbers.

a. $6.7 \div \underline{\hspace{2cm}} = 0.67$

b. $80 \div \underline{\hspace{2cm}} = 0.8$

c. $56.8 \div \underline{\hspace{2cm}} = 0.568$

d. $3.18 \div \underline{\hspace{2cm}} = 0.318$

e. $900 \div \underline{\hspace{2cm}} = 0.9$

f. $46 \div \underline{\hspace{2cm}} = 4.6$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 26

Divide.

a. $9 \div 300 =$

b. $95.4 \div 900 =$

c. $65 \div 5000 =$

d. $392 \div 4000 =$

e. $847 \div 7000 =$

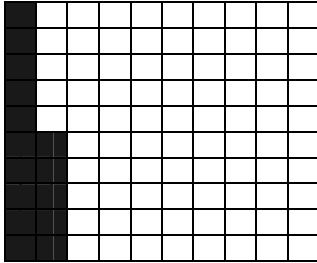
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Computational Fluency

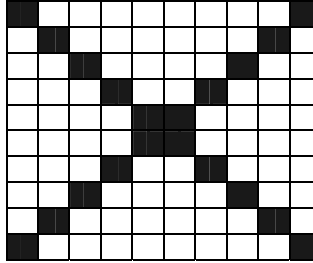
Name: _____ Date: _____ Time: _____
5 – 27

1. In each of the following, the whole is divided into 100 equal parts. What percentage of the whole is shaded?

a.

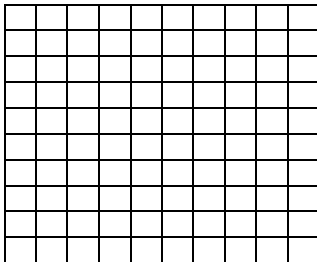


b.

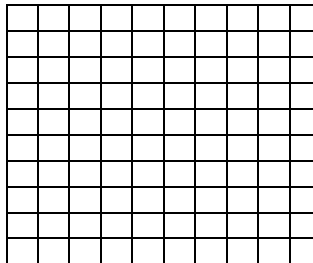


2. In each of the following, the whole is divided into 100 equal parts.

a. Shade 70% of the whole.



b. Shade 53% of the whole.



3. Express each fraction as a percentage.

a. $\frac{87}{100} =$

b. $\frac{5}{100} =$

c. $\frac{100}{100} =$

d. $\frac{11}{100} =$

4. Fill in the missing numerator or denominator.

a. $7\% = \frac{\quad}{100}$

b. $43\% = \frac{\quad}{100}$

c. $14\% = \frac{14}{\quad}$

d. $23\% = \frac{23}{\quad}$

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 28

1. Express each decimal as a percentage.

a. 0.15

b. 0.6

c. .47

d. 0.08

2. Express each percentage as a decimal.

a. 24%

b. 10%

c. 7%

d. 79%

3. Express each percentage as a fraction in its simplest form.

a. 22%

b. 40%

c. 4%

d. 96%

4. Express each fraction as a percentage.

a. $\frac{17}{20}$

b. $\frac{8}{50}$

c. $\frac{3}{5}$

d. $\frac{12}{40}$

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 29

1. Write each of the following as a percentage.

a. 39 out of 300

b. 96 out of 400

c. 235 out of 500

d. 122 out of 200

2. Mary mailed 20 Christmas cards. 9 of them were mailed to France. What percentage of the cards was mailed to France?

3. There are 80 members in a school chorus. 24 of them are 5th grade students. What percentage of the members is 5th grade students?

4. There are 200 marbles in a shoebox. 64 of them are yellow marbles. What percentage of the marbles are yellow marbles?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 30

1. Jean made 50 cookies. 24 of them were vanilla cookies. The rest were chocolate cookies.

- a. What percentage of the cookies were vanilla cookies?
- b. What percentage of the cookies were chocolate cookies?

2. John had \$80. He spent \$32 on a book.

- a. What percentage of his money did he spend on the book?
- b. What percentage of his money did he have left?

3. There are 400 seats in a baseball stadium. 120 of them are occupied.

- a. What percentage of the seats is occupied?
- b. What percentage of the seats is not occupied?

4. 125 runners take part in a 5-mile marathon. 85 of them are females.

- a. What percentage of the runners are females?
- b. What percentage of the runners are males?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 31

1. Find the value of each of the following:

a. 4% of 300

b. 72% of 150

c. 30% of \$94

d. 25% of 240 m

2. Pam paid \$85 last month for her utilities. 55% of this amount was for electricity. How much did Pam pay for electricity?

3. There were 48 traffic accidents in June last year. 25% of them happened on the freeways. How many accidents happened on the freeways?

4. Steve earns \$750 a month. He gives 30% of the money to charity. How much money does Steve give to charity?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 32

1. There are 55 marbles in a carton. 40% of them are red marbles and the rest are blue marbles. How many blue marbles are there in the carton?

2. Justin had \$840. He gave 30% of the money to his parents. How much money did he have left for himself?

3. Mark earns \$1200 a month. He saves 15% of the money and spends the rest. How much does he spend each month?

4. There were 750 questions in a mathematics book. Sue answered 82% of them correctly. How many questions did she answer incorrectly?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 33

Find the rate for each of the following:

a. Jerome pays \$225 to rent a hotel room for 3 days.

The rate is \$_____ per day.

b. Sammy types 750 words in 15 minutes.

The rate is _____ words per minute.

c. A machine fills 240 jars with jelly in 20 minutes.

The rate is _____ jars per minute.

d. A motorcycle can travel a distance of 102 mi on 3 gal of gas.

The rate is _____ mi per gallon.

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 34

Fill in the blanks.

a. A machine makes 45 cakes per minute.

At this rate, it will make _____ cakes in 5 minutes.

b. Carpets are sold at \$225 per m^2 .

At this rate, a carpet of area 35 m^2 will cost \$ _____.

c. Ben lays 25 bricks per hour.

At this rate, he will lay _____ bricks in 7 hours.

d. Matthew's family uses 24 m^3 of water per month.

At this rate, the family will use _____ m^3 of water in 6 months.

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 35

1. There are 2000 words on a page. How long will Allen take to read the page if he reads at the rate of 100 words per minute?

2. The room rate at Mountain Hotel is \$80 per day. At this rate, how many days did Bob stay at the hotel if he paid \$400?

3. A wheel makes 6 revolutions per minute. At this rate, how long will it take to make 45 revolutions?

4. A machine can make 200 loaves of bread per minute. At this rate, how many loaves of bread can the machine make in 5 minutes?

5. A car can travel 12 km on 1 liter of gas. At this rate, how much gas will be used if the car travels a distance of 180 km?

Computational Fluency

Name: _____ Date: _____ Time: _____

5 – 36

1. A taxi driver earns \$300 in 5 days. The rate is \$ _____ per day.

a. At this rate, he will earn \$ _____ in 6 days.

b. He will take _____ days to earn \$1200.

2. The cost of cementing a courtyard of area 40 m^2 is \$1600.

The rate is \$ _____ per m^2 .

a. At this rate, the cost of cementing an area of 90 m^2 is \$ _____.

b. The cost of cementing an area of _____ m^2 is \$2000.

3. A printing machine can roll out 600 pages of printed material in 4 minutes.

The rate is _____ pages per minute.

a. At this rate, the machine can roll out _____ pages in 15 minutes.

b. It will take the machine _____ minutes to roll out 750 pages.

4. A watch loses time at a rate of 80 seconds in 2 days.

a. How many seconds will it lose in 3 days?

b. How long will it take to lose 200 seconds?

Computational Fluency

Name: _____ Date: _____ Time: _____
5 – 37

1. This table shows the rates of charges for renting bicycles.

First hour	\$3
Every additional hour	\$2

- Jake rented a bicycle for 2 hours. How much should he pay?
- Jan rented a bicycle from 2:00 p.m. to 6:00 p.m. How much should she pay?
- Four boys rented 2 bicycles for 3 hours. If they shared the cost equally, how much should each boy pay?

2. This table shows the rates of charges for water consumption in a month.

First 20 m ³	\$0.56 per m ³
Next 20 m ³	\$0.80 per m ³
Additional amount above 40 m ³	\$1.17 per m ³

- What is the charge for 15 m³ of water used in a month?
- What is the charge for 30 m³ of water used in a month?
- What is the charge for 45 m³ of water used in a month?

Computational Fluency Answer Key
Grade 5

<u>5-1</u> a. 3,120 b. 5,785 c. 1,272 d. 24,670 e. 16,256 f. 66,120	<u>5-2</u> a. 37,710 b. 280,560 c. 80,977 d. 85,600 e. 78,475 f. 377,522	<u>5-3</u> a. 3 r 4 b. 6 r 37 c. 1 r 39 d. 2 r 28 e. 8 r 21 f. 5 r 2
<u>5-4</u> a. 13 b. 19 r 22 c. 82 d. 92 r 25 e. 162 r 12 f. 120 r 8	<u>5-5</u> a. 1 $\frac{5}{8}$ b. 1 $\frac{1}{9}$ c. 1 $\frac{1}{10}$ d. 1 $\frac{1}{3}$ e. 1 $\frac{1}{2}$	<u>5-6</u> a. 11/12 b. 1 $\frac{1}{18}$ c. 1 $\frac{1}{10}$ d. 1 $\frac{3}{20}$ e. 1 $\frac{1}{15}$
<u>5-7</u> a. $\frac{1}{8}$ b. $\frac{2}{5}$ c. $\frac{1}{4}$ d. $\frac{3}{4}$ e. $\frac{1}{2}$	<u>5-8</u> a. $\frac{3}{10}$ b. $\frac{5}{24}$ c. $\frac{9}{20}$ d. $\frac{8}{15}$ e. $\frac{14}{15}$	<u>5-9</u> a. 3 $\frac{7}{8}$ b. 6 $\frac{11}{15}$ c. 6 $\frac{1}{10}$ d. 5 $\frac{1}{3}$ e. 4 $\frac{1}{2}$
<u>5-10</u> a. 3 $\frac{13}{15}$ b. 4 $\frac{13}{24}$ c. 7 $\frac{3}{20}$ d. 6 $\frac{5}{18}$ e. 4 $\frac{7}{15}$	<u>5-11</u> a. 2 $\frac{3}{8}$ b. 3 $\frac{7}{10}$ c. 2 $\frac{1}{4}$ d. 4 $\frac{1}{6}$ e. 1 $\frac{4}{9}$	<u>5-12</u> a. 3 $\frac{1}{18}$ b. 2 $\frac{1}{18}$ c. 1 $\frac{3}{8}$ d. 1 $\frac{5}{12}$ e. 3 $\frac{2}{15}$
<u>5-13</u> a. 20 b. 33 c. 9 d. 1 e. 400 f. 30	<u>5-14</u> a. 40 cm b. 3 km 875 m c. 2 h 15 m d. 5 d 12 h e. 6 kg 750 g f. 2 lbs 2 oz	<u>5-15</u> a. 27m b. 260min c. 320cm d. 310s e. 1050m
<u>5-16</u> a. $\frac{3}{14}$ b. $\frac{1}{8}$ c. $\frac{6}{25}$ d. $\frac{15}{28}$ e. $\frac{1}{9}$ f. $\frac{1}{36}$	<u>5-17</u> a. $\frac{1}{4}$ b. $\frac{2}{15}$ c. $\frac{5}{24}$	<u>5-18</u> a. $\frac{2}{27}$ b. $\frac{3}{32}$ c. $\frac{1}{14}$ d. $\frac{7}{40}$ e. $\frac{1}{63}$ f. $\frac{1}{12}$

**Computational Fluency Answer Key
Grade 5**

<p><u>5-19</u> a. $\frac{1}{5}$lb b. $\frac{1}{10}$yd c. $\frac{1}{12}$</p>	<p><u>5-20</u> a. 50gal b. \$40</p>	<p><u>5-21</u> 1a. 0.3 1b. 0.09 1c. 29 1d. 3.21 1e. 60.15 1f. 4,128 2a. 3.8 2b. 128 2c. 277.8 2d. 1,832 2e. 1,116</p>
<p><u>5-22</u> 1. 30.04 300.4 3,004 81.9 819 8,190 204 2,040 20,400 2a. 616.6 2b. 520.1 2c. 72 2d. 4,860 3a. 10 3b. 10 3c. 100 3d. 1,000 3e. 1,000 3f. 100 3g. 100 3h. 1,000</p>	<p><u>5-23</u> a. 102 b. 2,720 c. 387,000 d. 224,560 e. 29,160</p>	<p><u>5-24</u> 1a. 0.6 1b. 0.005 1c. 0.12 1d. 2.05 1e. 23.9 1f. 0.058 2a. 0.185 2b. 0.089 2c. 0.912 2d. 0.423</p>

**Computational Fluency Answer Key
Grade 5**

<p><u>5-25</u> 1. 20.3 2.03 0.203 0.8 0.08 0.008 5.8 0.58 0.058 145.8 14.58 1.458 2a. 0.54 2b. 0.203 2c. 0.034 2d. 3.4 2e. 0.073 2f. 0.002 3a. 10 3b. 100 3c. 100 3d. 10 3e. 1,000 3f. 10</p>	<p><u>5-26</u> a. .03 b. 0.106 c. 0.013 d. 0.098 e. 0.121</p>	<p><u>5-27</u> 1a. 15% 1b. 20% 2a. 2b. 3a. 87% 3b. 5% 3c. 100% 3d. 11% 4a. 7/100 4b. 43/100 4c. 14/100 4d. 23/100</p>
<p><u>5-28</u> 1a. 15% 1b. 60% 1c. 47% 1d. 8% 2a. 0.24 2b. .10 2c. 0.07 2d. 0.79 3a. 11/50 3b. 2/5 3c. 1/25 3d. 24/25 4a. 85% 4b. 16% 4c. 60% 4d. 30%</p>	<p><u>5-29</u> 1a. 13% 1b. 24% 1c. 47% 1d. 61% 2. 45% 3. 30% 4. 32%</p>	<p><u>5-30</u> 1a. 48% 1b. 52% 2a. 40% 2b. 60% 3a. 30% 3b. 70% 4a. 68% 4b. 32%</p>

Computational Fluency Answer Key
Grade 5

<u>5-31</u> 1a. 12 1b. 108 1c. 28.8 1d. 60 2. \$46.75 3. 12 4. 225	<u>5-32</u> 1. 33 2. 588 3. 1,020 4. 135	<u>5-33</u> A. \$675.00 B. 70 C. 12 D. 34
<u>5-34</u> A. 225 B. \$7,875 C. 175 D. 144	<u>5-35</u> 1. 20 min. 2. 5 days 3. 7 min. 30 sec. 4. 1,000 loaves 5. 15 liters	<u>5-36</u> 1. 60 1a. 360 1b. 20 2. 40 2a. 3,600 2b. 50 3. 150 3a. 2,250 3b. 5 4a. 120 4b. 5
<u>5-37</u> 1a. \$5 1b. \$9 1c. \$3.50 2a. \$8.40 2b. \$19.20 2c. \$33.05		