

Anoka Hennepin K-12 Curriculum Unit Plan

Department: Elementary Math

Grade Level: Four

Unit Title: Unit Three – Multiplication and Division; Number Sentences and Algebra

Number of Lessons/Days: 13

Unit Summary: The purpose of this unit is to: use known multiplication facts to solve unknown facts, understand how multiplication and division are related, use the Distributive and Commutative Properties. Spiraling concepts include: multiplication facts, factors, equations/number sentences, open equations and measurement practice. Students will be assessed on unit concepts through formative and summative assessments.

DESIRED RESULTS (STAGE 1)

Program Understanding and/or Minnesota State/Local/Core Standards and Technology Standard(s) addressed:

- I. Students will understand that numbers can be used flexibly to solve problems.
- II. Students will understand that properties, patterns and relationships of numbers can be generalized into universal expressions.
- VI. Students will understand that reasoning and justification are fundamental aspects of mathematics.
- VII. Students will understand that greater mathematical understanding is reached through the communication of thoughts and ideas while using mathematical symbols and language.

MN Standards

Number and Operation

4.1.1 Demonstrate mastery of multiplication and division basic facts; multiply multi-digit numbers; solve real-world and mathematical problems using arithmetic.

Algebra

4.2.1 Use input-output rules, tables and charts to represent patterns and relationships and to solve real-world and mathematical problems.

4.2.2 Use number sentences involving multiplication, division and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences.

MN Benchmarks Assessed

***Boldface** indicates the part of the benchmark that is addressed in the unit.

Number and Operations

4.1.1.1 Demonstrate fluency with **multiplication and division facts**.

Algebra

4.2.1.1 Create and use input-output rules, involving **addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.**

4.2.2.1 Understand how to interpret number sentences involving multiplication, division and unknowns. Use real-world situations involving multiplication or division to represent number sentences.

4.2.2.2 Use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication and division to find values for the unknowns that make the number sentences true.

Overarching Understanding(s) from Curriculum Map/Course Understandings:

Students will understand that...

- identifying patterns and functions involving the **four operations** helps to analyze, describe and extend patterns when **developing** rules to represent and analyze change.
- the properties of arithmetic including the **Distributive Property** can be generalized to many situations adding flexibility and fluency to problem solving for an unknown and can be represented using **algebraic notation**.
- the four mathematical operations relate to one another to allow the efficient, flexible, and accurate computation of multi-digit numbers, fractions and decimals, to use and **justify** various strategies.

Topical Understanding(s) Specific to Unit:

Students will understand that...

- known multiplication facts can help me to solve unknown facts to add flexibility and fluency to problem solving.
- that the inverse relationship between multiplication and division is used to flexibly solve real world problems.
- there are many ways to use the **Distributive Property** to add flexibility and fluency to problem solving.
- number sentences/equations communicate relationships between quantities to represent problems.

Essential Question(s) from Curriculum Map. Course Essential Questions:

To understand, students will need to consider such questions as....

- How do I represent a situation using algebraic language?
- What makes an algorithm both effective and efficient?
- What are the relationships between fractions, decimals, and whole numbers?
- How do I know which operation is the most efficient to use?

Topical Essential Questions for Unit:

To understand, students will need to consider such questions as....

- How do known multiplication facts help me to solve unknown facts?
- What are some efficient strategies for solving mathematical problems?
- How does multiplication help me solve division problems?

To understand, students will need to...

- **know...** Students will need to know the following in order to... (e.g. facts, concepts, generalizations, rules, theories, principles)
- the difference between factors and products.

- **be able to...** (Students will be able to DO.. skills, procedures, processes)
 - name factors and products

Unit Three – Multiplication and Division; Number Sentences and Algebra

- that multiplication and division have an inverse relationship.
- mastery of basic multiplication facts 0, 1, 2, 5, 10.
- the concept of the Distributive Property.

Italicized words are words that students need to know for MCA testing. Please emphasize and use them often.

- **Common vocabulary:**
 - Commutative Property
 - Distributive Property
 - *dividend*
 - *divisor*
 - fact family
 - fact triangle
 - *factor*
 - factor of a counting number n
 - *input*
 - multiple of a number n
 - *number sentence /equation*
 - open sentence
 - *operation*
 - *output*
 - percent
 - *products*
 - *quotient*
 - *rule*
 - square number
 - *strategy*
 - *variable*
 - *Venn Diagram*
 - “What’s My Rule?” problem
- **Common misunderstanding(s):**
 - Different letters can never be the same value.

- solve multiplication and division problems
- solve division problems using multiplication
- solve multiplication facts to 10
- create fact families for multiplication and division
- use known facts to learn unknown facts
- multiply a sum by multiplying each addend separately and then adding the products. example: $(3 \times 4) + (2 \times 4) = 5 \times 4$
- read, analyze and solve number sentences