

3rd Grade Mathematics

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Hazelwood School District

Mission Statement

We are a collaborative learning community guided by a relentless focus to ensure each student achieves maximum growth.

Vision Statement

HSD will foster lifelong learners, productive citizens and responsible leaders for an ever-evolving society.

Board of Education on January 5, 2010

Goals

Goal #1: Hazelwood students will meet or exceed state standards in all curricular areas with emphasis in reading, writing, mathematics, science and social studies.

Goal #2: Hazelwood staff will acquire and apply skills necessary for improving student achievement.

Goal #3: Hazelwood School District, the community and all families will support the learning of all children.

Mathematics Curriculum Overview

The Hazelwood School District's (HSD) most recent adoption of elementary mathematics curriculum occurred in 2009. In 2010, Missouri officially adopted the Common Core State Standards and subsequently created and adopted the Missouri Learning Standards in 2016. These changes in state standards and learning progressions have resulted in the need for an intensive curriculum revision to ensure that all students in the Hazelwood School District are adequately prepared to meet grade-level learning expectations and be prepared for entry into college, or equipped to begin securing a career.

During the 2016-2017 school year, HSD piloted Investigations in Number, Data & Space 3rd Edition in 13 classrooms across the district. All pilot teachers were enamored with the updates to the curricular materials and were pleased with the strong alignment to the Missouri Learning Standards. Additionally, as of January 2017, the pilot teachers in grades 3-5 had an average of 46.2% of students meeting proficiency, compared to the district's 38.8% as measured by Evaluate mathematics benchmark assessment. Furthermore, 2016 Missouri Assessment Program data results for Grades 3-5 indicates a need for strengthening our current mathematics curriculum as the district's mathematics students scoring proficient and advanced fell to 34.6% from 37.1%. After a careful review of state and district data, it was determined by the Curriculum Department to revise the curriculum to align with the most recent state adopted standards.

The committee members aligned the curriculum with the 2016 Missouri Learning Standards published by Missouri Department of Elementary and Secondary Education. The curriculum meets all of the state and district requirements for research, technology, workplace readiness skills, gender/racial equity, and disability awareness.

The curriculum contains learning activities and unit assessments components that are rigorous, and outline clear learning expectations. As the curriculum is implemented and taught, the learning activities and assessments may be revised. The assessments are required. The learning activities should be implemented in the order, and with the fervor, as intended by the TERC curriculum writers.

We must be aware that students have mathematical ideas. The curriculum supports all students in developing and expanding those ideas. Also, teachers are engaged in ongoing learning about mathematics content, pedagogy, and student learning. The curriculum supports them in this learning. Moreover, teachers collaborate with the students and curriculum materials to create the curriculum as enacted in the classroom. The curriculum provides a clear, focused, and coherent mathematical agenda and supports teachers in implementing in a way that accommodates the needs of their particular students. Most of the learning activities are very sequential and, when all of them are used, a student should be able to successfully complete the unit assessments.

Mathematics Implementation Plan

The Investigations curriculum requires 55–60 minutes of math time a day in Kindergarten and 70–75 minutes a day in Grades 1–5. This includes a 45-minute (for Kindergarten) or 60-minute session (for Grades 1–5) and 10–15 minutes outside of math time for the daily Classroom Routine (Kindergarten–Grade 2) or Ten-Minute Math (Grades 3–5) activity. Each curriculum unit consists of 2–5 investigations. An investigation focuses on a set of related mathematical ideas, coordinating students’ work in hands-on activities, written activities, assessments, and classroom discussions over a period of several days. The duration of an investigation ranges from 4–9 class sessions. Each session begins with a list of all of the activities to help you plan the math time for the day. It is important to move through all of the activities because they are carefully designed to offer coherent and focused work on the main math ideas of the unit.

Mathematics teaching and learning, at its best, is a collaboration among teachers, students, and the curriculum. The curriculum materials provide a coherent, carefully sequenced core of mathematics content for students and supportive professional development material for teachers. Modifying the curriculum and making it work in your classroom requires knowing the curriculum well. It means taking the time to understand the mathematical focus of each lesson, how the Math Focus Points build over many lessons, and how the Mathematical Practices are integrated into the content. Learning the curriculum well means holding back the urge to change activities because you think they are too easy or too difficult for your students before you have tried them and actually seen your students’ work. Keep in mind that the way ideas are developed and sequenced has been researched and tested in multiple classrooms¹, and many suggestions for accommodations are already built into the curriculum.

Moreover, the curriculum has been written in a coherent manner and is horizontally and vertically connected. This means that several mathematics ideas and concepts are purposefully introduced in a particular sequence and over a period of time. Therefore, the curriculum should be presented in order, without omitting any session. The following charts below provide a visual of the spiraling of major concepts for grade 3. The darkened dots appear as sessions within units having another major focus.

MULTIPLICATION and DIVISION

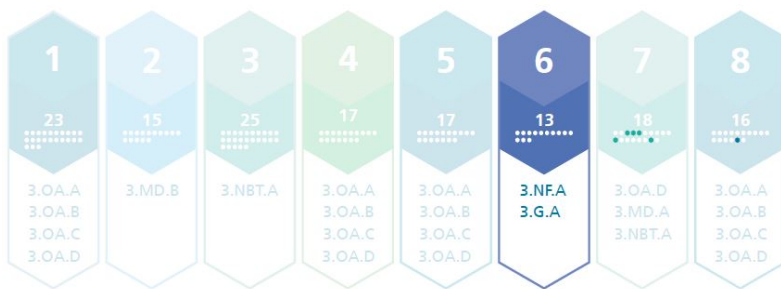


¹ http://assets.pearsonschool.com/asset_mgr/current/201021/PEAR_ResSum_InvMath_LoRes.pdf

ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM



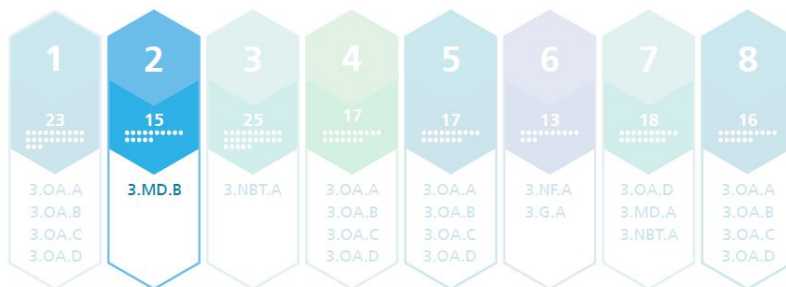
FRACTIONS



2-D GEOMETRY AND MEASUREMENT



MODELING WITH DATA



The HSD approach to assessing student learning is a comprehensive, carefully woven one that makes use of multiple sources of data: student written work, written assessments, and informal and formal observation of student behaviors and interactions. These multiple sources of data allow for a more in-depth portrait of each student's understandings of and proficiencies with key mathematical concepts, helping teachers provide more targeted instructional support. Assessments are tied to Unit Benchmarks that set clear expectations for what students should know and be able to do. These assessments include Embedded Assessments, Quizzes, and Assessment Checklists. Embedded Assessments in each curriculum unit are written activities that provide information on students' progress toward the Benchmarks. Starting in Grade 1, students encounter a Quiz every 5 to 10 sessions. These assessments have the dual purpose of providing evidence of students' progress towards meeting the Benchmarks and offering students exposure to the types assessment items that they are likely to encounter on the Missouri Assessment Program Grade Level Assessments. Finally, some Benchmarks are best assessed by observing students as they are actively engaged in doing mathematics. Because younger students are learning how to communicate their understanding through reading problems and writing responses, Assessment Checklists are used more often in Kindergarten and Grade 1 than in Grades 2–5.

Additional components that are germane to successful implementation of the curriculum include some combination of these five parts on a daily basis: Activity, Discussion, Math Workshop, Assessment Activity, and Session Follow-Up.

ACTIVITY: An Activity is where mathematical ideas are introduced and investigated. Activities are organized as work for the whole class, pairs, small groups, or individuals. Many activities are available as digital presentations, some of which include digital tools. Activities typically require 30-45 minutes.

Discussion: Many sessions include a whole-class Discussion, during which students share strategies and conclusions and compare methods and results. A subset of the session's Math Focus Points helps you guide each discussion. It is essential to allow time for class discussions, giving students an opportunity to articulate their own ideas, compare solutions, and consolidate their understanding. Discussions require 15-20 minutes.

Math Workshop: Some sessions include a Math Workshop, where students choose from and complete a set of activities. Students work individually, in pairs, or in small groups for 30-45 minutes during Math Workshop.

Assessment Activity: Some sessions include an Assessment Activity, where students are assessed on their progress toward unit specific Benchmarks through both written activities and observations. The Assessment Activities range from 10-40 minutes.

Session Follow-Up: Every session has a Session Follow-Up section where details about the review and practice assignments are found. Daily Practice offers ongoing review of materials from previous units or practice of content in the current unit. These practice activities can be completed in class or for homework. Homework offers practice with the content of the unit, review of previous content, or preparation for an upcoming activity.

COURSE TITLE: Investigations in Number, Data and Space

GRADE LEVEL: 3rd Grade

CONTENT AREA: Mathematics

Course Description:

Students develop an understanding of the operations of multiplication and division, particularly focusing on multiplication and division as involving equal groups. Students focus on understanding and extending knowledge of place value and the number system and on adding and subtracting fluently within 1,000. Students extend their understanding of the number system to include fractions. Students learn that when a whole is divided into equal parts, one of those parts is a unit fraction, and they come to recognize multiple equal parts as multiples of a unit fraction. Students measure length and calculate perimeter with both U.S. standard units and metric units. They also consider how different shapes can have the same perimeter. Students collect, represent, describe, and interpret both categorical and numerical data. They consider how to examine a data set as a whole and make statements about the whole group. Students also solve “How many more?” and “How many less?” questions about the data. Students study the attributes of 2-D shapes and how these attributes determine their classification. Students also work with the idea that shapes in different categories may share attributes.

Course Rationale:

Investigations in Number, Data, and Space is a K–5 mathematics curriculum designed to engage students in making sense of mathematical ideas. The curriculum is designed to: support students to make sense of mathematics and learn that they can be mathematical thinkers; focus on computational fluency with whole numbers as a major goal of the elementary grades; provide substantive work in important areas of mathematics—rational numbers, geometry, measurement, data, and early algebra—and the connections among them; emphasize reasoning about mathematical ideas; communicate mathematics content and pedagogy to teachers; and engage the range of learners in understanding mathematics.

Course Scope and Sequence

Unit 1: MULTIPLICATION AND DIVISION 1 (Approx. 23 days)	Unit 2: MODELING WITH DATA (Approx. 15 days)	Unit 3: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 1 (Approx. 25 days)
Unit 4: 2-D GEOMETRY AND MEASUREMENT (Approx. 17 days)	Unit 5: MULTIPLICATION AND DIVISION 2 (Approx. 17 days)	Unit 6: FRACTIONS (Approx. 13 days)
Unit 7: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 2 (Approx. 18 days)	Unit 8: MULTIPLICATION AND DIVISION 3 (Approx. 16 days)	

Essential Terminology/Vocabulary

Multiplication, equation, digit, factor, product, multiple, array, row, column, dimension, square number, area, square units, square inches, division, data, categories, bar graph, double-bar graph, key, scale, interval, pictograph, half, less than half, more than half, line plot, length, distance, U.S. Standard System, metric system, nearest half inch, unmarked number line, landmark numbers, estimate, round, difference, add up, subtract back, measurement, benchmark, polygon, tetromino, area, square units, square inch, square foot, square yard, square centimeter, square meter, gaps, overlaps, multiplication, division, multiple, parenthesis, product, quotient, fraction, numerator, denominator, unit fraction, equivalent fractions, nearest $\frac{1}{4}$ inch, liquid volume, millimeter, ml, liter, l, weight, mass, gram, g, kilogram, kg, conjecture, column, row, and table.

Unit Objectives:

Unit 1: MULTIPLICATION AND DIVISION 1 (Approx. 23 days)

- Demonstrate an understanding of multiplication and division as involving equal groups
- Solve multiplication and related division problems by using skip counting or known multiplication facts.
- Interpret and use multiplication and division notation.
- Demonstrate fluency with multiplication facts.

Unit 2: MODELING WITH DATA (Approx. 15 days)

- Organize, represent, and describe categorical data, choosing categories that help make sense of data.
- Make and interpret a bar graph and pictograph, including use of scales greater than 1.
- Make a line plot for a set of measurement data, with a scale that includes inches and half inches.
- Describe and summarize a set of data, describing concentrations of data and what those concentrations mean in terms of the situation the data represent.
- Generate measurement data by measuring lengths to the half inch

Unit 3: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 1 (Approx. 25 days)

- Use knowledge of place value to read, write, sequence, and round numbers up to 1,000.
- Solve addition problems with 3-digit numbers (up to 400) by using strategies that involve breaking each number apart by place, or by adding on one number in parts.
- Solve subtraction problems with 2- and 3- digit numbers (up to 300) by using strategies that involve either subtracting one number in parts, adding up, or subtracting back.
- Tell time to the nearest minute.

Unit 4: 2-D GEOMETRY AND MEASUREMENT (Approx. 17 days)

- Measure and find perimeter of 2-D figures using U.S. standard and metric units.
- Find the area of a 2-D figures using U.S. standard and metric units.
- Categorize quadrilaterals, including squares, rhombuses and rectangles, based on their attributes.

Unit 5: MULTIPLICATION AND DIVISION 2 (Approx. 17 days)

- Represent and explain the relationship between multiplication and division.
- Solve multiplication and division word problems and write equations to represent the problems.
- Solve division problems (2-digit number divided by single-digit number)
- Demonstrate fluency with multiplication facts.
- Multiply a single-digit number by a multiple of 10, up to 90.
- Solve multi-step problems involving multiplication and division.

Unit 6: FRACTIONS (Approx. 13 days)

- Partition a quantity into equal parts, and name those parts as fractions.
- Represent fractions as a number on a number line.
- Compare fractions with the same numerator same denominator by reasoning about their size.
- Identify equivalent fractions.
- Measure to the nearest fourth inch and represent measurement data to the nearest fourth inch on a line plot.

Unit 7: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 2 (Approx. 18 days)

- Solve addition and subtraction problems involving mass and volume
- Solve 3-digit addition problems using at least one strategy fluently
- Solve 3-digit subtraction problems fluently
- Estimate and measure liquid volume and mass using standard units

Unit 8: MULTIPLICATION AND DIVISION 3 (Approx. 16 days)

- Solve multiplication and division problems within 100.
- Demonstrate fluency with division facts.
- Solve multi-step problems involving more than one operation.
- Find the area of a rectangular array by breaking it apart (using the distributive property).
- Solve multiplication and division problems involving masses or volumes.

Approved Course Materials and Resources:

Investigations in Number, Data, and Space 3rd Edition

Pearson Education, Inc.

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