Hazelwood School District

We're on the move!

2nd 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.

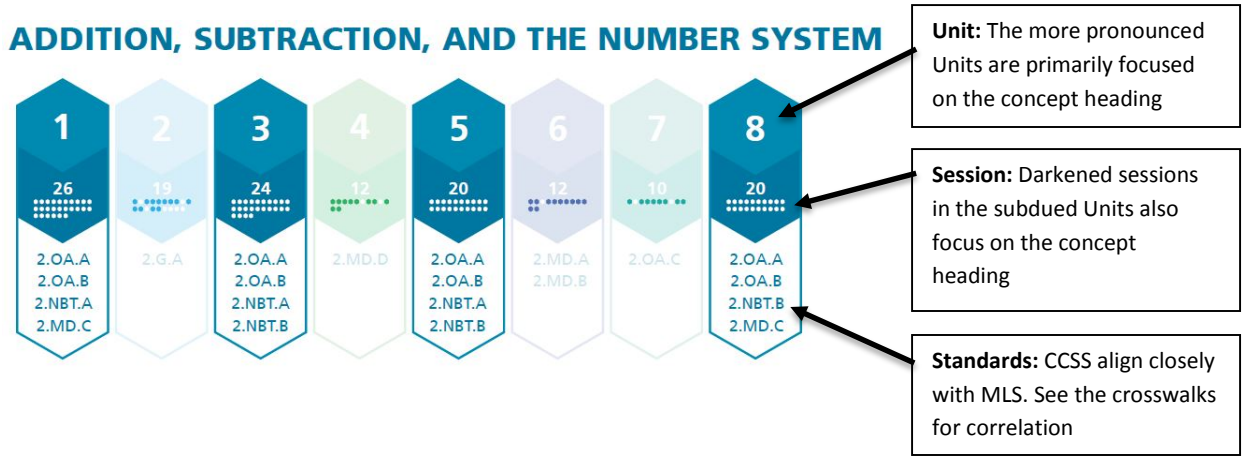
We must be aware that students have mathematical ideas. The curriculum supports all students in developing and expanding those ideas. Also, teachers are engaged in ongoing learning about mathematics content, pedagogy, and student learning. The curriculum supports them in this learning. Moreover, teachers 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.

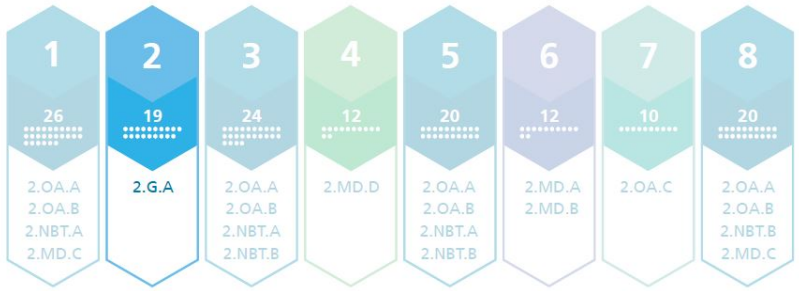
Mathematics teaching and learning, at its best, is a collaboration among teachers, students, and the curriculum. The curriculum materials provide a coherent, carefully sequenced core of mathematics content for students and supportive professional development material for teachers. Modifying the curriculum 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 classrooms[1], 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 2. The darkened dots appear as sessions within units having another major focus.

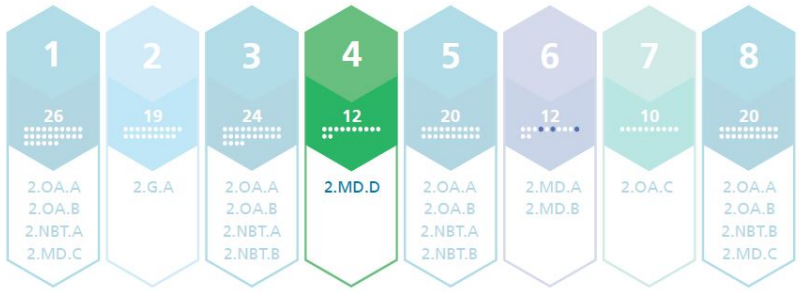


[1] http://assets.pearsonschool.com/asset_mgr/current/201021/PEAR_ResSum_InvMath_LoRes.pdf

GEOMETRY AND FRACTIONS

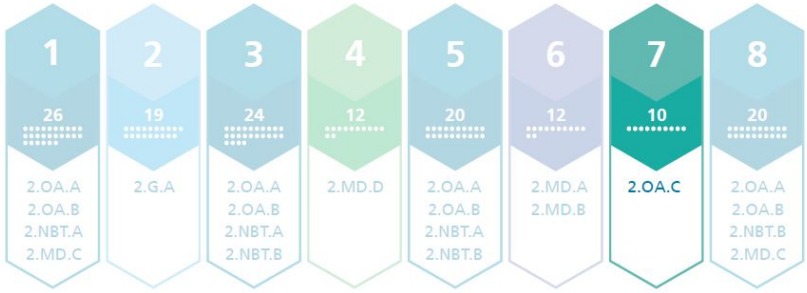


MODELING WITH DATA



MEASUREMENT

FOUNDATIONS OF MULTIPLICATION



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: 2nd Grade

CONTENT AREA: Mathematics

Course Description:

Students focus on using what you know to add and subtract single-digit numbers in any order; shifting from counting by 1s to counting by groups, particularly groups of tens and ones, which lays the foundation for students' work with place value and the base-10 number system; and developing and refining strategies for solving a variety of addition and subtraction problems. Students focus on observing and describing the defining attributes of 2-D and 3-D shapes (e.g., number and shape of faces, number and length of sides, and number of angles and vertices), and using those attributes to sort, construct, draw and compare shapes. Students develop ideas about fractions as equal parts of a whole, focusing specifically on partitioning and describing halves, fourths and thirds of one whole, and recognizing that the same fractional part of a whole can be different shapes. Students focus on the place value of 2-digit numbers and operating on those numbers within 100. Students come to see 100 as ten 10s and multiples of 100 as being made up of some number of hundreds. They solve a variety of story problems (e.g. put together/take apart with one or both addends unknown, add to and take from with result unknown, and problems with an unknown change or an unknown start). They also play games that involve combining amounts to get to 100 or $1; work on fluency with addition and subtraction within 10; and identify, read, and write numbers to 500. Students focus on sorting and classifying categorical data; ordering numerical data; and collecting and representing categorical and numerical data using a variety of representations: student-generated representations, picture graphs, bar graphs, Venn diagrams, cube towers, and line plots. Students describe the data and discuss what the data tell them about the group surveyed. In doing so, students develop the ability to model aspects of their worlds with data. Students focus on the place value of 3-digit numbers and operating on numbers within 100. Students come to see 100 as 10 tens and multiples of 100 as being made up of some number of hundreds. They solve a variety of types of story problems. They play games that involve combining amounts to get to 100 or $1. Work on fluency with addition and subtraction within 100 continues, with a focus on using known facts and knowledge of the operation. Students also identify, read, and write numbers to 1,000 and add and subtract 10 and 100 in that range. Students focus on developing strategies for accurately measuring length with nonstandard and standard units and tools and for considering the relationship between different units and tools. Students focus on working with equal groups as the foundation of multiplication by investigating even and odd numbers and by representing equal groups with arrays and tables. Students focus on developing and achieving fluency with subtraction within 100, and on achieving fluency with addition and subtraction facts within 20, which students have been working on throughout the year. Students are also introduced to a new type of story problem—comparison problems with a smaller unknown.

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: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 1 (Approx. 26 days)	Unit 2: GEOMETRY AND FRACTIONS (Approx. 19 days)	Unit 3: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 2 (Approx. 24 days)
Unit 4: MODELING WITH DATA (Approx. 12 days)	Unit 5: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 3 (Approx. 20 days)	Unit 6: LINEAR MEASUREMENT (Approx. 12 days)
Unit 7: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 4 (Approx. 10 days)	Unit 8: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 4 (Approx. 20 days)	

Essential Terminology/Vocabulary
Today's Number, number line, Quick Images, visual image, organize visual images, analyze visual images, identify coins, doubles, 100 Chart, order, time, clock, minute, hour, hour hand, minute hand, analog clock, o'clock, digital time, big hand, small hand, story problem, word problem, unknown change, compare, subtract, subtraction, whole, part, difference, combination, take apart, unkown, total, add to, take from, addition fluency, subtraction fluency, comparison story problem, difference unknown, put together/take apart/total unknown, result unknown, two-digit addend, two-digit numbers, two-digit minuend, two-digit subtrahend, equation, penny, coin, value, count, nickel, dime, quarter, equivalent, cent, cents, 2-digit number, one-digit number, 1-digit number, group of ten, group of ones, tens, quantity, how many, represent number, represent money amount, 10s, group of 10, five cents, 5 cents, ten cents, 10 cents, 25 cents, ¢, dollar, 100 cents, total number, cubes, connecting cubes, representation, puzzle, pattern block, shape, size, combine shapes, model, number word, numeral, picture, tally marks, tallies, combine groups, compose, take away, expression, order addends, addition property, Ten Frame, strategies, count by 5s, table, grouping, groups of two, groups of 2, groups of five, groups of 5, groups of ten, groups of 10, count by twos, count by 2s, count by fives, count by tens, count by 10s, skip count, Equal groups, groups of two, two equal groups, divide, division, even, even number, odd, odd number, partner, partners, team, time, clock, minute, hour, hour hand, minute hand, analog clock, o'clock, digital time, digital clock, A.M., P.M., five minutes, time to the nearest five minutes, 5 minutes, time to the nearest 5 minutes, time to the 5 minutes, time to the five minutes, Even number, pair, cube, model, pattern, groups of 2, assessment, sum, equal addends, Quick Images, visual image, arrays, rectangle, rectangular, rectangular array, square, addition, +, row, column, total, add equal groups, floor plan, cube building, 5 minutes later, puzzle, pattern block, shape, size, combine shapes, 2-dimensional, two-dimensional, hexagon, trapezoid, triangle, rhombus, table, multiplicative relationships, multiplication, Assessment, problem, solve, addition equation, write addition equations, total number, money, structure, complete tables, amount, nickel

Unit Objectives:

Unit 1: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 1 (Approx. 26 days)

- Recognize and identify coins and their values.
- Use known combinations to add several numbers in any order.
- Solve a comparison story problem with the difference unknown.
- Solve put together/take apart story problems with the total unknown, and add to and take from story problems with the result unknown.

Unit 2: GEOMETRY AND FRACTIONS (Approx. 19 days)

- Identify defining attributes of 2-D and 3-D shapes (number and shape of faces, number and length of sides, number of angles and vertices) and draw shapes with those attributes.
- Make a rectangle out of same size squares and specify the number of rows and the number of squares in each row.
- Recognize that (halves, thirds, fourths) of the whole can look different.
- Partition 2-D shapes into halves, thirds, and fourths and name the regions.

Unit 3: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 2 (Approx. 24 days)

- Solve a put together/take apart story problem with both addends unknown and find all of the possible combinations.
- Solve a put together/take apart story problem with one addend unknown.
- Solve two-step story problems about money.
- Understand that 100 can be seen as 1 hundred, as 10 tens, and as 100 ones.
- Understand that multiples of 100 (ex. 200, 300, 400, etc.) are made up of a number (2, 3, 4, etc.) of hundreds.
- Solve story problems with an unknown change.
- Solve story problems with an unknown start.

Unit 4: MODELING WITH DATA (Approx. 12 days)

- Organize a set of data with up to four categories.
- Create, describe, and interpret a variety of data representations, including picture graphs and bar graphs.
- Order, represent, and describe a set of numerical data.

Unit 5: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 3 (Approx. 20 days)

- Solve a 2-step story problem that involves finding the difference between a 2-digit number and 100.
- Understand that 3-digit numbers represent amounts of hundreds, tens, and ones.
- Read, write, count, and compare numbers to 1,000.
- Add/Subtract 10 or 100 to/from numbers within 1,000.
- Add fluently within 100.
- Solve comparison story problems with a bigger unknown.
- Count by 5's, 10's, and 100's within 1,000.

Unit 6: LINEAR MEASUREMENT (Approx. 12 days)

- Recognize that, when measuring the same length, larger units yield smaller counts (and vice versa).
- Estimate and measure lengths in inches, feet, centimeters, and meters.
- Represent measurement data on a line plot.
- Solve comparison and other story problems about lengths.

Unit 7: FOUNDATIONS OF MULTIPLICATION (Approx. 10 days)

- Define even and odd numbers in terms of numbers that can/cannot be organized into groups of two or two equal groups.
- Write an equation to express an even number as a sum of two equal addends.
- Solve problems that involve equal groups.
- Write an addition equation to express the total number of objects in a rectangular array.

Unit 8: ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM 4 (Approx. 20 days)

- Solve a comparison story problem with a smaller unknown.
- Name, notate, and tell time to the nearest 5 minutes using analog and digital formats and associate A.M. and P.M. with time of day.
- Fluently subtract two 2-digit numbers.
- Fluently add and subtract within 20.
- Represent and solve addition and subtraction problems with 3-digit numbers.

Approved Course Materials and Resources:

Investigations in Number, Data, and Space 3rd Edition
Pearson Education, Inc.
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