6/1/2013

NORTH SMITHFIELD SCHOOL DEPARTMENT

MATHEMATICS CURRICULUM GRADE 2

North Smithfield Elementary School
Curriculum Writers: Lorrie Manosh and Ginny Swanson

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This curriculum was developed based on the Common Core State Standards utilizing examples and strategies from various websites including Tucson, Arizona, Ohio, and New Jersey.

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The North Smithfield Mathematics Curriculum for grades K-12 was completed in June 2013 by a K-12 team of teachers. The team, identified as the Mathematics Task Force and Mathematics Curriculum Writers referenced extensive resources to design the document that included: *Common Core Standards for Mathematics*

- Common Core State Standards for Mathematics
- Common *Core State Standards for Mathematics Appendix A*
- *Best Practice, New Standards for Teaching and Learning in America's Schools;*
- *Classroom Instruction That Works* Strategies
- Differentiated Instructional Strategies
- Goals for the district
- Khan Academy
- Numerous state curriculum Common Core frameworks, e.g. Ohio Department of Education, Tucson Arizona, New Jersey, Connecticut
- PARCC Model Content Frameworks
- The Illustrative Mathematics Project:
- Third International Mathematics and Science Test (TIMSS)
- *Understanding Common Core State Standards, Kendall*

Mission Statement

**To foster the success of all students,
our mission is to engage them
in a challenging mathematics curriculum,
driven by standards-based instruction and focused on
mathematical practices, skills, concepts, and problem solving.**

The North Smithfield Mathematics Curriculum identifies what students should know and be able to do in mathematics. Each grade or course includes Common Core State Standards (CCSS), grade level Assessment problems, teacher notes, best practice instructional strategies, resources, a map (or suggested timeline), rubrics, checklists, and common formative and summative assessments.

COMMON CORE STATE STANDARDS

- Are fewer, higher, deeper, and clearer.
- Are aligned with college and workforce expectations.
- Include rigorous content and applications of knowledge through high-order skills.
- Build upon strengths and lessons of current state standards (GLEs and GSEs).
- Are internationally benchmarked, so that all students are prepared for succeeding in our global economy and society.
- Are research and evidence-based.

Common Core State Standards components include:

- Standards for **Mathematical Practice** (K-12)
- Standards **for Mathematical Content:**
  - Categories (high school only): e.g. numbers, algebra, functions, data
  - Domains: larger groups of related standards
  - Clusters: groups of related standards
  - Standards**:** define what students should understand and are able to do

The **North Smithfield Common Core Mathematics Curriculum** provides all students with a sequential comprehensive education in mathematics through the study of:

- Standards **for Mathematical Practice (K-12)**
  - Make sense of problems and persevere in solving them
  - Reason abstractly and quantitatively
  - Construct viable arguments and critique the reasoning of others
  - Model with mathematics*
  - Use appropriate tools strategically
  - Attend to precision
  - Look for and make use of structure
  - Look for and express regularity in repeated reasoning

This curriculum was developed based on the Common Core State Standards utilizing examples and strategies from various websites including Tucson, Arizona, Ohio, and New Jersey.

- Standards **for <u>Mathematical Content</u>:**
  - **K – 5 Grade Level Domains of**
    - Counting and Cardinality
    - Operations and Algebraic Thinking
    - Number and Operations in Base Ten
    - Number and Operations – Fractions
    - Measurement and Data
    - Geometry
  - **6-8 Grade Level Domains of**
    - Ratios and Proportional Relationships
    - The Number System
    - Expressions and Equations
    - Functions
    - Geometry
  - **9-12 Grade Level Conceptual Categories of**
    - Number and Quantity
    - Algebra
    - Functions
    - Modeling
    - Geometry
    - Statistics and Probability

RESEARCH-BASED INSTRUCTIONAL STRATEGIES

The North Smithfield Common Core Mathematics Curriculum provides a list of research-based **best practice instructional strategies** that the teacher may model and/or facilitate. It is suggested the teacher:

- Use **formative assessment to** guide instruction
- Provide opportunities for **independent, partner** and **collaborative group work**
- Use ***Classroom Instruction That Works* Strategies:**
  - Setting objectives and providing feedback
  - Reinforcing effort and providing recognition
  - Cooperative learning
  - Cues, questions, and advance organizers
  - Nonlinguistic representations
  - Summarizing and note taking
  - Assigning homework and providing practice
  - Identifying similarities and differences
  - Generating and testing hypotheses
- Differentiate **instruction** by varying the **content, process, and product** and providing opportunities for:
  - anchoring
  - cubing
  - jig-sawing
  - pre/post assessments
  - tiered assignments
- Address **multiple intelligences** instructional strategies, e.g. visual, bodily kinesthetic, interpersonal
- Provide opportunities for **higher level thinking: Webb's Depth of Knowledge, 2,3,4,** skill/conceptual understanding, strategic reasoning, extended reasoning
- Facilitate the integration of **Mathematical Practices** in all content areas of mathematics

- Employ strategies of "best practice" (student-centered, experiential, holistic, authentic, expressive, reflective, social, collaborative, democratic, cognitive, developmental, constructivist/heuristic, and challenging)
- Facilitate integration of the **Applied Learning Standards (SCANS):**
  - communication
  - critical thinking
  - problem solving
  - reflection/evaluation
  - research
- Provide **rubrics** and **models**
- Address **multiple intelligences** and brain dominance (spatial, bodily kinesthetic, musical, linguistic, intrapersonal, interpersonal, mathematical/logical, and naturalist)
- Employ **mathematics best practice strategies** e.g.
  - using manipulatives
  - facilitating cooperative group work
  - discussing mathematics
  - questioning and making conjectures
  - justifying of thinking
  - writing about mathematics
  - facilitating problem solving approach to instruction
  - integrating content
  - using calculators and computers
  - facilitating learning
  - using assessment to modify instruction

COMMON ASSESSMENTS

The North Smithfield Common Core Mathematics Curriculum includes common assessments. Required (red ink) indicates the assessment is required of all students e.g. common tasks/units**,** standardized mid-term exam, standardized final exam.

- **REQUIRED** COMMON ASSESSMENTS
  - Common units
  - Common unit assessment
- **Common Instructional Assessments (I)** - used by teachers and students during the instruction of CCSS.
- **Common Formative Assessments (F)** - used to measure how well students are mastering the content standards **before** taking state assessments
  - teacher and student use to make decisions about what actions to take to promote further learning
  - on-going, dynamic process that involves far more frequent testing
  - serves as a practice for students
- **Common Summative Assessment (S**) - used to measure the level of student, school, or program success
  - make some sort of judgment, e.g. what grade
  - program effectiveness
  - e.g. state assessments (AYP), mid-year and final exams
- Additional suggested assessments include:
  - Anecdotal records
  - Checklist
  - Conferencing
  - Exhibits
  - Interviews
  - Graphic organizers
  - Journals
  - Mathematical Practices
  - Modeling
  - Multiple Intelligences assessments, e.g.
    - Role playing - bodily kinesthetic
    - Graphic organizing - visual
  - Collaboration - interpersonal Oral presentations
  - Problem/Performance based/common tasks
  - Tests and quizzes
  - Technology
  - Think-alouds
  - Writing genres
    - Opinion
    - Informative

RESOURCES FOR Grade 2 Mathematics

Textbooks
enVisionMath – consumables

Supplementary
- *Read it! Draw it! Solve It!*
- *Mad Minutes*
- *Finish Line* – student consumables

Technology
- Calculators (for modification)
- Computer lab
- Computers
- Interactive boards
- LCD projectors
- Student response systems

Websites
- http://curriculum.northsmithfieldschools.com
- http://www.achieve.org/http://my.hrw.com
- http://www.illustrativemathematics.org/standards/practice
- http://www.nj.gov/education/modelcurriculum/math/2.pdf
- http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1
- http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S
- http://www.tusd1.org/contents/distinfo/curriculum/index.asp
- www.commoncore.org/maps
- www.corestandards.org
- www.illuminations.nctm.org
- www.ixL.com/standards/commom-core/math/grade2
- www.K-5 teaching resources.com
- www.khanacademy.com
- www.mrmaffesoli.com/printables
- www.ride.ri.gov
- www.uen.org/commoncore

Materials
- 3-D solid figures
- Addition and subtraction flash cards
- Base 10 blocks
- Centimeter rulers and tapes
- Conversion charts
- Counters
- Dices
- Dominoes
- Equivalent fraction charts/manipulatives
- Expo markers
- Geoboards
- Graph paper
- Hundreds chart (numbers 1-100) and blank hundreds chart
- Inch rulers and tapes
- Judy clock
- Laminated multiplication charts
- Meter sticks
- Number grid
- Number lines
- Place value charts
- Play money
- Rulers
- Straws/twisters
- Tiles/counters
- White boards
- Yardsticks

MATHEMATICS CURRICULUM Grade 2

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CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
OPERATIONS AND ALGEBRAIC THINKING (2.OA) Represent and solve problems involving addition and subtraction. . Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. **Essential Question** • *How are addition and subtraction related?* • *When does the order of the numbers matter when you solve contextual problems? Why?* • *How might different strategies be helpful when solving a problem?* • *Will the end result be more or less than the amount you started with?* • *How does your model represent your mathematical thinking?* **Mathematical Practices** • Make sense of problems and persevere in solving them • Construct viable arguments and critique the reasoning of others • Model with mathematics **Essential knowledge and skills** • Some addition and subtraction problems may require two-steps to solve. Sometimes the answer to one problem is needed to find the answer to another problem or question. • The unknown can be represented algebraically with a symbol (a box, a blank, or a question mark, NOT a letter at this grade level) and pictorially to solve all types of addition and subtraction situations. • Students' modeling of story problems helps them figure out what operation is involved in a problem, regardless of the size of the numbers. • Estimating is an important tool to determine the reasonableness of an answer • Two digit numbers can be broken apart using tens and ones and added and subtracted in different ways. • 10 ones can be regrouped for 1 ten. • 10 tens can be regrouped for one 100 **Teaching Examples** • Word problems that are connected to students' lives can be used to develop fluency with addition and subtraction. Table 1 describes the four different addition and subtraction situations and their relationship to the position of the unknown.	TEACHER NOTES See instructional strategies in the introduction • *Students now build on their work with one-step problems to solve two-step problems. Second graders need to model and solve problems for all the situations shown in Table 1 on page 88 in the Common Core State Standards and represent their solutions with equations. The problems should involve sums and differences less than or equal to 100 using the numbers 0 to 100. It is vital that students develop the habit of checking their answer to a problem to determine if it makes sense for the situation and the questions being asked.* • *Ask students to write word problems for their classmates to solve. Start by giving students the answer to a problem. Then tell students whether it is an addition or subtraction problem situation. Also let them know that the sums and differences can be less than or equal to 100 using the numbers 0 to 100. For example, ask students to write an addition word problem for their classmates to solve which requires adding four two-digit numbers with 100 as the answer. Students then share, discuss and compare their solution strategies after they solve the problems.* (ODE)	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Read it! Draw it! Solve It!* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. ▫ Role playing - bodily kinesthetic ▫ Graphic

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		Examples: • Difference example: David had 63 stickers. He gave 37 to Susan. How many stickers does David have now? 63 – 37 = ☐ • Add To example: David had $37. His grandpa gave him some money for his birthday. Now he has $63. How much money did David's grandpa give him? $37 + ☐ = $63 • Compare example: David has 63 stickers. Susan has 37 stickers. How many more stickers does David have than Susan? 63 – 37 = ☐ ○ Even though the modeling of the two problems above is different, the equation, 63 - 37 = ?, can represent both situations (How many more do I need to make 63?) • Difference (Start Unknown) David had some stickers. He gave 37 to Susan. Now he has 26 stickers. How many stickers did David have before? - 37 = 26 • It is important to attend to the difficulty level of the problem situations in relation to the position of the unknown. (TUSD) See page 41 for enlargement below		<u>Materials</u> • Base ten blocks • Number grid • Graph paper • White boards	organizing - visual Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres Opinion Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[1]
Put Together/ Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[3]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[2]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[3]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

Academic vocabulary

- Addend
- Addition sentence
- Area model
- Array
- Composing
- Decomposing
- Difference
- Doubles
- Equals
- Even
- Fact families
- Factor
- Fewer
- Mental math
- Minuend
- Minus
- More
- Multiplication
- Odd
- Part
- Product
- Regroup
- Strategy
- Subtraction sentence
- Subtrahend
- Sum

ASSESSMENT PROBLEMS

2. OA.1 Basic

- http://www.illustrativemathematics.org/standards/k8 (Pencil & Sticker)

2. OA.1 Advanced

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CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
OPERATIONS AND ALGEBRAIC THINKING (2.OA) Add and subtract within 20. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2. OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2; know from memory all sums of two one-digit numbers. Use strategies such as (from grade 1): • counting on; • making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); • decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); • using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8= 4); • creating equivalent but easier or known sums (e.g., adding 6 +7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). **Essential Question** • *What strategies can be helpful when solving a problem?* • *How could you use mental math to estimate the sum or difference?* • *How might you use mental strategies to solve any given problem?* • *How can you use a known fact to help you with an unknown fact?* **Mathematical Practices** • Reason abstractly and quantitatively. • Look for and make use of structure. **Essential knowledge and skills** • Doing mathematics involves a variety of processes including problem solving, reasoning, communicating, connecting, and representing. • Decomposing and recomposing numbers to solve addition and subtraction problems helps students make sense of number relationships. • Fluency in addition and subtraction within 20 (using various strategies) is critical to understanding addition and subtraction of larger numbers. TUSD • Addition and subtraction have an inverse relationship. This inverse relationship can be used to find subtraction and/or addition facts. Every subtraction fact has a related addition fact. **Teaching Examples** • This standard is strongly connected to all the standards in this domain. It focuses on students being able to fluently add and subtract numbers to 20. Adding and subtracting fluently refers to	TEACHER NOTES See instructional strategies in the introduction • *Provide many activities that will help students develop a strong understanding of number relationships, addition and subtraction so they can develop, share and use efficient strategies for mental computation. An efficient strategy is one that can be done mentally and quickly. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.* • *Provide activities in which students apply the commutative and associative properties to their mental strategies for sums less or equal to 20 using the numbers 0 to 20.* • *Provide simple word problems designed for students to invent and try a particular strategy as they solve it. Have students explain their strategies so that their classmates can understand it. Guide the discussion so that the focus is on the methods that are most useful. Encourage students to try the strategies that were shared so they can eventually adopt*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. Role playing - bodily kinesthetic Graphic

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. • Mental strategies help students make sense of number relationships as they are adding and subtracting within 20. The ability to calculate mentally with efficiency is very important for all students. Mental strategies may include the following: ○ Counting on ○ Decomposing a number leading to a ten (14 – 6 = 14 – 4 – 2 = 10 – 2 = 8) ○ Fact families (8 + 5 = 13 is the same as 13 - 8 = 5) ○ Doubles ○ Doubles plus one (7 + 8 = 7 + 7 + 1) • The use of objects, diagrams, or interactive whiteboards, and various strategies will help students develop fluency. (TUSD) **Academic vocabulary** • Addend • Addition sentence • Area model • Array • Composing • Decomposing • Difference • Doubles • Equals • Even • Fact families • Factor • Fewer • Mental math • Minuend • Minus • More • Multiplication • Odd • Part • Product • Regroup • Strategy • Subtraction sentence • Sum ASSESSMENT PROBLEMS 2. OA.2 Basic 2. OA.2 Advanced	*efficient strategies that work for them.* (ODE)	• www.ride.ri.gov Materials • Addition and subtraction flash cards • Base ten blocks • Counters • Graph paper • Number grid • White boards	organizing - visual Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres Opinion Informative
OPERATIONS AND ALGEBRAIC THINKING (2.OA) **Work with equal groups of objects to gain foundations for multiplication.**		**Students** 2. OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	TEACHER NOTES See instructional strategies in the introduction • *Students need to understand that a collection of objects can be one thing (a group)*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath*	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS

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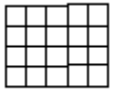
Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Essential Question** • *What arrays can you build from 24?* • *What equation(s) expresses the array?* • How *can you use a model to decide if a number is even or odd?* **Essential knowledge and skills** • Adding multiple groups of equal size is the foundation for multiplication. • Sets of objects can be arranged in a rectangular array. • Even numbers can be divided into two equal sets, arranged into pairs or counted by twos; odd numbers cannot. • Looking for a pattern can help solve a problem. **Teaching Examples** • Students explore odd and even numbers in a variety of ways including the following: students may investigate if a number is odd or even by determining if the number of objects can be divided into two equal sets, arranged into pairs or counted by twos. After the above experiences, students may derive that they only need to look at the digit in the ones place to determine if a number is odd or even since any number of tens will always split into two even groups. Example: • Students need opportunities writing equations representing sums of two equal addends, such as: 2 + 2 = 4, 3 + 3 = 6, 5 + 5 = 10, 6 + 6 = 12, or 8 + 8 =16. This understanding will lay the foundation for multiplication and is closely connected to 2.OA.4. • The use of objects and/or interactive whiteboards will help students develop and demonstrate various strategies to determine even and odd numbers. (ODE) **Mathematical Practices** • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics • Look for and make use of structure. • Look for and express regularity in repeated reasoning. 2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends. **Essential Question** • *What equation(s) expresses the array?* • How *can you use a model to decide if a number is* **Mathematical Practices** • Reason abstractly and quantitatively.	*and that a group contains a given number of objects. Investigate separating no more than 20 objects into two equal groups. Find the numbers (the total number of objects in collections up to 20 members) that will have some objects and no objects remaining after separating the collections into two equal groups. Odd numbers will have some objects remaining while even numbers will not. For an even number of objects in a collection, show the total as the sum of equal addends (repeated addition).* • *A rectangular array is an arrangement of objects in horizontal rows and vertical columns. Arrays can be made out of any number of objects that can be put into rows and columns. All rows contain the same number of items and all columns contain an equal number of items. Have students use objects to build all the arrays possible with no more than 25 objects. Their arrays should have up to 5 rows and up to 5 columns. Ask students to draw the arrays on grid paper and write two different equations under the arrays: one showing the total as a sum by rows and the other showing the total as a sum by columns. Both equations will show the total as a sum of equal addends.*	Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Graph paper • Tiles/counters	• Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. ▫ Role playing - bodily kinesthetic ▫ Graphic organizing - visual ▫ Collaboration - interpersonal • Oral presentations

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		even or odd **Essential knowledge and skills** • Adding multiple groups of equal size is the foundation for multiplication. • Sets of objects can be arranged in a rectangular array. • Even numbers can be divided into two equal sets, arranged into pairs or counted by twos; odd numbers cannot. **Teaching Examples** • Students explore odd and even numbers in a variety of ways including the following: students may investigate if a number is odd or even by determining if the number of objects can be divided into two equal sets, arranged into pairs or counted by twos. After the above experiences, students may derive that they only need to look at the digit in the ones place to determine if a number is odd or even since any number of tens will always split into two even groups. Example: • Students need opportunities writing equations representing sums of two equal addends, such as: 2 + 2 = 4, 3 + 3 = 6, 5 + 5 = 10, 6 + 6 = 12, or 8 + 8 =16. This understanding will lay the foundation for multiplication and is closely connected to 2.OA.4. • The use of objects and/or interactive whiteboards will help students develop and demonstrate various strategies to determine even and odd numbers. • Students may arrange any set of objects into a rectangular array. Objects can be cubes, buttons, counters, etc. Objects do not have to be square to make an array. Geoboards can also be used to demonstrate rectangular arrays. Students then write equations that represent the total as the sum of equal addends as shown below.  4 + 4 + 4 = 12  5 + 5 + 5 + 5 = 20 Interactive whiteboards and paper and pencil may be used to help students visualize and create arrays. (TUSD) • Construct viable arguments and critique the reasoning of others. • Model with mathematics • Look for and make use of structure. • Look for and express regularity in repeated reasoning.	 *The equation by rows: 20 = 5 + 5 + 5 +5* *The equation by columns: 20 = 4 + 4 + 4 + 4 + 4* • *Build on knowledge of composing and decomposing numbers to investigate arrays with up to 5 rows and up to 5 columns in different orientations. For example, form an array with 3 rows and 4 objects in each row. Represent the total number of objects with equations showing a sum of equal addends two different ways: by rows, 12 = 4 + 4 + 4; by columns, 12 = 3 + 3 + 3 + 3. Have students discuss this statement and explain their reasoning: The two arrays are different and yet the same.* (ODE)		• Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres Opinion Informative

MATHEMATICS CURRICULUM Grade 2

Curriculum Writers: Lorrie Manosh and Ginny Swanson

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		Academic vocabulary • Addend • Addition sentence • Area model • Array • Composing • Decomposing • Difference • Doubles • Equals • Even • Fact families • Factor • Fewer • Mental math • Minuend • Minus • More • Multiplication • Odd • Part • Product • Regroup • Strategy • Subtraction sentence • Subtrahend • Sum ASSESSMENT PROBLEMS 2. OA.3 Basic 2. OA.3 Advanced • http://www.illustrativemathematics.org/standards/k8 (Red and Blue Tiles) 2. OA.4 Basic • http://www.illustrativemathematics.org/standards/k8 (Counting Dots in Arrays) 2. OA.4 Advanced			
NUMBER AND OPERATIONS IN BASE TEN (2.NBT) Understand place value. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." 2.NBT.1a b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). 2.NBT.1b **Essential Question** • *What number is in the tens place? What is its value?* • *How does a digit's position affect its value?* • *How might you represent the number with a model?* **Essential knowledge and skills** • Three-digit numbers decompose into units of hundreds, tens and ones. **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with mathematics	TEACHER NOTES See instructional strategies in the introduction • *The understanding that 100 is 10 tens or 100 ones is critical to the understanding of place value. Using proportional models like base-ten blocks and bundles of tens along with numerals on place-value mats provides connections between physical and symbolic representations of a number. These models can be used to compare two numbers and identify the value of their digits.* • *Model three-digit numbers using base-ten blocks in multiple ways. For example, 236 can be 236 ones, or 23*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice)

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department		INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• The position of digits in numbers determines their value. **Teaching Examples** • Understanding that 10 ones make one ten and that 10 tens make one hundred is fundamental to students' mathematical development. ○ Students need multiple opportunities counting and "bundling" groups of tens in first grade. ○ In second grade, students build on their understanding by making bundles of 100s with or without leftovers using base ten blocks, cubes in towers of 10, ten frames, etc. This emphasis on bundling hundreds will support students' discovery of place value patterns. • As students are representing the various amounts, it is important that emphasis is placed on the language associated with the quantity. ○ For example, 243 can be expressed in multiple ways such as 2 groups of hundred, 4 groups of ten and 3 ones, as well as 24 tens and 3 ones. When students read numbers, they should read in standard form as well as using place value concepts. For example, 243 should be read as "two hundred forty-three" as well as two hundreds, 4 tens, 3 ones. • A document camera or interactive whiteboard can also be used to demonstrate "bundling" of objects. This gives students the opportunity to communicate their thinking. (TUSD)	• Use appropriate tools strategically • Look for and make use of structure • Look for and express regularity in repeated reasoning	*tens and 6 ones, or 2 hundreds, 3 tens and 6 ones, or 20 tens and 36 ones. Use activities and games that have students match different representations of the same number.* • *Provide games and other situations that allow students to practice skip-counting. Students can use nickels, dimes and dollar bills to skip count by 5, 10 and 100.* • *On a number line, have students use a clothespin or marker to identify the number that is ten more than a given number or five more than a given number.* • *Have students create and compare all the three-digit numbers that can be made using numbers from 0 to 9. For instance, using the numbers 1, 3, and 9, students will write the numbers 139, 193, 319, 391, 913 and 931. When students compare the numerals in the hundreds place, they should conclude that the two numbers with 9 hundreds would be greater than the numbers showing 1 hundred or 3 hundreds. When two numbers have the same digit in the hundreds place, students need to compare their digits in the tens place to determine which number is larger.* (ODE)	• http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Base-ten blocks • Expo markers • Place value mats/charts • Play money • White boards	• Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. □ Role playing - bodily kinesthetic □ Graphic organizing - visual □ Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres □ Opinion □ Informative
		2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s. **Essential Question** • *How might you represent the number with a model?* **Essential knowledge and skills** • The position of digits in numbers determines their value. • Numbers can be used to tell how many. **Teaching Examples**	**Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• Students need many opportunities counting, up to 1000, from different starting points. They should also have many experiences skip counting by 5s, 10s, and 100s to develop the concept of place value. • The ultimate goal for second graders is to be able to count in multiple ways with no visual support. (TUSD). (TUSD) mathematics • Look for and make use of structure • Look for and express regularity in repeated reasoning 2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form, e.g. 134 = 100 + 30 + 4 **Essential Question** • *What number is in the tens place? What is its value?* • *How does a digit's position affect its value?* • *How might you represent the number with a model?* • *In what other way might you decompose 125 using hundreds, tens, and/or ones?* **Essential knowledge and skills** • Three-digit numbers decompose into units of hundreds, tens and ones. • The position of digits in numbers determines their value. • Place value can be used to compare two or more quantities. **Teaching Examples** • Paper and pencil and manipulatives or interactive boards can also be used to demonstrate "bundling" of objects. This gives students the opportunity to communicate their thinking. (TUSD) **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with mathematics • Look for and make use of structure • Look for and express regularity in repeated reasoning 2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. **Essential Question** • *What number is in the tens place? What is its value?* **Mathematical Practices** • Make sense of problems and			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• *How does a digit's position affect its value?* • *How might you represent the number with a model?* • *How might you use place value to compare two or more quantities?* **Essential knowledge and skills** • Three-digit numbers decompose into units of hundreds, tens and ones. • The position of digits in numbers determines their value. • Place value can be used to compare and order numbers. • Numbers can be compared and related to other numbers in different ways > < +, before, after, between can be used to explain number relationships. • Position word before, after, between can be used to explain number relationships. **Teaching Examples** • The ultimate goal for second graders is to be able to count in multiple ways with no visual support. • Students need many opportunities reading and writing numerals in multiple ways. Examples: ○ Base-ten numerals 637 (standard form) ○ Number names six hundred thirty seven (written form) ○ Expanded form 600 + 30 + 7 (expanded notation) • When students say the expanded form, it may sound like this: "6 hundreds plus 3 tens plus 7 ones" OR 600 plus 30 plus 7." • Students may use models, number lines, base ten blocks, interactive whiteboards, document cameras, written words, and/or spoken words that represent two three-digit numbers. • To compare, students apply their understanding of place value. They first attend to the numeral in the hundreds place, then the numeral in tens place, then, if necessary, to the numeral in the ones place. • Comparative language includes but is not limited to: more than, less than, greater than, most, greatest, least, same as, equal to and not equal to.	persevere in solving them • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Model with mathematics • Attend to precision • Look for and make use of structure • Look for and express regularity in repeated reasoning		

MATHEMATICS CURRICULUM Grade 2

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CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		Students use the appropriate symbols to record the comparisons. (TUSD) **Academic vocabulary** • After • Before • Between • Equal to • Greater than • Greatest • Least • Less than • Number word • Pattern ASSESSMENT PROBLEMS 2. NBT.1 Basic • http://www.illustrativemathematics.org/standards/k8 (Bundling and Unbundling, Largest Number Game , One, Ten, and One Hundred More and Less) 2. NBT. • http://www.illustrativemathematics.org/standards/k8 (Boxes and Cartons of Pencils, Making 124) 2. NBT.2 Basic 2. NBT.2 Advanced • http://www.illustrativemathematics.org/standards/k8 (Saving Money) 2. NBT.3 Basic 2. NBT.3 Advanced 2. NBT.4 Basic • http://www.illustrativemathematics.org/standards/k8 (Comparisons 1, Digits 2-5-7, Ordering 3-Digit Numbers) 2. NBT.4 Advanced • http://www.illustrativemathematics.org/standards/k8 (Comparisons 2)			
NUMBER AND OPERATIONS IN BASE TEN (2.NBT Use place value understanding and properties of operations to add and subtract. Use **Mathematical**		**Students** 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. **Essential Question** • *How can I compose or decompose this number using place value to help me add or subtract?* **Mathematical Practices** • Make sense of problems and	TEACHER NOTES See instructional strategies in the introduction • *Explanations may be supported by drawings or objects.* • *Provide many activities that will help students develop a*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S)	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED

MATHEMATICS CURRICULUM Grade 2

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CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
Practices to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		• *Which mathematical property(ies) helped you solve this problem? Explain your thinking.* • *How are the commutative and associative properties of addition similar to and different from each other?* • *What strategy could you use to solve 48 + 27? What other strategy could you use?* • *How might you use place value to explain why addition and subtraction strategies work?* • *What is ten more/less than 35? What is ten more/less than 67? What stayed the same? What changed? Why? Will this always happen?* **Essential knowledge and skills** • Composing and decomposing numbers by place value allows for efficiency for addition and subtraction computation. • Sometimes it is necessary to compose a unit of the next higher value when adding multi-digit numbers. • Flexible methods for computation require a strong understanding of the operations of addition and subtraction and their properties. • Adding and subtracting hundreds or tens is similar to adding or subtracting single digit numbers. **Teaching Examples** • Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students should have experiences solving problems written both horizontally and vertically. They need to communicate their thinking and be able to justify their strategies both verbally and with paper and pencil • Addition strategies based on place value for 48 + 37 may include: ○ Adding by place value: 40 + 30 = 70 and 8 + 7 = 15 and 70 + 15 = 85. ○ Incremental adding (breaking one number into tens and ones); 48 + 10 = 58, 58 + 10 = 68, 68 + 10 = 78, 78 + 7 = 85 ○ Compensation (making a friendly number): 48 + 2 = 50, 37 – 2 = 35, 50 + 35 = 85 • Subtraction strategies based on place value for 81 - 37 may include:	persevere in solving them • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Model with mathematics • Attend to precision • Look for and make use of structure • Look for and express regularity in repeated reasoning	*strong understanding of number relationships, addition and subtraction so they can develop, share and use efficient strategies for mental computation. An efficient strategy is one that can be done mentally and quickly. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use. Students need to build on their flexible strategies for adding within 100 in Grade 1 to fluently add and subtract within 100, add up to four two-digit numbers, and find sums and differences less than or equal to 1000 using numbers 0 to 1000.* • *Initially, students apply base-ten concepts and use direct modeling with physical objects or drawings to find different ways to solve problems. They move to inventing strategies that do not involve physical materials or counting by ones to solve problems. Student-invented strategies likely will be based on place-value concepts, the commutative and associative properties, and the relationship between addition and subtraction. These strategies should be done mentally or with a written record for support.*	• *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Base-ten blocks • Counters • Graph paper • Place-value mat • Hundreds chart (numbers 1-100) and blank hundreds chart	FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. ▫ Role playing - bodily kinesthetic ▫ Graphic organizing - visual ▫ Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		○ Adding up (from smaller number to larger number): 37 + 3 = 40, 40 + 40 = 80, 80 + 1 = 81, and 3 + 40 + 1 = 44. ○ Incremental subtracting: 81 -10 = 71, 71 – 10 = 61, 61 – 10 = 51, 51 – 7 = 44 ○ Subtracting by place value: 81 – 30 = 51, 51 – 7 = 44 • Properties that students should know and use are: ○ Commutative property of addition (Example: 3 + 5 = 5 + 3) ○ Associative property of addition (Example: (2 + 7) + 3 = 2 + (7+3)) ○ Identity property of 0 (Example: 8 + 0 = 8) • Students in second grade need to communicate their understanding of why some properties work for some operations and not for others. ○ Commutative Property: In first grade, students investigated whether the commutative property works with subtraction. The intent was for students to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should also understand that they will be working with numbers in later grades that will allow them to subtract larger numbers from smaller numbers. This exploration of the commutative property continues in second grade. ○ Associative Property: Recognizing that the associative property does not work for subtraction is difficult for students to consider at this grade level as it is challenging to determine all the possibilities. (TUSD) 2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations. **Essential Question** • *How can I compose or decompose this number using place value to help me add or subtract?* • *What strategy could you use to solve 48 + 27? What other strategy could you use?* **Mathematical Practices** • Make sense of problems and persevere in solving them	• *It is vital that student-invented strategies be shared, explored, recorded and tried by others. Recording the expressions and equations in the strategies horizontally encourages students to think about the numbers and the quantities they represent instead of the digits.* • *Students will decompose and compose tens and hundreds when they develop their own strategies for solving problems where regrouping is necessary.* • *Have students analyze problems before they solve them. Present a variety of subtraction problems within 1000. Ask students to identify the problems requiring them to decompose the tens or hundreds to find a solution and explain their reasoning.* (ODE)		• Technology • Think-alouds • Writing genres □ Opinion □ Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• *Is my sum or difference a reasonable answer!* **Essential knowledge and skills** • Flexible methods for computation require a strong understanding of the operations of addition and subtraction and their properties. • Addition and subtraction problems are properly aligned – ones with ones, tens with tens. **Teaching Examples** • Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students should have experiences solving problems written both horizontally and vertically. They need to communicate their thinking and be able to justify their strategies both verbally and with paper and pencil. • Addition strategies based on place value for 48 + 37 may include: ○ Adding by place value: 40 + 30 = 70 and 8 + 7 = 15 and 70 + 15 = 85. ○ Incremental adding (breaking one number into tens and ones); 48 + 10 = 58, 58 + 10 = 68, 68 + 10 = 78, 78 + 7 = 85 ○ Compensation (making a friendly number): 48 + 2 = 50, 37 – 2 = 35, 50 + 35 = 85 • Subtraction strategies based on place value for 81 - 37 may include: ○ Adding up (from smaller number to larger number): 37 + 3 = 40, 40 + 40 = 80, 80 + 1 = 81, and 3 + 40 + 1 = 44. ○ Incremental subtracting: 81 -10 = 71, 71 – 10 = 61, 61 – 10 = 51, 51 – 7 = 44 ○ Subtracting by place value: 81 – 30 = 51, 51 – 7 = 44 • Properties that students should know and use are: ○ Commutative property of addition (Example: 3 + 5 = 5 + 3) ○ Associative property of addition (Example: (2 + 7) + 3 = 2 + (7+3)) ○ Identity property of 0 (Example: 8 + 0 = 8) • Students in second grade need to communicate their understanding of why some properties work for some operations and not for others. ○ Commutative Property: In first grade, • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Attend to precision • Look for and make use of structure			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		students investigated whether the commutative property works with subtraction. The intent was for students to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should also understand that they will be working with numbers in later grades that will allow them to subtract larger numbers from smaller numbers. This exploration of the commutative property continues in second grade. ○ Associative Property: Recognizing that the associative property does not work for subtraction is difficult for students to consider at this grade level as it is challenging to determine all the possibilities. (TUSD) 2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. **Essential Question** • *How do I know when to regroup?* • *Why do I need to align my numbers in correct place when adding or subtracting?* **Essential knowledge and skills** • Comparing an estimate with the answer is a way to make sure the computation is reasonable. • While working on addition and subtraction algorithms the use of place value models will help to strengthen the students understanding of both the algorithm and place value. **Teaching Examples** • Using graph paper will help students line up digits so that thousands, hundreds, tens, and ones are in their proper columns. • Interactive whiteboards, graph paper and models will be used to justify student thinking. (TUSD) **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with mathematics ★ • Use appropriate tools strategically • Look for and make use of structure • Look for and express regularity in repeated reasoning			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. **Essential Question** • *How can you use mental math to add multiples of 100's, 10's?* **Essential knowledge and skills** • Composing and decomposing numbers by place value allows for efficiency for addition and subtraction computation. • Sometimes it is necessary to compose a unit of the next higher value when adding multi-digit numbers. • Flexible methods for computation require a strong understanding of the operations of addition and subtraction and their properties. **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Look for and make use of structure • Look for and express regularity in repeated reasoning **Teaching Examples** • Students need many opportunities to practice mental math by adding and subtracting multiples of 10 and 100 up to 900 using different starting points. They can practice this by counting and thinking aloud, finding missing numbers in a sequence, and finding missing numbers on a number line or hundreds chart. Explorations should include looking for relevant patterns. • Mental math strategies may include: o counting on; 300, 400, 500, etc. o counting back; 550, 450, 350, etc. Examples: o 100 more than 653 is _____ (753) o 10 less than 87 is _____ (77) o "Start at 248. Count up by 10s until I tell you to stop." • An interactive whiteboard or document camera may be used to help students develop these mental math skills. (TUSD) 2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		Essential Question • *How can you use different strategies to successfully solve + or = problems?* • *How might you use place value to explain why addition and subtraction strategies work?* **Essential knowledge and skills** • Students need to be able to justify their answers orally, in writing and/or using models to explain. **Teaching Examples** • Students need multiple opportunities explaining their addition and subtraction thinking. Operations embedded within a meaningful context promote development of reasoning and justification. Example: • Mason read 473 pages in June. He read 227 pages in July. How many pages did Mason read altogether? ○ Karla's explanation: 473 + 227 = _____. I added the ones together (3 + 7) and got 10. Then I added the tens together (70 + 20) and got 90. I knew that 400 + 200 was 600. So I added 10 + 90 for 100 and added 100 + 600 and found out that Mason had read 700 pages altogether. ○ Debbie's explanation: 473 + 227 = _____. I started by adding 200 to 473 and got 673. Then I added 20 to 673 and I got 693 and finally I added 7 to 693 and I knew that Mason had read 700 pages altogether. ○ Becky's explanation: I used base-ten blocks on a base ten mat to help me solve this problem. I added 3 ones (units) plus 7 ones and got 10 ones which made one ten. I moved the 1 ten to the tens place. I then added 7 tens rods plus 2 tens rods plus 1 tens rod and got 10 tens or 100. I moved the 1 hundred to the hundreds place. Then I added 4 hundreds plus 2 hundreds plus 1 hundred and got 7 hundreds or 700. So Mason read 700 books. • Students should be able to connect different representations and explain the connections. Representations can include numbers, words (including mathematical language), pictures, **Mathematical Practices** • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Model with mathematics • Use appropriate tools strategically • Look for and make use of structure • Look for and express regularity in repeated reasoning			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		number lines, and/or physical objects. Students should be able to use any/all of these representations as needed. • An interactive whiteboard or document camera can be used to help students develop and explain their thinking. (TUSD) **Academic vocabulary** • After • Before • Between • Equal to • Greater than • Greatest • Least • Less than • Number word • Pattern ASSESSMENT PROBLEMS 2. NBT.5 Basic • http://www.illustrativemathematics.org/standards/k8 (Jamir's Penny Saving Jar) 2. NBT.5 Advanced • http://www.illustrativemathematics.org/standards/k8 (Saving Money 1 and Saving Money 2) 2. NBT.6 Basic 2. NBT.6 Advanced • http://www.illustrativemathematics.org/standards/k8 (Toll Bridge Puzzle) 2. NBT.7 Basic • http://www.illustrativemathematics.org/standards/k8 (How Many Days Until Summer Vacation?) 2. NBT.7 Advanced 2. NBT.8 Basic 2. NBT.8 Advanced 2. NBT.9 Basic 2. NBT.9 Advanced			
MEASUREMENT AND DATA (2.MD) Measure and estimate lengths in standard		**Students** 2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	TEACHER NOTES See instructional strategies in the introduction	RESOURCE NOTES RESOURCE NOTES See resources in the	ASSESSMENT NOTES See assessments in the introduction

MATHEMATICS CURRICULUM Grade 2

Curriculum Writers: Lorrie Manosh and Ginny Swanson

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
units. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Essential Question** • *Why does "what" we measure influence "how" we measure?* • *What tool would you use to measure the classroom? Why?* • *How did you measure that?* • *How do you determine which measuring tool to use?* **Essential knowledge and skills** • Standard units of measurement are necessary to measure an object accurately. • Rulers and other measurement tools can be used for quantifying measurement. • Measurement is a process of comparing a unit to the object being measured. **Teaching Examples** • Students in second grade will build upon what they learned in first grade from measuring length with non-standard units to the new skill of measuring length in metric and U.S. Customary with standard units of measure. • They should have many experiences measuring the length of objects with rulers, yardsticks, meter sticks, and tape measures. • They will need to be taught how to actually use a ruler appropriately to measure the length of an object especially as to where to begin the measuring. Do you start at the end of the ruler or at the zero? (TUSD) **Mathematical Practices** • Use appropriate tools strategically • Attend to precision • Look for and make use of structure 2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen **Essential Question** • *How do we use different units of measurement (centimeter, inches, feet yard) to measure the same object?* • *How do you compare/contrast two different units of measurement when measuring the same object?* **Essential knowledge and skills** • Different tools are used to measure different objects • Objects have different attributes and some attributes are measurable. **Mathematical Practices** • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Use appropriate tools strategically • Attend to precision • Look for and make	• *Second graders are transitioning from measuring lengths with informal or nonstandard units to measuring with these standard units: inches, feet, centimeters, and meters. The measure of length is a count of how many units are needed to match the length of the object or distance being measured. Students have to understand what a length unit is and how it is used to find a measurement. They need many experiences measuring lengths with appropriate tools so they can become very familiar with the standard units and estimate lengths. Use language that reflects the approximate nature of measurement, such as the length of the room is about 26 feet.* • *Have students measure the same length with different-sized units then discuss what they noticed. Ask questions to guide the discussion so students will see the relationship between the size of the units and measurement, i.e. the measurement made with the smaller unit is more than the measurement made with the larger unit and vice versa.* • *Insist that students always estimate lengths before they measure. Estimation helps them focus on the attribute to be measured, the length units, and the process. After they find measurements, have students discuss the*	introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov	REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. ▫ Role playing - bodily kinesthetic ▫ Graphic organizing - visual ▫ Collaboration - interpersonal

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• Linear measurement involves units of equal size repeated over and over. The smaller the unit, the more of it you will need to measure the length of an object. use of structure **Teaching Examples** • Students need multiple opportunities to measure using different units of measure. They should not be limited to measuring within the same standard unit. • Students should have access to tools, both U.S. Customary and metric. • The more students work with a specific unit of measure, the better they become at choosing the appropriate tool when measuring. • Students measure the length of the same object using different tools (ruler with inches, ruler with centimeters, a yardstick, or meter stick). This will help students learn which tool is more appropriate for measuring a given object. • They describe the relationship between the size of the measurement unit and the number of units needed to measure something. For instance, a student might say, "The longer the unit, the fewer I need." Multiple opportunities to explore provide the foundation for relating metric units to customary units, as well as relating within customary (inches to feet to unit, the fewer I need. Multiple opportunities to explore provide the foundation for relating metric units to customary units, as well as relating within customary (inches to feet to yards) and within metric (centimeters to meters). (TUSD) 2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters. **Essential Question** • *Why would estimating be helpful to choosing the correct measurement tools?* • *Estimate the length of your foot. Now choose a tool to measure it. What tool will you choose? How close was your estimate?* **Mathematical Practices** • Use appropriate tools strategically • Attend to precision **Essential knowledge and skills** • Some measurements can be approximated using known measurement units (feet, inches, yards) • The better we understand the size of a unit, the better we can estimate a length.	*estimates,* (ODE)	Materials • Centimeter rulers and tapes • Inch rulers and tapes • Meter sticks • Yardsticks	• Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres Opinion Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		Teaching Examples • Estimation helps develop familiarity with the specific unit of measure being used. To measure the length of a shoe, knowledge of an inch or a centimeter is important so that one can approximate the length in inches or centimeters. Students should begin practicing estimation with items which are familiar to them (length of desk, pencil, favorite book, etc.). • Some useful benchmarks for measurement are: ○ First joint to the tip of a thumb is about an inch ○ Length from your elbow to your wrist is about a foot ○ If your arm is held out perpendicular to your body, the length from your nose to the tip of your fingers is about a yard.  (TUSD) 2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. **Essential Question** • *How can you compare the objects being measured?* • *How much larger or smaller is one object compared to another?* • *How does the size of the unit of measure impact the number of units needed to measure an object or shape?* **Mathematical Practices** • Use appropriate tools strategically • Attend to precision **Essential knowledge and skills** • When measuring students need to have an understanding of greater than, less than, equal to, in order to compare objects. • The length of an object or shape can be measured using standard or non-standard units of measure. **Teaching Examples** • Students need experience working with addition and subtraction to solve word problems which include measures of length. It is important that			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		word problems stay within the same unit of measure. • Counting on and/or counting back on a number line will help tie this concept to previous knowledge. • Some representations students can use include drawings, rulers, pictures, and/or physical objects. An interactive whiteboard or document camera may be used to help students develop and demonstrate their thinking. • Equations include: ○ 20 + 35 = c ○ c - 20 = 35 ○ c – 35 = 20 ○ 20 + b = 55 ○ 35 + a = 55 ○ 55 = a + 35 ○ 55 = 20 + b Example: • A word problem for 5 – n = 2 could be: Mary is making a dress. She has 5 yards of fabric. She uses some of the fabric and has 2 yards left. How many yards did Mary use? • There is a strong connection between this standard and demonstrating fluency of addition and subtraction facts. Addition facts through 10 + 10 and the related subtraction facts should be included. (TUSD) **Academic vocabulary** • Bar graph • Categories • Centimeter, meter • Clock (analog and digital) • Coin • Data • Dime • Dollar • Estimate • Graph • Hour • Inch, Feet, yard • Length • Line plot • Linear • Measure, measurement • Minute • Nickel • Penny • Pictograph • Quarter • Represent • Ruler • Variable/symbol • Width ASSESSMENT PROBLEMS 2. MD.1 Basic 2. MD.1 Advanced			

MATHEMATICS CURRICULUM Grade 2

Curriculum Writers: Lorrie Manosh and Ginny Swanson

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		2. MD.2 Basic 2. MD.2 Advanced 2. MD.3 Basic 2. MD.3 Advanced 2. MD.4 Basic 2. MD.4 Advanced			
MEASUREMENT AND DATA (2.MD) Relate addition and subtraction to length. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. **Essential Question** • *How might you use addition or subtraction to solve a measurement problem?* • *How might you use a letter in an equation to represent a missing part or a missing whole?* **Essential knowledge and skills** • Addition and subtraction are routinely applied in situations that require measurement. • Variables or symbols can be used to express an unknown quantity in an equation. **Teaching Examples** • Students need experience working with addition and subtraction to solve word problems which include measures of length. It is important that word problems stay within the same unit of measure. • Some representations students can use include drawings, rulers, pictures, and/or physical objects. An interactive whiteboard or document camera may be used to help students develop and demonstrate their thinking. • Equations include: **Mathematical Practices** • Make sense of problems and persevere in solving them. • Reason abstractly and Quantitatively. • Model with mathematics • Use appropriate tools strategically • Look for and express regularity in Repeated reasoning	TEACHER NOTES See instructional strategies in the introduction • *Connect the whole-number units on rulers, yardsticks, meter sticks and measuring tapes to number lines showing whole-number units starting at 0. Use these measuring tools to model different representations for whole-number sums and differences less than or equal to 100 using the numbers 0 to 100.* • *Use the meter stick to view units of ten (10 cm) and hundred (100 cm), and to skip count by 5s and 10s.* • *Provide one- and two-step word problems that include different lengths measurement made with the same unit (inches, feet, centimeters, and meters). Students add and subtract within 100 to solve problems for these situations: adding to, taking from, putting together, taking apart, and comparing, and with*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
	-	○ 20 + 35 = c ○ c - 20 = 35 ○ c – 35 = 20 ○ 20 + b = 55 ○ 35 + a = 55 ○ 55 = a + 35 ○ 55 = 20 + b Example: • A word problem for 5 – n = 2 could be: Mary is making a dress. She has 5 yards of fabric. She uses some of the fabric and has 2 yards left. How many yards did Mary use? • There is a strong connection between this standard and demonstrating fluency of addition and subtraction facts. Addition facts through 10 + 10 and the related subtraction facts should be included. (TUSD) 2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram. **Essential Question** • *How is a ruler like a number line?* • *How might a number line help you add and subtract?* **Essential knowledge and skills** • A number line measures distances from zero as a ruler does. • An unmarked number line (an open number line) can be used to add and subtract. (Note: This standard supports NBT: Addition and subtraction.) **Teaching Examples** • Counting on and/or counting back on a number line will help tie this concept to previous knowledge. • Students represent their thinking when adding and subtracting within 100 by using a number line. An interactive whiteboard or document camera can be **Mathematical Practices** • Reason abstractly and quantitatively • Model with mathematics • Use appropriate tools strategically	*unknowns in all positions. Students use drawings and write equations with a symbol for the unknown to solve the problems.* • *Have students represent their addition and subtraction within 100 on a number line. [For 49 + 5, they start at 49 on the line and draw a curve to 50, then continue drawing curves to 54]. Drawing the curves or making the —hops|| between the numbers will help students focus on a space as the length of a unit and the sum or difference as a length.* (ODE)	oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Measuring tapes • Meter sticks • Rulers • Yardsticks	• Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. □ Role playing - bodily kinesthetic □ Graphic organizing - visual □ Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres □ Opinion □ Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		used to help students demonstrate their thinking. • Example: 10 – 6 = 4  (TUSD) **Academic vocabulary** • Bar graph • Categories • Centimeter, meter • Clock (analog and digital) • Coin • Data • Dime • Dollar • Estimate • Graph • Hour • Inch, Feet, yard • Length • Line plot • Linear • Measure, measurement • Minute • Nickel • Penny • Pictograph • Quarter • Represent • Ruler • Variable/symbol • Width ASSESSMENT PROBLEMS 2. MD.5 Basic 2. MD.5 Advanced 2. MD.6 Basic • http://www.illustrativemathematics.org/standards/k8 (Frog and Toad on the Number Line) 2. MD.6 Advanced			
MEASUREMENT AND DATA (2.MD) Work with time and money. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision		**Students** 2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. **Essential Question** • *How do you determine which hand measures hours vs. minutes* • *How are analog and digital clocks similar to and different from each other?* • *How might you prove that 15 minutes is the same time as one quarter of an hour?* **Essential knowledge and skills** • Time can be measured in units of time. **Mathematical Practices** • Use appropriate tools strategically • Attend to precision	TEACHER NOTES See instructional strategies in the introduction • *Second graders expand their work with telling time from analog and digital clocks to the nearest hour or half-hour in Grade 1 to telling time to the nearest five minutes using a.m. and p.m.* • *The topic of money begins at Grade 2 and builds on the work in other clusters in this and previous grades. Help students learn money*	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		• One day includes two cycles of 12 hours or one cycle of 24 hours; the 12 hours from midnight to noon can be indicated by "a.m.", while the 12 hours from noon to midnight can be indicated by "p.m.". • Units of time include hours (60 minutes), half-hours (30 minutes), minutes (60 seconds), and seconds. **Teaching Examples** • In first grade, students learned to tell time to the nearest hour and half-hour. Students build on this understanding in second grade by skip-counting by 5 to recognize 5-minute intervals on the clock. • They need exposure to both digital and analog clocks. It is important that they can recognize time in both formats and communicate their understanding of time using both numbers and language. • Common time phrases include the following: quarter till ___, quarter after ___, ten till ___, ten after ___, and half past ___. • Students should understand that there are 2 cycles of 12 hours in a day - a.m. and p.m. Recording their daily actions in a journal would be helpful for making real-world connections and understanding the difference between these two cycles. An interactive whiteboard or document camera may be used to help students demonstrate their thinking. (TUSD) 2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, Using $ and ¢ symbols appropriately. ○ *Example: If you have 2 dimes and 3 pennies, how many cents do you have?* **Essential Question** • *What is the value of each coin or bill?* • *How might you prove that two dimes and one nickel is equal to one quarter?* • *What are different ways that you can make 72 cents? How do you know you have all the ways?* **Essential knowledge and skills** • The symbols ¢ and $ represent cents and dollars in United States currency. • U.S. currency includes coins worth 1, 5, 10, 25, 50, and 100 cents and paper money worth 1, 2, 5, 10, **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with mathematics 5. Use appropriate tools strategically	*concepts and solidify their understanding of other topics by providing activities where students make connections between them. For instance, link the value of a dollar bill as 100 cents to the concept of 100 and counting within 1000. Use play money - nickels, dimes, and dollar bills to skip count by 5s, 10s, and 100s. Students use the context of money to find sums and differences less than or equal to 100 using the numbers 0 to 100. They add and subtract to solve one- and two-step word problems involving money situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. Students use drawings and equations with a symbol for the unknown number to represent the problem. The dollar sign, $, is used for labeling whole-dollar amounts without decimals, such as $29.* • *Students need to learn the relationships between the values of a penny, nickel, dime, quarter and dollar bill.* (ODE)	• LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Judy clock • Play money	• Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple Intelligences assessments, e.g. □ Role playing - bodily kinesthetic □ Graphic organizing - visual □ Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		20, 50, and 100 dollars; amounts of money can be configured in multiple ways. • Look for and express regularity in repeated reasoning **Teaching Examples** • Since money is not specifically addressed in kindergarten, first grade, or third grade, students should have multiple opportunities to identify, count, recognize, and use coins and bills in and out of context. They should also experience making equivalent amounts using both coins and bills. "Dollar bills" should include denominations up to one hundred ($1.00, $5.00, $10.00, $20.00, $100.00). • Students should solve story problems connecting the different representations. These representations may include objects, pictures, charts, tables, words, and/or numbers. Students should communicate their mathematical thinking and justify their answers. An interactive whiteboard or document camera may be used to help students demonstrate and justify their thinking. Example: • Sandra went to the store and received $ 0.76 in change. What are three different sets of coins she could have received? (TUSD) **Academic vocabulary** • Bar graph • Categories • Centimeter, meter • Clock (analog and digital) • Coin • Data • Dime • Dollar • Estimate • Graph • Hour • Inch, Feet, yard • Length • Line plot • Linear • Measure, measurement • Minute • Nickel • Penny Pictograph • Quarter • Represent • Ruler • Variable/symbol • Width ASSESSMENT PROBLEMS 2. MD.7 Basic 2. MD.7 Advanced 2. MD.8 Basic			• Think-alouds • Writing genres Opinion Informative

MATHEMATICS CURRICULUM Grade 2

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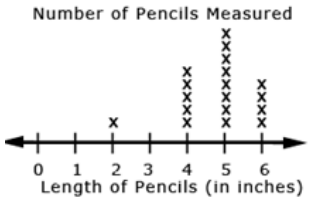
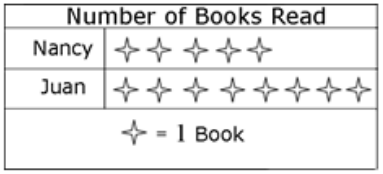
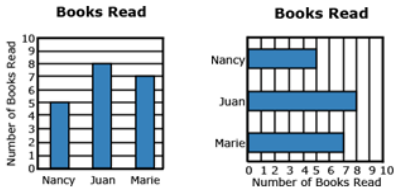
CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• http://www.illustrativemathematics.org/standards/k8 (Jamir's Penny Jar, Visiting the Arcade) 2. MD.8 Advanced • http://www.illustrativemathematics.org/standards/k8 (Delayed Gratification)			
MEASUREMENT AND DATA (2MD) Represent and interpret data. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. **Essential Question** • *How can a line plot be used to show units of measurement?* • *Why would you display data in different ways?* • *How might you represent your data in a way that makes sense?* • *What put together problem might you create from your data?* • *What take apart problem might you create from your data?* • *What compare problem might you create from your data?* **Mathematical Practices** • Model with mathematics • Use appropriate tools strategically • Attend to precision • Look for and express regularity in repeated reasoning **Essential knowledge and skills** • Measurement data can be represented on line plots. • The foundation of a line plot is a number line; an 'X' corresponds to the value of the nearest whole unit on the line for every piece of data. • Labeling graphs or line plots helps to interpret the representation. • Data can be analyzed to compare and contrast information. (TUSD) **Teaching Examples** • This standard emphasizes representing data using a line plot. Students will use the measurement skills learned in earlier standards to measure objects. Line plots are first introduced in this grade level. A line plot can be thought of as plotting data on a number line. An interactive whiteboard may be	TEACHER NOTES See instructional strategies in the introduction • *Line plots are useful tools for collecting data because they show the number of things along a numeric scale. They are made by simply drawing a number line then placing an X above the corresponding value on the line that represents each piece of data. Line plots are essentially bar graphs with a potential bar for each value on the number line.* • *Pose a question related to the lengths of several objects. Measure the objects to the nearest whole inch, foot, centimeter or meter. Create a line plot with whole-number units (0, 1, 2, ...) on the number line to represent the measurements.* • *Students makiehorizontal or vertical bar graphs with two to four categories and a single-unit scale. Use the information in the graphs to pose and solve simple put together, take-apart, and compare problems illustrated in Table 1 of the Common Core State Standards.* (ODE)	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1 • http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices • Modeling ★ • Multiple

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		used to create and/or model line plots.  (TUSD) 2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph. **Essential Question** • *Why would you display data in different ways?* • *How might you represent your data in a way that makes sense?* • *What put together problem might you create from your data?* • *What take apart problem might you create from your data?* • *What compare problem might you create from your data?* **Essential knowledge and skills** • Categorical data can be represented in many ways, including picture graphs and bar graphs. • Measurement data can be represented on line lots. • The foundation of a line plot is a number line; an 'X' corresponds to the value of the nearest whole unit on the line for every piece of data. • Labeling graphs or line plots helps to interpret the representation. • Data can be analyzed to compare and contrast information. **Teaching Examples** • Students should draw both picture and bar graphs representing data that can be sorted up to four categories using single unit scales (e.g., scales should count by ones). The data should be used to **Academic vocabulary** **Mathematical Practices** • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively • Model with mathematics		contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Common Core State Standards for Mathematics: Common addition and subtraction situations • Graph paper • Rulers	Intelligences assessments, e.g. ▫ Role playing - bodily kinesthetic ▫ Graphic organizing - visual ▫ Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres ▫ Opinion ▫ Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		solve put together, take-apart, and compare problems as listed in Table 1.  • In second grade, picture graphs (pictographs) include symbols that represent single units. Pictographs should include a title, categories, category label, key, and data.  • Second graders should draw both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data. (TUSD)			

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[1]
Put Together/ Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[3]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[2]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[3]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

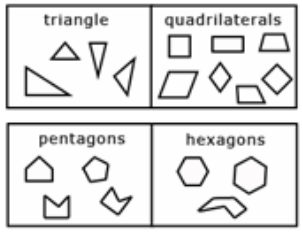
Academic vocabulary

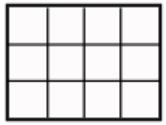
- Bar graph
- Categories
- Centimeter, meter
- Clock (analog and digital)
- Coin
- Data
- Dime
- Dollar
- Estimate
- Graph
- Hour
- Inch, Feet, yard
- Length
- Line plot
- Linear
- Measure, measurement
- Minute
- Nickel
- Quarter
- Represent
- Ruler
- Variable/symbol
- Width

MATHEMATICS CURRICULUM Grade 2

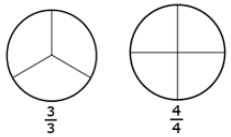
Curriculum Writers: Lorrie Manosh and Ginny Swanson

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		ASSESSMENT PROBLEMS 2. MD.9 Basic • http://www.illustrativemathematics.org/standards/k8 (Hand Span Measures) 2. MD.9 Advanced 2. MD.10 Basic 2. MD.10 Advanced			
GEOMETRY (2G) Reason with shapes and their attributes. Use **Mathematical Practices** to 1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others **4.** Model with mathematics ★ 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning		**Students** 2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. **Essential Question** • *How do the attributes help identify the shape?* • *Students identify, describe, and draw triangles, quadrilaterals, pentagons, and hexagons.* • *Pentagons, triangles, and hexagons should appear as both regular (equal sides and equal angles) and irregular.* **Essential knowledge and skills** • Shapes can be classified by their attributes. • Shapes can be composed and decomposed to make different shapes. **Teaching Examples** • Students identify, describe, and draw triangles, quadrilaterals, pentagons, and hexagons. • Pentagons, triangles, and hexagons should appear as both regular (equal sides and equal angles) and irregular. • Students recognize all four sided shapes as quadrilaterals. • Students use the vocabulary word "angle" in place of "corner" but they do not need to name angle types. • Interactive whiteboards and document cameras may be used to help identify shapes and their attributes. **Mathematical Practices** • Model with mathematics • Look for and make use of structure	TEACHER NOTES See instructional strategies in the introduction • *Sizes are compared directly or visually, not compared by measuring.* • *Modeling multiplication with partitioned rectangles promotes students' understanding of multiplication.* • *It is vital that students understand different representations of fair shares. Provide a collection of different-size circles and rectangles cut from paper. Ask students to fold some shapes into halves, some into thirds, and some into fourths. They compare the locations of the folds in their shapes as a class and discuss the different representations for the fractional parts.* (ODE)	RESOURCE NOTES See resources in the introduction Textbook • *enVisionMath* Supplementary Books, Teacher (T) Student (S) • *Mad Minutes* Technology • Calculators • Computers • LCD projectors • Interactive boards Websites • Skills Tutor • http://curriculum.northsmithfieldschools.com • http://www.achieve.org/http://my.hrw.com • http://www.illustrativemathematics.org/standards/practice • http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1	ASSESSMENT NOTES See assessments in the introduction REQUIRED COMMON ASSESSMENTS • Common units • Common unit assessments SUGGESTED FORMATIVE/ SUMMATIVE ASSESSMENTS • Anecdotal records • Checklist (mathematical practice) • Conferencing • Exhibits • Interviews • Graphic organizers • Journals • Mathematical Practices

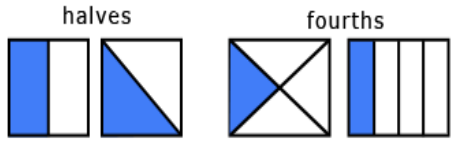
CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		• Shapes should be presented in a variety of orientations and configurations.  (TUSD) 2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. **Essential Question** • *How might you partition this rectangle into four equal shares (pieces)?* • *In what other ways might you partition the rectangle into four shares?* **Essential knowledge and skills** • Shapes can be used to represent fractions by partitioning them into equal shares (pieces). • Rectangles can be partitioned into rows and columns of equal sized pieces (Note: This is a foundation for multiplication and area) • Equal shares can be different shapes within the same whole. **Teaching Examples** • This standard is a precursor to learning about the area of a rectangle and using arrays for multiplication. An interactive whiteboard or manipulatives such as square tiles, cubes, or other square shaped objects can be used to help students partition rectangles. • Rows are horizontal and columns are vertical. **Mathematical Practices** • Reason abstractly and quantitatively • Attend to precision • Look for and express regularity in repeated reasoning		• http://www.parcconline.org/sites/parcc/files/PARCC%20Math%20S • http://www.tusd1.org/contents/distinfo/curriculum/index.asp • www.commoncore.org/maps • www.corestandards.org • www.khanacademy.com • www.ride.ri.gov Materials • Grid paper • Fraction bars/manipulatives • Equivalent fraction charts	• Modeling ★ • Multiple Intelligences assessments, e.g. Role playing - bodily kinesthetic Graphic organizing - visual Collaboration - interpersonal • Oral presentations • Problem/Performance based/common tasks • Tests and quizzes • Technology • Think-alouds • Writing genres Opinion Informative

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS
		 (TUSD)			
		2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. **Essential Question** • *How might you partition this rectangle into four equal shares (pieces)?* • *In what other ways might you partition the rectangle into four shares?* **Essential knowledge and skills** • Shapes can be used to represent fractions by partitioning them into equal shares (pieces). • Rectangles can be partitioned into rows and columns of equal sized pieces (Note: This is a foundation for multiplication and area) • Equal shares can be different shapes within the same whole. **Teaching Examples** This standard introduces fractions in an area model. Students need experiences with different sizes, circles, and rectangles. For example, students should recognize that when they cut a circle into three equal pieces, each piece will equal one third of its original whole. In this case, students should describe the whole as three thirds. If a circle is cut into four equal pieces, each piece will equal one fourth of its original whole and the whole is described as four fourths. **Mathematical Practices** • Reason abstractly and quantitatively • Construct viable arguments and critique the reasoning of others • Attend to precision • Look for and express regularity in repeated reasoning		

CATEGORIES, DOMAINS, CLUSTERS	UNIT	STANDARDS/BENCHMARKS North Smithfield School Department	INSTRUCTIONAL STRATEGIES	RESOURCES	ASSESSMENTS



Students should see circles and rectangles partitioned in multiple ways so they learn to recognize that equal shares can be different shapes within the same whole. An interactive whiteboard may be used to show partitions of shapes.



(TUSD)

Academic vocabulary

- Angle (instead of corner)
- Attribute
- Circle
- Columns (2-dimensional)
- Edges
- Faces (3-dimensional)
- Fourths
- Fraction
- Halves
- Hexagon
- Horizontal
- Line
- One-fourth
- One-half
- One-third
- Pentagon
- Quadrilateral
- Rectangle
- Rhombus
- Rows
- Shape
- Side
- Square
- Thirds
- Trapezoid
- Triangle
- Vertex (vertices)
- Vertical

ASSESSMENT PROBLEMS

2. G.1 Basic

2. G.1 Advanced

2. G.2 Basic

2. G.2 Advanced

2. G.3 Basic

- http://www.illustrativemathematics.org/standards/k8 (Which Pictures Represent One Half? Representing Half of a Rectangle)
- 2. G.3 Advanced

MATHEMATICS CURRICULUM Grade 2

Curriculum Writers: Lorrie Manosh and Ginny Swanson

This curriculum was developed based on the Common Core State Standards utilizing examples and strategies from various websites including Tucson, Arizona, Ohio, and New Jersey.

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[1]
Put Together/ Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[3]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[2]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[3]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.