



FIFTH GRADE

Unit 4

Division of Whole Numbers and Decimals

20 days

enVision 2.0 Topics 5-6

Overarching Understandings:

Using an understanding of place value, properties of operations, and operations with whole numbers, problems with decimals can be solved using addition, subtraction, multiplication, and division. Problems are solved using multiple representations: concrete models, drawings, equations, and a written explanation of the reasoning used.

Essential Questions:

- How can I use the four operations to solve real world problems?
- In what real life situations would you use decimals?
- What strategies can we use to efficiently solve problems?
- How can we use models and drawings to help solve problems with decimals?
- How can I use what I know about the operations with whole numbers to help solve problems with decimals?

Common Core State Standards:

5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, 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 and explain the reasoning used.

Key Vocabulary:

estimate
quotient
dividend
divisor

Sentence Frames:

My estimate is _____.
I used _____ to solve the problem by _____.
This model/drawing shows _____.

Suggested Materials:

dice
colored markers/pens
grid paper
place value charts
colored tiles

Number Talks: *Number Talks are used to build number sense, develop fluency, and make sense of problems.*

Problem Solving
Number Strings

FIFTH GRADE

Unit 4

Division of Whole Numbers and Decimals

20 days

19 lessons
1 Assessment Day

Suggested Order of Lessons

Objective 1: Students will divide whole numbers using strategies based on place value, properties of operations, and the relationship between multiplication and division. (5.NBT.6 and 5.NBT.7)

Day	Source	Lesson Title	Page Number	Notes
1	enVision 2.0	5-1 Use Patterns and Mental Math to Divide	ENV TE p. 239	
2	enVision 2.0	5-2 Estimate Quotients with 2-Digit Divisors	ENV TE p. 245	
3	enVision 2.0	5-3 Use Models to Divide with 2-Digit Divisors	ENV TE p. 251	
4	enVision 2.0	5-4 Use Partial Quotients to Divide	ENV TE p. 257	
5	enVision 2.0	5-5 Divide by Multiples of 10	ENV TE p. 263	
6	enVision 2.0	5-6 Use Estimation to Place the First Digit of the Quotient	ENV TE p. 269	
7	enVision 2.0	5-7 Divide by 2-Digit Divisors	ENV TE p. 275	
8	Georgia	Are These All $364/15$	Unit p. 9	
9	enVision 2.0	5-8 Make Sense and Persevere	ENV TE p. 281	

Objective 2: Students will divide decimals using strategies based on place value, properties of operations, and the relationship between multiplication and division. (5.NBT.6 and 5.NBT.7)

10	enVision 2.0	6-1 Patterns for Dividing with Decimals	ENV TE p.301	
11	enVision 2.0	6-2 Estimate Decimal Quotients	ENV TE p.307	
12	enVision 2.0	6-3 Use Models to Divide by a 1-Digit Whole Number	ENV TE p.313	
13	enVision 2.0	6-4 Divide by a 1-Digit Whole Number	ENV TE p.319	

14	enVision 2.0	6-5 Divide by a 2-Digit Whole	ENV TE p.325	
15	SDUSD	Decimal Story Problems	Unit p. 14	
16	enVision 2.0	6-6 Use Number Sense to Divide Decimals	ENV TE p.331	
17	enVision 2.0	6-7 Divide by a Decimal	ENV TE p.337	
18	enVision 2.0	6-8 Continue to Divide by a Decimal	ENV TE p.343	
19	enVision 2.0	6-9 Problem Solving	ENV TE p.349	
20	Assessment			

Notes:

SDUSD Math Lesson Map

Number Talks 15 minutes

Number Talks are a chance for students to come together to practice fluency and share their mathematical thinking by engaging in conversations and discussions around problem solving and number sense activities.

The structure of math lessons should follow the Launch, Explore, Summarize format. This structure allows students to explore mathematical concepts with rigor (fluency, concept development, and application) to develop understanding in ways that make sense. Some rich tasks may take multiple days for students to explore. In these cases, each day should still follow the Launch, Explore, Summarize format.

LAUNCH (5–10 minutes)

The teacher sets the stage for learning by ensuring the purpose and the rationale of the lesson are clear by connecting the purpose to prior learning, posing the problem(s), and introducing the Explore task for students. During this time the teacher is identifying the tools and materials available, reviewing academic vocabulary, and setting the expectations for the lesson.

The students are actively engaged in a short task or discussion to activate prior knowledge in preparation of the Explore task. Students may be using tools and/or manipulatives to make sense of the mathematical concept.

WHOLE GROUP

EXPLORE (15–20 minutes)

The teacher provides opportunities and support for students to develop conceptual understanding by providing meaningful explorations and tasks that promote active student engagement.

The teacher monitors the development of student understanding by conferring with students and asking students questions in order to understand and stimulate their thinking. The teacher uses this information to plan for the Summarize and, if needed, to call the students together for a mid-Explore scaffold to focus or propel student thinking.

The students are actively engaged in constructing meaning of the mathematical concept being taught. Students engage in private reasoning time before working with partners or groups. Students use multiple representations to solve rich tasks and communicate their mathematical understanding.

INDIVIDUAL, PAIRS, OR SMALL GROUP

SUMMARIZE (15–20 minutes)

The teacher provides opportunities to make public the learning that was accomplished by the students by sharing evidence of what was learned, and providing opportunities for students to analyze, compare, discuss, extend, connect, consolidate, and record thinking strategies. A summary of the learning is articulated and connected to the purpose of the lesson.

The students are actively engaged as a community of learners, discussing, justifying, and challenging various solutions to the **Explore** task. The students are able to articulate the learning/understanding of the mathematical concept being taught either orally or in writing. Students can engage in this discussion whether or not they have completed the task.

WHOLE GROUP

PRACTICE, REFLECT, and APPLY (10–15 minutes)

This time is saved for after the Summarize so students can use what they have learned to access additional tasks. The opportunities that teachers provide are responsive to student needs.

The students may have the opportunity to: revise their work, reflect on their learning, show what they know with an exit slip, extend their learning with a similar or extension problem, or practice with centers or games.

The teacher confers with individual students or small groups.

INDIVIDUAL, PAIRS, OR SMALL GROUP

FORMATIVE ASSESSMENT

The teacher determines what students are learning and are struggling with by conferring with students and by examining student work throughout the lesson. This formative assessment informs ongoing adjustments in the lesson and next steps for the class and each student.

The students are actively engaged in showing their learning accomplishments related to the mathematical concept of the lesson.

SDUSD Mathematics Units

We understand that for deep and sustainable change in mathematics to take place, teachers, students, and leaders must grapple with what the rich mathematics asked for by Common Core State Standards-Mathematics looks like in the classroom, in pedagogical practice, in student work, in curriculum, and in assessments. It is our goal that teachers and site leaders work collaboratively toward a shared vision of math instruction that develops mathematically proficient students as defined by the CCSS-Mathematics. It is our hope that these units provide a common instructional foundation for this collaboration.

The SDUSD Mathematics Units are designed to support teachers and students as we shift from a more directive style of teaching mathematics toward a more inquiry-based style. In problem-based learning, students develop the habits of mind and interaction of mathematicians through engaging in mathematical discourse, connecting representations, asking genuine questions, and justifying and generalizing ideas. These mathematical habits reflect the shifts in pedagogy required to support the Common Core Standards for Mathematical Practice.

The SDUSD math units are compiled with multiple sources to ensure students have a variety of mathematical experiences aligned to the CCSS. All lessons should follow the structure of Launch, Explore, and Summarize. The following document will guide teachers in planning for daily lessons, by helping them understand the structures of each of the sources.

Structure for enVision 2.0 Lessons

Use Step 1 Develop: Problem-Based Learning is the Launch, Explore, and Summarize for every enVision 2.0 Lesson.

Launch: (Before)

Start with the Solve-and-Share problem. Pose the problem to the students making sure the problem is understood. This does not mean you explain *how* to do the problem, rather you ensure that students understand what the problem is about. Establish clear expectations as to whether students will work individually, in pairs, or in small groups. This includes making sure students know which representations and tools they might be using or if they will have a choice of materials.

Explore: (During)

Students engage in solving the problem using a variety of strategies and tools. Use the suggested guiding questions to check in briefly with students as needed, in order to understand and push student thinking. You may want to use the “Extension for Early Finishers” as needed.

Summarize: (After)

Select student work for the class to analyze and discuss. If needed, use the Sample Student Work provided for each lesson in enVision 2.0.

Practice, Reflect, Apply: (Select Problems from Workbook Pages, Reteach, Games, Intervention Activity)

During this time, students may revise their work from the Explore time or you may use pieces of Step 2 Develop: Visual Learning and Step 3 Assess and Differentiate. Note: The Quick-Check component is now a

few select problems that are highlighted with a pink checkmark in the Teacher’s Edition. This time provides an excellent opportunity to pull small groups of students that may need additional support.

Structure for Engage NY Lessons

Launch/Explore: (Concept Development)

The Concept Development constitutes the major portion of instructional time when new learning is introduced. During this time, the lessons move through a deliberate progression on material, from concrete to pictorial to abstract. Your word choice may be slightly different from that in the vignettes, and you should use what works from the suggested talking points to meet your students’ needs.

Summarize: (Student Debrief)

The student debrief piece helps develop students’ metacognition by helping them make connections between parts of the lesson, concepts, strategies, and tools on their own. The goal is for students to see and hear multiple perspectives from their classmates and mentally construct a multifaceted image of the concepts being learned. Through questions that help make these connections explicit, and dialogue that directly engages students in the Standards for Mathematical Practice, they articulate those observations so the lesson’s objective becomes eminently clear to them.

Practice, Reflect, Apply: (Problem Set/Exit Ticket)

The Problem Set often includes fluency pertaining to the Concept Development, as well as conceptual and application word problems. The primary goal of the Problem Set is for students to apply the conceptual understandings learned during the lesson.

Exit Tickets are quick assessments that contain specific questions to provide a quick glimpse of the day’s major learning. The purpose of the Exit Ticket is twofold: to teach students to grow accustomed to being individually accountable for the work they have done, and to provide you with valuable evidence of the efficacy of that day’s work which is indispensable for planning purposes. This time provides an excellent opportunity to pull small groups of students that may need additional support.

Structure for Georgia Standards Lessons

The Georgia Standards tasks have been included in the units to provide students opportunities for rich, engaging, real-world mathematical experiences. These tasks allow students to develop conceptual understanding over time and may take more than one math lesson to complete. The extra time for these lessons has been allotted for in the units. When planning for a Georgia Task, it is suggested that you start by doing the mathematics the students will be engaging in before presenting it to the students.

Launch:

You may need to activate prior knowledge for some of the tasks that will be presented by showing images, letting students engage in partner talk about real-life situations, or using the suggested activity from the background knowledge component. Pose the task to the students making sure the task is understood. This does not mean that you explain *how* to do the problem, rather you ensure that students understand what the problem is about. You establish clear expectations as to whether students will work individually, in pairs, or in small groups. This includes making sure students know which representations and tools they might be using or if they will have a choice of materials.

Explore:

Students will engage in working on the task using a variety of strategies and tools. You may use the Essential Questions or Formative Assessment questions provided in the lesson as needed in order to understand and prompt student thinking.

Summarize:

Select student work for the class to analyze and discuss. Use partnerships and whole-class collaborative conversations to help students make sense of each others' work. The Formative Assessment questions may also be used during this time to facilitate the conversation.

Practice, Reflect, Apply:

At this time, provide students time to reflect and revise their work from the Explore after they have engaged in the conversation in the Summarize portion of the lesson. This time provides an excellent opportunity to pull small groups of students that may need additional support.

Common Core Approach to Assessment

Assessments provide ongoing opportunities for students to show their learning accomplishments in addition to offering students a pathway to monitor their progress, celebrate successes, examine mistakes, uncover misconceptions, and engage in self-reflection and analysis. A central goal of assessments is to make students aware of their strengths and weaknesses and to give them opportunities to try again, do better and, in doing so, enjoy the experience of seeing their hard work pay off as their skill and understanding increases. Furthermore, the data collected as a result of assessments represent invaluable tools in the hands of teachers and provides specific data about student understanding that can inform instructional decisions.

For each Topic in enVision 2.0 the following assessments are available:

In the Student Workbook:

- Topic Assessment
- Performance Assessment

Online Teacher's Edition:

- Additional topic assessment Black-line Master
- Additional performance assessment Black-line Master

Online Student Assessment

- Teacher can modify the number of items on an assessment
- Teacher can rearrange order of problems

All of the assessment items for enVision 2.0 are aligned to the types of problems students may encounter on state testing. We have found enVision 2.0 has an excessive amount of items suggested for each topic. To avoid over-assessing, we recommend that school sites work collaboratively in grade-level teams to determine how to best use all the assessment resources available to evaluate student understanding and reduce the amount of items assessed. The SDUSD math units have grouped related topics together within a unit. Sites may choose to only give an assessment at the end of each unit, consisting of items from multiple topics, rather than using multiple days to assess each topic individually.

Constructing Task: Are These All $364 \div 15$?

In this task, students analyze story problems that demonstrate three different division situations.

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

STANDARDS FOR MATHEMATICAL PRACTICE

- SMP 1. Make sense of problems and persevere in solving them.
- SMP 2. Reason abstractly and quantitatively.
- SMP 3. Construct viable arguments and critique the reasoning of others.
- SMP 4. Model with mathematics.
- SMP 5. Use appropriate tools strategically.
- SMP 6. Attend to precision.
- SMP 7. Look for and make use of structure.
- SMP 8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Since third grade, students have worked with division through the use of partitioning whole numbers, rectangular arrays area models and through the relationship of multiplication. They should be able to apply these understandings of various division situations within this task.

This standard references various strategies for division. Division problems can include remainders. Even though this standard leads more towards computation, the connection to story contexts is critical. Make sure students are exposed to problems where the divisor is the number of groups and where the divisor is the size of the groups. In fourth grade, students' experiences with division were limited to dividing by one-digit divisors. This standard extends students' prior experiences with strategies, illustrations, and explanations. When the two-digit divisor is a "familiar" number, a student might decompose the dividend using place value.

COMMON MISCONCEPTIONS

Students may not recognize the operation in a story problem situations. Students may translate a division problem to a story problem that requires a different operation.

ESSENTIAL QUESTIONS:

- How can I use the situation in a story problem to determine the best operation to use?
- How can I effectively explain my mathematical thinking and reasoning to others?

MATERIALS

- Paper
- Pencil
- Accessible manipulatives

GROUPING

individual/partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Comments

The three problems in this task represent situations where division can be used to solve different kinds of problems.

Problem A (measurement), creates a situation in which a given area must be divided to determine the number of openings in the fencing. This situation promotes the strategy similar to the one listed below:

$$\begin{array}{r}
 15 \overline{)364} \\
 \underline{300} \quad 20 \\
 64 \\
 \underline{60} \quad 4 \\
 4 \quad 24 \quad R4
 \end{array}$$

Problem B calls for the partitioning of the money given by Old Mother Hubbard to her 15 children

In Problem C, subtraction is used as a strategy to divide the given amounts. This is a low level strategy, but it opportunity for students to connect their understanding of repeated subtraction to help develop a more efficient division strategy.

Notice that students were not asked to actually solve any of these situations. The teacher may have students solve them either pictorially or using student invented strategies. Regardless, students should be required to explain their thinking.

TASK

Students will follow the directions below from the “Are These All $364 \div 15$?” recording sheet.

You have been learning about many situations that can be solved with division. Even though the following problems all use the same numbers, think about whether each describes a different type of division problem. After each problem explain why $364 \div 15$ can or cannot be used to solve the problem.

Problem A

The new playground equipment was delivered to Anywhere Elementary School before the new fence was installed. Thomas Fencing Company arrived the next day with 364ft of fencing the school's principal wanted an opening in the fence every 25 feet. According to the principal's estimation the playground area would have about 15 openings. The Thomas Fencing Company workers estimated 20 openings around the playground. Who is correct? How do you know?

Problem B

Old Mother Hubbard found an old silver coin in her empty cupboard. She took it to the neighborhood coin collector and received \$364 for the coin. With this increase in income, Old Mother Hubbard was able to pay her children for the chores they completed during the month. The 15 children inquired of their mother the amount of money each would receive. She was excited by the children's inquiry and ran to the cupboard to retrieve beans to represent the money and Ziploc bags. Her kids were told to use the materials to figure out the answer to their own question! What do you think they figured out and why?

Problem C

The new poetry book by Mel Goldstein is 364 pages packed of humorous poems. Lily Reader set a goal to read the entire book in 25 days. She planned to read 15 pages a days. With this plan, will she reach her goal? How do you know?

On the back of this paper, write 3 of your own problems that can be solved using $252 \div 12$.

FORMATIVE ASSESSMENT QUESTIONS

- How do you know which operation to use to solve the problem?
- What is happening to the whole or dividend within this situation?
- How many total parts does this situation involve?
- Does that amount make sense in this situation? Why or why not?
- How does this situation relate to multiplication?

DIFFERENTIATION

Extension

Students should be challenged to write problem situations that require a variety of operations and then solve them. Next, students can trade problems with a partner and discuss their solutions.

Intervention

- Carefully screen the vocabulary to make sure that it is suitable for your students.
- Working in cooperative learning groups will support the student who is an English language learner or for whom this task is challenging.

Name _____ Date _____

Are These All $364 \div 15$?



You have been learning about many situations that can be solved with division. Even though the following problems all use the same numbers, think about whether each describes a different type of division problem. After each problem explain why $364 \div 15$ can or cannot be used to solve the problem.

Problem A

The new playground equipment was delivered to Anywhere Elementary School before the new fence was installed. Thomas Fencing Company arrived the next day with 364ft of fencing the school's principal wanted an opening in the fence every 25 feet. According to the principal's estimation the playground area would have about 15 openings. The Thomas Fencing Company workers estimated 20 openings around the playground. Who is correct? How do you know?

Problem B

Old Mother Hubbard found an old silver coin in her empty cupboard. She took it to the neighborhood coin collector and received \$364 for the coin. With this increase in income, Old Mother Hubbard was able to pay her children for the chores they completed during the month. The 15 children inquired of their mother the amount of money each would receive. She was excited by the children's inquiry and ran to the cupboard to retrieve beans to represent the money and Ziploc bags. Her kids were told to use the materials to figure out the answer to their own question! What do you think they figured out and why?

Problem C

The new poetry book by Mel Goldstein is 364 pages packed of humorous poems. Lily Reader set a goal to read the entire book in 25 days. She planned to read 15 pages a days. With this plan, will she reach her goal? How do you know?

Write 2 of your own problems that can be solved using $252 \div 12$.

1.

2.

**Fifth Grade Unit 4
Lesson 15**

LESSON FOCUS	Decimal Story Problems
MATERIALS	Base-ten blocks
LAUNCH	<p>Solving Problems</p> <ol style="list-style-type: none"> 1. Write the following problem on the board: Liz spent \$12.72 on 6 bags of chips. How much did she pay for each bag? 2. Ask, "What do we need to find out?" 3. Ask, "What strategy did you use to solve the problem?" 4. Ask, "Did someone use a different strategy?" 5. Have several students share their thinking on the board or overhead. 6. Have students share an equation that matches this problem. (There may be more than one)
EXPLORE	<p>Solving Story Problems</p> <ol style="list-style-type: none"> 1. Give students the problem solving worksheet. 2. Students have three different number choices to use when solving the problem. Tell students to choose a set of numbers to place in the problem. The numbers must be used in order in the problem. (ex: the first number in the set goes in the first blank in the problem) 3. Students will be given 5 minutes of Private Think Time (PTT) to engage in problem alone. Once PTT is over, have students partner talk to explain the what and how of work, at end have them compare similarities and differences of work. 4. Students use words, pictures and/or numbers to explain how they got their answer. 5. Students choose another set of numbers to use in the problem as time allows.
SUMMARIZE	<p>Refocus students on carpet sitting in a circle and pose following questions: Place a students work on the overhead, and pose question to other students: How did _____ make sense of what the problem was asking? How do you know?</p> <p>Note: This work could contain some errors. Ask students to analyze work for what is correct, and where the error occurred. Have students partner talk before it goes to whole class so that every student has opportunity to share.</p> <p>Or</p> <p>Explain what _____ did, and why they did it.</p> <p>Display work of student. Don't let student who created work talk about the work, have other students make sense of what this student did.</p>

Name _____ Date _____

The tennis team is having _____ tennis rackets restrung. The total cost is _____. What is the cost per racket for restringing?

(3, \$363)

(10, \$895)

(8, \$319.60)

A developer owns _____ acres of land. If he plans to use _____ acres of the land for an entrance into a housing development and divide the remaining land into _____ acre lots, how many lots will he have?

(18, 8, 0.5)

(24, 1.2, 0.6)

(48, 13.5, 2.3)