3 Math Unit 04: Fluently Multiply and Divide within 100

Content Area: **Mathematics**
Course(s):
Time Period: **December**
Length: **2 weeks**
Status: **Published**

Unit Overview

Multiplication and division problem representations and solution methods can be considered as falling within three levels related to the levels for
addition and subtraction. Level 1 is making and counting all of the quantities involved in a multiplication or division. Level 2 is repeated counting on by
a given number, such as for 3: 3; 6; 9; 12; 15; 18; 21; 24; 27; 30. The count-bys give the running total. The number of 3s said is tracked with fingers or
a visual or physical (e.g., head bobs) pattern. For 8 * 3, you know the number of 3s and count by 3 until you reach 8 of them. For 24 3, you count by 3
until you hear 24, then look at your tracking method to see how many 3s you have. Because listening for 24 is easier than monitoring the tracking
method for 8 x 3s to stop at 8, dividing can be easier than multiplying. The difficulty of saying and remembering the count-by for a given number
depends on how closely related it is to 10, the base for our written and spoken numbers. For example, the count-by sequence for 5 is easy, but the
count-by sequence for 7 is difficult. Decomposing with respect to a ten can be useful in going over a decade within a count-by. For example, in the
count-by for 7, students might use the following mental decompositions of 7 to compose up to and then go over the next decade, e.g., 14+7
=14+6+1= 20+1 =21. The count-by sequence can also be said with the factors, such as "one times three is three, two times three is six, three times
three is nine, etc." Seeing as well as hearing the count-bys and the equations for the multiplications or divisions can be helpful. Level 3 methods use
the associative property or the distributive property to compose and decompose. These compositions and decompositions may be additive (as for
addition and subtraction) or multiplicative. For example, students multiplicatively compose or decompose: 4 x 6 is easier to count by 3 eight times: 4
x 6 = 4 x (2 x 3) = (4 x 2) x 3 = 8 x 3: Students may know a product 1 or 2 ahead of or behind a given product and say: "I know 6 x 5 is 30, so 7 x 5 is
30 + 5 more, which is 35. This implicitly uses the distributive property: 7 x 5 = (6 +1) x 5 = 6 x 5 + 1 x 5 = 30 + 5 = 35.

Multiplications and divisions can be learned at the same time and can reinforce each other. Level 2 methods can be particularly easy for division, as
discussed above. Level 3 methods may be more difficult for division than for multiplication.

Throughout multiplication and division learning, students gain fluency and begin to know certain products and unknown factors.

Use of two-step problems involving easy or middle difficulty adding and subtracting within 1,000 or one such adding or subtracting with one step of
multiplication or division can help to maintain fluency with addition and subtraction while giving the needed time to the major Grade 3 multiplication and
division standards.

All of the understandings of multiplication and division situations, of the levels of representation and solving, and of patterns need to culminate by the
end of Grade 3 in fluent multiplying and dividing of all single-digit numbers and 10.

Organizing practice so that it focuses most heavily on understood but not yet fluent products and unknown factors can speed learning. To achieve this
by the end of Grade 3, students must begin working toward fluency for the easy numbers as early as possible.

Patterns make multiplication by some numbers easier to learn than multiplication by others, so approaches may teach multiplications and divisions in
various orders depending on what numbers are seen as or are supported to be easiest.

How are multiplication and division related?
How can unknown division facts be found using known multiplication facts?
How do you use strategies that are accurate and efficient to multiply and divide?

Students will be able to...Use patterns and strategies to multiply and divide

Standards

MA.3.OA.C.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
MA.3.OA.D.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Materials

- EnVision Math

- 5.1 Patterns for Multiplication Facts
- 5.2 Use a Multiplication Table
- 5.3 Find Missing Numbers In a Multiplication Table
- 5.4 Use Strategies to Multiply
- 5.5 Solve Word Problems: Multiplication and Division Facts
- 5.6 Write Math Stories: Multiplication
- 5.7 Write Math Stories: Division
- 5.8 Look For and Use Structure

- [ST Math](#)
- [Happy Numbers](#)
- [3 Act Lessons](#)
- [Building Fact Fluency Kit](#)
- [Brainingcamp Manipulatives](#)
- [Nearpod Lessons](#)
- [Brainpop Resources](#)
- [Math Diagnosis and Intervention System](#)
- [Online Resources](#)

Technology

- 8.1.5.A.1,2,4 (solve problems, word processing, databases, spreadsheets)
- 8.1.5.F.1 (digital tools to support scientific finding)
- 8.2.5.C.1,2,3 (solve problems, troubleshoot repair tools)

Assessment

Formative Assessment

- Teacher Observation
- Daily Quick Check
- Quizzes
- Exit Tickets

Summative Assessment

- Topic Tests
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

- Follow IEP Plan which may contain some of the following examples...

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Limit number of questions
- Scribe
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices
- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers

- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework
- Extension Activities
- Today's Challenge

Interdisciplinary Connections

Topic 1 Math and Science Project - Using different presentations tools, students will collect different types of paper. Talk about the uses of
paper. Tell how strong each type of paper is.Tell how the paper feels. Tell if the paper can soak up water.

ELA:
NJSLSA.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.

Science:
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

21st Century Life Literacies & Key Skills

Critical Thinking and Problem Solving:

Problem-solving activities starting with the lesson "Solve and Share" and ending with higher order thinking questions that utilize the mathematical practices

Communication and Collaboration:

Throughout the lesson, students are provided with opportunities to discuss their ideas as they investigate mathematical concepts.

Creativity:

Students have opportunities to express their creativity by solving problems their own way, participating in performance tasks, and group projects.

Technology:

Use of iPads, instructional apps, lab materials embedded in lessons. Programs such as BrainPop,Math Reflex, Google Slides are used to support instruction.

Career Ready Practices

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.