Mathematics

Topic Name: Topic 2: Multiplication Facts: Use Patterns

   Topic 3: Apply Properties: Multiplication Facts for 3, 4, 6, 7,8

   Topic 4: Use Multiplication to Divide: Division Facts

Resource: enVision Math 2.0, Pearson, 2016

Duration: October

   Topic 2 (continued)

   Topic 3 (10 days)

   Topic 4 (11 days)

Enduring Understanding

Topic 3

- The distributive Property can be used to break a large array into smaller arrays.
- Multiplication facts with 3 as a factor can be found by breaking apart the unknown fact into known facts. The answers to the known facts are added to get the final product.
- Basic multiplication facts with 4 as a factor can be found by breaking apart the unknown fact into known facts. The answers to the known facts are added to get the final product.
- Basic multiplication facts with 6 or 7 as a factor can be found by breaking apart the unknown facts into known facts. The answers to the known facts are added to get the final product.
- Basic multiplication facts with 8 as a factor can be found by breaking apart the unknown facts into known facts. The answers to the known facts are added to get the final product.
- Strategies such as bar diagrams and arrays with known facts can be used to solve multiplication problems.
- Three or more numbers can be grouped and multiplied in any order.

- Good math thinkers look for things that repeat, and they make generalizations.

Topic 4

- Multiplication and division have an inverse relationship.
- The inverse relationship between multiplication and division can be used to find division facts; every division fact has a related multiplication facts.
- Factors and products can be identified by patterns as well as other characteristics, such as even or odd.
- Any number (except 0) divided by itself is equal to 1. Any number divided by 1 is that number. 0 divided by any number (except 0) is 0. 0 cannot be a divisor.
- Patterns and known facts can be used to find unknown multiplication facts. Division facts can be found by thinking of a related multiplication fact.
- You can use a multiplication or division fact to find the unknown value in an equation.
- Good math thinkers make sense of problems and think of ways to solve them. If they get stuck, they don't give up.

Essential Questions
Topic 3

- How can unknown multiplication facts be found using known facts?

Topic 4
- How can unknown division facts be found using known multiplication facts?

Focus of Standards			
Student Outcomes **Topic 3** ● I can break apart unknown facts into known facts and solve multiplication problems. ● I can use tools and properties strategically to solve problems when I multiply by 3. ● I can use what I know about multiplying by 2s	**Skills** ● Solving addition, subtraction, multiplication, and division problems ● Understanding	**Assessments** **Formative** ● Diagnostic assessment ● Study Island ● Exit tickets	**Resources** **Texts** ● enVision math 2.0 **Digital** ● Student/Teacher

and properties to multiply by 4.
- I can make and use models to solve multiplication problems that have 6 and 7 as factors.
- I can use known facts and properties to multiply by 8.
- I can use strategies and tools to represent and solve multiplication facts.
- I can multiply 3 factors in any order to find a product.
- I can use reasoning to look for and describe general strategies for finding products.

Topic 4
- I can use fact families to see how multiplication and division are related.
- I can divide by 2, 3, 4, and 5 by thinking about how I multiply with those numbers.
- I can divide by 6 and 7 by thinking about how I multiply with those numbers.
- I can divide by 8 and 9 by thinking about how I multiply with those numbers.
- I can find and explain patterns for even and odd numbers.
- I can understand the patterns of division with 0 and 1.
- I can use patterns and related facts to solve multiplication and division problems.
- I can use multiplication and division facts to find unknown values in an equation.
- I can make sense of problems and keep working if I get stuck.

concepts
- Reasoning

- Round Robin group work
  - Open ended questions
  - May/may not be game activity
- Analysis of student homework
- Class polls
  - Show of hands: 1 finger ok, 2 fingers need help, 3 fingers lost
- One thing I learned/One thing I need work on

Summative
- End topic tests
- Group topic assessment
- EOY test
- SGO tests

Benchmark
- Diagnostic assessment
- Pearson benchmark tests
- PARCC test

eText
- Interactive math story
- Home-school connection

Classroom Math Materials
- Two-color counters
- Pieces of string
- Index cards
- Pencils
- Centimeter grid paper
- Colored pencils
- Paper cups
- Multiplication table

| | | **Alternative**
● Work paper from tests will also be graded for additional points if reasoning is clear and correct, even if answer is wrong
● One on one conferencing
● Oral presentation on math strand
● Weekly time capsule:summary of what was learned
● Topic Pattern search: find the thread in topic
● Crosswords with math vocab | |

Vocabulary
Topic 3
distributive property, associative (grouping) property of multiplication
Topic 4
dividend, divisor, fact family, quotient, even, odd

NJ Student Learning Standards: Math
Topic 2
Operations and Algebraic Thinking
3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example,

describe a context in which a total number of objects can be expressed as 5 × 7.

3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.

3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.B.5 Apply properties of operations as strategies to multiply and divide.1 Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)

3.OA.B.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.2

3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

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Topic 4
3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 × ? = 48$, $5 = \square ÷ 3$, $6 × 6 = ?$.

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Standards for Mathematical Practice
MP1. Make sense of problems and persevere in solving them.
MP2. Reason abstractly and quantitatively.
MP3. Construct viable arguments and critique the reasoning of others.
MP4. Model with mathematics.
MP5. Use appropriate tools strategically.
MP6. Attend to precision.
MP7. Look for and make use of structure.
MP8. Look for and express regularity in repeated reasoning.

Career Ready Practices
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

NJSLS Technology Standards
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

Interdisciplinary Connections and Activities
NJSLS for ELA and Science are introduced, developed, and practiced in the context of learning math content and engaging in mathematical practices.
ELA Standards

- RL.3.1. Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- RI.3.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.

Science

- 3-PS2-2 Science findings are based on recognizing patterns.
- 3-LS2-1 Construct an argument with data, evidence and/or a model.
- 3-LS3-2 Use evidence (eg., observations, patterns) to support an explanation.
- 3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

NJSLS: 21st Century Life and Careers

Key Subjects and 21st Century: Themes Mastery of key subjects and 21st century themes is essential to student success. Key subjects include English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics. In addition, schools must promote an understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes into key subjects:
 • Global Awareness
 • Financial, Economic, Business and Entrepreneurial Literacy

9.1.4.A.2 Identify potential sources of income
9.1.4.C.5 Determine the relationship among income, expense and interest
9.1.4.D.2 Explain what it means to "invest".

Integrated Differentiation/Accommodations/Modifications for Mathematics *(Alternate Modes of Instruction and Support)*		
Modifications to Support Gifted and Talented Students	**Modifications to Support English Language Learners**	**Modifications to Support Our Learners (Students with IEPs/504s and At-Risk Learners)**
Provide appropriate challenge for wide ranging skills and development areas. Participate in inquiry and project-based learning units of study Assigning roles within partnerships Differentiated supports: content, process, product, environment	Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary) Pair visual prompts with verbal presentations Front load and immerse students in literacy and language experiences related to content Provide students with visual models, sentence stems, concrete objects, and hands-on materials. Model procedures for life skills. Collaboration between ELL and general education teacher to maximize learning	Review student individual educational plan and/or 504 plan. Establish procedures for accommodations and modifications for assessments as per IEP/504. Establish procedures for modification of classwork and homework as per IEP/504. Modify classroom environment to support academic and physical needs of the students as per IEP/504. Provide appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team. Differentiation through content, process, product, environment Provide Title I services to students not meeting academic standards in ELA and/or Math. Provide instructional adaptations and interventions in the general education classroom. Modify classroom environment to support student needs. Differentiated instruction Basic Skills

		Intensive individual intervention

Sources
New Jersey Student Learning Standards (2016) http://www.state.nj.us/education/cccs/2016/math/standards.pdf
New Jersey Student Learning Standards: Technology (2014) - http://www.state.nj.us/education/cccs/2014/tech/8.pdf
New Jersey Student Learning Standards: ELA (2014) - https://www.state.nj.us/education/cccs/2016/ela/g03.pdf
New Jersey Science and Engineering Practices - https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf
New Jersey 21st Century Life and Careers 9.1 - https://www.state.nj.us/education/cccs/2014/career/91.pdf
Pearson enVision 2.0 (2016) https://www.pearsonrealize.com/index.html#/