BOE Approved 8/18

Cliffside Park Public Schools Grade 4

Mathematics

Topic Name: Topic 10: Extend Multiplication Concepts to Fractions

Topic 11: Represent and Interpret Data on Line Plots

Resource: enVision Math 2.0, Pearson, 2016

Duration: February

Topic 10 (8 Days)

Topic 11 (6 Days)

Enduring Understandings

Topic 10

- Any fraction a/b can be written as *a* times the unit fraction 1/b.
- Models and equations can be used to represent problems and compute products of whole numbers and fractions.
- Models and equations can be used to represent problems and compute products of whole numbers and mixed numbers.
- The standard algorithm for adding, subtracting, multiplying, and dividing can be used to solve time problems.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

Topic 11

- A line plot organizes data on a number line and is useful for showing how data are distributed.
- Data from line plots can be used to solve problems.
- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

Essential Questions

Topic 10

- How can you describe a fraction using a unit fraction?
- How can you multiply a whole number by a mixed number?

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Topic 11
- How can you read data on a line plot?
- How can you make a line plot?

Focus of Standards

Student Outcomes	Skills	Assessments	Resources
Topic 10 ● I can fraction strips or number lines to understand a fraction as a multiple of a unit fraction. ● I can use drawings, area models, or number lines to multiply fractions by whole numbers. ● I can use patterns and equations to multiply a fraction by a whole number. ● I can use area models, drawings and equations to represent and solve problems involving multiplying a whole number and a mixed number. ● I can use addition, multiplication, or division to solve problems involving time. ● I can use various representations to solve problems. **Topic 11** ● I can interpret data using line plots. ● I can represent data using line plots. ● I can use line plots to solve problems involving fractions. ● I can use what I know about line plots to critique the reasoning of others.	● Solving problems ● Understanding concepts ● Reasoning	**Formative** ● Diagnostic assessment ● Study Island ● Xtra Math ● Exit tickets ● 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	**Envision Math 2.0** **Digital:** ● Student and Teacher eTexts ● Interactive Math story ● Home-School Connection **Classroom Math Materials** ● Fraction strips ● Clock face ● Centimeter Ruler ● Number lines

		Summative ● End topic tests ● Group topic assessment ● EOY test ● SGO tests **Benchmark** ● Diagnostic assessment ● Pearson benchmark tests ● PARCC test **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 10: unit fraction,
Topic 11: line plot, outlier

NJ Student Learning Standards: Math Standards
Topic 10
Numbers and Operations: Fractions
4.NF.B.4a Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
4.NF.B.4b Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
4.NF.B.4c Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
4.NF.B.3d Understand a fraction a/b with a > 1 as a sum of fractions 1/b. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Measurement and Data
4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Topic 11
Measurement and Data
4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Numbers and Operations: Fractions

4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
4.NF.B.3d Understand a fraction a/b with a > 1 as a sum of fractions 1/b. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

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
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.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- RI.4.4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

Science

- 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- 4-LS1-1 Construct an argument with evidence, data, and/or a model.
- 4-ESS1-1 Identify the evidence that supports particular points in an explanation.

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”.

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Integrated Differentiation/Accommodations/Modifications *(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. See RtI and ELL intervention in EnVision 2.0 resources. 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/g04.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#/