



**Mathematics**

**Topic Name: Topic 8: Extend Understanding of Fraction Equivalence and Ordering**

**Topic 9: Understand Addition and Subtraction of Fractions**

**Resource: enVision Math 2.0, Pearson, 2016**

**Duration: January**

**Topic 8 (9 Days)**

**Topic 9 (13 Days)**

**Enduring Understandings**

**Topic 8**

- Two fractions that represent the same part of the same whole are equivalent. The two fractions are different names for the same number.
- The same fractional amount can be represented by an infinite set of different but equivalent fractions.
- When the numerator and denominator of a fraction are multiplied by the same number greater than 1, it is the same as multiplying the fraction by 1. This gives an equivalent fraction because multiplying by 1 does not change the value of a number.
- When the numerator and denominator of a fraction are divided by a common factor, the result is an equivalent fraction.
- One way to compare two fractions that are parts of the same whole is by comparing each to a benchmark fraction such as  $\frac{1}{2}$ .
- When two fractions have the same denominator, the fraction with the greater numerator is greater. When two fractions have the same numerator, the fraction with the lesser denominator is greater.
- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

**Topic 9**

- Models can be used to show addition of fractions as joining parts of the same whole.
- A fraction  $\frac{a}{b}$ , where  $a > 1$ , can be decomposed into the sum of two or more unit or non-unit fractions in one or more ways where the sum of the fractions is equal to the original fraction.
- Two fractions can be joined or added to find the total. There is a general method for adding fractions with like denominators.
- Models can be used to show subtraction of fractions as separating a part from the same whole.



- The difference between two fractions with like denominators can be found by separating one fractional amount from the other. There is a general method for subtracting fractions with like denominators.
- Fraction addition and subtraction can be thought about as joining and separating segments on the number line. They can also be thought about as counting forward not counting backward on the number line.
- Fraction sums and difference can be estimated by thinking about how each fraction relates to other fractions that are easy to add and subtract mentally.
- Adding and subtracting mixed numbers is an extension of the ideas and procedures for adding and subtracting fractions.
- Two procedures for adding mixed numbers both involve changing the calculation to a simpler equivalent calculation.
- Two procedures for subtracting mixed numbers both involve changing the calculation to a simpler equivalent calculation. These are extensions of the same procedures used for adding mixed numbers with like denominators.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

## Essential Questions

### Topic 8

- What are some ways to name the same part of a whole?
- How can you compare fractions with unlike denominators?
- How can you use a number line to explain why fractions are equivalent?
- How can we use a number line to explain why fractions are equivalent?
- How can you use multiplication to find equivalent fractions?
- How can you use division to find equivalent fractions?
- How can you use benchmarks to compare fractions?
- How can we compare fractions with unlike denominators?
- How can you construct arguments using mathematics?

### Topic 9

- How do you add and subtract fractions and mixed numbers with like denominators?
- How can fractions be added and subtracted on a number line?
- How can you use tools to add fractions?
- How can you represent a fraction in a variety of ways?
- How can you use tools to subtract fractions?



- How can you decide if a fraction sum or difference is reasonable?
- How can you use math to model problems using fractions?

**Focus of Standards**

Student Outcomes	Skills	Assessments	Resources
<p><b>Topic 8</b></p> <ul style="list-style-type: none"> <li>• I can recognize and generate equivalent fractions.</li> <li>• I can name the same amount on a number line using equivalent fractions.</li> <li>• I can use multiplication to find equivalent fractions.</li> <li>• I can use division to find equivalent fractions.</li> <li>• I can use benchmarks, area models and number lines to compare fractions.</li> <li>• I can use equivalent fractions to compare fractions.</li> <li>• I can construct math arguments using what I know about fractions.</li> </ul> <p><b>Topic 9</b></p> <ul style="list-style-type: none"> <li>• I can use tools such as fraction strips or area models to add fractions.</li> <li>• I can use fractions strips, area models or drawings to decompose fractions.</li> <li>• I can use my understanding of addition as joining parts of the same whole to add fractions with like denominators.</li> </ul>	<ul style="list-style-type: none"> <li>• Solving problems</li> <li>• Understanding concepts</li> <li>• Reasoning</li> </ul>	<p><b>Formative</b></p> <ul style="list-style-type: none"> <li>• Diagnostic assessment</li> <li>• Study Island</li> <li>• Xtra Math</li> <li>• Exit tickets</li> <li>• Round Robin group work               <ul style="list-style-type: none"> <li>○ Open ended questions</li> <li>○ May/may not be game activity</li> </ul> </li> <li>• Analysis of student homework</li> <li>• Class polls               <ul style="list-style-type: none"> <li>○ Show of hands: 1 finger ok, 2 fingers need help, 3 fingers lost</li> </ul> </li> <li>• One thing I learned/One thing I need work on</li> </ul>	<p><b>Envision Math 2.0</b></p> <p><b>Digital:</b></p> <ul style="list-style-type: none"> <li>• Student and Teacher eTexts</li> <li>• Interactive Math story</li> <li>• Home-School Connection</li> </ul> <p><b>Classroom Math Materials</b></p> <ul style="list-style-type: none"> <li>• Fraction strips</li> <li>• Number lines</li> <li>• Crayons</li> </ul>



<ul style="list-style-type: none"><li>● I can use tools such as fraction strips or area models to subtract fractions with like denominators.</li><li>● I can use my understanding of subtraction as separating parts of the same whole to subtract fractions with like denominators.</li><li>● I can use a number line to add and subtract fractions when the fractions refer to the same whole.</li><li>● I can use number lines and benchmark fractions to estimate fraction sums and differences.</li></ul>		<p><b>Summative</b></p> <ul style="list-style-type: none"><li>● End topic tests</li><li>● Group topic assessment</li><li>● EOY test</li><li>● SGO tests</li></ul> <p><b>Benchmark</b></p> <ul style="list-style-type: none"><li>● Diagnostic assessment</li><li>● Pearson benchmark tests</li><li>● PARCC test</li></ul> <p><b>Alternative</b></p> <ul style="list-style-type: none"><li>● Work paper from tests will also be graded for additional points if reasoning is clear and correct, even if answer is wrong</li><li>● One on one conferencing</li><li>● Oral presentation on math strand</li><li>● Weekly time capsule:summary of what was learned</li><li>● Topic Pattern search: find the thread in topic</li><li>● Crosswords with math</li></ul>	
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vocab

**Vocabulary****Topic 8:** equivalent fractions, fraction, numerator, denominator, common factor, benchmark fraction**NJ Student Learning Standards: Math****Topic 8**

**4.NF.A.1** Explain why a fraction  $a/b$  is equivalent to a fraction  $(n \times a)/(n \times b)$  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.A.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as  $1/2$ . Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual fraction model.

**Topic 9**

**4.NF.B.3a** Understand a fraction  $a/b$  with  $a > 1$  as a sum of fractions  $1/b$ . Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

**4.NF.B.3b** Understand a fraction  $a/b$  with  $a > 1$  as a sum of fractions  $1/b$ . Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples:  $3/8 = 1/8 + 1/8 + 1/8$ ;  $3/8 = 1/8 + 2/8$ ;  $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$ .

**4.NF.B.3c** Understand a fraction  $a/b$  with  $a > 1$  as a sum of fractions  $1/b$ . Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

**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-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- DCI: LS1.D: Information Processing
  - Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)

### 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".



<b>Integrated Differentiation/Accommodations/Modifications</b> <i>(Alternate Modes of Instruction and Support)</i>		
<b>Modifications to Support Gifted and Talented Students</b>	<b>Modifications to Support English Language Learners</b>	<b>Modifications to Support Our Learners (Students with IEPs/504s and At-Risk Learners)</b>
<p>Provide appropriate challenge for wide ranging skills and development areas.</p> <p>Participate in inquiry and project-based learning units of study</p> <p>Assigning roles within partnerships</p> <p>Differentiated supports: content, process, product, environment</p>	<p>Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)</p> <p>Pair visual prompts with verbal presentations</p> <p>Front load and immerse students in literacy and language experiences related to content</p> <p>Provide students with visual models, sentence stems, concrete objects, and hands-on materials.</p> <p>Model procedures for life skills.</p> <p>Collaboration between ELL and general education teacher to maximize learning</p>	<p>Review student individual educational plan and/or 504 plan.</p> <p>Establish procedures for accommodations and modifications for assessments as per IEP/504.</p> <p>Establish procedures for modification of classwork and homework as per IEP/504.</p> <p>Modify classroom environment to support academic and physical needs of the students as per IEP/504.</p> <p>Provide appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team.</p> <p>Differentiation through content, process, product, environment</p> <p>Provide Title I services to students not meeting academic standards in ELA and/or Math.</p> <p>Provide instructional adaptations and interventions in the general education classroom. See Rtl and ELL intervention in EnVision 2.0 resources.</p> <p>Modify classroom environment to support student needs.</p>



BOE Approved 8/18

# Cliffside Park Public Schools

# Grade 4

		Differentiated instruction  Basic Skills  Intensive individual intervention
<p><b>Sources</b>          New Jersey Student Learning Standards (2016) <a href="http://www.state.nj.us/education/cccs/2016/math/standards.pdf">http://www.state.nj.us/education/cccs/2016/math/standards.pdf</a>          New Jersey Student Learning Standards: Technology (2014) - <a href="http://www.state.nj.us/education/cccs/2014/tech/8.pdf">http://www.state.nj.us/education/cccs/2014/tech/8.pdf</a>          New Jersey Student Learning Standards: ELA (2014) - <a href="https://www.state.nj.us/education/cccs/2016/ela/g04.pdf">https://www.state.nj.us/education/cccs/2016/ela/g04.pdf</a>          New Jersey Science and Engineering Practices - <a href="https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf">https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf</a>          New Jersey 21st Century Life and Careers 9.1 - <a href="https://www.state.nj.us/education/cccs/2014/career/91.pdf">https://www.state.nj.us/education/cccs/2014/career/91.pdf</a>          Pearson enVision 2.0 (2016) <a href="https://www.pearsonrealize.com/index.html#/">https://www.pearsonrealize.com/index.html#/</a></p>		