## Unit 1 - Number Sense

Content Area:
Course(s): Sample Course
Time Period: Length: Status:

SeptOct
7 Weeks \& Grade 6 Published

## Title Section

## Department of Curriculum and Instruction



Belleville Public Schools
Curriculum Guide

# MATHEMATICS <br> GRADE 6 - UNIT 1 

Belleville Board of Education
102 Passaic Avenue
Belleville, NJ 07109

Dr. Richard Tomko, Superintendent of Schools

Mr. Thomas D'Elia, Director of Curriculum and Instruction

Ms. Diana Kelleher, District Supervisor of ELA/Social Studies
Mr. George Droste, District Supervisor of Math/Science

Board Approved: August 24, 2015
Board Approved Revisions: August 22, 2016

## Unit Overview

Students should expect to learn from this unit;

- how to model parts of a whole and various fractional representations.
- the relationship between multiplication and division to understand the procedures for dividing fractions
- estimation of benchmark fractions
- distinguish between prime and composite numbers and list factor pairs of numbers
- determine the greatest common factor and least common multiple of two or more numbers
- all operations with decimals including converting terminating and repeating decimals into fractions, determining decimal equivalents of fractions
- use the number line and coordinate plane to model positive and negative integers and fractions
- Use the distributive property to express a sum of two whole numbers
- Understand and order the absolute value of rational numbers


## NJSLS

Please link all standards that apply in this section within the curriculum of the unit being written. Please include all New Jersey Student Learning Standards.
fractions by fractions.

| MA.6.NS.A.1 | Interpret and compute quotients of fractions, and solve word problems involving division <br> of fractions by fractions, e.g., by using visual fraction models and equations to represent <br> the problem. |
| :--- | :--- |
| MA.6.NS.B | Compute fluently with multi-digit numbers and find common factors and multiples. |
| MA.6.NS.B.2 | Fluently divide multi-digit numbers using the standard algorithm. |
| MA.6.NS.B.3 | Fluently add, subtract, multiply, and divide multi-digit decimals using the standard <br> algorithm for each operation. |
| MA.6.NS.B.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the <br> least common multiple of two whole numbers less than or equal to 12. Use the <br> distributive property to express a sum of two whole numbers 1-100 with a common factor |
| as a multiple of a sum of two whole numbers with no common factor. |  |

## Exit Skills

What are the skills that the students should have obtained by the end of this unit?
For Example:

By the end of Unit 1 6th grade math students should be able to:
Connect rate and ratio to whole number multiplication ad division and use concepts of ratio and rate to solve problems.

- Students use reasoning about multiplication and dividion to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table and by analyzing simple drawings that indicate the relative size of quatities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.


## Complete an understanding of division of fractions and extending the notation of numbers to the system of rational

 numbers, which includes negataive numbers.- Students use the meaning of fractions, the meanings of multiplication and division and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of numbers and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers and in particular negative integers. In addition they reason about the order and absolute value of rational numbers.


## Enduring Understanding

- The proper operations and procedures must be determined in order to solve problems.
- Factors of a whole number are always less than or equal to the number itself.
- Multiples of a whole number are always greater than or equal to the number itself.
- Positive and negative numbers are used together to describe quantities having opposite directions or values.
- A rational number is a point on a number line.
- Rational numbers on the number line are oriented left to right or bottom to top.
- Rational numbers have an order that exists related to their location on a number line.
- Model and perform operations on fractions, decimals, and mixed numbers.
- Fractions are a part to a whole.
- Define the absolute value of a number
- Plot ordered pairs on a coordinate plane


## Essential Questions

- How are numbers related to one another?
- Why would one need to find common factors and multiples?
- What is the difference between prime and composite numbers?
- How does one determine the prime factorization of a number?
- In what situation would one want to use the distributive property to add two whole numbers?
- What type(s) of problems require using multi-digit decimal operations?
- How can understanding fractions make your life easier?
- Why is it important to identify fractions as part of a whole?
- What type of visual models can be used to represent division of fractions?
- How are division and multiplication of a fraction by a fraction related?
- How is the opposite value of a number different or similar to the absolute value of a number?
- How can absolute value help model real world phenomena?
- How do we compare positive and negative integers using a number line?
- How can rational numbers help us solve real world situations?
- When and how is a coordinate plane used in real life situations?


## Learning Objectives

After completing grade 6 math, students will be able to;

- Distinguish between prime and composite numbers
- Determine the prime factorization of a number using exponents
- Demonstrate the GCF and LCM of two or more numbers using factors
- Compare and order all integers, fractions and decimals on a number line
- Identify and plot all integers, fractions and decimals on a number line
- Construct and compute fraction models to multiply and divide fractions
- Define and differentiate absolute value of all rational numbers
- Plot and indentify points on a coordinate plane


## Action Verbs

Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy. These are useful in writing learning objectives, assignment objectives and exam questions.

If you are utilizing the objectives but want to address rigor use the chart below;

| Remember | Understand | Apply | Analyze | Evaluate | Create |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Choose | Classify | Choose | Categorize | Appraise | Combine |
| Describe | Defend | Dramatize | Classify | Judge | Compose |
| Define | Demonstrate | Explain | Compare | Criticize | Construct |
| Label | Distinguish | Generalize | Differentiate | Defend | Design |
| List | Explain | Judge | Distinguish | Compare | Develop |
| Locate | Express | Organize | Identify | Assess | Formulate |
| Match | Extend | Paint | Infer | Conclude | Hypothesize |
| Memorize | Give Examples | Prepare | Point out | Contrast | Invent |
| Name | Illustrate | Produce | Select | Critique | Make |
| Omit | Indicate | Select | Subdivide | Determine | Originate |
| Recite | Interrelate | Show | Survey | Grade | Organize |
| Select | Interpret | Sketch | Arrange | Justify | Plan |
| State | Infer | Solve | Breakdown | Measure | Produce |
| Count | Match | Use | Combine | Rank | Role Play |
| Draw | Paraphrase | Add | Detect | Rate | Drive |


| Outline | Represent | Calculate | Diagram | Support | Devise |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Point | Restate | Change | Discriminate | Test | Generate |
| Quote | Rewrite | Classify | Illustrate |  | Integrate |
| Recall | Select | Complete | Outline |  | Prescribe |
| Recognize | Show | Compute | Point out |  | Propose |
| Repeat | Summarize | Discover | Separate |  | Reconstruct |
| Reproduce | Tell | Divide |  |  | Revise |
|  | Translate | Examine |  |  | Rewrite |
|  | Associate | Graph |  |  | Transform |
|  | Compute | Interpolate |  |  |  |
|  | Convert | Manipulate |  |  |  |
|  | Discuss | Modify |  |  |  |
|  | Estimate | Operate |  |  |  |
|  | Extrapolate | Subtract |  |  |  |
|  | Generalize |  |  |  |  |
|  | Predict |  |  |  |  |



## Interdisciplinary Connections

Please list all and any cross-curricular content standards that link to this Unit.

Science
Social Studies
Health \& Nutrition
Music

## Alignment to 21st Century Skills \& Technology

Key SUBJECTS AND 21st CENTURY THEMES
Mastery of key subjects and 21st century themes is essential for all students in the 21stcentury.
Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics


## 21st Century/Interdisciplinary Themes

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy


## 21st Century Skills

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Life and Career Skills

What technology can be used in this unit to enhance learning?


## Differentiation

Resources:

- NJDOE: Instructional Supports and Scaffolds for Success in Implementing the Common Core State Standards http://www.state.nj.us/education/modelcurriculum/success/math/k2

Differentiation

- Pre-teach new vocabulary and meaning of symbols
- Connect new vocabulary and symbols to background knowledge and experience
- Break down terms to familiar parts, suffixes and prefixes
- Make dictionaries available to learners
- Increase experience to academic vocabulary and language
- Provide flash cards
- Incorporate as many learners senses as possible to enhance retentention
- Brainstorm examples of use of new terms or symbols making real world applications
- Engage student in relevant discussion about conceptual process
- Post and refer to math guides and anchor charts when applicable
- Clarify the relationships between the operations
- Develop graphic representations of math processes
- Make connections to formulas, concepts or structures preciously learned
- Utilize manipulatives to display structures
- Offer various ways to solve math problems
- Provide opportunities to integrate math, technology and art
- Provide graphic organizers and anchor charts for all symbols and formulas
- Create math journals for terms, formulas and symbols
- Develop interactive games and activities to promote retention
- Integrate videos
- Utilize graphics, diagrams, charts


## Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes


## ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing the number of answer choices on a multiple choice test
- tutoring by peers


## Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify


## Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this secion.

- Admit Tickets
- Anticipation Guide
- Common benchmarks
- Compare \& Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Question Stems
- Quickwrite
- Quizzes
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Unit tests


## Primary Resources

Carnegie Learning Textbook Course 1
Standards Solution
NJ Model Curriculum
PARCC/Pearson

## Ancillary Resources

Dinah Zike's Foldables-Interactive Study Guides, Macmillan/MacGraw Hill
Glencoe/MacGraw Hill Workbooks
http://www.khanacademy.org
http://mathgoodies.com
http://purplemath.com
http://buzzmath.com
http://IXL.com/math
http://www.ncpublicschools.org/acre/standards/common-core-tools/
http://www.uen.org/commoncore/
http://www.parcconline.org/math-plds
http://www.parcconline.org/mcf/mathematics/parcc-model-content-frameworks-browser
http://ime.math.arizona.edu/progressions/
http://www.nciea.org/publications/Math_LPF_KH11.pdf
http://www.nciea.org/publications/Math\ Expanded\ LPF\ 5-8_KH11.pdf
http://www.corestandards.org/the-standards/mathematics
Dan Meyer's Three-Act Lessons
https://docs.google.com/spreadsheet/ccc?key=0AjIqyKM9d7ZYdEhtR3BJMmdBWnM2YWxWYVM1UWo wTEE\#gid=0

## Sample Lesson

One Lesson per Curriculum must bein this lesson plan template. I.e. one lesson in one unit
Unit Name:
CCSS/NJCCCS:
Interdisciplinary Connection:
Statement of Objective:
Anticipatory Set/Do Now:
Learning Activity:
Student Assessment/CFU's:
Materials:
21st Century Themes and Skills:
Differentiation/Modifications:
Integration of Technology:

