**SAMPLE Syllabus**

**Instructor use only: Link to course materials and answer keys on OneDrive:** [Math 2008](https://sgsc-my.sharepoint.com/:f:/g/personal/rauf_tailony_sgsc_edu/EssQNoL0x3tJjtHGbwqAgn8BKCMuYpuczKdwoIL0KLnHrw?e=kAK2T4)

**Course: MATH 2008 – Foundations of Numbers and Operations**

**Term: XXXXXXX**

**Location: This class is ONLINE through GaView**

**Day/Time: This class will not meet in person. This class is ONLINE through GaView**

**Instructor: XXXXXXX**

**Office Location: XXXXXXX**

**Office Phone #: XXXXXXX**

**Office hours: XXXXXXX**

**Email: XXXXXXX**

**Course description from College Catalog:** Foundations of Numbers and Operations for Teachers. This course is designed for K-8 pre-service teachers and emphasizes the understanding and use of the major concepts of number and operations. Topics include problem-solving strategies; inductive and deductive reasoning; numeration systems and place value; operations and algorithms; identity elements and inverse operations; rational and irrational numbers; integers and number theory; special sets of numbers; exponents and decimals; ratios, percent’s, and proportional reasoning. Prerequisite: Three credits of college-level Mathematics with a grade of C or higher. 3-0-3

**Course Goal:** To provide students with numbers and operations content knowledge to effectively teach mathematics in an early childhood setting.

**Student Learning Outcomes:** Upon successful completion of this course,

1. Students will be able to add, subtract, multiply, and divide all forms of rational numbers.
2. Students will be able to identify various subsets of real numbers.

**Required text and other required materials:** This course uses OER materials that are free to the student. Here is a link to the OER books referenced in this course:

**Book 1:** Mathematics for Elementary Teachers by Michelle Manes

[**https://pressbooks-dev.oer.hawaii.edu/math111/**](https://pressbooks-dev.oer.hawaii.edu/math111/)

**Book 2:** Fundamentals of Mathematics by Denny Burzynski and Wade Ellis

[**https://open.umn.edu/opentextbooks/textbooks/154**](https://open.umn.edu/opentextbooks/textbooks/154)

**Calculator Required:** It is recommended that all calculations be completed without the use of a calculator.

**Student Responsibilities for this Online Math Class:**

**Internet & Printer:** You are responsible for using the Internet to access the required materials for this course. You are also required to utilize a printer to PRINT the Lesson Notes and Worksheet and Quiz each week.

**Lesson Notes: Due each Friday by 11:59 PM**

Each week you will be assigned Lesson Notes in GeorgiaView. You will take Notes for each Lesson covered in this class. The Notes sheet will be provided for you in GeorgiaView. You are expected to PRINT the Notes and watch/listen to the Lesson Videos each week and submit your handwritten Notes through GeorgiaView to the Assignment Box each Friday by 11:59 PM. **Sign each page** of your Notes, use a scanning app to take a picture, and upload **one file** per lesson. You will usually upload two files each week because there are typically two lessons (and videos) each week. Keep the Lesson Notes in a notebook and use them as a reference when completing other class assignments. You are expected to “attend class” each week and take Notes. Your completed Notes will be submitted via the Assignment Box in GeorgiaView. Notes count 20% of your average.

**Worksheets: Due each Sunday by 11:59 PM**

Each week you will be assigned a Worksheet in GeorgiaView. You are expected to PRINT the Worksheet and submit your handwritten Worksheet with your answers through GeorgiaView to the Assignment Box each Sunday by 11:59 PM. **Sign each page** of your Worksheet, use a scanning app to take a picture, and upload **one file** per Worksheet. Some Worksheets are multiple pages so remember to save all pages together as one file. You will upload one Worksheet per week. You **must show all work** on your Worksheet. Your work must be shown for credit.

Keep the Worksheets in a notebook and use them as a reference when completing other class assignments. You are expected to “attend class” each week by completing the Worksheet. Your completed Worksheet will be submitted via the Assignment Box in GeorgiaView. Worksheets count 20% of your average.

**Box Quiz: Due each Sunday by 11:59 PM**

Each week you will be assigned a Box Quiz in GeorgiaView. You are expected to PRINT the Box Quiz and submit your handwritten Box Quiz with your answers through GeorgiaView to the Assignment Box each Sunday by 11:59 PM. **Sign each page** of your Box Quiz, use a scanning app to take a picture, and upload **one file** per Box Quiz. You will upload one Box Quiz per week. You **must show all work** on your Box Quiz. Your work must be shown for credit.

Keep the Box Quiz in a notebook and use them as a reference when completing other class assignments. You are expected to “attend class” each week by completing the Box Quiz. Your completed Box Quiz will be submitted via the Assignment Box in GeorgiaView. Box Quizzes count 20% of your average.

**Discussions:** You will be assigned optional Discussions during the semester. Each Discussion must exhibit correct grammar and punctuation while thoughtfully answering the question. Discussions are given to evoke critical thinking as you prepare for the classroom. Discussions are optional, however extra credit may be awarded to various assignments throughout the semester for completion of Discussion topics.

**Late Policy for Notes, Worksheets, and Quiz Submissions:**

Instructor preference **XXXXXXX**

**Late Policy for Midterm:** Instructor preference **XXXXXXX**

The Midterm Exam cannot be taken after the due date. The Midterm Exam will be announced and details given later about the due date. The Midterm Exam will count 20% of your average.

**Late Policy for Final Exam:** Instructor preference **XXXXXXX**

The Final Exam cannot be taken after the due date.The Final Exam will be given during the Final Examination Schedule. The Final Exam will count for 20% of your average.

**Tutor.com** ALL students have 24/7 access to Tutor.com through GeorgiaVIEW.

Ask them anything, anytime!!

**Grading Policy:**

**Lesson Notes, Worksheets, Quizzes, Midterm, Final, Content Related Discussions**

20% Lesson Notes Sign each page, upload as one file.

There will be 26 Lessons throughout the semester.

20% Worksheets Sign each page, upload as one file.

There will be 15 Worksheets throughout the semester.

20% Box Quiz Sign each page, upload as one file.

There will be 15 Box Quizzes throughout the semester.

20% Midterm Must be PRINTED, Show all work,

upload as one file by the announced due date.

20% Final Must be PRINTED, Show all work,

upload as one file by the announced due date.

DiscussionsVarious discussions assigned throughout the semester. Optional

The following grade scale will be used

**A** 90% - 100%

**B** 80% - 89%

**C** 70% -79%

**D** 60% -69%

**F** below 60 %

**WF Withdrawal Failing,** counts as an attempt

**W** **Withdrawal**, only if you withdraw before Midterm

**Instructor Responsibilities/How to Contact Instructor:**

Instructor preference **XXXXXXX** You may contact me anytime by email through GaView. You may also contact me by phone during my posted office hours, just let me know how I can help you!

**Class Policies and Procedures:**

Instructor preference **XXXXXXX**

**Attendance Policy**

**Students are responsible for “attending class online” and regularly accessing the online course, and for the material presented in all classes.** At the beginning of each semester, all instructors will inform students of policies regarding class absences and their policy for making up missed work due to absences. This class is online and you are not required to attend class in person. You are expected to complete all work by the posted due dates. I allow 2 late assignments per category of Lesson Notes, Worksheet, and Box Quiz. Exams may not be completed late.

* Lesson Notes are due every Friday to the Assignment Box by 11:59 PM
* Worksheets are due every Sunday to the Assignment Box by 11:59 PM
* Box Quizzes are due every Sunday to the Assignment Box by 11:59 PM
* You may complete assignments early and turn them in before the due date that week!

**College Access Statement**

Instructor preference **XXXXXXX**

**Plagiarism**

Intentional plagiarism involves two kinds of wrongdoing. Using another entity's or person's ideas, information, or expressions without acknowledging that entity or person constitutes intellectual theft. Passing off another entity's or person's ideas, information, or expressions as your own to get a better grade or gain some other advantage constitutes fraud. Unacknowledged use of content generated by AI with or without the instructor's permission constitutes plagiarism. All sources must be appropriately cited to avoid plagiarism.

The first time a student is determined by the faculty member to have intentionally plagiarized will result in a zero for that assignment. Any other intentional infractions will result in an F for the course.

**Satisfactory Academic Progress (Sap) Standards for Financial Aid**

The U.S. Department of Education requires institutions of higher education to establish minimum standards of satisfactory academic progress for all students enrolled in a degree program, regardless of whether federal aid was received.  Satisfactory academic progress (SAP) means that a student is progressing in a positive manner toward fulfilling the requirements for a degree.  Failure to maintain satisfactory academic progress will result in the loss of all federal and state financial aid and VA Education Benefits.

The SAP requirements include three parts.  The minimum cumulative GPA for a student's academic level, the minimum 67% Pace or Rate of Completion and a Maximum Time Frame to complete equal to 150% of the required hours for a student's academic program.

**Early Alert Service**

This class uses the Early Alert Service. Week four through week six, I will notify the office of Student Success if you are not making adequate progress in your class(es). This warning is not an official grade; it’s a recommendation to use a specific academic support service. If you are contacted about an Early Alert, please respond to those individuals and also reach out to me during my office hours so we can talk about strategies for how you can be successful in the class.

**Midterm Grades**

Midterm grades will be posted for this course. Your midterm grade will be posted by XXXXXX. This grade will reflect your progress in the class up to that day. This is not your final grade, simply a calculation of your work in progress.

**Tentative Schedule for Math 2008 --- Spring 2025**

*\*The Professor reserves the right to change this schedule to meet the needs of the class***.**

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| --- | --- | --- | --- |
|  | | | DUE DATES |
| Week 1 | Read Syllabus this week  **Lesson 1:** Problem Solving: George Polya's 4 step process  **Lesson 2:**Patterns, Fibonacci Sequence, Pascal's Triangle, Arithmetic and Geometric sequences, Find the nth term  **Worksheet 1**  **Box Quiz 1** | **Assignment**: Watch videos for Lesson 1 and upload completed Lesson 1 Notes to GeorgiaView.  Watch videos for Lesson 2 and upload completed Lesson 2 Notes to GeorgiaView.  Complete and Upload Worksheet 1 in GeorgiaView.  Complete and Upload Box Quiz 1 in GeorgiaView. | Lesson 1 Notes and Lesson 2 Notes due Friday, January 17 by 11:59 pm  Worksheet 1 and Box Quiz 1 due Sunday, January 19 by 11:59 pm |
| Week 2 | **Lesson 3:**Inductive (conjecture, counterexample), Deductive  **Lesson 4:** Logic: Statement and negation, Truth tables (p and q), Conjunction, Disjunction, Converse, Inverse, Contrapositive  **Worksheet 2**  **Box Quiz 2** | **Assignment:** Watch videos for Lesson 3 and upload completed Lesson 3 Notes to GeorgiaView.  Watch videos for Lesson 4 and upload completed Lesson 4 Notes to GeorgiaView.  Complete and Upload Worksheet 2 in GeorgiaView.  Complete and Upload Box Quiz 2 in GeorgiaView. | Lesson 3 Notes and Lesson 4 Notes due Friday, January 24 by 11:59 pm  Worksheet 2 and Box Quiz 2 due Sunday, January 26 by 11:59 pm |
| Week 3 | **Lesson 5:**Sets: Venn Diagrams (intersection, union, complement, subset, word problems), elements, members, equal, one to one, equivalent, finite and infinite sets, universal  **Worksheet 3**  **Box Quiz 3** | **Assignment:** Watch videos for Lesson 5 and upload completed Lesson 5 Notes to GeorgiaView.  Complete and Upload Worksheet 3 in GeorgiaView.  Complete and Upload Box Quiz 3 in GeorgiaView. | Lesson 5 Notes due Friday, Jan. 31 by 11:59 pm  Worksheet 3 and Box Quiz 3 due Sunday, Feb. 2 by 11:59 pm |
| Week 4 | **Lesson 6:**Numeration System: Hindu Arabic number system, place value, Babylonian, Egyptian, Mayan, Greek, Roman, expanded form, base ten blocks  **Worksheet 4**  **Box Quiz 4** | **Assignment:** Watch videos for Lesson 6 and upload completed Lesson 6 Notes to GeorgiaView.  Complete and Upload Worksheet 4 in GeorgiaView.  Complete and Upload Box Quiz 4 in GeorgiaView. | Lesson 6 Notes due Friday, Feb. 7 by 11:59 pm  Worksheet 4 and Box Quiz 4 due Sunday, Feb. 9 by 11:59 pm |
| Week 5 | **Lesson 7:**Addition of Whole Numbers: number line model, counting on, doubles, making 10, Properties: Closure, Commutative, Identity, Associative, Standard addition, left to right, lattice method, scratch, mental math, compatible numbers, rounding estimation  **Lesson 8:**Subtraction of Whole Numbers: take away, number line model, missing addend, comparison, base ten blocks, counting up  **Worksheet 5**  **Box Quiz 5** | **Assignment:** Watch videos for Lesson 7 and upload completed Lesson 7 Notes to GeorgiaView.  Watch videos for Lesson 8 and upload completed Lesson 8 Notes to GeorgiaView.  Complete and Upload Worksheet 5 in GeorgiaView.  Complete and Upload Box Quiz 5 in GeorgiaView. | Lesson 7 Notes and Lesson 8 Notes due Friday, Feb. 14 by 11:59 pm  Worksheet 5 and Box Quiz 5 due Sunday, Feb. 16 by 11:59 pm |
| Week 6 | **Lesson 9:**Multiplication: repeated addition model, array and area model, lattice method, partial products, Fundamental Counting Principle, definition of factors, closure property, commutative, associative, distributive property, identity, property of zero, factoring, rules of exponents, estimation  **Lesson 10:**Division: missing factor model, repeated subtraction, set partition model, definition of dividend, divisor, quotient,  **Week 6 continued on next page:**  Division by 0 and 1, exponent properties, mental math and estimation, Order of Operations  **Worksheet 6**  **Box Quiz 6** | **Assignment:** Watch videos for Lesson 9 and upload completed Lesson 9 Notes to GeorgiaView.  Watch videos for Lesson 10 and upload completed Lesson 10 Notes to GeorgiaView.  Complete and Upload Worksheet 6 in GeorgiaView.  Complete and Upload Box Quiz 6 in GeorgiaView. | Lesson 9 Notes and Lesson 10 Notes due Friday, Feb. 21 by 11:59 pm  **Cont’d**  Worksheet 6 and Box Quiz 6 due Sunday, Feb. 23 by 11:59 pm |
| Week 7 | **Lesson 11:**Divisibility: divisibility rules, definition of even/odd, factor, divisor, multiples  **Lesson 12:**Prime and Composite: definition of prime and composite, Sieve of Erathosthenes, factor tree (prime factorization), Fundamental Theorem of Arithmetic  **Worksheet 7**  **Box Quiz 7** | **Assignment:** Watch videos for Lesson 11 and upload completed Lesson 11 Notes to GeorgiaView.  Watch videos for Lesson 12 and upload completed Lesson 12 Notes to GeorgiaView.  Complete and Upload Worksheet 7 in GeorgiaView.  Complete and Upload Box Quiz 7 in GeorgiaView. | Lesson 11 Notes and Lesson 12 Notes due Friday, Feb. 28 by 11:59 pm  Worksheet 7 and Box Quiz 7 due Sunday, March 2 by 11:59 pm |
| Week 8 | **Worksheet 8**  **Box Quiz 8**  **Midterm Exam** | **Assignment:** Complete and Upload Worksheet 8 in GeorgiaView.  Complete and Upload Box Quiz 8 in GeorgiaView.  Complete Midterm Exam. (May Be Proctored) | Worksheet 8, Box Quiz 8, and Midterm due Sunday, March 9 by 11:59 pm |
| Week 9 | **Lesson 13:** GCD: greatest common divisor or greatest common factor, Euclidean Algorithm Method  **Lesson 14:** LCM: least common multiple, Prime factorization method  **Worksheet 9**  **Box Quiz 9** | **Assignment:** Watch videos for Lesson 13 and upload completed Lesson 13 Notes to GeorgiaView.  Watch videos for Lesson 14 and upload completed Lesson 14 Notes to GeorgiaView.  Complete and Upload Worksheet 9 in GeorgiaView. Complete and Upload Box Quiz 9 in GeorgiaView. | Lesson 13 Notes and Lesson 14 Notes due Friday, March 14 by 11:59 pm  Worksheet 9 and Box Quiz 9 due Sunday, March 16 by 11:59 pm |
| Week 10 | **Lesson 15:** Addition of Integers - dfn of integer, opposites, absolute value, number line model, chip model, pattern, Properties: closure, commutative, associative, identity, additive inverse, equality  **Lesson 16:** Subtraction of Integers - number line model, chip model, patterns, subtract with opposites  **Worksheet 10**  **Box Quiz 10** | **Assignment:** Watch videos for Lesson 15 and upload completed Lesson 15 Notes to GeorgiaView.  Watch videos for Lesson 16 and upload completed Lesson 16 Notes to GeorgiaView.  Complete and Upload Worksheet 10 in GeorgiaView.  Complete and Upload Box Quiz 10 in GeorgiaView. | Lesson 15 Notes and Lesson 16 Notes due Friday, March 28 by 11:59 pm  Worksheet 10 and Box Quiz 10 due Sunday, March 30 by 11:59 pm |
| Week 11 | **Lesson 17:** Multiplication of Integers - number line model, chip model, patterns, Properties: closure, commutative, associative, Identify, Distributive, Zero product  **Lesson 18:** Division of Integers - definition  **Worksheet 11**  **Box Quiz 11** | **Assignment:** Watch videos for Lesson 17 and upload completed Lesson 17 Notes to GeorgiaView.  Watch videos for Lesson 18 and upload completed Lesson 18 Notes to GeorgiaView.  Complete and Upload Worksheet 11 in GeorgiaView.  Complete and Upload Box Quiz 11. | Lesson 17 Notes and Lesson 18 Notes due Friday, April 4 by 11:59 pm  Worksheet 11 and Box Quiz 11 due Sunday, April 6 by 11:59 pm |
| Week 12 | **Lesson 19:** Rational Numbers - numerator, denominator, equivalent fractions, simplifying, ordering, proper fractions, improper fractions, fraction strips, equality  **Lesson 20:** Add, Subtract, Estimate - area model, number line model, addition/subtraction with like and unlike denominators, mixed number, additive inverse property, addition property, estimation  **Worksheet 12**  **Box Quiz 12** | **Assignment:** Watch videos for Lesson 19 and upload completed Lesson 19 Notes to GeorgiaView.  Watch videos for Lesson 20 and upload completed Lesson 20 Notes to GeorgiaView.  Complete and Upload Worksheet 12 in GeorgiaView.  Complete and Upload Box Quiz 12 in GeorgiaView. | Lesson 19 Notes and Lesson 20 Notes due Friday, April 11 by 11:59 pm  Worksheet 12 and Box Quiz 12 due Sunday, April 13 by 11:59 pm |
| Week 13 | **Lesson 21:** Multiplication/Division - repeated addition, dfn of mult, multiplicative identify, multiplicative inverse, distributive, property of 0, dfn division, estimation, properties of exponents  **Lesson 22:** Proportional Reasoning - ratios, proportions, unit rate strategy, scale  **Worksheet 13**  **Box Quiz 13** | **Assignment:** Watch videos for Lesson 21 and upload completed Lesson 21 Notes to GeorgiaView.  Watch videos for Lesson 22 and upload completed Lesson 22 Notes to GeorgiaView.  Complete and Upload Worksheet 13 in GeorgiaView.  Complete and Upload Box Quiz 13 to GeorgiaView. | Lesson 21 Notes and Lesson 22 Notes due Friday, April 18 by 11:59 pm  Worksheet 13 and Box Quiz 13 due Sunday, April 20, by 11:59 pm |
| Week 14 | **Lesson 23:**Decimal notation, block model, convert decimals to fractions, terminating, Repeating decimals, ordering on a number line, comparing  **Lesson 24:** Adding, subtracting, multiplying, dividing, decimals. Scientific notation, mental computations, rounding, significant digits  **Worksheet 14**  **Box Quiz 14** | **Assignment:** Watch videos for Lesson 23 and upload completed Lesson 23 Notes to GeorgiaView.  Watch videos for Lesson 24 and upload completed Lesson 24 Notes to GeorgiaView.  Complete and Upload Worksheet 14 in GeorgiaView.  Complete and Upload Box Quiz 14 in GeorgiaView. | Lesson 23 Notes and Lesson 24 Notes due Friday, April 25 by 11:59 pm  Worksheet 14 and Box Quiz 14 due Sunday, April 27 by 11:59 pm |
| Week 15 | **Lesson 25:**Percents - convert decimal to percent, application word problems, estimations, simple interest  **Lesson 26:**Real numbers - irrational, square roots, other roots, Properties of Real Numbers  **Worksheet 15**  **Box Quiz 15** | **Assignment:** Watch videos for Lesson 25 and upload completed Lesson 25 Notes to GeorgiaView.  Watch videos for Lesson 26 and upload completed Lesson 26 Notes to GeorgiaView.  Complete and Upload Worksheet 15 in GeorgiaView.  Complete and Upload Box Quiz 15 in GeorgiaView. | Lesson 25 Notes and Lesson 26 Notes due Friday, May 2 by 11:59 pm  Worksheet 15 and Box Quiz 15 due Sunday, May 4 by 11:59 pm |
| Week 16 | **Final Exam** | **Assignment:** Complete Final Exam. (May be Proctored) | Final Exam due Sunday, May 11 by 11:59 pm |

**Goals and Objectives of the Course**include, but not limited to,

* Apply and adapt a variety of appropriate strategies to solve problems.
* Identify how a sequence (in both numeric forms and in diagrams) grows and find the general term of sequence using the pattern in the sequence. Explain how Gauss method works and generalize the method to find the sum of terms in a sequence with a pattern.
* Construct numeric systems for various bases and explain the role of place values and zero in the systems. Be able to convert back and forth numbers in base 10 to numbers in base other than 10.
* Identify and explain various strategies and algorithms for number operations (addition, subtraction, multiplication, and division) and use those in calculation.
* Be able to model operations using various representations (visual and verbal) and explain how multiple representations are connected.
* Explain how mathematical properties, such as the distributive, commutative, and associative properties, are embedded in various strategies in operations and use the properties efficiently in problem solving.
* Define and find multiples and factors including the greatest common divisor (GCD)and the least common multiple (LCM). Be able to explain how prime factorizations of numbers are associated with the GCD and LCM.
* State the divisibility rules and explain why those rules work. Apply the rules to determine if numbers are divisible by certain numbers and to list numbers that satisfy the rules.
* Explain and compute integer operations using various models.
* Understand and explain ratios and proportions and solve word problems using properties.
* Understand and explain sequences such as arithmetic, geometric, and Fibonacci sequences.
* Be able to convert sequences into mathematical forms with variables by finding the nth term.
* Understand and explain the relationships between fractions, decimals, and percents and be able to convert one from another.
* Solve problems involving percents and percent increase/decrease.
* Explain difference between simple and compound interests and be able to apply the concepts in real life problem situations.
* Understand and explain the difference between repeating and non-repeating nonterminating decimals and their connection to rational and irrational numbers.

*After completion of the course, the student will --*

**Sequences & mathematical reasoning**

* Identify patterns, predict next term, find and apply formulas for arithmetic, geometric, Fibonacci, “see-and-say”, exponential (nx), and power sequences (2n)
* Model sequences concretely, symbolically and abstractly
* Develop and use iteration and recursion to model and solve problems
* Investigate interesting subsets of the natural numbers (evens, odds, powers of two, Fibonacci numbers, perfect squares)

**Number systems**

* Compare and contrast number systems (additive, subtractive, character, place value)
* Identify the structure and chart the relationships in the real number system
* Describe the roles of zero, face and place value in the base ten system
* Model whole numbers using Base 10 blocks
* Analyze, explain and model binary operations on whole numbers using Base 10 blocks
* Recognize and analyze standard and non-standard algorithms for binary operations on whole numbers
* Analyze error patterns of students working standard algorithms for binary operations on whole numbers
* Recognize and apply properties of real numbers

**Prime & composite numbers**

* Explain two or more reasons why one is not a prime number
* Develop full definitions of prime and composite numbers
* Identify prime numbers between 1-100 and how to find prime numbers greater than 100
* List all factors of a given number
* Determine the prime factorization of any given whole number
* Find GCF/LCM for a given set of whole numbers

**Integers**

* Model integers using 2-color chips
* Analyze, explain and model binary operations on integers using 2-color chips
* Explore historical/cultural scenarios using powers of two
* Explore powers of ten

**Rational numbers**

* Model fractions using Pattern blocks, Fraction bars and Fraction grids (area models)
* Model binary operations on fractions using Pattern blocks, Fraction bars and Fraction grids (area models)
* Explain and justify traditional algorithms for binary operations on fractions
* Create equivalent fractions using paper and manipulative
* Explain why rational numbers are dense on the real numbers; give an example of a number set that is not dense and explain why not
* Put a set of fractions in order from smallest to greatest
* Find at least two fractions between a given pair of fractions

*In the context of the above expectations, a student will --*

**Mathematical processes**

* Make conjectures and use deductive methods to evaluate the validity of conjectures
* Recognize that a mathematical problem can be solved in a variety of ways, evaluate the appropriateness of various strategies, and select an appropriate strategy for a given problem
* Evaluate the reasonableness of a solution to a given problem
* Use physical and numerical models to represent a given problem or mathematical procedure
* Recognize that assumptions are made when solving problems and identify and evaluate those assumptions
* Explore problems using verbal, graphical, numerical, physical, and algebraic representations

**Mathematical Perspectives**

* Appreciate the contributions that different cultures have made to the field of mathematics and the impact mathematics has on society and culture
* Understand and apply how mathematics progresses from concrete to representation to abstract generalizations

**Communication**

* Communicate mathematical ideas and concepts in age-appropriate oral, written and visual forms for a class presentation
* Use mathematical processes to reason mathematically, solve mathematical problems, make mathematical connections within and outside of mathematics, and communicate mathematically
* Reflect on personal learning, change of attitude and beliefs, and growth in understanding through mathematical journaling
* Translate mathematical statements among developmentally appropriate language, standard English, mathematical language, and symbolic mathematics