Lesson Plan Template

Grade: 9		Subject: Algebra	
Materials: Algebra I textbook, notebook, writing utensils, calculator.		**Technology Needed:** iPad, laptop or technology of some sort if preferred over pen and paper	

Instructional Strategies:	Guided Practices and Concrete Application:
- **Modified Student: Student will follow along with classroom instruction while being provided filled out notes. If there is an opportunity to work with another student of the same grade level, they will be paired up**	**Modified Student:** **Student will be given a printout of the notes with the answers to the notes. This allows the student to be able to copy down the notes as they are given while also having the end result of the example problems.**
Standard(s): HS.A-APR.7 Add, subtract, multiply, and divide rational expressions. **Objective(s):** Students will understand that rational expressions form a system comparable to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression. **Bloom's Taxonomy Cognitive Level:** Application	**Differentiation** **Modified Student: Student will only be required to do half of the homework problems.**
Classroom Management- (grouping(s), movement/transitions, etc.) The answers to the previous assignment will be displayed at the front on the board. The students will take out their previous day's assignment, and grade their assignment themselves, then putting their score at the top of the paper for me to come around and record what their scores were.	**Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)** **Modified Student:** The student can work on the assignment with a partner if it is possible, or work with an aid if that is available.

Minutes	Procedures
2	**Set-up/Prep:** Review basic properties of adding like terms
3	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Have students do quick warm up review problems with like terms.
7	**Explain: (concepts, procedures, vocabulary, etc.)** Introduce new vocab words, exponents properties and adding/subtracting procedures, and how the new vocab words relate to the procedures.
13	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** Start with 2-3 guided practice problems where as a class I help them through each step and problem to get to the correct answer. Then move to 2-3 independent practice problems that they can attempt by themselves or in groups of 2-3. They can do the problems on a technology device or with pen/paper.
5	**Review (wrap up and transition to next activity):** We will then go over the answers to the independent practice problems and clear up any confusion or questions, and then assign the homework problems for the lesson, allowing the rest of class for the students to work on the homework.

Lesson Plan Template

Formative Assessment: (linked to objectives)
  Progress monitoring throughout lesson- clarifying questions, check-
  in strategies, etc.
Asking if there are any questions or if they're understanding the steps as I am going through the guided practice problems. Watch the student as they are trying practice problems. Work through each step with the student for the first practice problem to show them exactly what to do.

  Consideration for Back-up Plan: Give the student(s) homework in a form of multiple choice.

Summative Assessment (linked back to objectives)
  End of lesson:
Half of the homework problems related to the lesson.

  If applicable- overall unit, chapter, concept, etc.:

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

Notes:

Factor.

1. $2x^2 - 3x + 1$
2. $4x^2 - 9$
3. $5x^2 + 6x + 1$

$(2x - 1)(x - 1)$
$(2x - 3)(2x + 3)$
$(5x + 1)(x + 1)$

Rational Expression – the quotient of two polynomials.

Simplest Form – the numerator and denominator of a rational expression have no common factor

---

Examples:

1. What is $\dfrac{x^2 - 6x - 16}{x^2 + 5x + 6}$ in simplest form? State restrictions on the variable.

$$\frac{x^2 - 6x - 16}{x^2 + 5x + 6} = \frac{(x+2)(x-8)}{x^2 + 5x + 6} = \frac{(x+2)(x-8)}{(x+2)(x+3)} = \frac{x-8}{x+3}$$

x≠-3,-2

2. What is the product $\dfrac{x^2 - 25}{x^2 + 4x + 3} \cdot \dfrac{x^2 + x - 6}{x - 5}$ in simplest form? State any restrictions on the variable.

$$\frac{x^2-25}{x^2+4x+3}\cdot\frac{x^2+x-6}{x-5}=\frac{\left(x^2-25\right)\left(x^2+x-6\right)}{\left(x^2+4x+3\right)\left(x-5\right)}=\frac{\left(x+3\right)\left(x-2\right)\left(x^2-25\right)}{\left(x-5\right)\left(x^2+4x+3\right)}$$

$$=\frac{\left(x+3\right)\left(x-2\right)\left(x^2-25\right)}{\left(x-5\right)\left(x+1\right)\left(x+3\right)}=\frac{\left(x-2\right)\left(x^2-25\right)}{\left(x-5\right)\left(x+1\right)}=\frac{\left(x+5\right)\left(x-5\right)\left(x-2\right)}{\left(x-5\right)\left(x+1\right)}$$

$$=\frac{\left(x+5\right)\left(x-2\right)}{x+1}$$

$x\neq-3,-1,-5$

3. What is the quotient $\dfrac{x^2+5x+4}{x^2+x-12}\div\dfrac{x^2-1}{2x^2-6x}$ in simplest form? State any restrictions on the variable.

$$\left(\frac{\left(x^2+5x+4\right)}{\left(x^2+x-12\right)}\right)\div\left(\frac{\left(x^2-1\right)}{\left(2x^2-6\right)}\right)=\frac{\left(x^2+5x+4\right)\left(2x^2-6x\right)}{\left(x^2+x-12\right)\left(x^2-1\right)}=\frac{2x\left(x-3\right)\left(x+1\right)\left(x+4\right)}{\left(x^2-1\right)\left(x^2+x-12\right)}$$

$$=\frac{2x\left(x-3\right)\left(x+1\right)\left(x+4\right)}{\left(x-3\right)\left(x+4\right)\left(x^2-1\right)}=\frac{2x\left(x+1\right)}{x^2-1}=\frac{2x\left(x+1\right)}{\left(x+1\right)\left(x-1\right)}=\frac{2x}{x-1}$$

$X\neq-4,-1,1,3$

4. Find the product in simplest form of:

$$\frac{\left(2x^2+7x-15\right)}{\left(4x^2-8x+3\right)}\cdot\frac{\left(2x^2+x-1\right)}{\left(x^2+6x+5\right)}$$

$$\frac{\left(2x^2+7x-15\right)}{\left(4x^2-8x+3\right)}\cdot\frac{\left(2x^2+x-1\right)}{\left(x^2+6x+5\right)}=\frac{\left(x+5\right)\left(2x-3\right)}{\left(2x-1\right)\left(2x-3\right)}\cdot\frac{\left(x+1\right)\left(2x-1\right)}{\left(x+1\right)\left(x+5\right)}$$

$$=\frac{x+5}{2x-1}\cdot\frac{2x-1}{x+5}=\frac{\left(x+5\right)\left(2x-1\right)}{\left(2x-1\right)\left(x+5\right)}=\frac{2x-1}{2x-1}=1$$

5. Find the quotient in simplest form of:

$$\frac{\left(12x^2-22x+8\right)}{\left(3x\right)}\div\frac{\left(3x^2+2x-8\right)}{\left(2x^2+4x\right)}$$

$$\frac{\left(12x^2-22x+8\right)}{\left(3x\right)}\div\frac{\left(3x^2+2x-8\right)}{\left(2x^2+4x\right)}=\frac{\left(12x^2-22x+8\right)\left(2x^2+4x\right)}{3x\left(3x^2+2x-8\right)}$$

$$=\frac{4x\left(x+2\right)\left(6x^2-11x+4\right)}{3x\left(3x^2+2x-8\right)}=\frac{4\left(6x^2-11x+4\right)\left(x+2\right)}{3\left(3x^2+2x-8\right)}=\frac{4\left(x+2\right)\left(2x-1\right)\left(3x-4\right)}{3\left(3x^2+2x-8\right)}$$

$$=\frac{4\left(x+2\right)\left(2x-1\right)\left(3x-4\right)}{3\left(x+2\right)\left(3x-4\right)}=\frac{4\left(2x-1\right)}{3}$$

Homework:

Simplify.

1. $\dfrac{18x^6}{27x^4}$

2. $\dfrac{3x^2}{12x}$

3. $\dfrac{10a^3b}{-15ab^3}$

4. $\dfrac{36k^3m}{24k^4mn^5}$

5. $\dfrac{3x-12}{3x^2-12x}$

6. $\dfrac{6}{x^2-9x+20}\cdot\dfrac{5x-25}{15}$

7. $\dfrac{x-5}{6}\div\dfrac{2x-10}{12}$