Lesson Plan Template

Grade: 9th Grade

Subject: Algebra

Materials: Quiz, Notebook, Pencil, GCF handout

Technology Needed: Calculators

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)
- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Explain:
Since students will be taking a quiz, we will not have much time for students to work on their own. Most of this lesson will be a large group activity of understanding how to find the Greatest Common Factor between two integers.

Standard(s)
HS.A.SSE.2: Use the structure of an equation to identify ways to rewrite it.

Objective(s)
In this lesson, students will begin to learn how to identify the greatest common factor between integers. This will help them understand how to factor in different types of expressions.
"I can identify the GCF of two integers.

Bloom's Taxonomy Cognitive Level: Understanding, Applying, Analyzing

Differentiation

Below Proficiency: These students will likely struggle to find all the factors in the tree. I will try to assist these students by giving them the factoring handout as they work on the question on the board. I will also have these students come to me with questions after class if they need to. I will also try to have these students work with one of their peers who is doing well in the second day of teaching GCFs.

Above Proficiency: These students should grasp the material quickly. They will quickly understand how to create factor trees and should be able to find the GCF of two numbers. They may even be able to recognize the GCF in some cases without needing to create a factor tree or diagram. These students will be challenged by trying to find creative applications of the GCF.

Approaching/Emerging Proficiency: Students who are approaching proficiency will be expected to understand the example that we do on the board. They should also have a good understanding of how to create factor trees. The place that these students may struggle is in remembering to write down numbers that repeat. My hope is that the visual example of planning a party will help these students to gain a better understanding of the GCF.

Modalities/Learning Preferences: working in a large group, teaching the steps of a procedure for finding GCF, visual diagrams (factor trees), handouts with helpful notes

Classroom Management- (grouping(s), movement/transitions, etc.)

- Students are expected to work quietly during the quiz.
- Students are also expected to listen attentively throughout the lesson.
- Students are also expected to work quietly when they are trying a problem on their own.

Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules, and expectations, etc.)

- Students are expected to work quietly on the quiz and when they are trying a problem on their own.
- Students are also expected to listen attentively during the lesson.
- Students are expected to respect the contributions of others.

Minutes	Procedures
2 min	**Set-up/Prep:** The set up for this lesson will consist of passing out the quiz to students.
20-25 min	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Students will begin class by taking the first quiz of the unit. The quiz will probably take about 15-20 minutes. Then, we will begin the other half of the lesson.

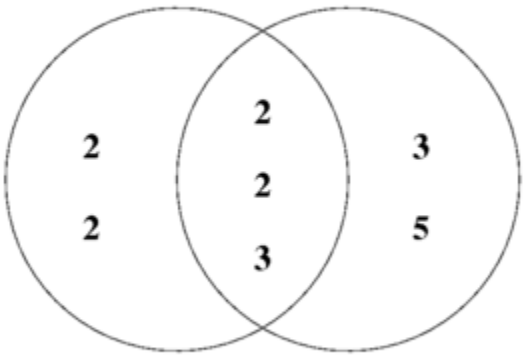
Lesson Plan Template

	As an opening question, I will ask students to imagine that they are planning a party and they want to know how many guests that they can invite. They will have 36 cookies, 24 appetizers and 12 entrees. Students must figure out how many guests they can invite so that each guest receives the same number of cookies, appetizers, and entrees as other guests. They will discuss as a class, and I will ask them to describe their reasoning as they solve the problem. To solve the problem, we will draw different dots on the board to represent each item that a guest will receive. Then, by arranging these dots, students should start to see how many guests they could have and how many items each guest would receive. Finally, I will tell them that the answer should be 12 guests (including themselves). "The number 12 is called the Greatest Common Factor" of these three numbers. This example will motivate the need for finding the greatest common factor between different numbers.
15 min	**Explain: (concepts, procedures, vocabulary, etc.)** To explain a helpful way of finding the GCF of two numbers, I will draw a Venn Diagram on the board, and I will have students copy the diagram in their notes. Then, I will have them pull out their calculators. First, we will begin by creating a factor tree for the two numbers. This will help us to find the prime factorization of the numbers. I will explain to students that we create a prime factorization tree by dividing our original number by one of its factors and writing the two numbers in the next line of our tree. Then, we repeat this process for each of the two numbers until we have only prime numbers at the bottom of each branch of the tree. Then, we will write our original numbers in the circles of our Venn diagram. We will find all the prime numbers that they do not share first. These numbers will go in the outside part of the Venn diagram corresponding to each number. Then, we will find the numbers that they share and write these numbers in the shared part of the Venn diagram. This is shown in an image below. It is also important to note that if they share more than one copy of the same number, this number should be written twice in the Venn diagram. Finally, we will multiply all the numbers that they share to find our GCF. For example, if they share the numbers 2, 3, and 5, the GCF will be 30. The example we will work on as a class will be the numbers 20 and 30. Their prime factorizations are 2*2*5 and 2*3*5, respectively. Their GCF is 10.
10 min	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** Students will be given two numbers, and they will be asked to try to find their GCF. I will encourage them to use the same process that we just used. First, they should make a factor tree (using a calculator if necessary), and then, they will create their Venn diagram. Finally, they should multiply these numbers to find the GCF. I will have students try to find the GCF for the numbers 40 and 70. They should find the prime factorizations 2*2*2*5 and 2*5*7, respectively. They should find that the GCF here is 10.
5 min	**Review (wrap up and transition to next activity):** We will wrap up by talking about how else this might be helpful. My hope is that students will recognize that they can also find the GCF of polynomials. They may also recognize that GCFs are helpful in performing each of the four arithmetic operations (adding, subtracting, multiplying, and dividing). I will also finish class by handing out a sheet of numbers 1-100 which lists all the factors of each number. This will be helpful in finding the GCF in the future.

Formative Assessment: (linked to objectives) **Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.** I will monitor the contributions of students throughout the class period to see how they are doing. I will also walk around to check on students as they are trying the problem on their own. **Consideration for Back-up Plan:** If students are having trouble finding the factorizations of numbers, I will pass out the GCF hand out during the lesson to help them see the factors of each number. We will return to this next lesson, if necessary.	**Summative Assessment (linked back to objectives)** **End of lesson:** At the end of the lesson, I will not have students turn any work in, but I will have them turn work in after the next lesson where we will continue to work on finding the GCF. **If applicable- overall unit, chapter, concept, etc.:** Students will need to know how to find the GCF so that they can factor polynomials on the test.

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

48 = 2 x 2 x 2 x 2 x 3
180 = 2 x 2 x 3 x 3 x 5



Least common multiple = 2 x 2 x 2 x 2 x 3 x 3 x 5 = 720

Greatest common divisor = 2 x 2 x 3 = 12

Number	Factors	Prime Factorization	Prime	composite	Count of Factors
1	1	1		-	1
2	1, 2	2	✓		2
3	1, 3	3	✓		2
4	1, 2, 4	2^2		✓	3
5	1, 5	5	✓		
6	1, 2, 3, 6	2 × 3		✓	4
7	1, 7	7	✓		
8	1, 2, 4, 8	2^3		✓	4
9	1, 3, 9	3^2			3
10	1, 2, 5, 10	2 × 5		✓	4
11	1, 11	11	✓		2
12	1, 2, 3, 4, 6, 12	$2^2 \times 3$		✓	6
13	1, 13	13	✓		2
14	1, 2, 7, 14	2 × 7		✓	4
15	1, 3, 5, 15	3 × 5		✓	4
16	1, 2, 4, 8, 16	2^4		✓	5
17	1, 17	17	✓		2
18	1, 2, 3, 6, 9, 18	2×3^2		✓	6
19	1, 19	19	✓		2
20	1, 2, 4, 5, 10, 20	$2^2 \times 5$		✓	6
21	1, 3, 7, 21	3 × 7		✓	4
22	1, 2, 11, 22	3 × 11		✓	4
23	1, 23	23	✓		2
24	1, 2, 3, 4, 6, 8, 12, 24	$2^3 \times 3$		✓	8
25	1, 5, 25	5^2		✓	3