Level 1: Determine if each question is GCF or LCM. Highlight any clues. Solve using the correct method for the problem.

1. Ava and Ethan are at the state fair. There are 2 different Ferris wheels. There is a large Ferris wheel and a small Ferris wheel. Ava rides the large Ferris wheels and Ethan rides the small Ferris wheel. The large and small Ferris wheels always start at the same time but they rotate at different speeds. The large Ferris wheel makes a complete rotation every 132 seconds. The small Ferris wheel makes a rotation every 42 seconds. How many seconds will pass until each Ferris wheel makes a complete rotation at the same exact time? How many rotations did each Ferris wheel make?

2. Don loves peanut butter and jelly sandwiches. One day while eating he notices that each jar of jumbo peanut butter has 72 servings but the jelly jar has only 40 servings. If he opened the jars on the same day and used exactly one serving of peanut butter and one servings of jelly each day, how many days would it take until he emptied a peanut butter jar and jelly jar on the same day? How many jars of peanut butter and jelly would this be?

3. A choir director at your school wants to divide the choir into smaller groups to do individual practice. However, he does not have enough materials so he must divide the students into the greatest group size possible. There are 24 sopranos, 60 altos, and 36 tenors. Each group will have the same number of students in a group. What is the greatest number of students in a group that can be formed? How many groups of sopranos, altos, and tenors will there be?

4. Buses going to downtown and buses going the airport leave the bus station both starting at 4:00am. Buses going downtown leave every 18 minutes. Buses going to the airport leave every 28 minutes. How many minutes will pass until they leave together at the same time? What time will it be when they leave together again at the same time?

5. Max has 54 NFL cards and 156 MLB cards. He is putting them into an album with the same number of cards on each page. He wants to put the greatest number of cards on a page. How many cards can Max put on a page? How many pages will be needed for the NFL cards? How many pages are needed for the MLB cards?

6. What is the largest number that can divide 56 and 104 evenly?

7. Mr. Mendoza and his 23 students are planning to have hot dogs at their class picnic. He can buy hot dogs in packages of 12 and hot dog buns in packages of 8.   Mr. Mendoza wants everyone to have the same number of hot dogs and hot dog buns with no leftovers.

    a. What is the least number of hot dogs and hot dog buns Mr. Mendoza can buy? How many hot dogs and buns will each person get?

    b. Suppose the class invites the principal, the nurse, the custodian, and three parents to join the picnic. Mr. Mendoza still wants everyone to get the same number of hot dogs and hot dog buns with no leftovers. What is the least number of hot dogs and hot dog buns will he need to buy now? How many hot dogs and hot dog buns will each person get?

8. Mrs. Knouff is taking 60 fifth graders, 75 sixth graders, and 45 seventh graders to Cedar Point for Math and Science Day. Cedar Point sets forth the following conditions: A. Each group must be equal in size. B. The grades are not allowed to mix. C. The students must be in the largest group possible. How many students will be in a group? How many groups of each grade level will there be?

9. Is it possible to create a situation where the "best group size" is 1? Is it possible for the GCF of two numbers to be 1? If so, explain how. If not, explain why not.

10. If it is possible to find the Least Common Multiple (LCM) of two or more numbers, then is it possible to find the Greatest Common Multiple (GCM) of two or more numbers? Explain your reasoning.

Level 2: Determine if each question is GCF or LCM. Highlight any clues. Solve using the correct method for the problem.

1. Ava and Ethan are at the state fair. There are 2 different Ferris wheels. There is a large Ferris wheel and a small Ferris wheel. Ava rides the large Ferris wheels and Ethan rides the small Ferris wheel. The large and small Ferris wheels always start at the same time but they rotate at different speeds. The large Ferris wheel makes a complete rotation every 132 seconds. The small Ferris wheel makes a rotation every 42 seconds. How many seconds will pass until each Ferris wheel makes a complete rotation at the same exact time? How many rotations did each Ferris wheel make?

2. Don loves peanut butter and jelly sandwiches. One day while eating he notices that each jar of jumbo peanut butter has 72 servings but the jelly jar has only 40 servings. If he opened the jars on the same day and used exactly one serving of peanut butter and one servings of jelly each day, how many days would it take until he emptied a peanut butter jar and jelly jar on the same day? How many jars of peanut butter and jelly would this be?

3. A choir director at your school wants to divide the choir into smaller groups to do individual practice. However, he does not have enough materials so he must divide the students into the greatest group size possible. There are 24 sopranos, 60 altos, and 36 tenors. Each group will have the same number of students in a group. What is the greatest number of students in a group that can be formed? How many groups of sopranos, altos, and tenors will there be?

4. Buses going to downtown and buses going the airport leave the bus station both starting at 4:00am. Buses going downtown leave every 18 minutes. Buses going to the airport leave every 28 minutes. How many minutes will pass until they leave together at the same time? What time will it be when they leave together again at the same time?

5. Max has 54 NFL cards and 156 MLB cards. He is putting them into an album with the same number of cards on each page. He wants to put the greatest number of cards on a page. How many cards can Max put on a page? How many pages will be needed for the NFL cards? How many pages are needed for the MLB cards?

6. What is the largest number that can divide $56ca^2t^3s^4$ and $104c^4at^2s$ evenly?

7. Mr. Mendoza and his 23 students are planning to have hot dogs at their class picnic. He can buy hot dogs in packages of 12 and hot dog buns in packages of 8. Mr. Mendoza wants everyone to have the same number of hot dogs and hot dog buns with no leftovers.
   a. What is the least number of hot dogs and hot dog buns Mr. Mendoza can buy? How many hot dogs and buns will each person get?

   b. Suppose the class invites the principal, the nurse, the custodian, and three parents to join the picnic. Mr. Mendoza still wants everyone to get the same number of hot dogs and hot dog buns with no leftovers. What is the least number of hot dogs and hot dog buns will he need to buy now? How many hot dogs and hot dog buns will each person get?

8. Mrs. Knouff is taking 60 fifth graders, 75 sixth graders, and 45 seventh graders to Cedar Point for Math and Science Day. Cedar Point sets forth the following conditions: A. Each group must be equal in size. B. The grades are not allowed to mix. C. The students must be in the largest group possible. How many students will be in a group? How many groups of each grade level will there be?

9. Is it possible to create a situation where the "best group size" is 1? Is it possible for the GCF of two numbers to be 1? If so, explain how. If not, explain why not.

10. If it is possible to find the Least Common Multiple (LCM) of two or more numbers, then is it possible to find the Greatest Common Multiple (GCM) of two or more numbers? Explain your reasoning.

Level 3: Determine if each question is GCF or LCM. Highlight any clues. Solve using the correct method for the problem.

1. Ava and Ethan are at the state fair. There are 2 different Ferris wheels. There is a large Ferris wheel and a small Ferris wheel. Ava rides the large Ferris wheels and Ethan rides the small Ferris wheel. The large and small Ferris wheels always start at the same time but they rotate at different speeds. The large Ferris wheel makes a complete rotation every 132 seconds. The small Ferris wheel makes a rotation every 42 seconds. How many seconds will pass until each Ferris wheel makes a complete rotation at the same exact time? How many rotations did each Ferris wheel make?

2. Don loves peanut butter and jelly sandwiches. One day while eating he notices that each jar of jumbo peanut butter has 72 servings but the jelly jar has only 40 servings. If he opened the jars on the same day and used exactly one serving of peanut butter and one servings of jelly each day, how many days would it take until he emptied a peanut butter jar and jelly jar on the same day? How many jars of peanut butter and jelly would this be?

3. A choir director at your school wants to divide the choir into smaller groups to do individual practice. However, he does not have enough materials so he must divide the students into the greatest group size possible. There are 24 sopranos, 60 altos, and 36 tenors. Each group will have the same number of students in a group. What is the greatest number of students in a group that can be formed? How many groups of sopranos, altos, and tenors will there be?

4. Buses going to downtown and buses going the airport leave the bus station both starting at 4:00am. Buses going downtown leave every 18 minutes. Buses going to the airport leave every 28 minutes. How many minutes will pass until they leave together at the same time? What time will it be when they leave together again at the same time?

5. Max has 54mn^2 NFL cards and 156x^{2}y MLB cards. He is putting them into an album with the same number of cards on each page. He wants to put the greatest number of cards on a page. How many cards can Max put on a page? How many pages will be needed for the NFL cards? How many pages are needed for the MLB cards?

6. What is the largest number that can divide $56ca^2t^3s^4$ and $104c^4at^2s$ evenly?

7. Mr. Mendoza and his 23 students are planning to have hot dogs at their class picnic. He can buy hot dogs in packages of 12 and hot dog buns in packages of 8. Mr. Mendoza wants everyone to have the same number of hot dogs and hot dog buns with no leftovers.

    a. What is the least number of hot dogs and hot dog buns Mr. Mendoza can buy? How many hot dogs and buns will each person get?

    b. Suppose the class invites the principal, the nurse, the custodian, and three parents to join the picnic. Mr. Mendoza still wants everyone to get the same number of hot dogs and hot dog buns with no leftovers. What is the least number of hot dogs and hot dog buns will he need to buy now? How many hot dogs and hot dog buns will each person get?

8. Mrs. Knouff is taking $60a^2b^3$ fifth graders, $75a^4b^7f$ sixth graders, and $45ab^2c^3$ seventh graders to Cedar Point for Math and Science Day. Cedar Point sets forth the following conditions: A. Each group must be equal in size. B. The grades are not allowed to mix. C. The students must be in the largest group possible. How many students will be in a group? How many groups of each grade level will there be?

9. Is it possible to create a situation where the "best group size" is 1? Is it possible for the GCF of two numbers to be 1? If so, explain how. If not, explain why not.

10. If it is possible to find the Least Common Multiple (LCM) of two or more numbers, then is it possible to find the Greatest Common Multiple (GCM) of two or more numbers? Explain your reasoning.