Group Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Investigation Riding the Ferris Wheels**

Many things happen over and over again in a fixed cycle. For example, a morning news program may have a traffic report every 7 minutes. A train may arrive at a particular station every 12 minutes or a cuckoo clock may sound every 15 minutes. Can you think of anything else that happens in a fixed cycle?

Thinking about common factors and common multiples can help you solve such problems

Let’s start by comparing the multiples of 20 and 30

* The multiples of 20 are: 20, 40, 60 \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_
* The multiples of 30 are: 30, 60, 90 \_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_

The numbers \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, are multiples of both 20 and 30. We all these numbers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of 20 and 30. Of these multiples 60 is the least common multiple or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now let’s compare the factors of 12 and 30

* The factors of 12 are: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The factors of 30 are:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The numbers \_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_, are both factors of 12 and 30. We call these number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of 12 and 30. Of these factors 6 is the greatest common factor or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Jeremy and his little sister, Deborah, are at a carnival. There are both a large and small Ferris wheel. The rides begin at the same time. For each situation below, decide how many seconds will pass before Jeremy and Deborah are both at the bottom again.

**A**. The large wheel makes on revolution in 60 seconds and the small wheel makes one revolution in 20 seconds.

**B.**  The large wheel makes one revolution in 50 seconds and the small wheel makes one revolution in 30 seconds

**C**. The large wheel makes one revolution in 10 seconds and the small wheel makes one revolution in 7 seconds.

**D**. For questions A-C determine the number of times each Ferris wheel goes around before Jeremy and his sister are both on the ground again.

Question A:

Question B:

Question C:

Group Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Investigation 2: Looking at Cicada Cycles**

Cicadas (si KAY dahs) spend most of their lives under ground. Some populations of cicadas come above ground every 13 years, while other come up every 17 years. Although cicadas do not cause damage directly to fruits and vegetables, they can damage orchards because the female makes slits in trees to lay her eggs.

Let’s open to page 39 in our books to take a closer look at cicadas

Stephan’s grandfather told him about a terrible year when the cicadas were so numerous that they wrecked the buds on all the young trees in his orchard. Stephan conjectured that both 13-year and 17 year cicadas came up that year. Assume that Stephan’s conjecture is correct.

**A**. How many years after an appearance of 13 year and 17 year cicadas together will both types of cicadas appear together again? Explain.

**B.** Suppose there were 12 year, 14 year, and 16 year cicadas, and they all came up this year. How many years will elapse before they all come up together again? Explain.

**Homework**

For exercises 1 – 8, the list the common multiples from 1 to 100 for each pair of numbers, then find the least common multiple for each pair

1. 8 and 12

2. 3 and 15

3. 7 and 11

5. 24 and 36

7. 42 and 14

8. Use the terms *factor, divisor, multiple, product,* and  *divisible by* to write as many statements as you can about the number sentence below.

7 x 9 = 63

For next exercises, find two pairs of number with the given number as their least common multiple: example: 18

Two number that have 18 as it’s least common multiple are 6 and 9. Another pair is 2 and 18

6: 6, 12, **18** 2: 2, 4, 6, 8, 10, 12, 16, **18**

9: 9, **18** 18: **18**, 36, 54, 72

9. 10

10. 36

11. The school cafeteria serves pizza every sixth day and applesauce every eighth day. If pizza and applesauce are both on today’s menu, in how many days will they be together on the menu again?

12. a. A restaurant is open 24 hours a day. The manager wants to divide the day into work shifts of equal length. The shifts should not overlap, and all shift durations should be a whole number of hours. Describe the different ways this can be done.

b. The restaurant’s two neon signs are turned on at the same time. Both signs blink as they are turned on. One sign blinks every 9 seconds. The other sign blinks every 15 seconds. In how many seconds will they blink together again?