Applications Connections Extensions ACE

# Applications

**For Exercises 1–8, 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

**4.** 9 and 10

**5.** 24 and 36

**6.** 20 and 25

**7.** 42 and 14

**8.** 30 and 12

**9. a.** Find three pairs of numbers for which the least common multiple equals the product of the two numbers.

**b.** Look at the pairs of numbers you found in part (a). What is true about all three pairs of numbers?

**For Exercises 10–13, find two pairs of numbers with the given number as their least common multiple.**

**10.** 10

**11.** 36

**12.** 60

**13.** 105

**14. 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?

**15.** 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?

**For Exercises 16–23, list the common factors for each pair of numbers. Then find the greatest common factor for each pair.**

Go Online PHSchool.com
**For:** Multiple-Choice Skills Practice
**Web Code:** ama-1354

**16.** 18 and 30

**17.** 9 and 25

**18.** 60 and 45

**19.** 23 and 29

**20.** 49 and 14

**21.** 140 and 25

**22.** 142 and 148

**23.** 84 and 105

**24.** **Multiple Choice** For which pair is the greatest common factor 8?

**A.** 2 and 4

**B.** 7 and 15

**C.** 32 and 64

**D.** 56 and 72

**25.** **Multiple Choice** For which pair is the greatest common factor 15?

**F.** 60 and 75

**G.** 30 and 60

**H.** 10 and 25

**J.** 3 and 5

**26.** **Multiple Choice** For which pair is the greatest common factor 1?

**A.** 5 and 10

**B.** 8 and 4

**C.** 8 and 10

**D.** 8 and 15

**27.** Mr. Mendoza and his 23 students are planning to have hot dogs at their class picnic. Mr. Mendoza can buy hot dogs in packages of 12 and hot dog buns in packages of 8.

Homework Help Online PHSchool.com
**For:** Help with Exercise 27
**Web Code:** ame-1327

**a.** Mr. Mendoza plans that everyone will get the same number of hot dogs and buns and there will be no leftovers. What are the least number of hot dog packages and the least number of bun packages Mr. Mendoza can buy? How many hot dogs and buns will each person get?

**b.** Suppose that the class invites the principal, the secretary, the bus driver, and three parents to help supervise. How many packages of hot dogs and buns will Mr. Mendoza need to buy so that everyone will get the same number of hot dogs and buns with no leftovers? How many hot dogs and buns will each person get?

**28.** The cast of a play had a party at the drama teacher's house. There were 20 cookies and 40 carrot sticks served as refreshments. Each cast member had the same number of whole cookies and the same number of whole carrot sticks. Nothing was left over. The drama teacher did not eat. How many cast members might have been at the party? Explain.

**29.** Make up a word problem that you can solve by finding common factors. Then make up a different word problem that you can solve by finding common multiples. Solve your problems, and explain how you know that your answers are correct.

**30.** **Multiple Choice** Neena has 54 smiley-face stickers, 36 glittery stickers, and 81 heart stickers. She wants to divide the stickers evenly among her friends. Find the greatest number that Neena can use to divide the stickers evenly.

**F.** 3 **G.** 9 **H.** 18 **J.** 27

## Connections

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

$$7 \times 9 = 63$$

**32.** **a.** What factor is paired with 12 to give 48?

**b.** What factor is paired with 11 to give 110?

**33.** Use the fact that $135 \times 37 = 4{,}995$ to find the value of $1{,}350 \times 3{,}700$.

**34.** **a.** Suppose a jet travels 60 kilometers in 5 minutes. How many kilometers will it travel in 2 hours? In 6 hours?

**b.** How many more kilometers will the jet travel in 6 hours than in 2 hours?

**c.** Suppose that Nodin flew on this jet to the Dominican Republic. If his trip took 4 hours, how many kilometers did he travel?

**35.** Mario's watch runs fast. In 1 day, it gains an hour; so in 12 days, it gains 12 hours and is correct again. Julio's watch also runs fast. In 1 day, it gains 20 minutes. If they both set their 12-hour watches correctly at 9:00 A.M. on Monday, when will their watches both be correct again at the same time?

**36.** $3 \times 5 \times 7 = 105$. Use this fact to find each product.

**a.** $9 \times 5 \times 7$

**b.** $3 \times 5 \times 14$

**c.** $3 \times 50 \times 7$

**d.** $3 \times 25 \times 7$

## Extensions

**37.** Ms. Santiago has many pens in her desk drawer. She says that if you divide the total number of pens by 2, 3, 4, 5, or 6, you get a remainder of 1. What is the smallest number of pens that could be in Ms. Santiago's drawer?

**38.** What is the mystery number pair?

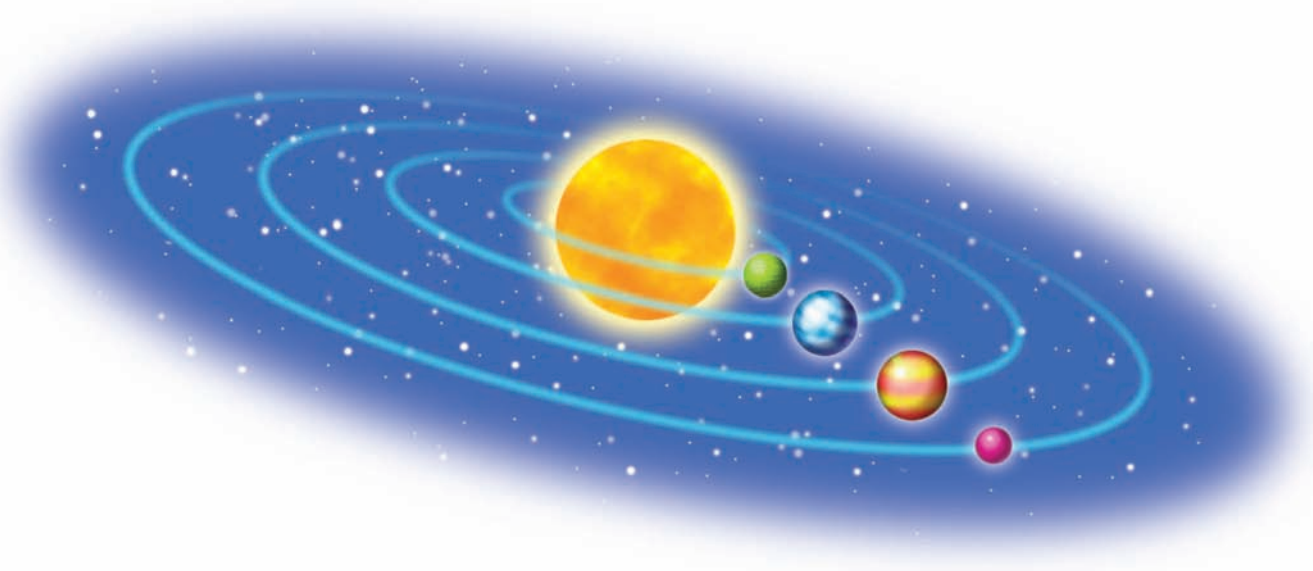
**Clue 1** The greatest common factor of the mystery pair is 7.

**Clue 2** The least common multiple of the mystery pair is 70.

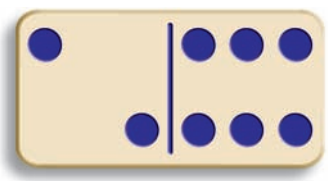
**Clue 3** Both of the numbers in the mystery pair have two digits.

**Clue 4** One of the numbers in the mystery pair is odd and the other is even.

**39.** Suppose that, in some distant part of the universe, there is a star with four orbiting planets. One planet makes a trip around the star in 6 Earth years, the second planet takes 9 Earth years, the third takes 15 Earth years, and the fourth takes 18 Earth years. Suppose that at some time the planets are lined up as pictured below. This phenomenon is called *conjunction*. How many years will it take before the planets return to this position?



**40.** Eric and his friends practice multiplying by using dominoes such as those above. Each half of a domino has dots on it to show a number from 0 to 6. The students use the two numbers on a domino as factors. So when Eric sees a domino like the one below, he answers 12.



**a.** What is the greatest product you can make from numbers on dominoes?

**b.** What is the least product you can make from numbers on dominoes?

**c.** Eric reasons that he has to know the answers for $0 \times 0, 0 \times 1, 0 \times 2, 0 \times 3, 0 \times 4, 0 \times 5, 0 \times 6, 1 \times 0, 1 \times 1$, and so on. Because there are seven different numbers, 0, 1, 2, 3, 4, 5, and 6, that can occur on each half of the domino, he reasons that he needs to know 49 different answers. This is too many. What did he forget?

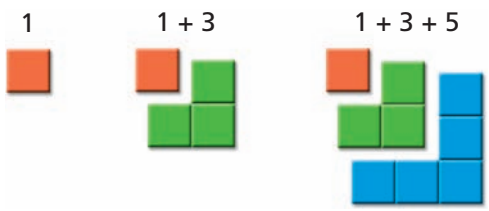
**41.** Examine the number pattern below. You can use the tiles to help you see a pattern.

Row 1: $1 = 1$

Row 2: $1 + 3 = 4$

Row 3: $1 + 3 + 5 = 9$

Row 4: $1 + 3 + 5 + 7 = 16$




**a.** Complete the next four rows in the number pattern.

**b.** What is the sum in row 20?

**c.** In what row will the sum be 576? What is the last number (addend) in the sum in this row? Explain.

**42.** Examine the pattern below. Using tiles or making a diagram may help you see a pattern.

Row 1: $2 = 2$

Row 2: $2 + 4 = 6$

Row 3: $2 + 4 + 6 = 12$

Row 4: $2 + 4 + 6 + 8 = 20$

**a.** Complete the next four rows in the pattern.

**b.** What is the sum in row 20?

**c.** In what row will the sum be 110? What is the last number (addend) in the sum in this row? Explain.

**43. a.** Suppose that cicadas have predators with 2-year cycles. How often would 12-year cicadas face their predators? Would life be better for 13-year cicadas? Explain.

**b.** Suppose that 12-year and 13-year cicadas have predators with both 2-year and 3-year cycles. Suppose that both kinds of cicadas and both kinds of predators came up this year. When would the 12-year cicadas again have to face both kinds of predators at the same time? When would the 13-year cicadas face both? Which type of cicada do you think is better off?


**44.** While Nina was reading through her old journals, she noticed that on November 9, 1999, she had written the date 11-9-99. It looked like a multiplication problem, $11 \times 9 = 99$. Nina wondered if there were any other such dates from 1900 to 1999. Are there? Explain.

Extensions