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Module 1 Number Sense
Lesson 2 Divisibility Rules

# Challenge Problems <br> 1.2 

## Set 1

(1) Explain why a number that is divisible by ten is also divisible by two and five.
2) Identify and describe the characteristics of numbers that are divisible by all of the numbers $2,4,5$, and 10 .

## Set 2

If a number is divisible by 3 , is it divisible by 9 ? Explain.

If a number is divisible by 9 , is it divisible by 3 ? Explain.
3) Identify and describe the characteristics of numbers that are divisible by all of the numbers $2,3,4,5,6,9$ and 10 .

## Possible Answers

Set 1

1. Since $2 \times 5=10$, dividing a number by $\mathbf{1 0}$ is the same as dividing that number by 2 and then 5 . If a number is divisible by 10 , the number can be divided into groups of 10 with no remainder. Each of those groups can then be divided into groups of five's or two's, so the original number is also divisible by 2 and 5.
2. Since $2 \times 5=10$, ignore the 2 and 5 and concentrate on the 10 and 4. The smallest number divisible by 10 and 4 is 20 . So, numbers divisible by $2,4,5$, and 10 are divisible by 20 . Numbers divisible by 20 end in 0 and have an even number in the ten's position.

Set 2

1. Nine is equal to $3 \times 3$, or $3^{2}$. Any number that is divisible by 9 is also divisible by 3 , but the opposite is not always true. For example, the number 12 is divisible by 3 but not 9 . Being divisible by 3 only means that the number might also be divisible by 9 . To be divisible by 9 , a number must be divisible by 3 and that number divided by 3 must also be divisible by 3 .
2. Since $9=3 \times 3$, a number that is divisible by 9 can also be divided into 3 times as many groups of 3 , so it is also divisible by 3 .
3. Since $2 \times 5=10$, numbers that are divisible by $2,3,4,5,6,9$, and 10 are the same as those divisible by $3,4,6,9$, and 10 . Since the smallest number that is divisible by 3,4 , and 6 is 12 , the numbers being investigated are the same numbers that are divisible by 9,10 , and 12 . The smallest number divisible by 9,10 , and 12 is 180. Therefore, numbers divisible by $2,3,4,5,6,9$, and 10 are multiples of 180 .
