

## Sample Lesson: Divisibility Rules

*Subject:* Divisibility Rules

*Overview of Unit:* This is an introductory lesson in a unit on fractions. After learning the divisibility rules, the students will apply them to find the greatest common factors and least common multiples of sets of numbers. They will then use these skills to simplify fractions and change unlike fractions to fractions with a common denominator.

*Grade Level:* Junior Division: third, fourth, and fifth grades.

*Objective:* The students will identify and apply divisibility rules for the numbers 2, 3, 4, 5, 6, 9, 10, and 11.

*Materials:*

- Hundreds chart
- Colored pencils (8 different colors)

*Key Vocabulary:* Divisible, even, odd, factor, prime number, composite number

*Instruction:*

### Daily Math Fact Practice

Timed Skill Drill –The purpose of the Skill Drill is to improve instant recall. Throughout the Junior Division, students will complete Skill Drills in addition, subtraction, multiplication, division, simplifying fractions, as well as fraction, decimal, and percent equivalents. For this lesson, students will begin class with 60 basic division facts.

### Introduction

After completing their Skill Drill, students will write a response to a journal prompt using complete sentences. Journal writing is meant to promote fluency in communication of mathematical reasoning and to reinforce the use of math vocabulary. Journal responses vary in length from four to ten sentences. Once students have completed their journal responses, they will have the opportunity to share their responses with the class. As students share, classmates may add to their responses.

Journal Prompt: For this lesson, the students will explain what it means for one number to be divisible by another number.

### Lesson/Activity (Sieve of Eratosthenes)

Each student will receive a hundreds chart. Students will be asked to gather seven different colored pencils. Using one color, they will circle all of the numbers on the chart that are divisible by two. Then, the students will circle all the numbers divisible by three in another color. They will continue to do this with the numbers 4, 5, 6, 9, 10, and 11.

After the numbers have been circled, the students will look for patterns. For example, all the even numbers are divisible by two. For a number to be divisible by three, the sum of its digits must be divisible by three. As they continue to look for patterns, they will notice that numbers that are divisible by both two and three are also divisible by six. While investigating the divisibility patterns, the students will record their findings in a table of divisibility rules. Once students have had the opportunity to investigate the rules of divisibility on their own, the teacher will facilitate sharing as a class to compile a list of as many divisibility rules as possible. After having compiled a student-generated list, the teacher will complete the list with any missing divisibility rules that could not be discovered using the sieve. The class will then test the rules using a teacher-generated list of numbers, finding all the factors (2, 3, 4, 5, 6, 9, 10, and 11) for each number.

*Extension:*

As an extension activity, students will be asked to look for patterns to help them develop a list of four or five-digit numbers that are all divisible by 3 or 9. For example, starting with one five-digit number that is divisible by 9, students can rearrange the digits in any order, and the resulting numbers will also be divisible by 9.

*Reinforcement and Assessment:*

The homework assignment for the day will include a printed review of the rules of divisibility and ask students to find all the factors for several numbers up to 4 or 5 digits. The homework will conclude with a word problem that requires students to apply the divisibility rules to solve the problem.