



Unit 1

Lesson 1.1

Divisibility Rules - Lesson Plan

OBJECTIVE

Students will be able to find out if one number can be divided evenly into another number.

INTRODUCTION

Ask students which multiplication facts they were required to memorize in elementary school. Tell them that when you went to school you had to memorize the 3s up to 1,000. Admit that although you can't remember every 3s fact up to 1,000, you do remember all of the answers. Ask them to quiz you by calling out any number up to 1,000 and you will let them know if 3 goes into that number evenly. Have them check your answers by dividing the numbers by 3 on their calculators. Variation: Show the trick to several students ahead of time and they can claim they memorized up to 1,000 also.

Example 1

Student states "621." Teacher mentally adds digits $6 + 2 + 1 = 9$. Because 9 is divisible by 3, the teacher states, "621 can be evenly divided by 3."

Example 2

Student states "950." Teacher mentally adds digits $9 + 5 + 0 = 14$. Because 14 is not divisible by 3, the teacher states, "950 cannot be evenly divided by 3."

LESSON

Define **factor**. Explain that a number must divide evenly (no remainder) in order to be a factor.

Write several division problems on the board to help determine factors of a number.

Examples

$$7 \overline{)35}$$

7 and 5

$$2 \overline{)10}$$

2 and 5

$$11 \overline{)24}$$

11 not a factor

$$3 \overline{)20}$$

3 not a factor

$$10 \overline{)130}$$

10 and 13

Explain to students that they can use divisibility rules to determine factors. Write several odd and even numbers on the board. Discuss which might have 2 as a factor. Lead students to understand that the last digit (ones place) is all that matters. Continue with 5s and 10s.

Explain the trick you used in the introduction for divisibility by 3. Include divisibility by 9. Write the following on the board: 615, 23, 7,035. Have students add the digits to determine if 3 is a factor.

Then write the following on the board: 75, 540, 117. Have students add the digits to determine if 9 is a factor.

Explain the divisibility rule for 4s.

Common errors

- Students often think that adding the digits will work for every number. Remind them this only works for the 3s and the 9s.
- Students are confused with the 4s divisibility rule when the last two digits are 00. Have students check that 100, 1,000, 10,000, etc. are all divisible by 4.

PRACTICE

- Begin with the factor 2. Ask students to think of progressively larger numbers that have a factor of 2. Continue with 3s, 4s, etc.
- Write the following on the board: 68, 284, 370, 5,742. Have students determine if these numbers have the factors 2, 3, 4, 5, 9, and/or 10. Remind students that a number can have many factors.

Name: _____ Date: _____

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Divisibility Rules - Worksheet

Directions: List as many factors as you can of the following numbers.

1. 21

2. 54

Example: 1, 3, 7, 21

3. 39

4. 8

5. 20

6. 42

7. 45

8. 10

9. 70

10. 32

11. 81

12. 7

Directions: Solve the problem below.

13. Patrick purchased 120 trading cards in different packages. The same amount of trading cards were in each package. List all the possibilities for the amounts of trading cards in each package.