

1.1

Divisibility by 10, 5, and 2

YOU WILL NEED

- a place value chart

GOAL

Create and use divisibility rules to determine if 10, 5, or 2 is a factor of a whole number.

LEARN ABOUT the Math

Three schools co-hosted the district soccer championships. Each school sold a different type of gift card to raise money for the event.



School	Amount raised
Mountain Heights	\$1995
Lavallée	\$1020
Plains View	\$1634

Communication **Tip**

Every whole number is divisible by its factors. For example, "1020 is divisible by 10" means the same as "10 is a factor of 1020."

$$1020 \div 10 = 102$$

$$102 \times 10 = 1020$$



How can you determine which type of card each school sold?

- Represent each amount raised on a place value chart.
- How does regrouping 1020 into 102 tens and 0 ones show that 1020 is divisible by 10, 5, and 2?
- How does regrouping 1995 into tens and ones show that 1995 is divisible by 5? Is 2 or 10 a factor of 1995? Explain.

- D.** How does regrouping 1634 into tens and ones show that 1634 is divisible by 2? Is 5 or 10 a factor of 1634? Explain.
- E.** Which type of card did each school sell? How do you know?

Reflecting

- F.** How does regrouping a whole number into tens and ones help you determine the remainder when you divide the number by 10, 5, or 2?
- G.** What are the possible ones digits if a number is divisible by 10? What if a number is divisible by 5 or by 2?
- H.** Describe the **divisibility rules** you would use to determine whether 10, 5, and 2 are factors of a number.

divisibility rule

a way to determine if one whole number is a factor of another whole number without actually dividing the entire number

WORK WITH the Math



Example

Using divisibility rules for 10, 5, and 2

Without dividing the entire number, determine if 10, 5, or 2 is a factor of 34 648.

Ryan's Solution

$$34\ 648 = \underbrace{3464}_{\text{tens}} + 8 \text{ ones}$$

Any number of tens is divisible by 10, 5, and 2.

8 is not divisible by 10.

8 is not divisible by 5.

8 is divisible by 2.

2 is a factor of 34 648, but 5 and 10 are not.

When I divide and there is no remainder, the divisor is a factor.

When I divide 34 648 by 10, the remainder is the ones digit, 8.

When I divide 34 648 by 5, the remainder is 3 because the 3464 tens are divisible by 5 and the remainder when I divide 8 by 5 is 3.

When I divide 34 648 by 2, the remainder is 0 because the 3464 tens are divisible by 2 and 8 is divisible by 2.

A Checking

- Use divisibility rules to decide if 10, 5, or 2 is a factor of each number. If 10, 5, or 2 is not a factor, determine the remainder.
a) 375 b) 1987 c) 12 456 d) 1 000 000
- Write all the possibilities for the missing digit.
a) $136\blacksquare$ is divisible by 10, 5, and 2.
b) $456\blacksquare$ is divisible by 2, but not by 10 or 5.
c) $786\blacksquare$ has a remainder of 2 when divided by 5.
d) $943\blacksquare$ is divisible by 5, but not by 10 or 2.

B Practising

- Why do you think a divisibility rule for 1 is not needed?
- Write a four-digit number that is divisible by 5, but not by 10. Explain how you know.
- A truck is loaded with 1645 kg of potatoes in bags that have the same mass. Are the bags 1 kg, 2 kg, 5 kg, or 10 kg bags? Explain.
- How many ways can you pay each amount using only one type of Euro coin shown? Explain how you know.
a) 456 cents c) 2445 cents
b) 1430 cents d) 6843 cents
- a) Is your year of birth divisible by 10, 5, or 2? Explain.
b) How old will you be in the next year that is divisible by 10, 5, and 2?
- a) Which numbers between 1000 and 1100 are divisible by 20?
b) Use your answer in part (a) to create a divisibility rule for 20. Use a four-digit number as an example to help you explain your rule.
- Try the number trick at the left. Then explain why it works.
- What are the greatest and least numbers between 900 and 1000 that are divisible by 10, 5, and 2? Explain your thinking.
- How are the divisibility rules for 10, 5, and 2 similar? How are they different?



Number Trick

- Multiply your age by 2.
- Multiply this product by 5.
- Remove the last digit.
- The answer is your age.