LESSON MAKER PRO

# Decimal Detectives

*Divide fractions to find decimals that stop or repeat.*

**GRADE 8 · 8.NS.A.1.a**

**8.NS.A.1.a** "Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates."

NAME _____ DATE _____

### FOLLOW THE REMAINDER

Every number has a decimal expansion. To write a fraction as a decimal, divide its numerator by its denominator. For a rational number, a remainder of 0 makes the decimal terminate; a repeated remainder makes its digits repeat.

**WORKED EXAMPLE**

Write 3/11 as a decimal. Does it terminate or repeat?

1. 3 ÷ 11 gives 0 with a remainder of 3. Add a decimal point and a zero.
2. 30 ÷ 11 gives 2 with a remainder of 8.
3. 80 ÷ 11 gives 7 with a remainder of 3.
4. The remainder is 3 again, so the digits 27 repeat.

**Answer: 3/11 = 0.272727…; it repeats.**

## PRACTICE 6 problems

**1** Write 5/8 as a decimal.

**ANSWER** _____

**2** Write 2/9 as a decimal. Which digit repeats?

**ANSWER** _____

**3** Write 7/20 as a decimal. Does it terminate or repeat?

**ANSWER** _____

**4** Write 4/15 as a decimal. Which digit repeats?

**ANSWER** _____

**5** Write 9/16 as a decimal. Does it terminate or repeat?

**ANSWER** _____

**6** Write 13/6 as a decimal. Explain how a remainder shows that the decimal repeats.

**ANSWER** _____

## APPLY IT Show your work

**1** A music app splits a 5-second sound into 12 equal clips. How long is each clip in seconds? Write the length as a decimal and tell whether it terminates or repeats.

WORK SPACE

**ANSWER** _____

**2** You pour 9 liters of sports drink equally into 40 bottles. How many liters go in each bottle? Write the amount as a decimal and tell whether it terminates or repeats.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A student says every fraction with an even denominator has a terminating decimal. Test the claim using 10/18. Simplify the fraction, write its decimal expansion, and explain whether the claim is true.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Decimal Detectives

**GRADE 8 · 8.NS.A.1.a**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Write 5/8 as a decimal. | **0.625** |
| 2 | Write 2/9 as a decimal. Which digit repeats? | **0.222…; the digit 2 repeats.** |
| 3 | Write 7/20 as a decimal. Does it terminate or repeat? | **0.35; it terminates.** |
| 4 | Write 4/15 as a decimal. Which digit repeats? | **0.2666…; the digit 6 repeats.** |
| 5 | Write 9/16 as a decimal. Does it terminate or repeat? | **0.5625; it terminates.** |
| 6 | Write 13/6 as a decimal. Explain how a remainder shows that the decimal repeats. | **2.1666…; dividing by 6 produces a remainder of 4 again and again, so the digit 6 repeats.** |

## PART 2 · APPLY IT

1. **0.41666… second; it repeats.** Divide 5 by 12. The remainder 8 recurs, so the digit 6 repeats.
2. **0.225 liter; it terminates.** Divide 9 by 40 to get 0.225. The division reaches a remainder of 0.

## CHALLENGE

**10/18 = 5/9 = 0.555… . The claim is false: 18 is even, but the decimal repeats.**

Accept equivalent notation that clearly identifies the repeating digits. For problem 6, accept any explanation that shows a nonzero remainder repeating.