

## Activity Lab

### Repeating Decimals

You will need your notebooks for today's lab.

#### EXAMPLE Writing a Repeating Decimal as a Fraction

In a recent survey,  $0.\overline{45}$  of those asked chose blue as their favorite color. Write  $0.\overline{45}$  as a fraction in simplest form.

**Step 1** Represent the given decimal with a variable.

$$n = 0.\overline{45}$$

**Step 2** Multiply by  $10^n$ , where  $n$  = the number of digits that repeat. In this case, multiply by  $10^2$ , or 100, because the repeating part of the decimal is 45.

$$100n = 45.\overline{45}$$

**Step 3** Subtract to eliminate the repeating part.

$$100n = 45.454545 \dots$$

$$- n = - 0.454545 \dots \quad \leftarrow \text{Use the Subtraction Property of Equality.}$$

$$99n = 45.000000 \dots \quad \leftarrow \text{Simplify.}$$

$$99n = 45$$

**Step 4** Solve the new equation.

$$\frac{99n}{99} = \frac{45}{99} \quad \leftarrow \text{Divide each side by 99.}$$

$$n = \frac{45}{99} = \frac{5}{11} \quad \leftarrow \text{Simplify using the GCF, 9.}$$

● The repeating decimal  $0.\overline{45}$  equals  $\frac{5}{11}$ .

Write these in your notes as we work them out together on the whiteboard.

Write each repeating decimal as a fraction in simplest form.

1.  $0.\overline{5}$

2.  $0.\overline{7}$

3.  $0.\overline{24}$

4.  $0.\overline{15}$

5.  $0.\overline{135}$

6.  $0.\overline{282}$