Real-World Link

Movies Josefina surveyed 298 students and found that 52% like scary movies. Estimate the number of students that like scary movies.

1. Write the common percents from 0% to 100% at the top of the bar diagram.

2. What common percent is 52% close to? **50%**
   Shade the bar diagram above to show your answer.

3. Round 298 to the nearest hundred. 298 ≈ **300**
   Write your answer in the box below 100%.

4. Use the bar diagram to estim

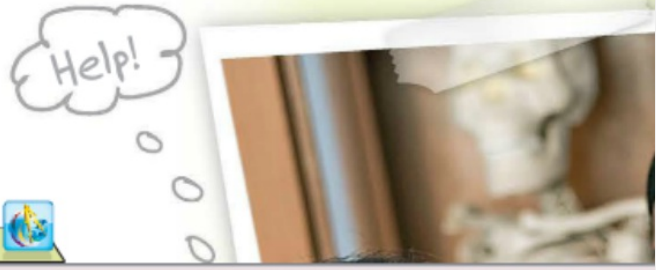
Essential Que

WHEN is it better to use a fraction, a decimal, or percent?

Common Core State Standa

Content Standards
6.RP.3, 6.RP.3c

Mathematical Practi
1, 3, 4, 5



Guided Practice

Check

Estimate each percent. (Examples 1 and 2) Sample answers: 1–6

1. 19% of \$53 ≈ $\frac{1}{5}$ of \$50 is \$10.

Show your work.

2. 21% of 96 ≈ $\frac{1}{5}$ of 100 is 20.

3. 59% of 16 ≈ $\frac{3}{5}$ of 15 is 9.

4. A purse that originally cost \$29.99 is on sale for 50% off. About how much is the sale price of the purse? (Example 3)

   $\frac{1}{2}$ of \$30 is \$15.

5. Mr. Marcucci received a bonus of \$496 from his employer. He has to pay 33% of his bonus to taxes. How much will Mr. Marcucci pay in taxes? (Examples 4 and 5)

   \$33 × 5 = \$165

6. **Building on the Essential Question** When is an estimate more useful than an exact answer?

   Estimates are useful when you are checking to see if your exact answer is reasonable.

Rate Yourself!

How confident are you about estimating with percents? Shade the ring on the target.

For more help, go online to access a Personal Tutor.

Tutor

Name _____ My Homework _____

Independent Practice

Go online for Step-by-Step Solutions eHelp

Estimate each percent. (Examples 1 and 2) **Sample answers: 1–7**

1. 47% of $118 ≈ $\frac{1}{2}$ of $120 is $60.

2. 19% of 72 ≈ $\frac{1}{5}$ of 70 is 14.

3. 42% of 16 ≈ $\frac{2}{5}$ of 15 is 6.

4. 67% of 296 ≈ $\frac{2}{3}$ of 300 is 200.

Show your work.

Estimate using a rate per 100. (Example 4)

5. 24% of 289 ≈ 24 + 24 + 24 = 72

6. 67% of 208 ≈ 67 + 67 = 134

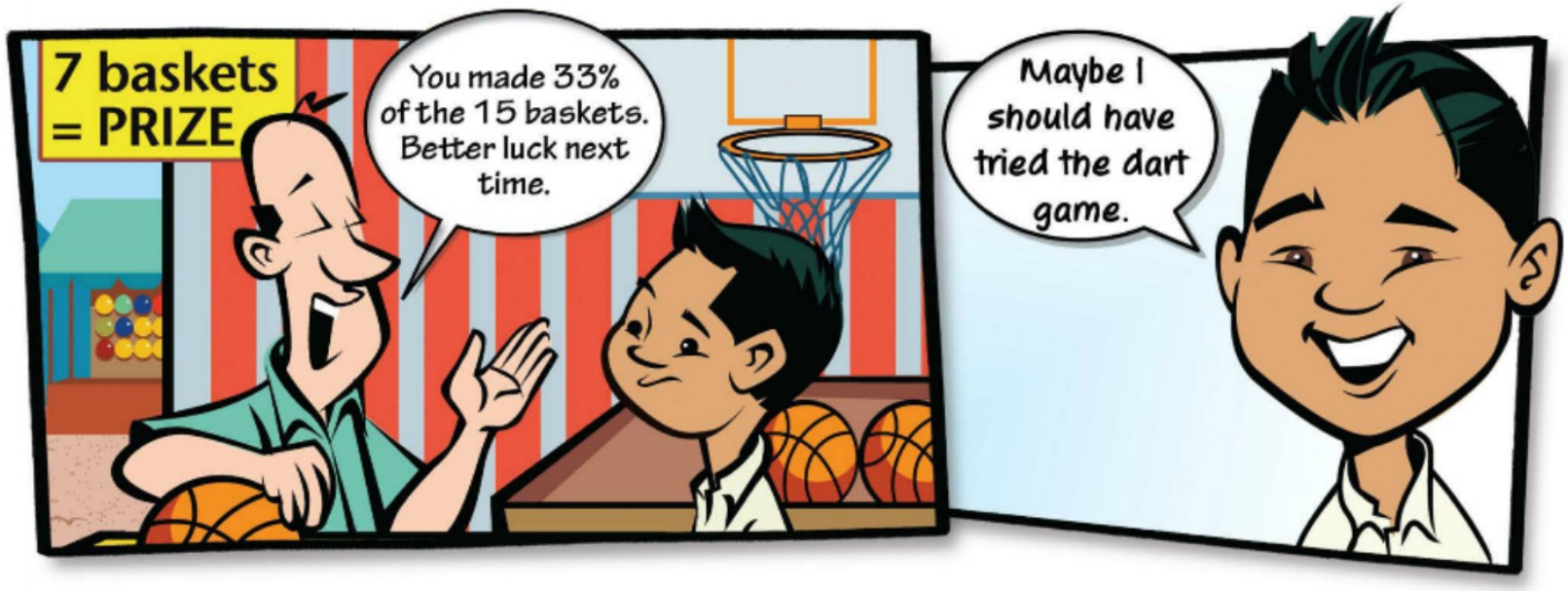
7. STEM Penguins spend almost 75% of their lives in the sea. An Emperor Penguin in the wild has a life span of about 18 years. About how many years does this penguin spend in the sea? (Example 3)

$\frac{3}{4}$ of 20 yr is 15 yr.

8. In Nathan's baseball card collection, 58% of the cards are players from the National League. He has 702 baseball cards. About how many baseball cards are players from the National League? Use a rate per 100 to estimate. (Example 5)

406; 58 × 7 = 406

9. MP **Model with Mathematics** Refer to the graphic novel frame below for Exercises a–b.



a. Suppose Angel is shooting baskets and makes 40% of the 15 shots. Does he win a prize? Explain your reasoning.

no; 40% is $\frac{2}{5}$, and $\frac{2}{5}$ of 15 is 6. He needs 7 baskets to win a prize.

b. About what percent of the baskets need to be made in order to win a prize? **about 50%**

10. About 42% of Alaska's population lives in the city of Anchorage. If Alaska has a total population of 648,818, about how many people live in Anchorage?

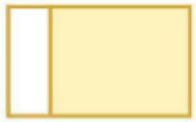
Sample answer: about 260,000; $\frac{2}{5}$ of 650,000 is 260,000.

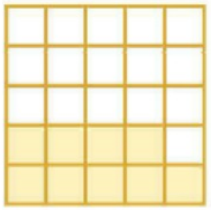
11 During the basketball season, Tyrone made 37 baskets out of 71 attempts. About what percent of his shots did he miss?

Sample answer: 71 − 37 = 34 missed shots and $\frac{34}{71}$ is about $\frac{35}{70}$ or $\frac{1}{2}$. Since $\frac{1}{2}$ = 50%, he missed about 50% of his shots.

MP Use Math Tools Estimate the percent that is shaded in each figure.

12.  **about 25%**

13.  **about 75%**

14.  **about 40%**

H.O.T. Problems Higher Order Thinking

15. MP Reason Inductively Rachel wants to buy a shirt regularly priced at $32. It is on sale for 40% off. Rachel estimates that she will save $\frac{2}{5}$ of $30 or $12. Will the actual amount be m[illegible]

$32. It is on sale for 40% off. Rachel estimates that she will save $\frac{2}{5}$ of $30 or $12. Will the actual amount be more or less than $12? Explain.

more; Rachel rounded $32 down to $30, so the actual amount she will save will be more than $12.

16. **Persevere with Problems** Order 10% of 20, 20% of 20, and $\frac{1}{5}$% of 20 from least to greatest. $\frac{1}{5}$% of 20, 10% of 20, 20% of 20

17. **Construct an Argument** A classmate is trying to estimate 42% of $122. Explain how your classmate should solve the problem.
Sample answer: First, round 42% to 40%, and $122 to $125. Next, rewrite 40% as $\frac{2}{5}$. Then find $\frac{1}{5}$ of $125. Finally, multiply this result by 2 to find $\frac{2}{5}$ of $125.

18. **Model with Mathematics** Melissa's homeroom has raised 63% of its goal for the school fundraiser. Matt's homeroom has raised 48%. Create a situation in which Matt's homeroom raised more money than Melissa's homeroom. Sample answer: Melissa's homeroom has raised 63% of its goal to raise $500 for the school fundraiser. Matt's homeroom has raised 48% of its $1,000 goal. How much has each homeroom raised? Melissa's homeroom: $315; Matt's homeroom: $480