# Learn About

Using Estimation: Rounding Numbers

An **estimate** is a number that is close to the actual number you are looking for. Numbers can be rounded to the nearest ten, hundred, thousand, ten thousand, and so forth. Decimals can be rounded to the nearest whole number, tenth, hundredth, thousandth, and so forth. If the digit one place to the right of the place being rounded to is 5 or greater, round up. If the digit one place to the right of the place being rounded to is 4 or less, round down.

For example, the number 576.16, when rounded to the nearest tenth, is 576.2 because the hundredths place contains the digit 6, which is greater than 5.

You can also round mixed numbers. When rounding mixed numbers round to the nearest whole number: round up if the fraction is $\frac{1}{2}$ or more; round down if the fraction is less than $\frac{1}{2}$. For example, $23\frac{5}{8}$ rounds up to 24 because $\frac{5}{8}$ is greater than $\frac{1}{2}$.

Caitlyn is building a trundle wheel to measure distances. She calculated the circumference of the wheel as 127.6764 centimetres. Her teacher asked the students to round their circumferences to the nearest hundredth. What is the circumference of Caitlyn's trundle wheel, rounded to the nearest hundredth?
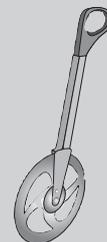
The digit in the thousandths place is 6, so round up. The rounded circumference is **127.68 centimetres.**

Remember:

Numbers can be rounded to the nearest ten, hundred, thousand, ten thousand, and so forth. Decimals can be rounded to the nearest whole number, tenth, hundredth, thousandth, and so forth. The number 5 is the midpoint for rounding.

1. **The living room has a length of 8 metres and a width of 6 metres. Isaac estimated the floor area by rounding each measurement to the nearest ten. What is the approximate floor area of the living room?**

    Ⓐ about 50 square metres

    This answer is not correct. A length of 8 metres rounds to 10 metres, and a width of 6 metres rounds to 10 metres. Therefore, the area is approximately $10 \times 10 = 100 \, m^2$, not $50 \, m^2$.

    Ⓑ about 70 square metres

    This answer is not correct. A length of 8 metres rounds to 10 metres, and a width of 6 metres rounds to 10 metres. Therefore, the area is approximately $10 \times 10 = 100 \, m^2$, not $70 \, m^2$.

    ● about 100 square metres

    This answer is correct. A length of 8 metres rounds to 10 metres, and a width of 6 metres rounds to 10 metres. Therefore, the area is approximately $10 \times 10 = 100 \, m^2$.

    Ⓓ about 140 square metres

    This answer is not correct. A length of 8 metres rounds to 10 metres, and a width of 6 metres rounds to 10 metres. Therefore, the area is approximately $10 \times 10 = 100 \, m^2$, not $140 \, m^2$.

2. **One door has a height of 2.75 metres and a width of 1.65 metres. Rounding the height and width to the nearest whole number, what is the approximate area of the door?**

    ● about 6 square metres

    This answer is correct. The height rounds to 3 and the width rounds to 2. Therefore, the area is approximately $3 \times 2 = 6 \, m^2$.

    Ⓑ about 5 square metres

    This answer is not correct. The height rounds to 3 and the width rounds to 2. Therefore, the area is approximately $3 \times 2 = 6 \, m^2$, not $5 \, m^2$.

    Ⓒ about 4 square feet

    This answer is not correct. The height rounds to 3 and the width rounds to 2. Therefore, the area is approximately $3 \times 2 = 6 \, m^2$, not $4 \, m^2$.

    Ⓓ about 3 square metres

    This answer is not correct. The height rounds to 3 and the width rounds to 2. Therefore, the area is approximately $3 \times 2 = 6 \, m^2$, not $3 \, m^2$.

Water, Water Everywhere

Daniel read a book about the oceans of the world. He learned that 70.8% of Earth's total surface area is covered by water. This is about 361,132,000 square kilometres. He made a list to show the area of each ocean in square kilometres.

Oceans of the World

Arctic Ocean	14,056,000 km²
Atlantic Ocean	82,400,000 km²
Indian Ocean	73,556,000 km²
Pacific Ocean	169,200,000 km²
Southern Ocean	20,327,000 km²

1. **Daniel rounded the total surface area of Earth's water and the surface area of the Indian Ocean to the nearest ten million. Then he expressed the numbers as a ratio of the Indian Ocean's surface area to the total surface area of Earth's water. What was his ratio?**

   Ⓐ $\frac{1}{6}$

   Ⓑ $\frac{1}{5}$

   Ⓒ $\frac{1}{4}$

   Ⓓ $\frac{1}{3}$

2. **Daniel found the total number of square kilometres in the Arctic and Southern Oceans combined. He rounded each number to the nearest ten thousand before adding. What was his correct estimate?**

   Ⓐ about 35,000,000 square kilometres

   Ⓑ about 34,000,000 square kilometres

   Ⓒ about 34,300,000 square kilometres

   Ⓓ about 34,390,000 square kilometres

Around the Sun

Harry studies how long it takes for each planet to make a full orbit around the sun. He knows that Earth takes about 365 days to orbit the sun. This is called one year. Neptune is much farther away from the sun than Earth is, so the distance it must travel to orbit the sun is greater. It takes about 165 Earth years for Neptune to make one full orbit around the sun. That means one year on Neptune is about 60,189 days. The list below shows what Harry learned about other planets.

Orbits of Planets

Mercury	0.24 Earth years
Venus	0.62 Earth years
Earth	1 year = 365.26 days
Mars	1.88 Earth years
Jupiter	11.86 Earth years
Saturn	29.46 Earth years
Uranus	84.01 Earth years
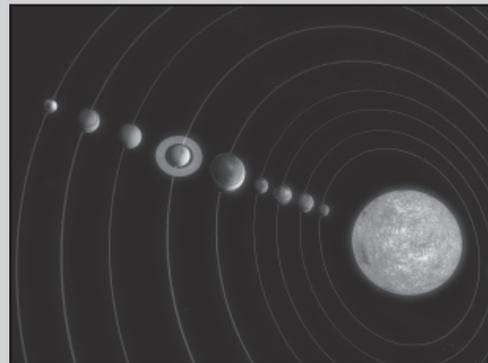
1. It takes Earth 365.26 days to orbit the sun. Mercury's orbit takes only 24% of that time. Harry rounds 365.26 to the nearest whole number. He changes 24% to a decimal number without rounding it. What is his correct estimate for the time it takes Mercury to orbit the sun? Round your answer to the nearest whole number.

   Ⓐ about 72 Earth days

   Ⓑ about 88 Earth days

   Ⓒ about 100 Earth days

   Ⓓ about 182 Earth days

2. One year on Uranus is 30,685.4 Earth days. Harry correctly rounds this number of Earth days to the nearest hundred. What is Harry's rounded number?

   Ⓐ about 30,680 Earth days

   Ⓑ about 30,685 Earth days

   Ⓒ about 30,690 Earth days

   Ⓓ about 30,700 Earth days

Self-Assessment 2
Lessons 6–10

Answer these questions after you have completed Lessons 6–10. Before you begin, re-read what you wrote in Self-Assessment 1.

FOCUS on Using Estimation, Book H

Name _____ Date _____

1. Rate your work in Lessons 6–10. Circle your answer.

   successful   somewhat successful   needs improvement

2. Did any of the questions give you trouble? _____
   If so, what kind of trouble did you have?

   _____

   _____

   Is this the same kind of trouble you had in Lessons 1–5? _____

3. Did you find the questions easier or more difficult than those in Lessons 1–5?

   _____

   Why do you think this is so?

   _____

   _____

4. Did you meet the goal you set for yourself for Lessons 6–10? _____
   Why or why not?

   _____

   _____

5. What is your goal for Lessons 11–15?

   _____

   _____

Cut along the dotted line.