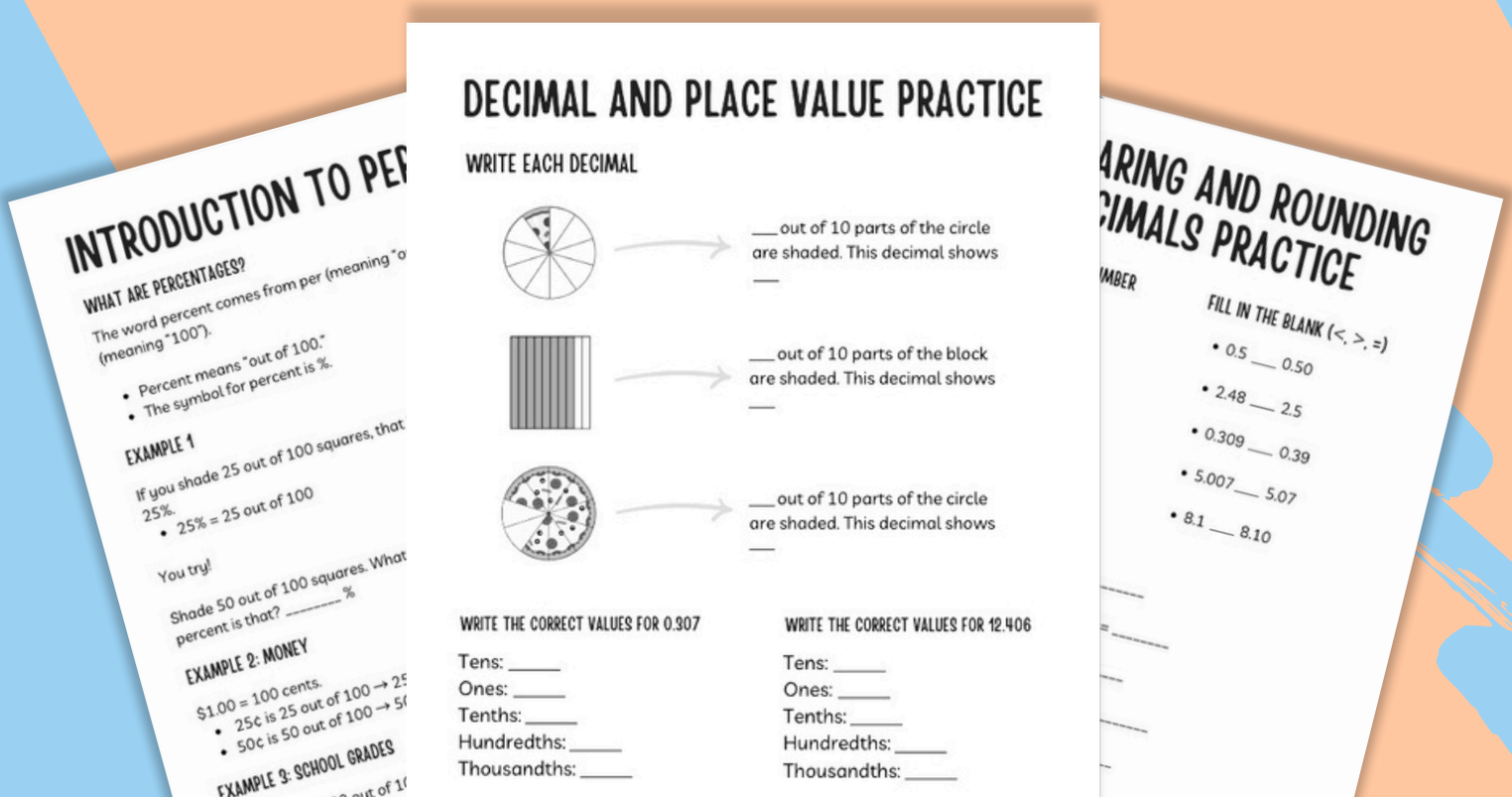
GAUSS Mathematics

UNDERSTANDING DECIMALS & PERCENTS

LEARNING MATH – MADE EASY!

- Place Value Basics
- Comparing Decimals
- Operations
- Understanding Percents
- Words Problems
- Real-Life Math
- Practice Pages
- Diagrams & examples



INTRODUCTION TO PER

WHAT ARE PERCENTAGES?

The word percent comes from per (meaning "o (meaning "100").

- Percent means "out of 100."
- The symbol for percent is %.

EXAMPLE 1

If you shade 25 out of 100 squares, that 25%.

- 25% = 25 out of 100

You try!

Shade 50 out of 100 squares. What percent is that? _____ %

EXAMPLE 2: MONEY

$1.00 = 100 cents.

- 25¢ is 25 out of 100 → 25
- 50¢ is 50 out of 100 → 5(

EXAMPLE 3: SCHOOL GRADES

DECIMAL AND PLACE VALUE PRACTICE

WRITE EACH DECIMAL

___ out of 10 parts of the circle are shaded. This decimal shows ___

___ out of 10 parts of the block are shaded. This decimal shows ___

___ out of 10 parts of the circle are shaded. This decimal shows ___

WRITE THE CORRECT VALUES FOR 0.307

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR 12.406

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

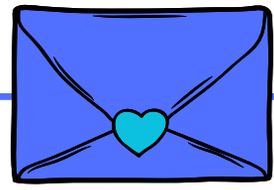
ARING AND ROUNDING CIMALS PRACTICE

UMBER

FILL IN THE BLANK (<, >, =)

- 0.5 ___ 0.50
- 2.48 ___ 2.5
- 0.309 ___ 0.39
- 5.007 ___ 5.07
- 8.1 ___ 8.10

GAUSS Mathematics
gaussmathematics05@gmail.com
Empowering learners with visual, accessible math.



Dear Learner, Parent, or Educator,

This workbook was made with a lot of heart to show you that decimals and percents aren't scary at all. They're just another way to understand the world, and once you get used to them, they're actually pretty cool.

Whether you're learning on your own, working with a parent, or following along in class, this book is here to help you take math one clear step at a time. With colorful visuals, simple explanations, and real-life examples like shopping, time, and cooking, everything will start to click.

At GAUSS Mathematics, we believe everyone can learn math in a way that makes sense. You'll find space to think, practice, and even make a few mistakes, because that's how real learning happens.'

This isn't just another workbook. It's a way to see how math connects to your everyday life and to build confidence as you go. So grab a pencil, smile, and get ready to explore decimals and percents. You've got this!

With encouragement,
GAUSS Mathematics

INTRODUCTION TO DECIMALS

WHAT ARE DECIMALS?

Decimals are numbers that show parts of a whole. They help us describe things that are smaller than one whole, in a way that's easy to read and compare.

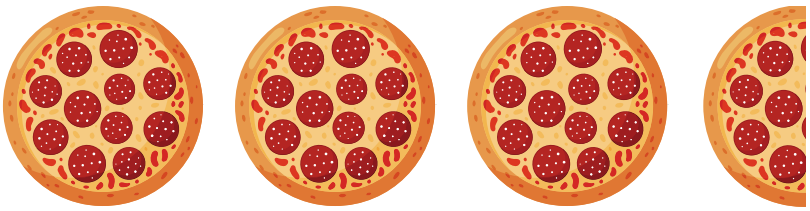
Whole numbers show count complete things. For example, we can write that there are 3 pizzas below.

= 3 PIZZAS

But what if we have only half a pizza? That's not a whole number! This is where decimals help us. Instead of writing a fraction, we can write it as a decimal:
0.5 = half a pizza

= 0.5 PIZZAS

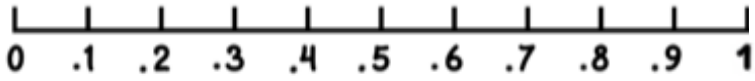
And what if we had 3 and a half pizzas? We could also write it as a decimal!



= 3.5 PIZZAS

THE DECIMAL POINT

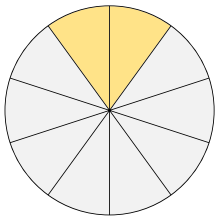
Decimal points are the dots that separate whole numbers from parts of a number.



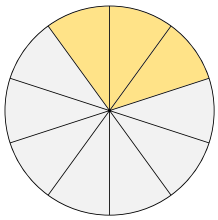
This number line is split into 10 different parts. Each part represents one tenth (0.1) of the line. For example, the point 0.3 shows three tenths of the line.

YOU TRY!

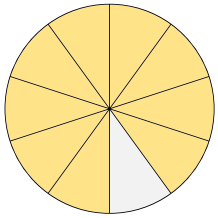
Mark .5 and .8 on the number line.



2 out of 10 parts of the circle are shaded. This decimal shows 0.2



___ out of 10 parts of the circle are shaded. This decimal shows ___



___ out of 10 parts of the circle are shaded. This decimal shows ___

THE PLACE VALUE CHART

A **place value chart** shows where each digit belongs in a number.

- Digits to the **left** of the decimal point are whole numbers.
- Digits to the **right** of the decimal point are parts of a number.

Ones	decimal point	tenths	hundredths
	•		

- The decimal point **separates whole numbers from parts.**
- Each place to the **right** is **10 times smaller.**

EXAMPLE: 6.35

6 = ones
3 = tenths (3 out of 10)
5 = hundredths (5 out of 100)

Ones	decimal point	tenths	hundredths
6	.	3	5

YOU TRY!

WRITE THE CORRECT VALUES FOR 2.06

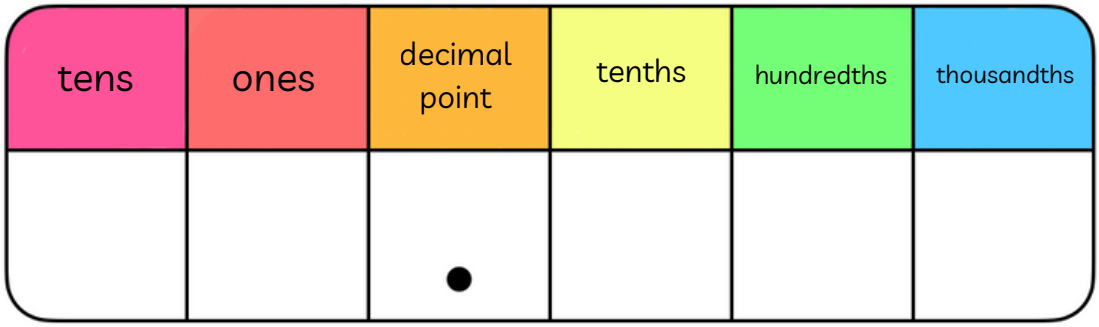
Ones: _____
Tenths: _____
Hundredths: _____

Ones	decimal point	tenths	hundredths
	•		

THE FULL PLACE VALUE CHART

Let's now add two more digits to our place value chart.

- The **tens** place show how many tens are in a number.
- The **thousandths** place show how many parts out of 1,000 you have.



- The decimal point **separates whole numbers from parts.**
- Each place to the **right** is **10 times smaller.**

YOU TRY!

WRITE THE CORRECT VALUES FOR 13.205

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR 10.901

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR .008

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

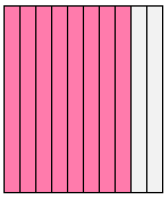
WRITE THE CORRECT VALUES FOR 25.390

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

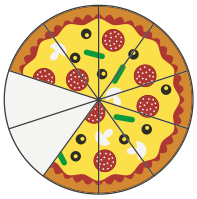
DECIMAL AND PLACE VALUE PRACTICE

WRITE EACH DECIMAL

___ out of 10 parts of the circle are shaded. This decimal shows ___



___ out of 10 parts of the block are shaded. This decimal shows ___



___ out of 10 parts of the circle are shaded. This decimal shows ___

WRITE THE CORRECT VALUES FOR 0.307

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR 12.406

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR 45.7

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

WRITE THE CORRECT VALUES FOR 27.519

Tens: _____
Ones: _____
Tenths: _____
Hundredths: _____
Thousandths: _____

COMPARING DECIMALS

Let's learn how to compare decimals (in other words, find the bigger decimal). Sometimes decimals can look tricky, but we can compare them just like whole numbers if we line them up by the decimal point.

1. Line up the numbers by the decimal point.
2. Start from the left and compare digits.
3. Add zeros if needed so the numbers have the same number of places.

EXAMPLE

Compare 0.7 and 0.65

First, line up the numbers

0.70
0.65

Then, start from the left and compare digits.

- 0=0 (same)
- 7 is bigger than 6 → so **0.7 is bigger**

YOU TRY!

Directions: For each decimal pair, circle the bigger number.

- 0.5 and 0.45 → 5 is bigger than 4 → circle 0.5!
- 1.008 and 1.01
- 0.4 or 0.39
- 2.56 or 2.506

ROUNDING DECIMALS

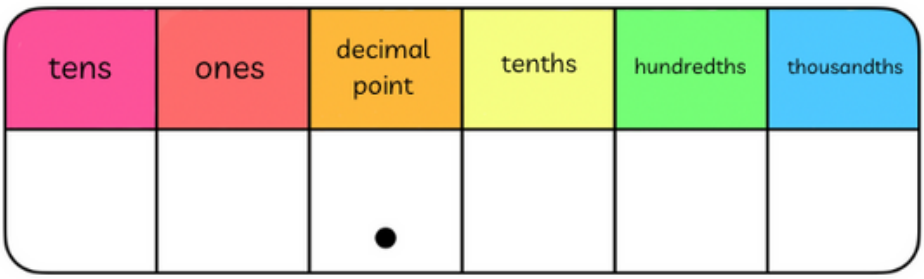
Sometimes decimals have too many digits. Rounding helps us make numbers simpler and easier to use.

STEPS TO ROUND A DECIMAL

Example: Round 3.46 to the nearest tenth.

1. **Find the place you are rounding to.**
   - Tenths = the first digit after the decimal → 4 in 3.46.
2. **Look at the digit to the right.**
   - Hundredths place → 6.
3. **Decide:**
   - If the digit is 5 or more → round up.
   - If the digit is 4 or less → keep the number the same.
4. **Answer: 3.46 → 3.5**

Make sure to remember the proper place value!



YOU TRY!

- Round 5.34 to the nearest tenth → _____
- Round 8.76 to the nearest tenth → _____
- Round 12.437 to the nearest hundredth → _____
- Round 0.995 to the nearest tenth → _____

COMPARING AND ROUNDING DECIMALS PRACTICE

CIRCLE THE BIGGER NUMBER

- 0.7 or 0.65
- 0.25 or 0.205
- 3.09 or 3.9
- 4.08 or 4.080
- 12.36 or 12.306

FILL IN THE BLANK (<, >, =)

- 0.5 ___ 0.50
- 2.48 ___ 2.5
- 0.309 ___ 0.39
- 5.007___ 5.07
- 8.1 ___ 8.10

MIXED ROUNDING

- 3.278 → nearest tenth = _____
- 5.604 → nearest hundredth = _____
- 9.851 → nearest tenth = _____
- 0.499 → nearest hundredth = _____
- 27.666 → nearest tenth = _____

WORD PROBLEM

A rope is 4.678 meters long. Round to the nearest tenth.
Answer: _____ meters

ADDING DECIMALS

WHY DO WE ADD DECIMALS?

Decimals show parts of a whole, like money, measurements, and time. Sometimes we need to add these parts together. For example, if a snack costs $2.45 and a drink costs $3.60, how much do they cost altogether? To solve this, we add decimals.

STEP 1: LINE UP THE DECIMAL POINTS

```
 3.6
+2.45
------
```

STEP 2: ADD ZEROS TO THE END

```
 3.60
+2.45
------
```

STEP 3: ADD LIKE WHOLE NUMBERS

```
 3.60
+2.45
------
 6.05
```

MORE EXAMPLES

1. 4.2 + 5.35

```
 4.20
+5.35
------
 9.55
```

2. 7.85 + 2.6

```
 7.85
+2.60
------
10.45
```

3. 2.47 + 8.53

```
 2.47
+8.53
------
11.00
```

YOU TRY!

SHOW YOUR WORK HERE!

- 6.3 + 1.42 = _____
- 12.07 + 3.8 = _____
- 0.25 + 4.7 = _____
- 9.56 + 2.44 = _____

SUBTRACTING DECIMALS

WHY DO WE SUBTRACT DECIMALS?

Sometimes we need to find the difference between two decimals. For example, if a toy costs $5.75 and you pay with $10.00, how much change do you get back? To solve this, we subtract decimals.

STEP 1: LINE UP THE DECIMAL POINTS

```
 7.5
- 3.25
------
```

STEP 2: ADD ZEROS TO THE END

```
 7.50
- 3.25
------
```

STEP 3: SUBTRACT LIKE WHOLE NUMBERS

```
 7.50
- 3.25
------
 4.25
```

YOU TRY!

SHOW YOUR WORK HERE!

- 6.3 – 1.42 = _____
- 10.5 – 4.75 = _____
- 3.06 – 2.8 = _____
- 25.07 – 8.6 = _____

WORD PROBLEM

You have $20.00. You buy a shirt for $12.45 and a drink for $2.80. How much money do you have left?

Answer: $_____

WORKSHEET: ADDING AND SUBTRACTING DECIMALS

PART A: ADD THE DECIMALS

SHOW YOUR WORK HERE!

- 3.6 + 2.45 = _____
- 7.85 + 1.4 = _____
- 12.07 + 5.8 = _____

PART B: SUBTRACT THE DECIMALS

- 6.3 – 1.42 = _____
- 10.5 – 4.75 = _____
- 9.56 – 2.44 = _____

WORD PROBLEMS

A snack costs $2.45 and a drink costs $3.6. How much do they cost together?

Answer: $_____

You have $10.00. You spend $4.35. How much money is left?

Answer: $_____

MULTIPLYING DECIMALS

WHY DO WE MULTIPLY DECIMALS?

Sometimes we need to find parts of parts.

- Example: If one chocolate bar costs $1.25, how much do 3 chocolate bars cost?
- We multiply decimals to solve problems like this.

STEP 1: IGNORE THE DECIMAL FIRST

Multiply the numbers like they are whole numbers.
Example: 0.4 × 0.2
Think of it first as 4 × 2 = 8.

STEP 2: COUNT THE DECIMAL PLACES

Now, count how many digits are after the decimal point in both numbers.

- 0.4 → 1 digit
- 0.2 → 1 digit
- Together = 2 decimal places

STEP 3: PLACE THE DECIMAL IN THE ANSWER

Start with your whole-number answer (8). Then move the decimal two places left.

- 8 → 0.08

So, 0.4 × 0.2 = 0.08

YOU TRY!

- 0.3 × 0.5 = _____
- 0.6 × 0.7 = _____
- 0.25 × 4 = _____

- Multiply 3 × 5 = 15.
- Count 2 decimal places (one in 0.3 and one in 0.5).
- Move the decimal 2 places → 0.15.

MULTIPLYING DECIMALS WORKSHEET

MULTIPLY THE DECIMALS

- 0.2 × 0.4 = _____
- 0.35 × 0.6 = _____
- 0.75 × 0.8 = _____
- 3.25 × 4 = _____
- 2.5 × 12 = _____
- 0.48 × 9 = _____

WORD PROBLEMS

A notebook costs $2.75. How much do 6 notebooks cost?

Answer: $_____

A rope is 3.5 meters long. If you cut 8 ropes, what is the total length?

Answer: _____ meters

A farmer sells apples for $1.85 per pound. How much do 5 pounds cost?

Answer: $_____

DIVIDING DECIMALS

WHY DO WE DIVIDE DECIMALS?

Division with decimals comes up in real life when we want to split amounts into equal groups.

- Example: If $7.20 is shared between 3 friends, how much does each get?
- Division helps us find the answer.

STEP 1: SET UP THE PROBLEM

Write the problem like long division.

7.20 ÷ 3

STEP 2: DIVIDE LIKE WHOLE NUMBERS

Ignore the decimal point at first.

720 ÷ 3 = 240

STEP 3: PLACE THE DECIMAL IN THE ANSWER

Count how many decimal places were in the original number.
Place the decimal in the answer.

7.20 ÷ 3 = 2.40

YOU TRY!

- 0.3 × 0.5 = _____
- 0.6 × 0.7 = _____
- 0.25 × 4 = _____

DECIMAL OPERATIONS PRACTICE

PART A: ADD OR SUBTRACT

SHOW YOUR WORK HERE!

- 3.5 + 2.4 = _____
- 6.8 – 4.25 = _____
- 0.75 + 0.5 = _____
- 9.2 – 3.7 = _____

PART B: MULTIPLY

- 0.3 × 0.5 = _____
- 2.4 × 3 = _____
- 0.6 × 0.7 = _____
- 1.25 × 4 = _____

PART C: DIVIDE

- 8.4 ÷ 4 = _____
- 9.6 ÷ 3 = _____
- 5.25 ÷ 5 = _____
- 7.2 ÷ 6 = _____

DECIMAL WORD PROBLEMS PRACTICE

FOR EACH PROBLEM, DECIDE WHETHER TO ADD, SUBTRACT, MULTIPLY, OR DIVIDE

A sandwich costs $4.25 and a drink costs $1.80. How much do they cost together?

Answer: $_____

You have $10.00. You spend $6.75. How much money is left?

Answer: $_____

A rope is 2.5 meters long. If you cut 4 ropes, what is the total length?

Answer: _____ meters

$9.60 is shared equally among 6 friends. How much does each get?

Answer: $_____

A notebook costs $2.75. If you buy 3 notebooks, how much will you spend?

Answer: $_____

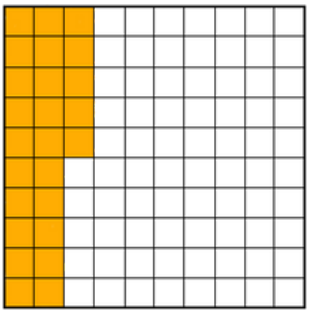
INTRODUCTION TO PERCENTS

WHAT ARE PERCENTAGES?

The word percent comes from per (meaning “out of”) and cent (meaning “100”).

- Percent means “out of 100.”
- The symbol for percent is %.

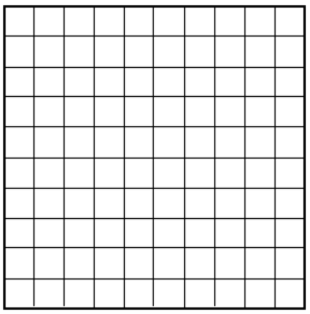
EXAMPLE 1



If you shade 25 out of 100 squares, that is 25%.

- 25% = 25 out of 100

You try!



Shade 50 out of 100 squares. What percent is that? _____ %

EXAMPLE 2: MONEY

$1.00 = 100 cents.

- 25¢ is 25 out of 100 → 25% of a dollar
- 50¢ is 50 out of 100 → 50% of a dollar

EXAMPLE 3: SCHOOL GRADES

If you answer 90 out of 100 questions correctly on a test, your grade is 90%.

Try it:
You got 80 out of 100. What percent is that? _____ %

PERCENTS AS FRACTIONS AND DECIMALS

PERCENTS TO FRACTIONS

Percents always mean “out of 100.”

- Write the percent over 100 to make a fraction.

Examples:

- 25% = 25/100 = 1/4
- 50% = 50/100 = 1/2
- 75% = 75/100 = 3/4

TRY IT!

Write each as a fraction:

1. 10% = _____
2. 40% = _____
3. 80% = _____

PERCENTS TO DECIMALS

When changing from percents to decimals, move the decimal point two places to the left.

Examples:

- 25% = 0.25
- 50% = 0.50
- 75% = 0.75

TRY IT!

Write each as a decimal:

1. 10% = _____
2. 40% = _____
3. 80% = _____

PERCENTS, FRACTIONS, AND DECIMALS PRACTICE

PART A: PERCENTS TO FRACTIONS

Write each percent as a fraction (simplify if you can).

- 20% = _____
- 50% = _____
- 75% = _____

PART B: PERCENTS TO DECIMALS

Write each percent as a decimal.

- 25% = _____
- 60% = _____
- 80% = _____

PART C: FRACTIONS TO PERCENTS

Write each fraction as a percent.

- 1/2 = _____ %
- 1/4 = _____ %
- 3/4 = _____ %

PART D: DECIMALS TO PERCENTS

Write each decimal as a percent.

- 0.25 = _____ %
- 0.5 = _____ %
- 0.75 = _____ %

FINDING A PERCENT OF A NUMBER

WHY SHOULD WE FIND PERCENTS?

Percents are everywhere in daily life. When we find a percent of a number, we're figuring out part of a whole:

Money (Sales & Discounts):
If a shirt costs $20 and it's 50% off, we want to know: What is 50% of $20?
Answer = $10 → the discount.
People (Groups & Classes):
If there are 40 students in a class and 25% are absent, we want to know: What is 25% of 40?
Answer = 10 students.
Measurement (Distance & Time):
If you run 1 mile and complete 10%, that's only part of the mile.
Answer = 0.1 miles

STEP 1: CHANGE THE PERCENT TO A DECIMAL

Percents are "out of 100," so move the decimal point two places to the left.
Examples:

- 50% → 0.50
- 25% → 0.25

STEP 2: MULTIPLY BY THE NUMBER

Multiply the decimal by the number you want to find the percent of.
Percent (as decimal) × Whole = Part
Examples:

- 50% of 20 = 0.50 × 20 = 10
- 25% of 40 = 0.25 × 40 = 10

STEP 3: WRITE THE ANSWER WITH A LABEL

Always include units if it's money, people, or distance.
Examples:

- $10 (money)
- 10 students (people)
- 0.1 miles (distance)

YOU TRY!

Find each percent. Show your work!

- What is 25% of 60?
- What is 10% of $40?
- What is 75% of 20 students?
- What is 5% of 100 miles?
- What is 50% of $14?

WORD PROBLEMS

- A backpack costs $50, and it's 30% off during a sale.
  - How much money will you save?
  - How much will the backpack cost after the discount?
- There are 40 students in the science club. 25% of them are working on the robotics team.
  - How many students are on the robotics team?
- Alex ran 60% of a 5-mile race before stopping for a break.
  - How many miles did Alex run?

FINDING THE WHOLE OR THE PERCENT

FINDING THE WHOLE

When you know the part and the percent:
Whole = Part ÷ Percent (as decimal)

Example:
If 25% of a number is 10, what is the whole?
→ 10 ÷ 0.25 = 40

FINDING THE PERCENT

When you know the part and the whole:
Percent = (Part ÷ Whole) × 100
Example:
You scored 18 out of 20 on a test.
→ 18 ÷ 20 = 0.9 → 0.9 × 100 = 90%

REAL-LIFE CONNECTIONS

Here are some examples of where you would need to know this in the real world:

- Sales tax (finding percent)
- Finding total cost after tip
- Figuring out original prices
- Determining grade percentages

FINDING THE WHOLE OR THE PERCENT

PART A: FINDING THE WHOLE

When you know the part and the percent, divide to find the whole.

Example:
25% of a number is 10. What is the whole?
→ 10 ÷ 0.25 = 40

YOU TRY!

- 50% of a number is 20. What is the whole? _____
- 10% of a number is 8. What is the whole? _____
- 80% of a number is 16. What is the whole? _____

PART B: FINDING THE PERCENT

When you know the part and the whole, divide the part by the whole and multiply by 100.

Example:
You scored 18 out of 20 on a test.
→ (18 ÷ 20) × 100 = 90%

YOU TRY!

- You saved $15 out of $60. What percent did you save? _____ %
- 12 out of 30 students play piano. What percent is that? _____ %

MIXED PERCENT PRACTICE

PART A: FIND THE PART

Use the formula Part = Percent × Whole.

- What is 25% of 60? _____
- What is 50% of 80? _____
- What is 10% of $40? _____
- What is 75% of 24? _____
- What is 20% of 300? _____

PART B: FIND THE PERCENT

Use the formula Percent = (Part ÷ Whole) × 100.

- You scored 18 out of 20 on a quiz. What percent is that? _____
- You read 45 out of 60 pages of your book. What percent did you finish? _____
- Out of 50 apples, 10 are red. What percent are red? _____
- You saved $15 from a $60 allowance. What percent did you save? _____
- Out of 40 students, 12 are in art class. What percent is that? _____

PART C: FIND THE WHOLE

Use the formula Whole = Part ÷ Percent.

- 25% of a number is 10. What is the number? _____
- 10% of a number is 6. What is the number? _____
- 40% of a number is 16. What is the number? _____
- 5% of a number is 2.5. What is the number? _____
- 75% of a number is 30. What is the number? _____

WORD PROBLEMS

A sweater costs $50, and it's 20% off.
How much money will you save, and how much will the sweater cost after the discount?

Answer: _____

In a basketball game, you made 12 out of 15 shots.
What percent of your shots did you make?

Answer: _____

Your group finished 40% of a poster. You've colored 16 inches so far.
How big is the whole poster?

Answer: _____

_____

PERCENT WORD PROBLEMS CHALLENGE

1. A jacket costs $60. It's on sale for 25% off.
How much money will you save?
How much will the jacket cost after the discount?

Answer: _____

2. You buy a video game for $50 and the sales tax is 8%.
How much tax will you pay?
What is the total cost of the game?

Answer: _____

3. Your meal costs $36, and you want to leave a 15% tip.
How much is the tip?
What's the total amount you'll pay?

Answer: _____

4. Liam made 12 out of 15 shots during basketball practice.
What percent of his shots did he make?

Answer: _____

5. 40 students entered the science fair. 25% of them are in the robotics category.
How many students are in robotics?

Answer: _____

6. Sarah got 45 out of 50 questions right on her quiz.
What percent did she score?

Answer: _____

PERCENT INCREASE & DECREASE

WHAT IT MEANS

A **percent increase** shows how much something grows compared to its original amount.

A **percent decrease** shows how much something shrinks or drops compared to its original amount.

STEP-BY-STEP SOLUTION

Step 1: Find the Change
Subtract to find how much it changed:
Change = New – Original

Step 2: Divide by the Original
Change ÷ Original

Step 3: Convert to a Percent
Multiply by 100 to find the percent change.

EXAMPLE 1: PERCENT INCREASE

A backpack cost $40 last year. This year, it costs $50. Find the **percent increase**.

Step 1: Change = 50 – 40 = 10

Step 2: 10 ÷ 40 = 0.25

Step 3: 0.25 × 100 = 25% increase

Answer: The price **increased by 25%.**

EXAMPLE 2: PERCENT DECREASE

A video game was $60, but now it costs $45. Find the **percent decrease.**

Step 1: Change = 60 – 45 = 15

Step 2: 15 ÷ 60 = 0.25

Step 3: 0.25 × 100 = 25% decrease

Answer: The price **decreased by 25%.**

YOU TRY!

- A book price went from $20 to $25. What is the percent increase?

  Answer: _____

- A shirt price dropped from $30 to $24. What is the percent decrease?

  Answer: _____

- A class had 40 students last year and 50 students this year. What is the percent increase in students?

  Answer: _____

- A game score went from 80 points to 60 points. What is the percent decrease?

  Answer: _____

PERCENT INCREASE & DECREASE PRACTICE

PART A: FIND THE PERCENT INCREASE

Remember: Percent Change = (Change ÷ Original) × 100

- A toy's price goes from $10 to $15. _____
- The school population grows from 400 to 500 students. _____
- A video game score rises from 80 to 100 points. _____

PART B: FIND THE PERCENT DECREASE

Use the same formula, but label it "decrease."

- A bike's price drops from $200 to $150. _____
- A store's sales fall from $600 to $450. _____
- A school club shrinks from 40 to 30 members. _____

PART C: MIXED PRACTICE

Find the **percent change** and label it **increase or decrease.**

- A sweater's price changes from $40 to $44. _____
- The temperature drops from 75°F to 60°F. _____
- A YouTube channel's subscribers go from 500 to 550. _____
- A team's wins fall from 20 to 16. _____

PERCENTS IN MONEY

WHY IT MATTERS

Percents are everywhere in the real world, especially when we spend money! We use percents to figure out sales tax, tips, and discounts every day.

1. SALES TAX

Sales tax is added to the price when you buy something.
Example:
A video game costs $50. The sales tax is 8%.
→ 8% of 50 = 0.08 × 50 = $4
→ Total = $50 + $4 = $54

You Try:
A pair of shoes costs $80. The tax is 10%.
What is the total cost? _____

2. TIPS

Tips are extra money we give for good service — like at a restaurant.

Example:
Your meal costs $30, and you leave a 15% tip.
→ 15% of 30 = 0.15 × 30 = $4.50
→ Total = $30 + $4.50 = $34.50

You Try:
Your haircut costs $40. You want to leave a 20% tip.
How much tip should you leave? _____
What will the total be? _____

3. DISCOUNTS

Discounts are subtracted from the price — a percent off.
Example:
A backpack costs $60, and it's 25% off.
→ 25% of 60 = 0.25 × 60 = $15
→ Sale Price = $60 – $15 = $45

You Try:
A jacket costs $100, and it's 30% off.
How much is the discount? _____
What is the final price? _____

PRACTICE: PERCENTS IN MONEY

PART A: SALES TAX

Use the formula:
Tax = Price × Percent (as decimal)
Total = Price + Tax

- A book costs $20. Sales tax is 5%.

→ Total cost = _____

- A video game costs $45. Tax is 8%.

→ Total cost = _____

- A new pair of sneakers costs $60. Tax is 7%.

→ Tax = _____ | Total = _____

- A bicycle costs $150. Tax is 6%.

→ How much tax do you pay? _____ Total = _____

PART B: TIPS

Use the formula:
Tip = Cost × Percent (as decimal)
Total = Cost + Tip

- Your restaurant bill is $40. You leave a 20% tip.

→ Tip = _____ | Total = _____

- A pizza delivery costs $25, and you tip 15%.

→ Tip = _____ | Total = _____

- Your haircut costs $30, and you tip 10%.

→ Tip = _____ | Total = _____

- A taxi ride costs $50, and you tip 18%.

→ Tip = _____ | Total = _____

PART C: DISCOUNTS

Use the formula:
Discount = Price × Percent (as decimal)
Final Price = Price – Discount

- A jacket costs $80, and it's 25% off.

→ Discount = _____ | Final Price = _____

- A backpack costs $50, and it's 10% off.

→ Final Price = _____

- A video game costs $60, and it's 40% off.

→ Discount = _____ | Sale Price = _____

- A phone case costs $20, and it's 30% off.

→ Sale Price = _____

WORD PROBLEMS: PERCENTS IN MONEY

1. Lila is shopping for a new pair of jeans that cost $40 before tax. The store adds 8% sales tax to every purchase. How much will Lila pay in tax? What will be the total amount she pays for the jeans?

2. After a long day, Ben and his family eat dinner at their favorite restaurant. The total on their bill is $60. Ben wants to leave a 20% tip for the waiter to thank them for good service. How much is the tip? What is the total amount Ben will pay including the tip?

3. A local coffee shop keeps a tip jar on the counter. Yesterday, the baristas collected $25 in tips. Today, the jar has $40 by the end of the day! By what percent did the amount of tips increase?

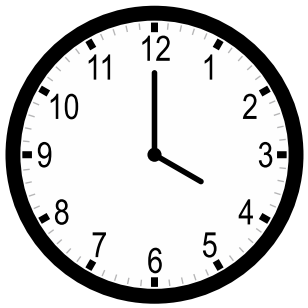
4. Last month, a new pair of running shoes cost $90. This month, they're on sale for $72. What percent discount did the store give?

5. Last month, the student council raised $120 during their school fundraiser. This month, after adding a bake sale and raffle, they raised $180 in total! By what percent did the fundraiser amount increase?

DECIMALS IN MEASUREMENT

WHY IT MATTERS

Decimals aren't just numbers on paper — we use them to measure real things every day! They help us show parts of a whole when measuring time, distance, and ingredients.



1. TIME

A decimal can show part of an hour.

For example:

- 0.5 hours = half an hour = 30 minutes
- 0.25 hours = a quarter of an hour = 15 minutes
- 1.75 hours = 1 hour and 0.75 × 60 = 1 hour 45 minutes

When we see a decimal hour, that means part of an hour.
To find how many minutes that part equals, we use this simple rule:

Multiply the decimal by 60.
This is because there are 60 minutes in one hour!

You Try:

- 0.1 hour = _____ minutes
- 1.5 hours = _____ hours and _____ minutes
- 2.25 hours = _____ hours and _____ minutes

2. DISTANCE

Decimals help measure part of a mile or kilometer.

For example:

- 0.5 miles = half a mile
- 1.25 miles = 1 mile + ¼ mile
- 2.75 miles = 2 miles + ¾ mile

You Try:

1. 0.1 miles = _____ of a mile
2. 3.5 miles = _____ miles and _____ of a mile
3. 1.75 miles = _____ miles and _____ of a mile

3. RECIPES

When cooking or baking, decimals can show partial cups or spoons.

For example:

- 0.5 cup = ½ cup
- 0.25 cup = ¼ cup
- 1.75 cups = 1 cup + ¾ cup

You Try:

1. 0.75 cup = _____ cups
2. 0.33 cup = about _____ of a cup
3. 2.5 cups = _____ cups and _____ of a cup

PRACTICE: DECIMALS IN MEASUREMENT

PART A: TIME

Convert between hours and minutes.

1. 0.25 hours = _____ minutes
2. 0.5 hours = _____ minutes
3. 1.75 hours = _____ hours and _____ minutes
4. 2.5 hours = _____ hours and _____ minutes
5. 0.1 hours = _____ minutes

PART B: DISTANCE

Use decimals to show parts of a mile (or kilometer).

1. 0.25 miles = _____ of a mile
2. 0.5 miles = _____ of a mile
3. 1.25 miles = _____ miles and _____ of a mile
4. 2.75 miles = _____ miles and _____ of a mile
5. 3.5 miles = _____ miles and _____ of a mile

PART C: RECIPES

Use decimals to measure ingredients.

Remember:
1 cup = 4 fourths = 100 hundredths (think of it like 1.00)

1. 0.5 cups = _____ of a cup
2. 0.25 cups = _____ of a cup
3. 1.5 cups = _____ cups and _____ of a cup
4. 0.75 cups = _____ of a cup
5. 2.25 cups = _____ cups and _____ of a cup

PRACTICE: DECIMAL WORD PROBLEMS

1. A cookie recipe needs 2.5 cups of flour, but Jamie only has 1.75 cups at home. How much more flour does she need?

Answer: _____

2. Ben jogged for 0.75 hours. How many minutes did he run?

Answer: _____

3. The total race is 5 miles, but Sara only ran 3.5 miles. What decimal part of the race did she complete?

Answer: _____

4. A student spent 1.25 hours reading on Monday and 0.75 hours on Tuesday. How many total hours did they read? How many minutes is that in all?

Answer: _____

5. A smoothie recipe calls for 1.5 cups of milk and 0.25 cups of honey. What is the total amount of liquid in the recipe?

Answer: _____

MIXED REAL-WORLD PRACTICE: DECIMALS & PERCENTS

DIRECTIONS

These problems combine decimals and percents — just like in real life! Think carefully: Are you finding part of a whole, converting between forms, or combining both? **Show all your steps clearly and label your units.**

PART A: SHOPPING & MONEY

- A backpack costs $40 and is 25% off. What is the discount amount, and what is the sale price?

- A shirt costs $24.50, and the tax rate is 8%. How much is the tax? What is the total price?

- A pair of shoes costs $60, and you use a 20% off coupon. The store then adds 5% sales tax to the discounted price. What do you pay in the end?

PART B: TIME & PERCENT OF A GOAL

- You planned to study for 2 hours but finished 1.5 hours. What percent of your goal did you complete?

- A jogger runs 0.75 hours out of a 1-hour plan. What percent of the hour did they run?

- You watched 0.4 hours of a 1-hour show. How many minutes did you watch? What percent of the show is that?

PART C: DISTANCE & PERCENT CHANGE

- Last week, Taylor ran 2.5 miles. This week, she ran 3.0 miles. What percent increase in distance did she achieve?

- A race was shortened from 5 miles to 4 miles due to weather. What percent decrease in distance was that?

- If one lap around the park is 0.4 miles, how many laps make 1.2 miles? What percent of the total distance is each lap?

PART D: RECIPES & PROPORTIONS

- A recipe uses 1.5 cups of milk and 0.5 cups of sugar. What percent of the total liquid is sugar?

- If a recipe calls for 2.5 cups total and you used 2.0 cups, what percent of the recipe did you make?

- A smoothie recipe uses 0.25 cups of honey. You decide to reduce it by 40%. How much honey do you use now?

- A recipe uses 2.5 cups of flour to make 4 dozen cookies. Maya wants to make half a batch. How many cups of flour will she need?

Master decimals and percents with Confidence – The Fun, Visual Way!

Understanding Fractions is a thoughtfully crafted workbook that makes learning decimals and percentages approachable, visual, and engaging.
This book is perfect for:

- **Visual learners**
- **Students with special needs**
- **Struggling math students**
- **Homeschooling families and educators**

Through clear models, colorful number lines, real-life word problems, and creative challenges, this workbook builds deep understanding of key key math concepts one step at a time.