



Suan Sunandha Rajabhat university
Faculty of Education
English for Mathematics Instructions

Chapter 1

Arithmetic and Fractions

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Course Outline



Suan Sunandha Rajabhat University
English for Mathematics Instructions

01 Mathematics English Challenge (Warm up)

02 Why Mathematics Teachers Need English

03 Vocabulary Discovery

04 Reading Activity

05 Mathematics Arithmetic Operations

06

Academic Verbs for Mathematics
English

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Essential Classroom English for
Mathematics

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Assignment

Students work in pairs

Pair Work

"What do these words mean?"

Discuss with your partner and write down the definitions.



NUMBER



INTEGER



FRACTION



SUM



PRODUCT



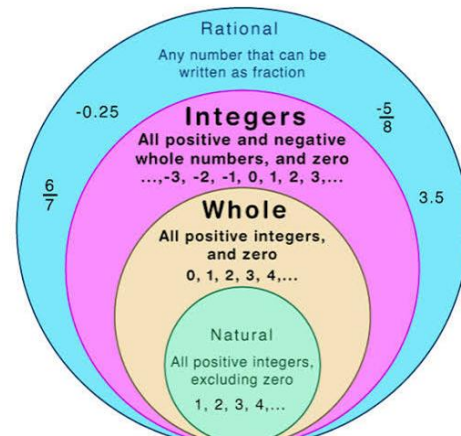
DECIMAL

Speaking Practice

Vocabulary	Simple Definition
Number	
Integer	
Fraction	
Sum	
Product	
Decimal	

Usage Examples

- **5** is a number
- $\frac{1}{2}$ is a fraction
- **3.5** is a decimal
- **-3, 0, and 7** are integers
- The **sum** of 4 and 6 is 10



Speaking Challenge

Use the following pattern to present:

A/An _____ is _____.

e.g., "A number is a mathematical value."

2👉 Do mathematics teachers really need English?

Please discuss with your partner for one minute.



Think about your future career as a mathematics teacher.



Why might English be useful for you?



Academic Materials

- Reading books 
- Reading textbooks 
- Using the Internet 

Research & Professional Development

- Reading research articles 
- Reading research papers 
- Attending conferences 

International Engagement

- Teaching international students 
- Studying abroad 
- Teaching through EMI 
- International communication 



Why do mathematics teachers really need English?

Reading textbooks

- "Many mathematics books are written in English."
- "Even when textbooks are translated into Thai, the newest editions are usually published in English first."
- "For example, many university mathematics textbooks, teacher manuals, and online learning materials are available only in English."

"If we can read English well, we can access more knowledge."

Reading research articles.

- "As future teachers, you will not only teach."
- "You will also continue learning." .
- "Educational research helps teachers improve their teaching methods."

Attending Conferences

- "Many teachers attend conferences to learn from experts."
- "At conferences, researchers and teachers present new ideas and innovations."
- an international conference."

"Most presentations were conducted in English."

Teaching through EMI

- In many schools and universities, mathematics is now taught in English."
- "For example, international schools often teach mathematics entirely in English."
- "Even in Thai universities, some programs are becoming bilingual or international."

"As future mathematics teachers, you may need to explain mathematical concepts in English."

DISCUSSION QUESTIONS

"What problems might you face if you cannot read English textbooks?"

- Difficult to understand content
- Limited resources
- Depend on translations
- Miss new information

"Raise your hand if you have ever read a research article before."

"Don't worry if you haven't."

"This course will help you develop the English skills needed to read academic articles."

"What opportunities could English create for your future career?"

- Scholarships
- Study abroad
- International schools
- Research collaboration
- Professional development

"Which reason is the most important for you and why?"

Key Message

- 📌 English helps mathematics teachers access more learning resources
- 📌 English gives teachers access to global educational research.
- 📌 English helps teachers participate in international academic communities.
- 📌 English prepares teachers for bilingual and international classrooms.

3. Vocabulary Discovery

Group Work (10 -15 minutes)

Make a group with the same items.

Group A
Numbers

Group B
Operations

Group C
Properties

Group D
Academic Verbs

Categorize the 10 items from the provided vocabulary list according to your group name.

4. Reading Passage Activity 1: Skimming

Read the short passage and answer the following questions.

A real number is any number on the number line. Real numbers include integers, fractions, and decimals. Zero is neither positive nor negative. Integers include positive and negative whole numbers and zero.

1. What is the topic?

The topic is “Real numbers”.

2. How many number types are mentioned?

3. Which number is neither positive nor negative?

Reading Passage

Understanding Numbers in Mathematics

Numbers are an important part of mathematics. We use numbers every day for counting, measuring, and calculating. For example, we use numbers to tell the time, count money, and measure distance.

A **real number** is any number on the number line. Real numbers include integers, fractions, and decimals. Most numbers that we use in daily life are real numbers.

An **integer** is a whole number that can be positive, negative, or zero. Examples of integers are -5, -2, 0, 3, and 10. Integers do not contain fractions or decimal points.

A **fraction** is a number that represents part of a whole. Fractions have two parts: a numerator and a denominator. Examples of fractions are $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{5}{8}$.

A **decimal** is a number that contains a decimal point. Examples of decimals are 0.5, 2.75, and 3.14. Fractions and decimals can represent the same value. For example, $\frac{1}{2}$ is equal to 0.5.

The difference between a fraction and a decimal is the way they are written. A fraction uses a numerator and a denominator, while a decimal uses a decimal point.

Zero is a special number. It is neither positive nor negative. It is also an integer and a real number.

Real numbers are important in mathematics because they help us describe quantities, solve problems, and perform calculations. Without real numbers, mathematics would be difficult to use in everyday life.

Some students think integers are the easiest number type to understand because they are simple whole numbers. Others may think decimals are easier because they are commonly used in money and measurements. Different students may have different opinions.

Pair Activity

- Work with a partner. Student "A" get the reading paragraph and student "B" get the question set.
- Student "B" ask the questions and student "A" answer the questions.
- Use complete sentences.
- Give examples whenever possible.

1. What is a number?
2. What is an integer?
3. What is a fraction?
4. What is a decimal?
5. What is the difference between a fraction and a decimal?
6. What is a real number?
7. What is zero?
8. Why are real numbers important in mathematics?
9. Which number type do you think is easiest to understand?
Why?

Language Frame

Use the following language when you answer the questions.

"A _____ is..."

"It refers to..."

"It means..."

"For example..."

Sum

Difference

Product

Quotient

5. Mathematics Arithmetic Operations

Result of Addition

+ Sum**+**

$$8 + 5 = 13$$

13 is the sum

8 plus 5 equals 13

The answer, 13, is called the sum.

− Difference**−**

$$15 - 7 = 8$$

8 is the difference.

15 minus 7 equals 8

The answer, 8, is called the difference.

× Product**×**

$$4 \times 6 = 24$$

24 is the product.

4 times 6 equals 24.

24, is called the product.

÷ Quotient**÷**

$$20 \div 4 = 5$$

5 is the quotient.

20 divided by 4 equals 5.

5, is called the quotient.

Result of Subtraction

Result of Multiplication

Result of Division

What is the sum of 6 and 4?

The sum of _____ and _____ is _____.

What is the difference between 10 and 4?

The difference between _____ and _____ is _____.

What is the product of 5 and 8?

The product of _____ and _____ is _____.

What is the quotient of 18 and 3?

The quotient of _____ and _____ is _____.

Operation	Academic Word	Example
Addition	Sum	$4 + 5 = 9$
Subtraction	Difference	$9 - 4 = 5$
Multiplication	Product	$4 \times 5 = 20$
Division	Quotient	$20 \div 5 = 4$

Sum = Answer to addition
Difference = Answer to subtraction
Product = Answer to multiplication
Quotient = Answer to division

When you see addition, think of sum.

When you see subtraction, think of difference.

When you see multiplication, think of product.

When you see division, think of quotient.

**As future mathematics teachers, using these academic words makes
your explanations more professional.**

Mini Discussion
Questions

1. Which mathematics term is easiest to remember?
2. Which term is difficult?
3. Why is mathematics vocabulary important for teachers?

6. Essential Academic Verbs for Mathematics English

- define
- explain
- describe
- compare
- identify
- classify
- convert

- simplify
- estimate
- Calculate
- Evaluate
- determine
- solve
- interpret

- justify
- demonstrate
- represent
- analyze
- conclude
- verify
- divide

7. Essential Classroom English for Mathematics Instruction/Questions

- Please read the question carefully.
- Work with your partner.
- Discuss your answer.
- Compare your results.
- Explain your reasoning.
- Write your answer clearly.
- Check your work again.
- Present your findings.

- What does this term mean?
- Can you explain it in your own words?
- Why do you think so?
- What information is important?
- Which keyword helps you understand the problem?

7. Essential Classroom English for Mathematics Instruction

- Read the problem carefully.
- Identify the key information.
- Explain your reasoning.
- Compare your answers.
- Justify your solution.

- Present your findings.
- Check your calculations.
 - Interpret the result.
- Work with a partner.
- Discuss your ideas.

Reflection Activity

Exit Ticket

Students answer:

1. Three new words I learned today:
2. One word I still find difficult:
3. Why is English important for mathematics instruction?

Assignment

Mathematics Vocabulary

Select 20 words from the chapter and complete the table.

Word	Definition	Example Sentence
1. Integer	Whole number including negatives and zero	An integer can be negative or positive.
2.		
3.		

Search one mathematics education article from:

- Google Scholar
- ERIC

Write:

- Title**
- Author**
- Three mathematics vocabulary words found in the article**

Next Week

Mathematics Vocabulary Sharing Activity

Each group receives one vocabulary category:

Group 1: Numbers and Number Types

Group 2: Arithmetic Operations

Group 3: Mathematical Properties

Group 4: Academic Verbs

Task

Prepare a short presentation.

Requirements:

- Explain 5 vocabulary words.
- Give simple definitions.
- Use each word in a sentence.
- Teach the words to classmates.

Thank you!
