جامعة مولود معمري تيزي وزو

ⵜⴰⵙⴷⴰⵡⵉⵜ ⵎⵓⵍⵓⴷ ⴰⵜ ⵎⵄⴻⵎⵎⴻⵕ

Université Mouloud Mammeri de Tizi-Ouzou

FACULTY OF SCIENCES
DEPARTMENT OF MATHEMATICS

Teaching Mathematics In English

Prepared by: Ania ADIL, *PhD*

AGENDA

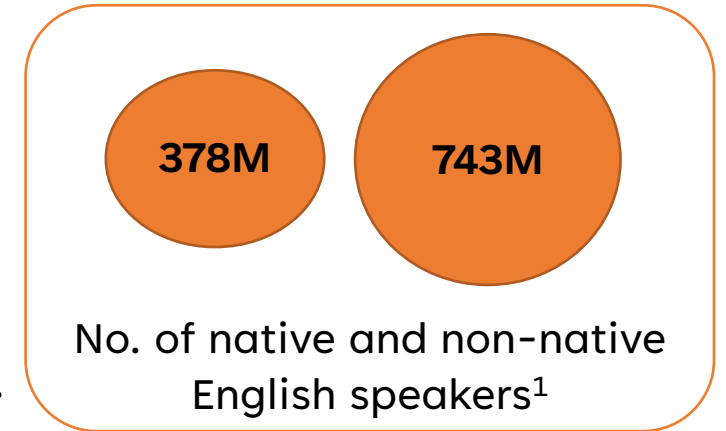Introduction

Math Vocabulary

Math Lesson in English

Summary

INTRODUCTION

Why is it important to teach in **English**?

- English is an international language.

- English helps communicate with and understand the world around.

- English is the language of technical and scientific journals.

- Collaboration and employment opportunities.

378M **743M**

No. of native and non-native English speakers[1]

>50%

% of technical and scientific journals in English[1]

[1] https://lemongrad.com/english-language-statistics/

GOAL

How to teach a math lesson in English?

TIMELINE

STEP 1 ———————— Learn the basic math vocabulary and how to read math in English

STEP 2 ———————— Learn the math vocabulary related to the course (Analysis, Algebra, Statistics and Probability, ...)

STEP 3 ———————— Prepare the lesson in English

STEP 4 ———————— Students' learning difficulties

HOW TO PROCEED?

STEP 1: Learn the basic math vocabulary and how to read math in English

Numbers Vocabulary:

Set of numbers:

$\mathbb{N}$: The set of Natural numbers
$\mathbb{Z}$: The set of Integers
$\mathbb{Z}^+$: The set of positive Integers
$\mathbb{Q}$: The set of Rational numbers
$\mathbb{Q}^+$: The set of positive Rational numbers
$\mathbb{R}$: The set of real numbers

Examples:

$\{1, 2, 3, 4,...\}$
$\{0, \pm1, \pm2, \pm3,...\}$
$\{1, 2, 3, 4,...\}$
$\frac{m}{n}$: m, n $\in \mathbb{Z}$, n$\neq$ 0
$\{x: x \in \mathbb{Q}, x > 0\}$

$\Re$: **Real part**

$\Im$: **Imaginary part**

Cardinal Numbers:

0	zero, nought	11	eleven	21	twenty-one	100	one hundred
1	one	12	twelve	22	twenty-two	101	one hundred and one
2	two	13	thirteen	23	twenty-three	152	one hundred and fifty-two
3	three	14	fourteen	24	twenty-four	200	two hundred
4	four	15	fifteen	30	thirty	1,000	one thousand
5	five	16	sixteen	31	thirty-one	1,000,000	one million
6	six	17	seventeen	40	forty	1,000,000,000	one billion
7	seven	18	eighteen	50	fifty	1,000,000,000,000	one trillion
8	eight	19	nineteen	60	sixty		
9	nine	20	twenty	70	seventy		
10	ten			80	eighty		
				90	ninety		

⚠️ In English, when we write cardinal numbers, we separate thousands with a comma (,)

For numbers in the hundreds:
British English: 120 = *one hundred **and** twenty*
American English: 120 = *one hundred twenty*

For numbers in the thousands
British English: 3,486 = *three **thousand**, four hundred and eighty-six*
American English: 3,486 = *thirty-four **hundred**, eighty-six*

NOTE: British English takes "and" following "hundred". American English omits "and".

How to Say Numbers in the Hundreds:

Say numbers in the hundreds by beginning with numerals one through nine followed by "hundred". Finish by saying the last two digits:

➢ 350 – three hundred fifty
➢ 425 – four hundred twenty-five
➢ 873 - eight hundred seventy-three
➢ 112 - one hundred twelve

How to Say Numbers in the Thousands:

Say a number up to 999 followed by "thousand." Finish by reading the hundreds when applicable:

➢ 15,560 – **fifteen thousand** *five hundred sixty*
➢ 786,450 – **seven hundred eighty-six thousand** *four hundred fifty*
➢ 342,713 - **three hundred forty-two thousand** *seven hundred thirteen*
➢ 569,045 - **five hundred sixty-nine thousand** *forty-five*

How to Say Numbers in the Millions

For millions, say a number up to 999 followed by "million." Finish by saying first the thousands and then the hundreds when applicable:

➢ 2,450,000 – **two million** four hundred fifty thousand
➢ 27,805,234 - **twenty-seven million eight** hundred five thousand two hundred thirty-four
➢ 934,700,000 – **nine hundred thirty-four million** seven hundred thousand
➢ 589,432,420 - **five hundred eighty-nine million** four hundred thirty-two thousand four hundred twenty

Ordinal numbers:

We use **ordinal numbers** to talk about the "order" of things or to define a thing's position in a series.

first	1**st**	**eleventh**	11th	**twenty-first**	21**st**	**eightieth**	80th
second	2**nd**	**twelfth**	12th	**twenty-second**	22**nd**	**ninetieth**	90th
third	3**rd**	**thirteenth**	13th	**twenty-third**	23**rd**	**hundredth**	100th
fourth	4**th**	**fourteenth**	14th	**twenty-fourth**	24th	**hundred and first**	101**st**
fifth	5th	**fifteenth**	15th	**thirtieth**	30th	**hundred and fifty-second**	152**nd**
sixth	6th	**sixteenth**	16th	**thirty-first**	31**st**	**two hundredth**	200th
seventh	7th	**seventeenth**	17th	**fortieth**	40th	**thousandth**	1,000th
eighth	8th	**eighteenth**	18th	**fiftieth**	50th	**millionth**	1,000,000th
ninth	9th	**nineteenth**	19th	**sixtieth**	60th	**billionth**	1,000,000,000th
tenth	10th	**twentieth**	20th	**seventieth**	70th	**trillionth**	1,000,000,000,000th

Fractions:

In the fraction $\frac{a}{b}$ (a over b):
- ➤ a is called the **numerator**
- ➤ b is called the **denominator**.

A **proper fraction** has its numerator less than its denominator, e.g. $\frac{3}{4}$

An **improper fraction** has its numerator more than its denominator, e.g. $\frac{9}{2}$

How to Talk About Fractions:

Say the top number as a cardinal number, followed by the ordinal number + "s:"

- 3/8 - three-eighth**s**
- 5/16 - five-sixteenth**s**
- 2/32 - two thirty-second**s**

Exceptions to this rule are:

- 1/4, 3/4 - one-quarter, three quarters
- 1/3, 2/3 - one third, two-thirds

Read numbers together with fractions by first stating the number followed by "and" and then the fraction:
- 4 7/8 - four and seven-eighths

½	**a half OR one half**
⅓	**a third OR one third**
¼	**a quarter OR one quarter**
⅕	**a fifth OR one fifth**
¾	**three quarters**
⅛	**an eighth OR one eighth**
⅔	**two thirds**
⅗	**three fifths**
⅝	**five eighths**
1½	**one and a half**
5¾	**five and three quarters**

How to Say Numbers With Decimals:

Speak decimals as the number followed by "point."
Next, say each number beyond the point individually:

- 2.36 – two **point** three six
- 0.25 – nought **point** two five / **point** two five
- 0.6405 – nought **point** six four oh five or
    zero **point** six four zero five
- 14.82 – fourteen **point** eight two
- 9.7841 –nine **point** seven eight four one
- 3.14159 – three **point** one four one five nine

⚠️ To indicate a decimal number we use a point (.)

0.1	**nought point one**
0.25	**nought point two five / point two five**
0.01	**nought point oh one**
0.75	**nought point seven five / point seven five**
0.0001	**nought point oh oh oh one**
1.1	**one point one**
1.2	**one point two**
1.23	**one point two three**
1.0123	**one point oh one two three**
3.33	**three point three three**
8.195	**eight point one nine five**
9.1567	**nine point one five six seven**
10.01	**ten point oh one**
21.57	**twenty-one point five seven**
2.6666666666....	**two point six recurring**

Mathematical Symbols:

✓ <mark>Arithmetic operators :</mark>

+ : **plus**
    addition : **addition**
    additionner : **to add**
    la somme : **the sum**

<mark>Examples :</mark>

- 10 + 2 = 12 Ten **plus** two **equals** twelve *or* Ten **plus** two **is** twelve.
- 23 + 5 + 6 = 34

Twenty-three **plus** five **plus** six **equals** thirty-four.
Or Twenty-three **plus** five **plus** six **is** thirty-four.

- 405 + 67 + 12 = 484

Four hundred and five **plus** sixty-seven **plus** twelve **equals** four hundred and eighty-four.
Or Four hundred **and** five **plus** sixty-seven **plus** twelve **is** four hundred and eighty-four

⚠️ <mark>Note that we usually say **equals** NOT **equal.**</mark>

— : minus
    soustraction : **subtraction**
    soustraire : **to subtract / to take**
    away (enlever)
    la différence : **the difference**

Examples :

- 16 - 13 = 3 : Thirteen **from** sixteen **leaves** three
Or Sixteen **minus** thirteen **equals** three.
Or Sixteen **minus** thirteen **is** three.
- 47 - 11 = 36
Eleven **from** forty-seven **leaves** thirty-six.
Or Forty-seven **minus** eleven **equals** thirty-six.
Or Forty-seven **minus** eleven **is** thirty-six.

✕ : multiplied by, times
multiplication : **multiplication**
multiplier : **to multiply**
fois (multiplié par) : **times**
le produit : **the product**

Examples :

- 8 x 5 = 40

Eight **times** five **equals** forty *or* Eight five**s is** forty.

- 35 x 11 = 385

Thirty-five **times** eleven **equals** three hundred and eighty-five.
or
Thirty-five eleven**s is** three hundred and eighty-five.

÷ or / : divided by

division : **division**

diviser : **to divide**

divisé par : **divided by**

le quotient : **the quotient**

- 62 : 2 = 31

Sixty-two **divided by** two **equals** thirty-one *or* Two **into** sixty-two **is** thirty-one

or **If you divide** sixty-two **by** two **you get** thirty-one

- 140 : 5 = 28

One hundred and forty **divided by** five **equals** twenty-eight.

or

Five **into** one hundred and forty **is** twenty-eight.

- 6 x 30 + 5 = 185

Six **times** thirty **plus** five **equals** one hundred and eighty-five *or*
Six **times** thirty **plus** five **is** one hundred eighty-five.

- 23 - 7 + 14 x 11 = 170

Twenty three **minus** seven **plus** fourteen **times** eleven **equals** one hundred and seventy *or*
Twenty three **minus** seven **plus** fourteen **times** eleven **is** one hundred and seventy.

$\neq$: **is not equal to**

$\approx$: **almost equal to**

$\equiv$: **identical to**

$\sim$: **approximately**

$\pm$: **plus or minus**

$\mp$: **minus or plus**

Examples:
x $\neq$ z : x **is not equal to** z
x $\approx$ y : x **is approximately equal to** y

x $\pm$ 1 : x **plus or minus 1**
$x \equiv y$: x **is equivalent to** y; x **is identical with** y

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