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INSTITUTE FOR THE PROFESSIONAL
DEVELOPMENT OF ADULT EDUCATORS

Incorporating Mathematics into ESOL Instruction

April 17, 2019

www.floridaipdae.org

This training event is supported with federal funds as appropriated to the Florida Department of Education, Division of Career and Adult Education for the provision of state leadership professional development activities.

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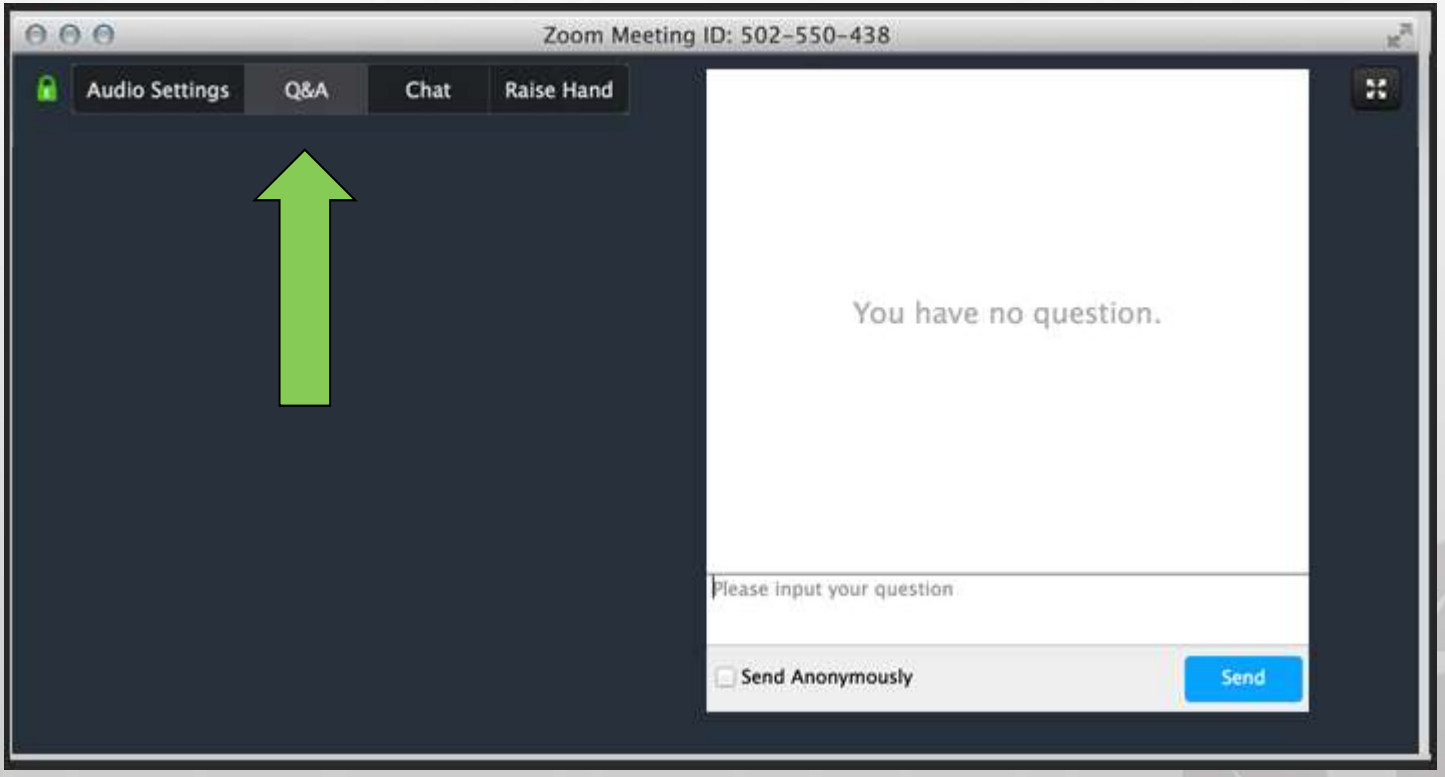
Webinar Things to Remember

- If you have a question, please type it into the **Q&A** option.



- Attendee microphones will be muted. You will be in **listen only** mode.
- Today's presentation is being **recorded**. It will be archived and available on the IPDAE website within 48 hours.

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Agenda

- Why Mathematics?
- The Math You Already Do
- Blending Math with Language Instruction
- Using Math to Promote Critical Thinking
- IPDAE Resources

Rationale

WHY MATHEMATICS?

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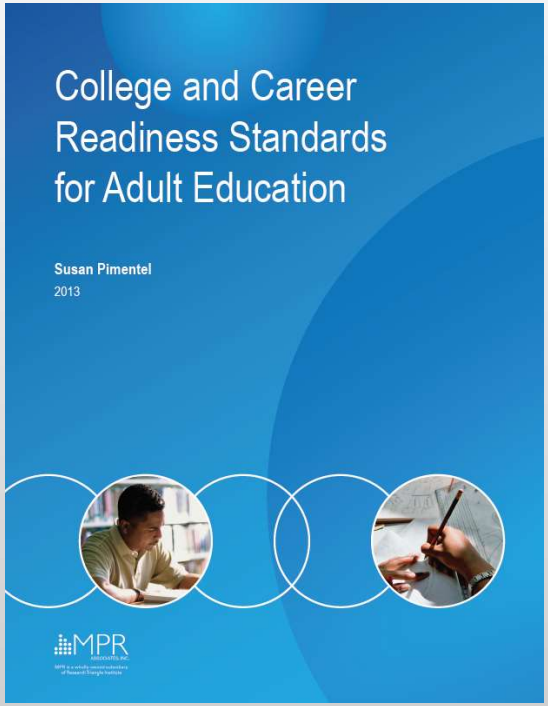
The Standards



The importance of college and career readiness for adult students cannot be overstated.

- Adult learners need to meet the real-world demands of postsecondary training and employment
- Today's workplace requires critical knowledge and skills in Language Arts and Mathematics
- Potential for advancement in the workplace hinges on being able to perform complex tasks

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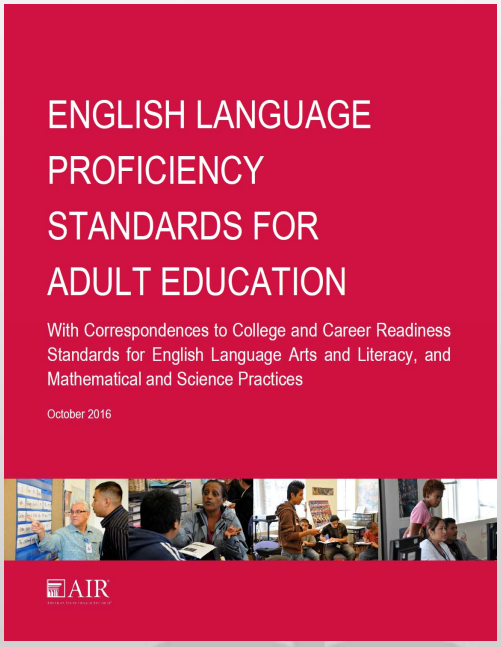
The Standards

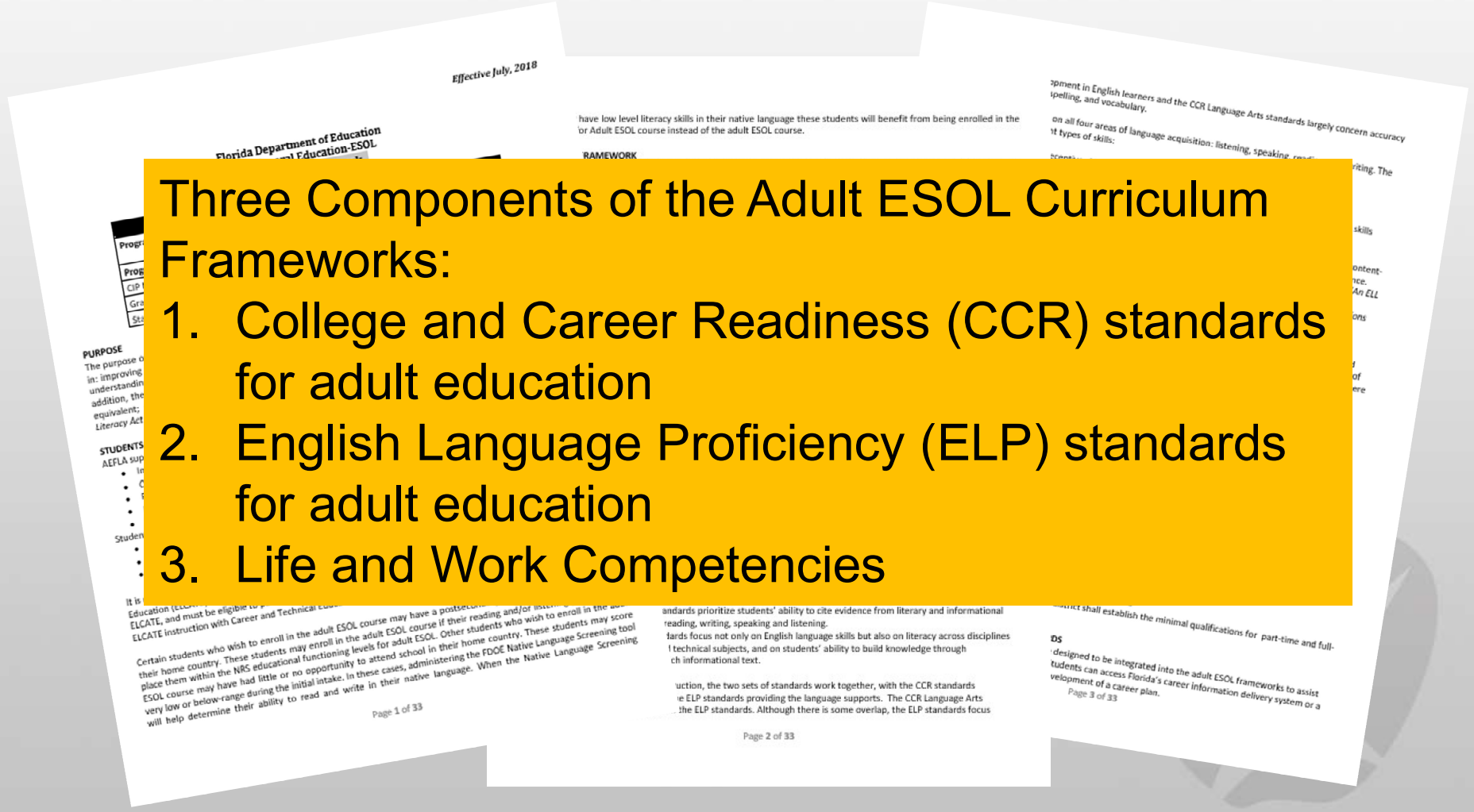
The Workforce Innovation and Opportunity Act (WIOA) requires states to align content standards for adult education with state-adopted challenging academic content standards with an emphasis on improving:

A. Reading, writing, speaking and comprehension in English
B. Mathematics Skills

The English Language Proficiency (ELP) Standards for Adult Education (AE) are intended to address the urgent need for **educational equity**, **access**, and **rigor** for adult English language learners (ELLs) with the goal of ensuring that adult learners are **adequately prepared for careers and postsecondary education**.



Adult ESOL Curriculum Frameworks



Three Components of the Adult ESOL Curriculum Frameworks:

1. College and Career Readiness (CCR) standards for adult education
2. English Language Proficiency (ELP) standards for adult education
3. Life and Work Competencies

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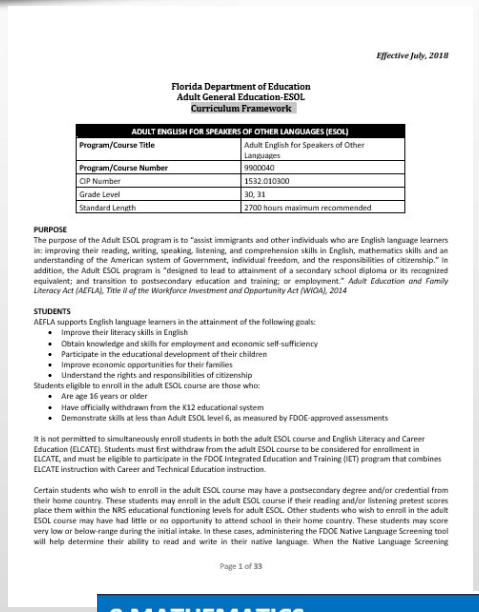
The Competencies



Effective July, 2018

Florida Department of Education
Adult General Education-ESOL
Curriculum Framework

ADULT ENGLISH FOR SPEAKERS OF OTHER LANGUAGES (ESOL)	
Program/Course Title	Adult English for Speakers of Other Languages
Program/Course Number	9900040
CIP Number	1532.010300
Grade Level	30, 31
Standard Length	2700 hours maximum recommended

PURPOSE

The purpose of the Adult ESOL program is to "assist immigrants and other individuals who are English language learners in: improving their reading, writing, speaking, listening, and comprehension skills in English, mathematics skills and an understanding of the American system of Government, individual freedom, and the responsibilities of citizenship." In addition, the Adult ESOL program is "designed to lead to attainment of a secondary school diploma or its recognized equivalent; and transition to postsecondary education and training; or employment." *Adult Education and Family Literacy Act (AEFLA), Title II of the Workforce Investment and Opportunity Act (WIOA), 2014*

STUDENTS

AEFLA supports English language learners in the attainment of the following goals:

- Improve their literacy skills in English
- Obtain knowledge and skills for employment and economic self-sufficiency
- Participate in the educational development of their children
- Improve economic opportunities for their families
- Understand the rights and responsibilities of citizenship

Students eligible to enroll in the adult ESOL course are those who:

- Are age 16 years or older
- Have officially withdrawn from the K12 educational system
- Demonstrate skills at less than Adult ESOL level 6, as measured by FDOE-approved assessments

It is not permitted to simultaneously enroll students in both the adult ESOL course and English Literacy and Career Education (ELCATE). Students must first withdraw from the adult ESOL course to be considered for enrollment in ELCATE, and must be eligible to participate in the FDOE Integrated Education and Training (IET) program that combines ELCATE instruction with Career and Technical Education instruction.

Certain students who wish to enroll in the adult ESOL course may have a postsecondary degree and/or credential from their home country. These students may enroll in the adult ESOL course if their reading and/or listening pretest scores place them within the NRS educational functioning levels for adult ESOL. Other students who wish to enroll in the adult ESOL course may have had little or no opportunity to attend school in their home country. These students may score very low or below-range during the initial intake. In these cases, administering the FDOE Native Language Screening tool will help determine their ability to read and write in their native language. When the Native Language Screening

Page 1 of 33

LIFE AND WORK COMPETENCIES
AREAS
1 COMMUNICATION
2 EMPLOYMENT
3 COMMUNITY
4 CONSUMER ECONOMICS
5 HEALTH
6 CIVICS
7 ENVIRONMENT
8 MATHEMATICS
9 LEARNING AND THINKING

8 MATHEMATICS
Multi-level
Interpret 24-hour time and A.M./P.M. time.
Tell and write time in different formats.
Count to 100 by ones and by tens.
Identify and classify numeric symbols.
Interpret 24-hour time and A.M./P.M. time.
Tell and write time in different formats.
Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
Use decimal notation for fractions with denominators 10 or 100.
Measure the length of an object using appropriate tools.
Describe measurable attributes of objects, such as length or weight.
Compare objects with a measurable attribute in common, using "more of"/"less of".

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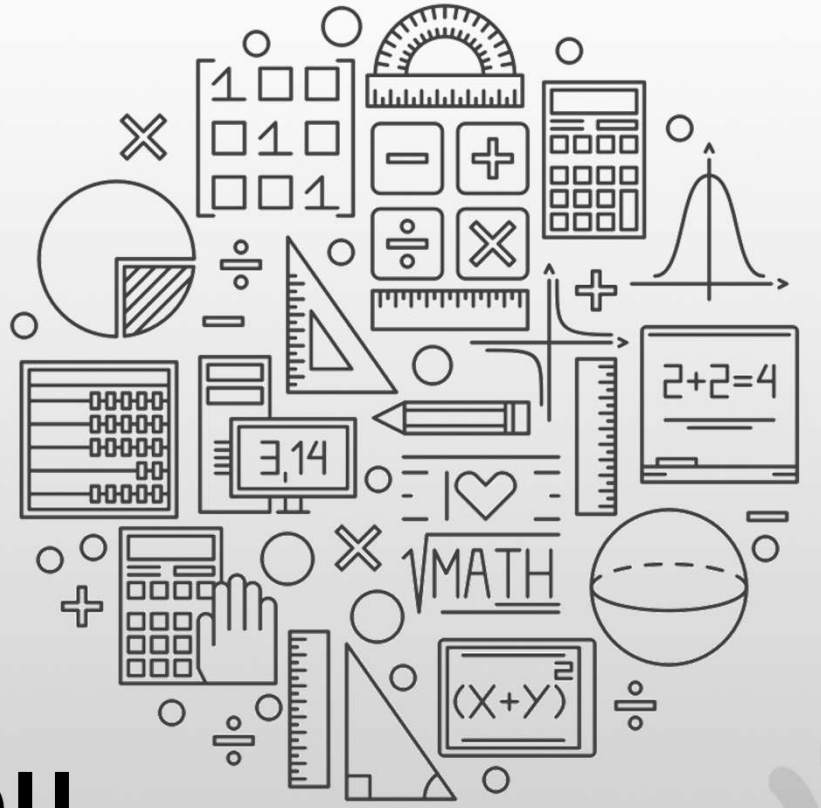
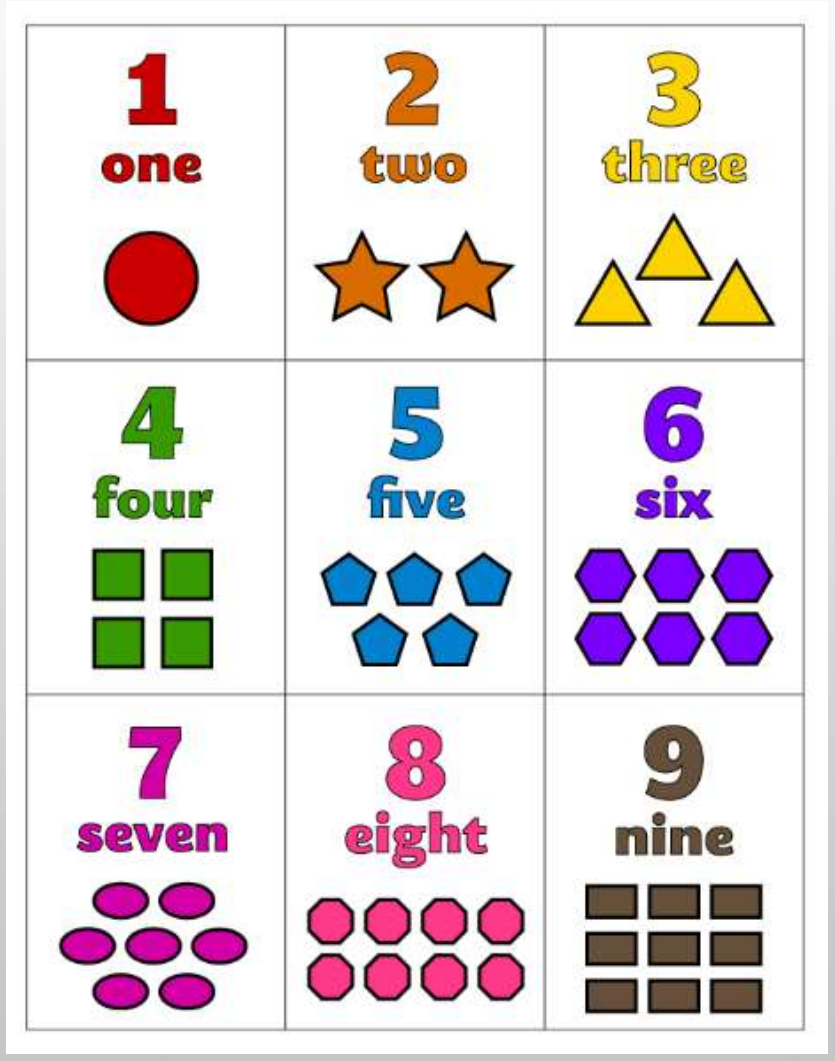


Current Best Practice

THE MATH YOU ALREADY DO

Numbers and Counting



Why do we teach students how to count, read and write numbers at the literacy and foundations level?

Mathematics Competencies:

- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Compare objects with measurable attributes in common.

Numbers in the English Language

At the foundations and beginning levels, we also teach students how numbers are used in the English language.

Mathematics Competencies:

- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Compare objects with measurable attributes in common.

Cardinal Numbers

1	One	11	Eleven	21	Twenty One
2	Two	12	Twelve	22	Twenty two
3	Three	13	Thirteen	23	Twenty three
4	Four	14	Fourteen	30	Thirty
5	Five	15	Fifteen	40	Forty
6	Six	16	Sixteen	50	Fifty
7	Seven	17	Seventeen	60	Sixty
8	Eight	18	Eighteen	70	Seventy
9	Nine	19	Nineteen	80	eighty
10	Ten	20	twenty	90	ninety
				100	One hundred

Ordinal Numbers

- dates
- rankings
- floor
- order of things

1st	first
2nd	second
3rd	third
4th	fourth
5th	fifth
6th	sixth
7th	seventh
8th	eighth
9th	ninth
10th	tenth

Date

Mathematics Competency:

- Tell and write time in different formats.

Month-Day-Year
March the Fourteenth, 2016
March 14, 2016
March 14th, 2016
3/14/2016 or 3-14-2016
3/14/16 or 3-14-16
03/14/16 or 03-14-16

Months		
Number	**Name**	**Abbreviation**
1	January	Jan
2	February	Feb
3	March	Mar
4	April	Apr
5	May	May
6	June	Jun
7	July	Jul
8	August	Aug
9	September	Sep
10	October	Oct
11	November	Nov
12	December	Dec

Days of the Month	
1st	First
2nd	Second
3rd	Third
4th	Fourth
5th	Fifth
6th	Sixth
7th	Seventh

Mathematics Competency:

- Tell and write time in different formats.
- Interpret 24-hour time and A.M./P.M. time

Five past six

6.05 AM

06:05

Two o'clock

2.00 PM

14:00

Half past eleven

11.30 AM

11:30

Quarter to eight

7.45 PM

19:45

Money!!!

Mathematics Competencies:

- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Read and write numbers to 1000, using base 10 numerals, number names and expanded form.
- Use decimal notation.
- Compare objects with measurable attributes in common.

Shopping and Percents

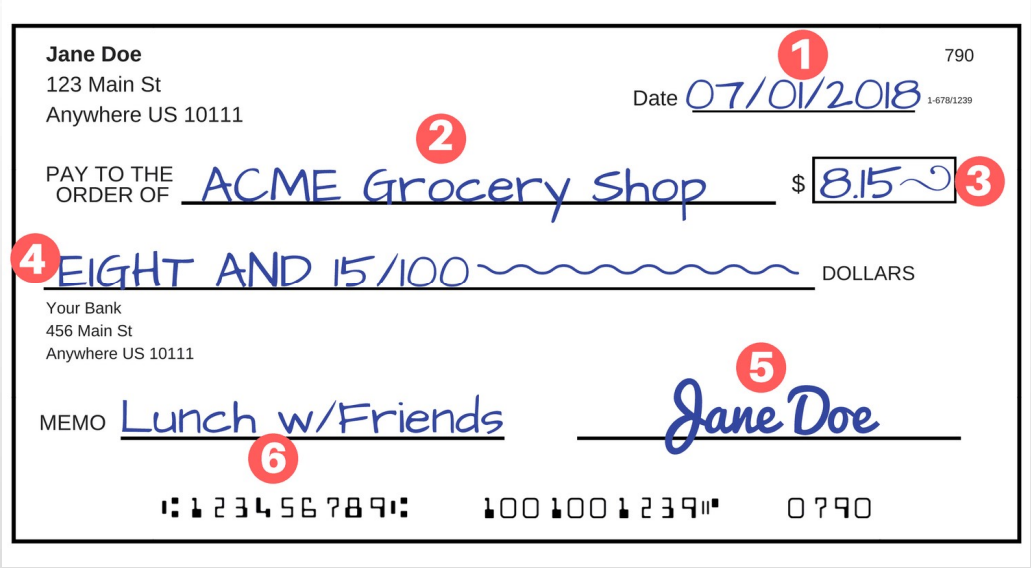
Mathematics Competencies:

- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Read and write numbers to 1000, using base 10 numerals, number names and expanded form.
- Use decimal notation for fractions with denominators 10 or 100.
- Compare objects with measurable attributes in common.

CASAS READING TASK AREAS

1. Forms;
2. Charts, maps, consumer billings, matrices, graphs, or tables;
3. Stories, articles, paragraphs, sentences, directions, or pictures;
4. Signs, price tags, ads, or product labels;
5. Measurement scales and diagrams

Tie It Altogether: Write Checks



Mathematics Competencies:

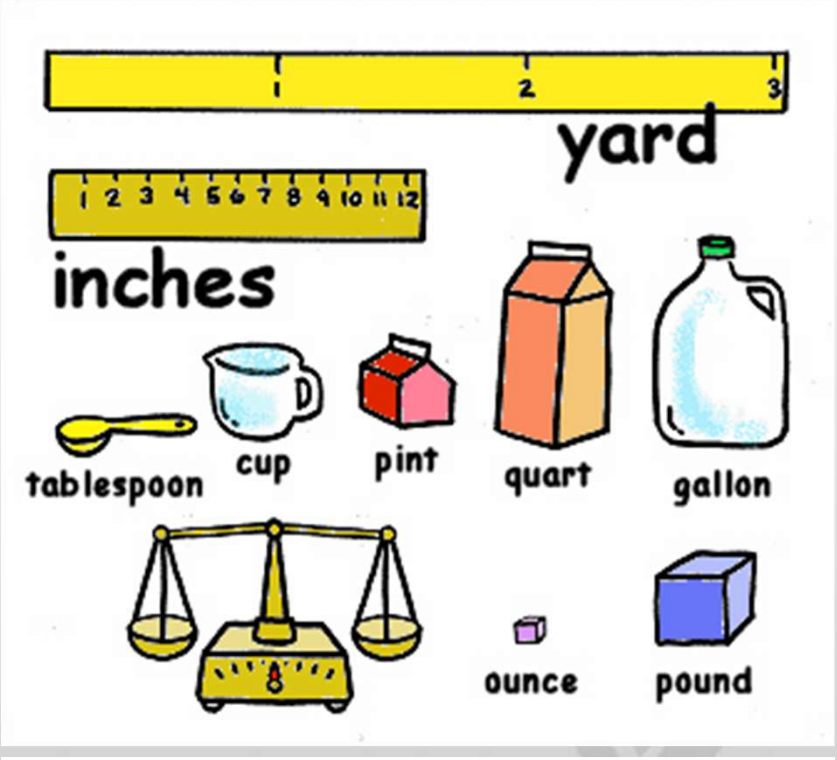
- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Read and write numbers to 1000, using base 10 numerals, number names and expanded form.
- Use decimal notation for fractions with denominators 10 or 100.

Measurement

Measurement vocabulary is essential not only in daily life but also in the workplace.

Mathematics Competencies:

- Measure the length of an object using appropriate tools.
- Describe measurable attributes of objects, such as length and weight.
- Compare objects with measurable attributes in common.



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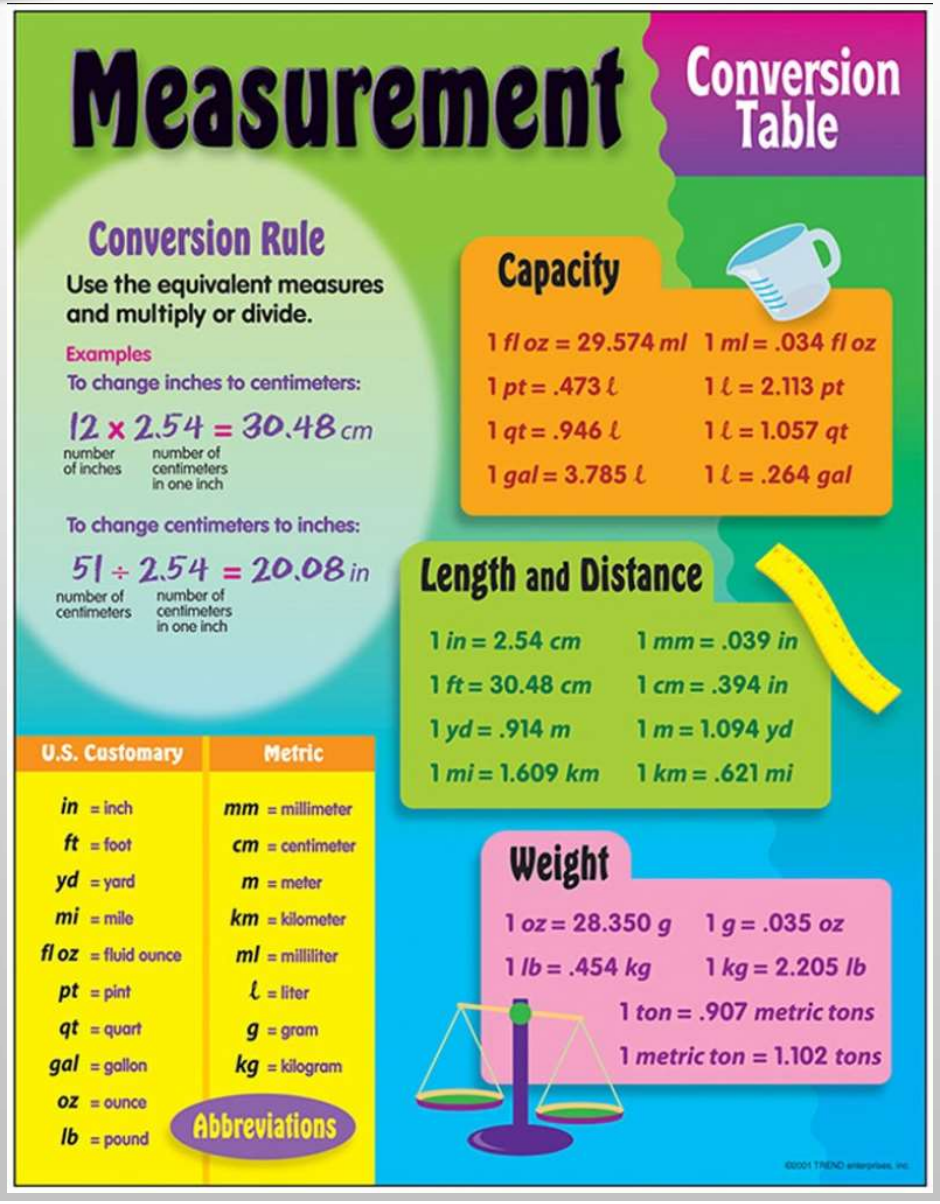
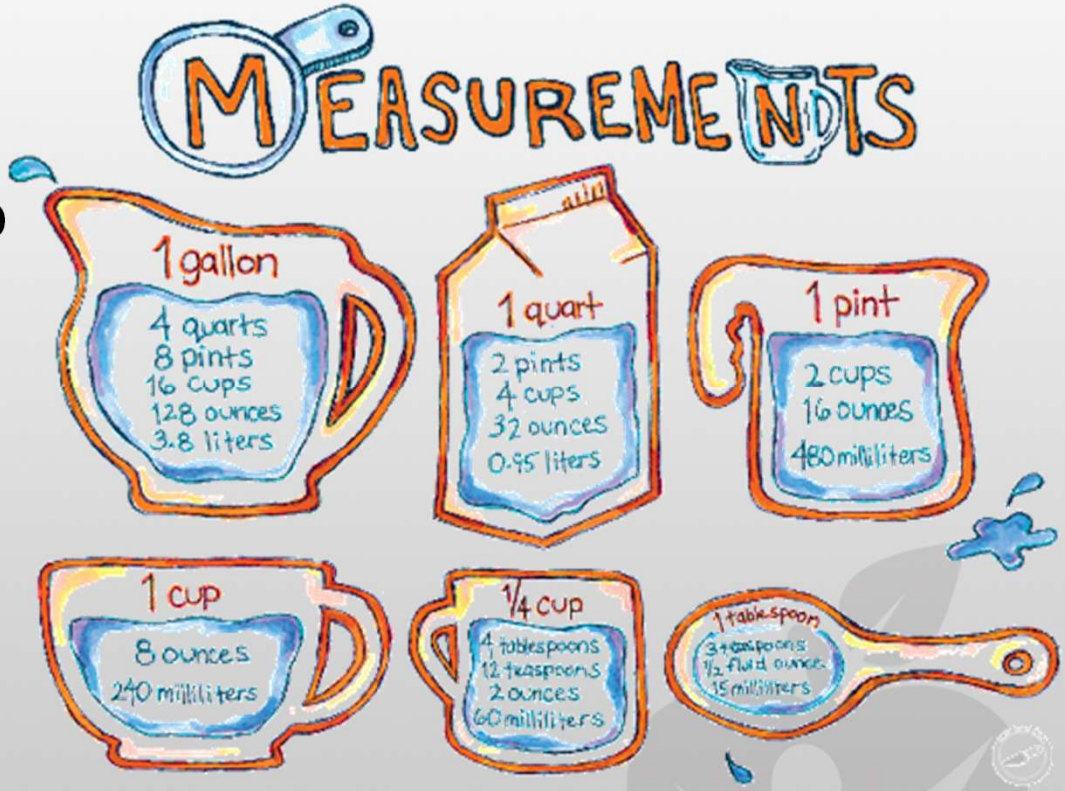
Measurement



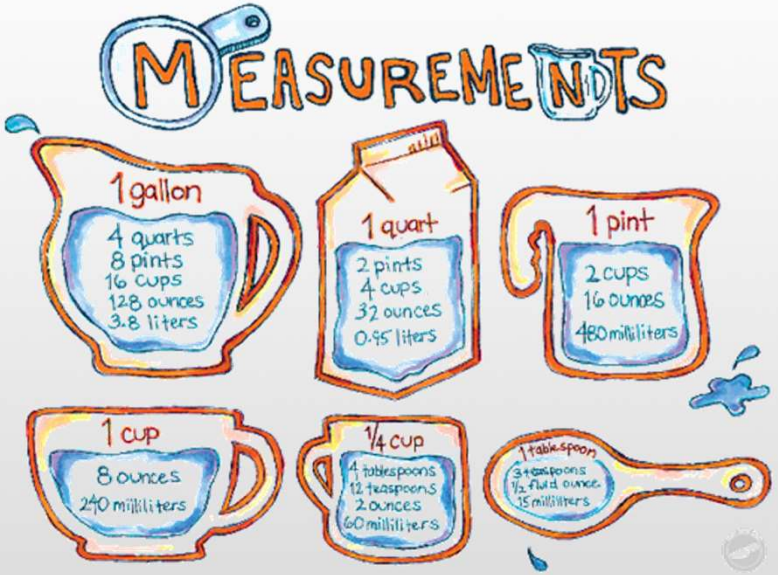
Most adult ESOL students are used to metric measurements but most Americans use the English system (otherwise known as Customary Units) of measurement. Therefore, students need to be taught how to convert or estimate using the measurement system they are used to at early stages.

Measurement

Adult ESOL students also need to be used to converting between U.S. Customary System of Measurements such as gallons to quarts, quarts to pints, etc.



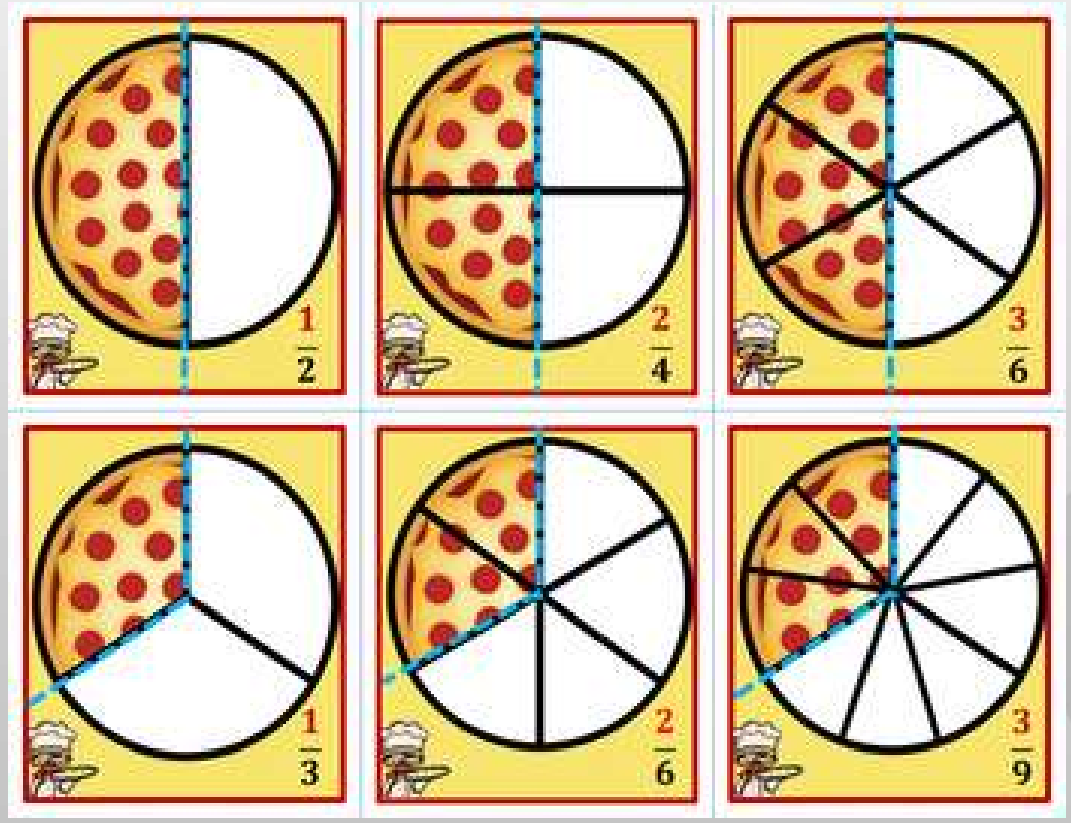
Teach Conversion with Food



Teach Fractions with Food

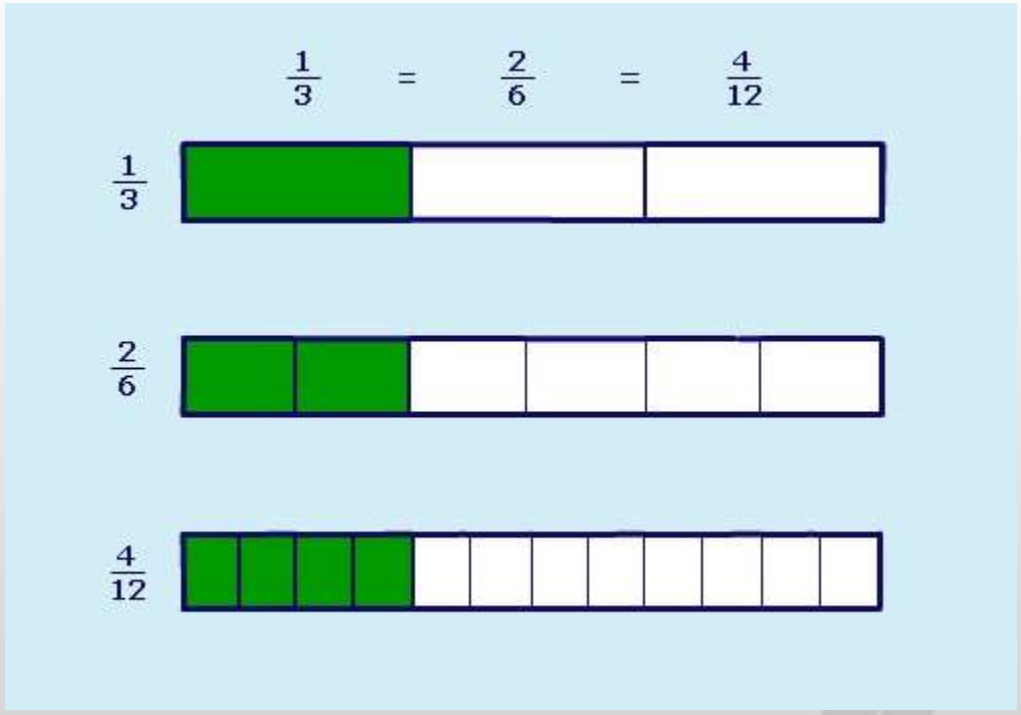
Mathematics Competencies:

- Identify and classify numeric symbols.
- Use decimal notation for fractions with denominators 10 or 100.



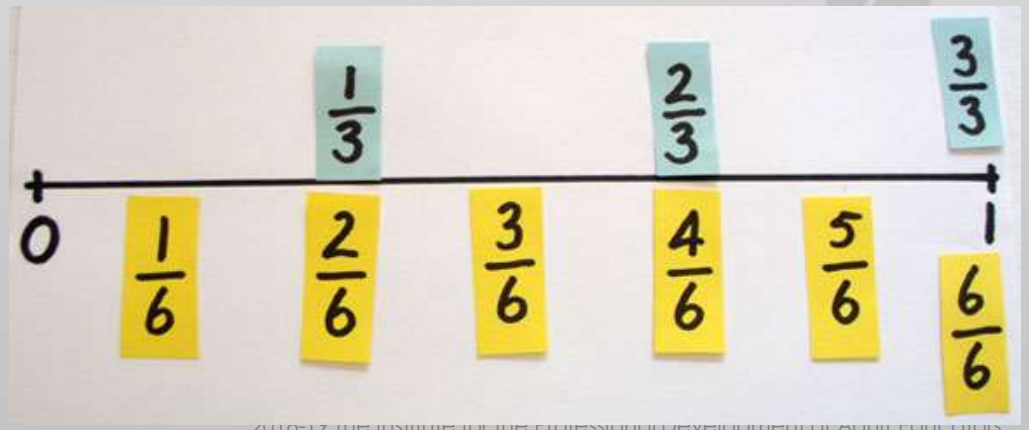
Teach Fractions Without Food

Teachers must also teach fractions without using food so they can interact with different contents involving fractions. Use fraction tiles and number lines to show order and equivalence.



Mathematics Competency:

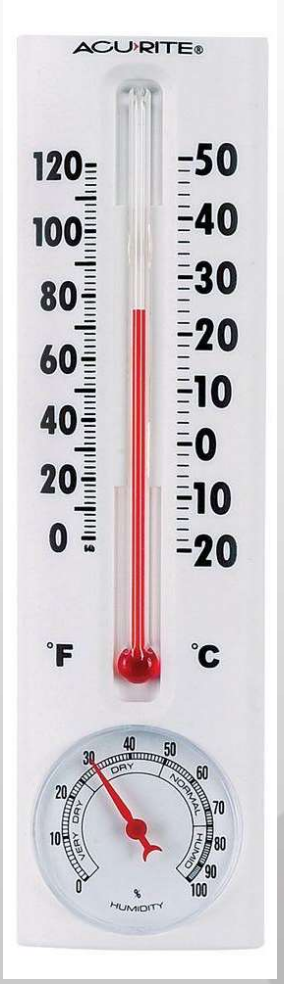
- Compare objects with measurable attributes in common.

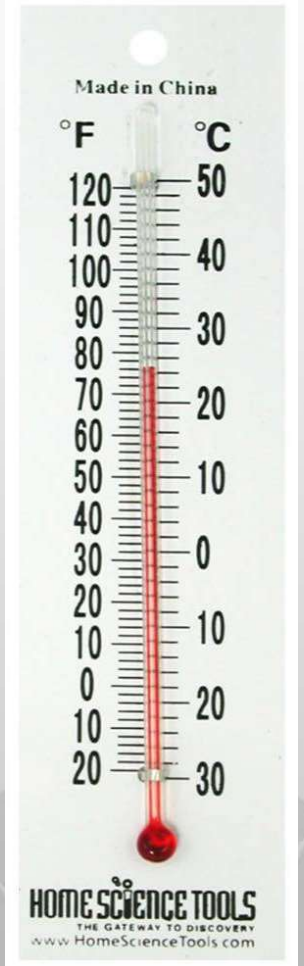


Extend Measurement to Weather

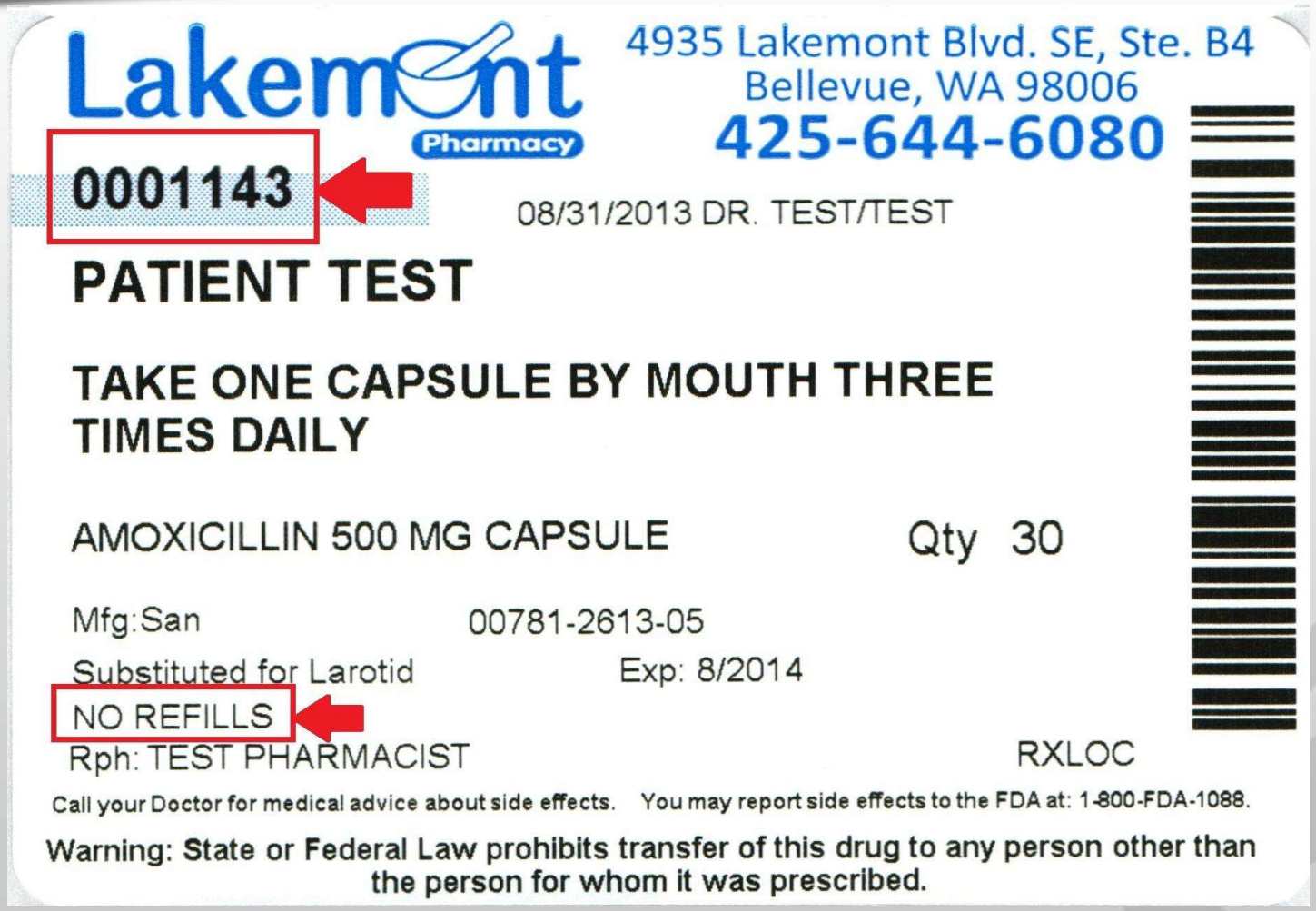
Mathematics Competencies:

- Count to 100 by ones and tens.
- Identify and classify numeric symbols.
- Compare objects with measurable attributes in common.

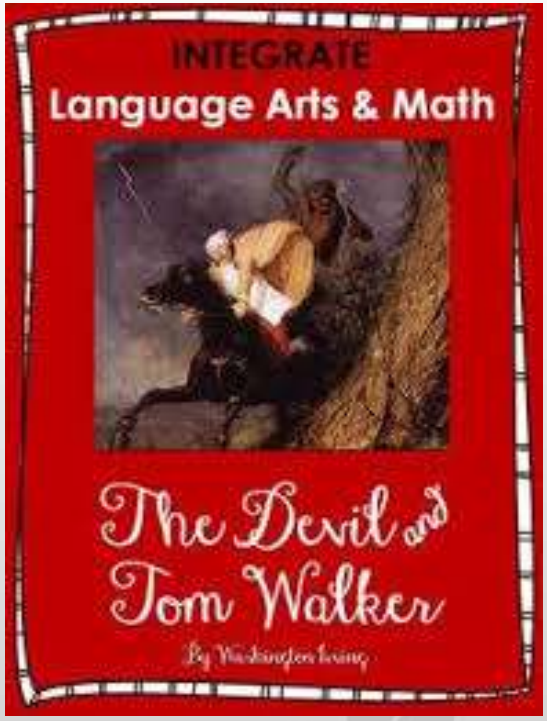




Tie It Altogether with Medicine Labels



List all the math topics you can teach using a medicine label.

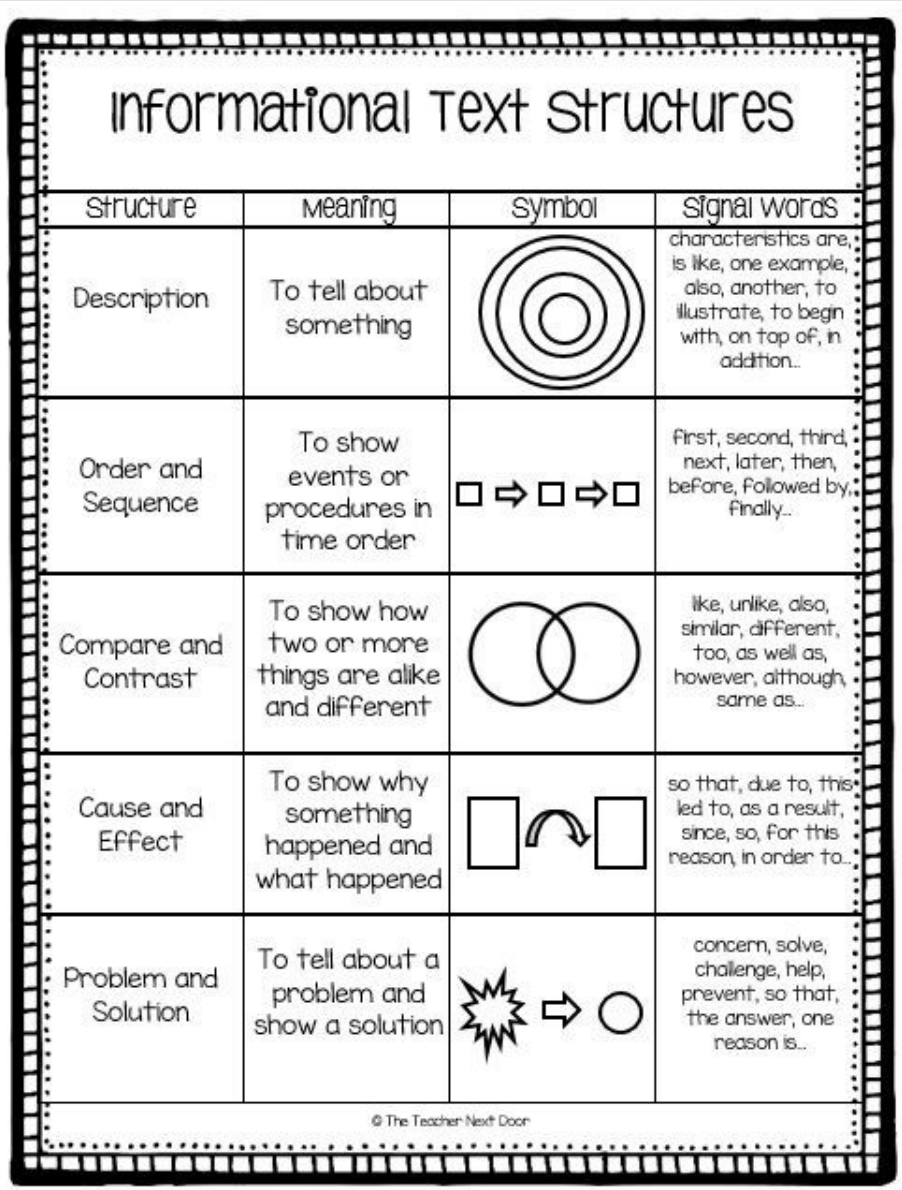


Hit Two Birds with One Stone - Integrate

BLENDING MATH WITH LANGUAGE INSTRUCTION

Informational Text

Understanding different information text structures will help adult ESOL students interact with content better and anticipate tasks at hand. These are the most common informational text structures in use in academic texts.



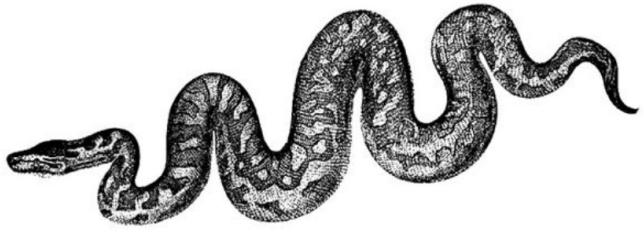
Informational Text Structures

Structure	Meaning	Symbol	Signal Words
Description	To tell about something		characteristics are, is like, one example, also, another, to illustrate, to begin with, on top of, in addition...
Order and Sequence	To show events or procedures in time order		first, second, third, next, later, then, before, followed by, finally...
Compare and Contrast	To show how two or more things are alike and different		like, unlike, also, similar, different, too, as well as, however, although, same as...
Cause and Effect	To show why something happened and what happened		so that, due to, this led to, as a result, since, so, for this reason, in order to...
Problem and Solution	To tell about a problem and show a solution		concern, solve, challenge, help, prevent, so that, the answer, one reason is...

Boa Constrictors

(You really got a hold on me)

Boa constrictors are amazing snakes. Like all snakes, boa constrictors are reptiles and **cold-blooded**. Boa constrictors are non-venomous (not poisonous) and must rely on other methods to kill and eat their prey. These snakes kill by constriction, wrapping their body around and squeezing the prey until it dies. (Remember, no warm hugs for these snakes)



Cold-blooded does not mean you have ice running through your veins. Cold-blooded creatures take on the temperature of their surroundings. They are warm when it is warm and cool when it is cool. These creatures move around a lot more when it is warm outside.

Not as big as anacondas, most boa constrictors can be as small as 30 inches (a little smaller than a yardstick) or as big as 10 feet. The biggest one ever found was over 18 feet long. *Use a ruler to measure out 18 feet. Pretty big, huh!* They can weigh over 100 pounds.

Boa constrictors can be found in Central and South America. *Go ahead, look them up on a map.* They will eat almost anything they can catch. They eat birds, other reptiles, monkeys, and even pigs. Their meal of choice is rodent. They are **nocturnal** hunters, searching for a meal in the dark of night. Often, they hang from trees by a cave and wait for a bat to fly by. They don't chew their food up like you and me (you do chew your food, don't you). After the prey has been suffocated ,they swallow it whole. If it is a big meal, their jaws can stretch wide to get it all in. They usually live about 20 to 30 years.

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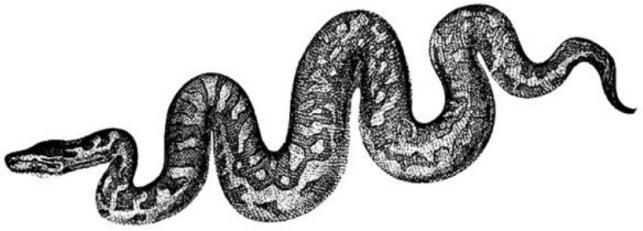

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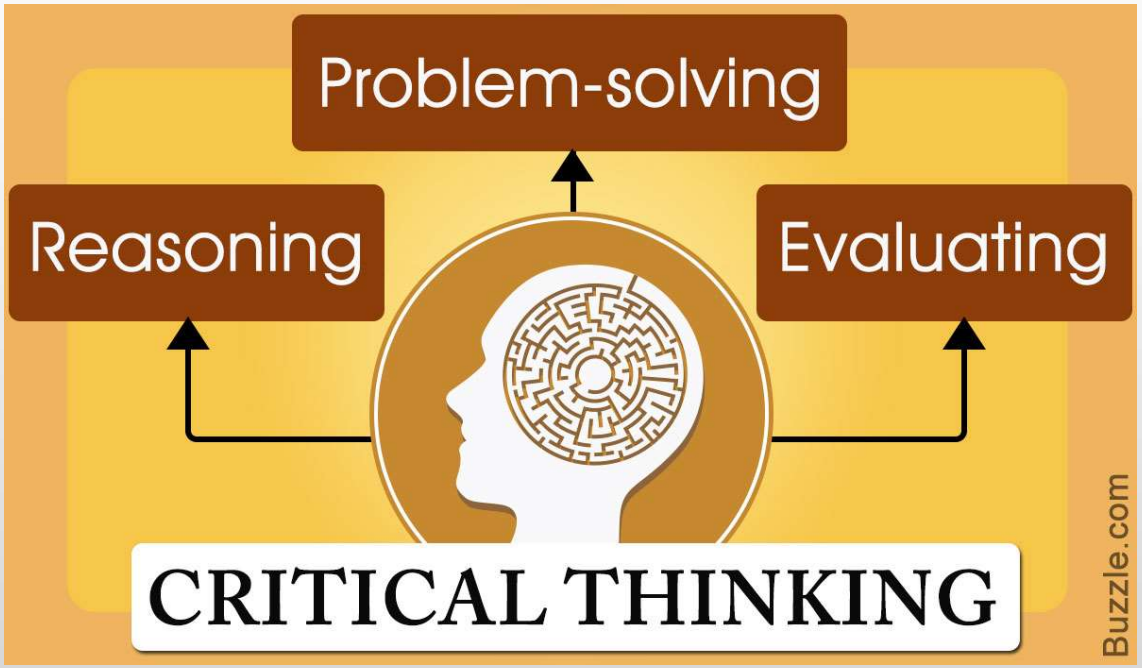


Taking It to the Next Level

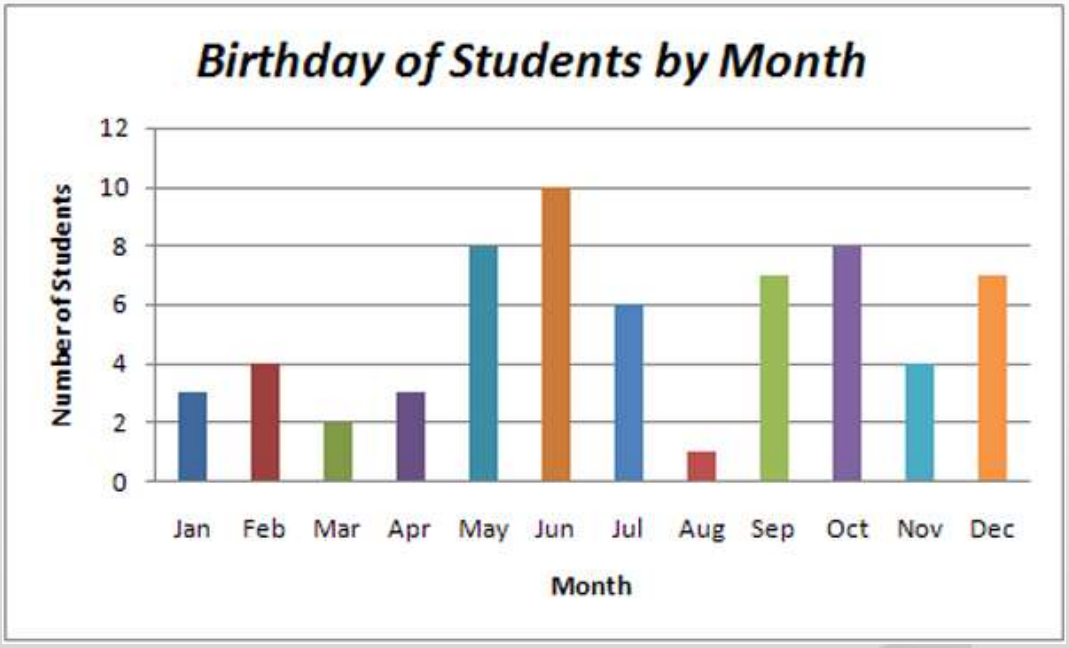
USING MATH TO PROMOTE CRITICAL THINKING

Data

Allow adult ESOL students to collect, interact and generate graphical representations of data.

Mathematics Competencies:

- Identify and classify numeric symbols.
- Compare objects with measurable attributes in common.

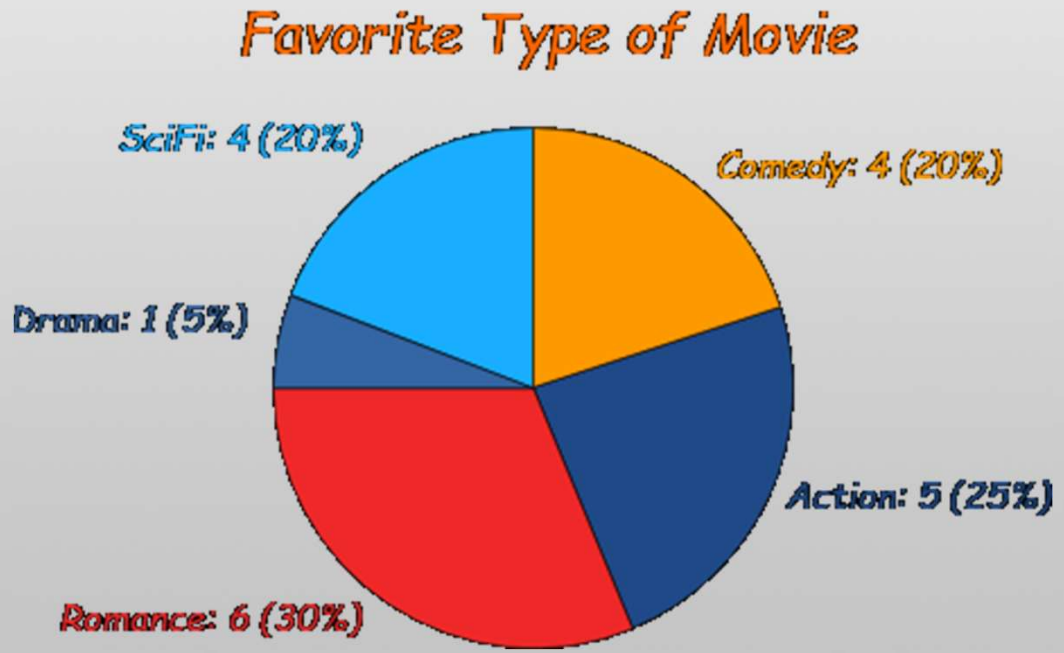


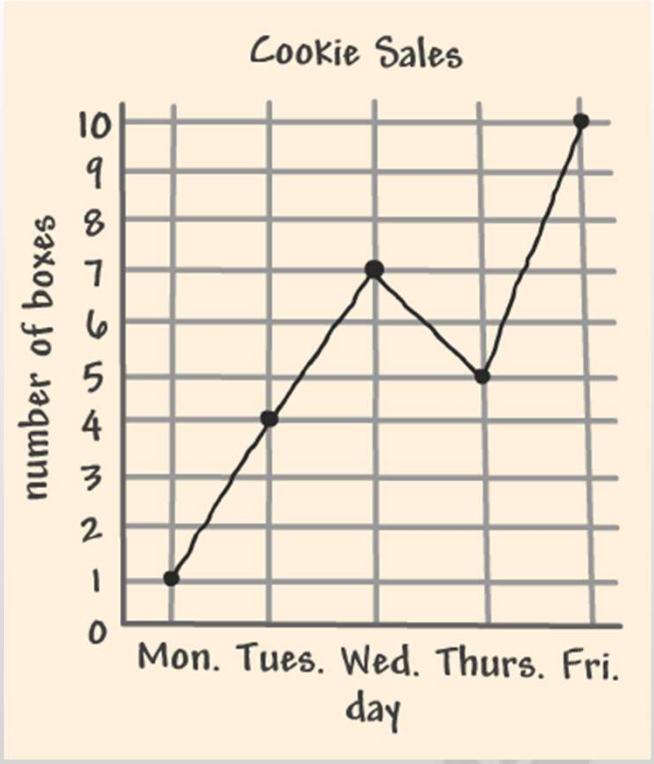
CASAS READING TASK AREAS

1. Forms;
2. Charts, maps, consumer billings, matrices, graphs, or tables;
3. Stories, articles, paragraphs, sentences, directions, or pictures;
4. Signs, price tags, ads, or product labels;
5. Measurement scales and diagrams

Data

Show multiple data representations to get adult ESOL students familiarized. You'll find out that reading statistical data is more universal than the English language.

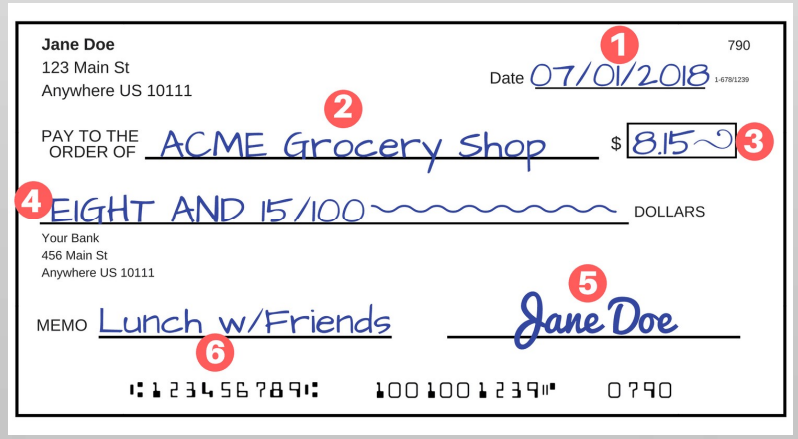




Give your students the opportunity to evaluate data or use data to guide/justify their decisions.

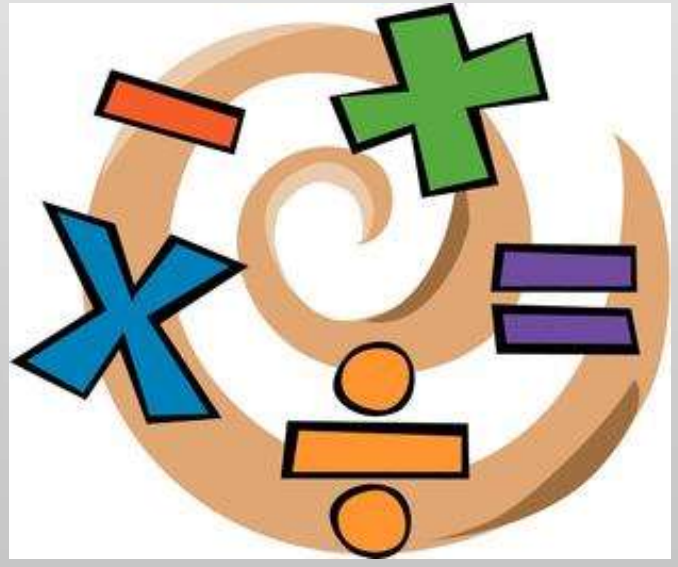
4 Basic Operations

Allow adult ESOL students start performing the 4 basic operations to solve simple real-world problems involving money, shopping or even balancing checkbooks. Can you come up with some real-world questions you can ask your students?



4 Basic Operations

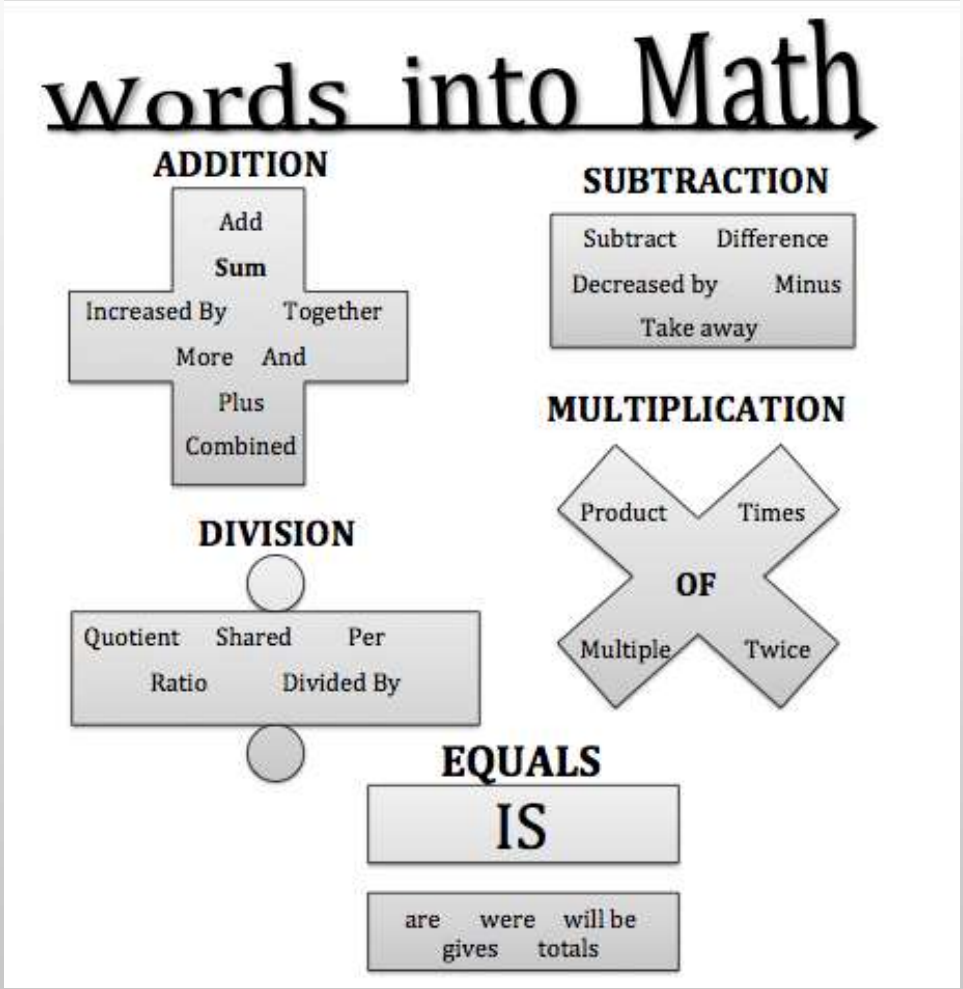
Some of our students may already know the basic mathematical operations but not word problems in English.



Words for ADDITION +

Words that translate to Adding		
plus	added to	the sum of
sum	more than	combined together
and	increased by	heavier than
total	next year	the total of
combined	longer than	older than
still	gain	bigger than
perimeter	together	older than

4 Basic Operations



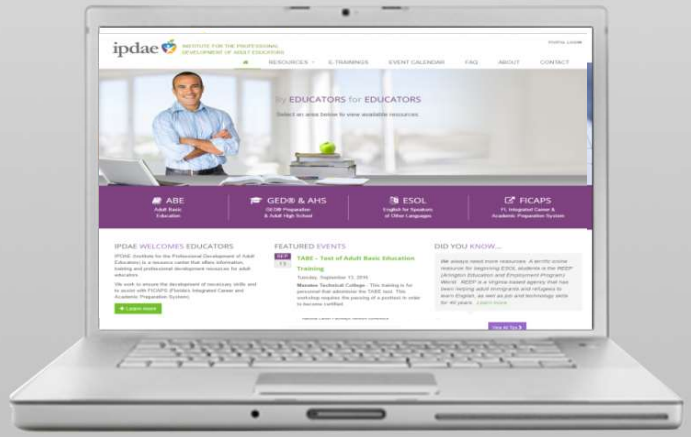
KEYS TO MATH SIGNS

Sign	Look For
ADDITION	+ What is the total? + How many altogether? + How many in all? + What is the perimeter? + The sum is... + What is the sum?
SUBTRACTION	- How many fewer? - How much change? - How many are left? - The difference is... - What is the difference?
MULTIPLICATION	x How many altogether? x Find multiples of... x What is the area? x The product is... x What is the product?
DIVISION	÷ The quotient is... ÷ What is the quotient? ÷ Divide into_____parts. ÷ How many per... ÷ What are the factors?

IPDAE Resources

English for Speakers of Other Languages (ESOL) Toolkit

- Introduction
  - The Wonderful World of the Internet for ESOL Instruction
- Integrated Education
- Math
- Reading
- Research and Guides
- Speaking and Listening
- Writing
- Complete Toolkit



CCRS ELA - Module 1

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CCRS ELA - Module 3

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CCRS Math - Module 1

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Evaluation

IPDAE would like to know what you think!

Please complete this quick survey.

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Thank you for your participation!