

MATHEMATICAL VOCABULARY



AN OVERVIEW AND SOME IDEAS

A LESSON IN CHINESE NATURAL (WHOLE) NUMBERS



一	二	三	四	五	六	七	八	九	十
1	2	3	4	5	6	7	8	9	10
yī	èr	sān	sì	wǔ	liù	qī	bā	jiǔ	shí
十一	十二	十三	十四	十五	十六	十七	十八	十九	二十
11	12	13	14	15	16	17	18	19	20
shí yī	shí èr	shí sān	shí sì	shí wǔ	shí liù	shí qī	shí bā	shí jiǔ	èr shí

NOW LET'S COMPARE TO ENGLISH



1 one	2 two	3 three	4 four	5 five	6 six	7 seven	8 eight	9 nine	10 ten
11 eleven	12 twelve	13 thir teen	14 fourteen	15 fifteen	16 sixteen	17 seventee n	18 eighteen	19 nineteen	20 twenty
21 twenty- one	22 twenty- two	23 twenty- three	24 twenty- four	25 twenty- five	26 twenty- six	27 twenty- seven	28 twenty- eight	29 twenty- nine	30 thirty

In old Dutch, “teen” means “toe”

AND SPANISH...



1	uno/una/un	31	treinta y uno/una/un
2	dos	32	treinta y dos
3	tres	40	cuarenta
4	cuatro	50	cincuenta
5	cinco	60	sesenta
6	seis	70	setenta
7	siete	80	ochenta
8	ocho	90	noventa
9	nueve	100	cien(to)
10	diez	101	ciento uno/una/un
11	once	182	ciento ochenta y dos
12	doce	200	doscientos/as
13	trece	300	trescientos/as
14	catorce	400	cuatrocientos/as
15	quince	500	quinientos/as
16	dieciséis	600	seiscientos/as
17	diecisiete	700	setecientos/as
18	dieciocho	800	ochocientos/as
19	diecinueve	900	novecientos/as
20	veinte	1000	mil
21	veintiuno/una/ún	1001	mil uno
22	veintidós	1010	mil diez
23	veintitrés	1100	mil cien
24	veinticuatro	10000	diez mil
25	veinticinco	100000	cien mil
26	veintiséis	1000000	un millón
27	veintisiete	2000000	dos millones
28	veintiocho	10^{12}	un billón
29	veintinueve	10^{18}	un trillón
30	treinta	10^{24}	un cuatrillón

DEPTH IS KEY IN LEARNING THE MEANING OF WORDS



- Even something as “simple” as the meaning of a number can be explored deeply to gain “control” of a word.

STRATEGIES WE KNOW DON'T WORK



- Look the word up in the dictionary (online or otherwise).
- Just use the context!
- Skip it and you'll learn it later on.

WHAT'S THE DEFINITION OF THE WORD "RUN"?

OR WHY LOOKING UP WORDS DOESN'T WORK



- **a** : an act or the action of running : continued rapid movement
- **b** : a quickened gallop
- **c** : a migration of fish (as up or down a river) especially to spawn; *also* : such fish in the process of migration

- **a**: something that flows in the course of an operation or during a particular time the first *run* of sap in sugar maples

- **a** : the stern of the underwater body of a ship from where it begins to curve or slope upward and inward
- **b** : the direction in which a vein of ore lies

- **a** : the distance covered in a period of continuous traveling or sailing
- **b** : a course or trip especially if mapped out and traveled with regularity
- **c** : a news reporter's regular territory : BEAT
- **d** : freedom of movement in or access to a place or area "has the *run* of the house"

VOCABULARY “FRONT LOADING” NOT VERY EFFECTIVE.



- Words don't have much meaning until you put them in a sentence
 - Paraphrasing Friedrich Ludwig Gottlob Frege (1848 – 1925), German [philosopher](#), [logician](#), and [mathematician](#).

"EVERYDAY" VS. ACADEMIC VOCABULARY



- Mathematics requires specific terms.

Everyday	Academic
guess	estimate
cross	intercept
problem	equation
steps	algorithm

A FALSE COGNATE IN MATHEMATICS, IN “QUOTIDIAN” VS. ACADEMIC LANGUAGE



- What does “of” mean in general English?
- What does it mean in mathematics?
- How can we help students learn the mathematical meaning?

IS MATHEMATICAL VOCABULARY PART OF THE TEKS



- If so, what is the focus?

A FEW STRATEGIES TO TRY. THE SEMANTIC GRID



Table 2. Example of a semantic grid

	<i>Features of transportation</i>							
	Has motor	Has wheels	Needs a ticket	Uses gas (petrol)	Uses electricity for motion	Goes by air	Goes on land	Goes on water
<i>Transportation mode</i>								
Automobile/car	+	+	-	+	-	-	+	-
Bus	+	+	+	+	-	-	+	-
Bicycle	-	+	-	-	-	-	+	-
Train	+	+	+	-	-	-	+	-
Airplane	+	+	+	+	-	+	-	-
Subway	+	+	+	-	-	-	-	+
Sailboat	-	-	-	-	-	-	-	+
Motorboat	+	-	-	+	-	-	-	+



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Train	+	+	+	-	-	-	+	-
Airplane	+	+	+	+	-	+	-	-
Subway	+	+	+	-	-	-	-	+
Sailboat	-	-	-	-	-	-	-	+
Motorboat	+	-	-	+	-	-	-	+

MATHEMATICS EXAMPLE



Features

Number Type	Includes Zero	Includes Fractions (Ratios)	Includes Negative Numbers
Natural (or Counting) Numbers	-	-	-
Integers	+	-	+
Real	+	+	+

MORE STRATEGIES TO USE MONDAY MORNING



- **Omit** the target word (a new term for your students) from a sentence and then consider what the word might fit in the mathematical sentence.
- Mathematics **sentence walls**, in addition to a word wall. Students are the best sources, but the curricular materials may also be useful. “Our playground’s grass area is rectangular and about 50 square meters in size.”
- Finding **root/history** of the word (e.g., triangle, tricycle, tripod, trilogy).
- Provide as many mathematical **Objects** as possible (for example, providing 3 D models of shapes). Have students experiment with folding models.
- Be consistent in your use of **terms**. Do the terms and syntax in your curricular, instructional, assessment, and standards match?