

## Examples of the Academic Language of Mathematics

### Vocabulary

#### Unknown to ELLs

- *each, represent, position, depend, fill in, related, evenly, pattern, whether, time passes, heads/tails, odd/even*

#### Multiple meanings

- *table, set, place, value, point, field, plot, square, power, odd, even, period, round, order, chord, compass, face, edge, net, figure, scale, mean, plane, evaluate, common, operation*

#### Synonyms, homophones and perceived homophones

- *add/plus/combine/put together/increased by, subtract/minus/less/take away/decreased by, divided into/divided by, left/left over/remain*
- *sum/some, whole/hole, sixty/sixteen, six/sixth, then/than*

#### Word families

- *rotate/rotation/rotational, form/transform/transformation*

#### Difficult to say/spell, or to remember

- *hundredths, multiply/multiple*
- *commutative, associative, numerator, denominator, isosceles, hypotenuse, ratio*

#### Conceptually dense

- *exponent, least common multiple prime factorization, square root, greatest common factor, least common denominator, reciprocal, proportion, variable, coordinate plane*

### Grammatical Structures

#### Word order

- *By what percent is 16 increased to make 24? 16 is increased by what percent to make 24?*
- *The number a is 5 less than the number b ( $a - 5 = b$ ?).*

#### Passive verbs

- *10/5 can be renamed as 2.*

## Examples of the Academic Language of Mathematics (contd.)

- *4/6 could be thought of as 2/3.*
- *The difference between  $x$  and  $y$  is best described as ...*

### Hypothetical sentences

- *Tom buys a pizza. If he ate 1/2 of it and his brother ate 1/4 of it, how much was left?*
- *If he had eaten 1/4 of it, how much would have been left?*
- *Suppose his brother didn't eat any ...*

### Comparatives

- *How much taller is José than his brother?*
- *Order the numbers from greatest to least.*
- *7 is half as many as what number?*
- *As the width increases, the perimeter also increases.*

### Multiple embedded clauses and phrases

- *The chart shows the maximum amount of three pollutants that a light-duty truck may emit per mile.*

## Language Functions and Discourse Structures

### Functions

- *ask questions, answer questions, explain, describe, express, define, compare, sequence, label*

### Logical Connectors

- *because, since, so, therefore, for this reason, consequently (causal)*
- *first/second/third ..., initially, to start with, next, then, finally, previously, afterwards, at last (sequential)*
- *but, although, in spite of, however, while, on the other hand (contrastive)*
- *for example, such as, like (examples)*

### Semantics

- *3 times a number is more than 2 times the number.*
- *a given number, the unknown, a number multiplied by itself; change over time; let  $x$  equal 10; other than; impossible/unlikely/likely/probable/certain*