Instead of That, Say This

One way to help students with their understanding of mathematics vocabulary is to emphasize formal mathematics language in the classroom. What follows are some examples of how informal or incorrect language (Instead of that…) can be replaced with formal mathematics language (Say this…).

Formal mathematics language is important because this is the type of language that students read in texts and on the STAAR. If students only experience informal mathematics language, it will be difficult for students to fully participate in mathematics and demonstrate their mathematics competency.

Each of these examples come from an article named *Supporting Clear and Concise Mathematics Language: Instead of That, Say This* (Hughes, Powell, & Stevens, 2016). The article can be accessed here:
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Here are examples related to number and operations.

Instead of that...	Say this...
What number is in the tens place? Problem: For example, the number is 243. The digit in the tens place is 4 with a value of 40.	***What digit is in the tens place? What is the value of the digit 4 in the tens place?*** Solution: This reinforces the conceptual understanding of place value and emphasizes that 4 is part of 243 with a value of 40.
"Five hundred and twenty-nine" Problem: "And" should only be used to represent the decimal point (e.g., 3.25 is "3 and twenty-five hundredths") or fractions (e.g., 3 1/4 is "3 and one-fourth").	***"Five-hundred twenty-nine"*** Solution: This is mathematically correct.
Makes up or ***break apart*** Problem: These informal terms are procedural and not the terms used in textbooks or high-stakes assessments.	***Compose*** and ***decompose*** Solution: Use the formal terms to describe composing a number (e.g., "24 is composed of 2 tens and 4 ones").
Alligator eats the bigger number Problem: Children do not learn how to read math expressions from left to right or understand the meaning of the greater than (>) and less than (<) symbols.	***Is less than*** or ***is greater than*** Solution: Children learn how to read and write the inequality symbols and read equations correctly from left to right. Children also learn that < and > are two distinct symbols and not one symbol that switches back and forth.
Bigger number and ***smaller number*** Problem: This is not mathematical language and it does not transfer to positive and negative integers.	***Number that is greater*** and ***number that is less*** Solution: These terms are mathematically accurate and reflect the language in standards.
Equals Problem: This term is often used to indicate that children write an answer.	***the same as*** Solution: This reinforces the equal sign as a symbol that indicates the quantities on both sides need to be the same.
When adding, your answer is always bigger. When subtracting, your answer is always smaller. Problem: This is not always true. When working with 0, rational numbers, or negative numbers, adding will not always produce a greater number and subtracting will not always produce a number that is less.	Ask children to predict and reason Solution: Do not say rules that expire in subsequent grade levels because it leads to an erroneous understanding of addition and subtraction.
Carry or ***borrow*** Problem: This terminology is procedural.	***Regroup*** or ***trade*** or ***exchange*** Solution: This reinforces the conceptual understanding of grouping ones into tens, tens into hundreds, etc. or ungrouping hundreds into tens, tens into ones, etc.

Hughes, Powell, & Stevens (2016)

Here are examples related to fractions and decimals.

Instead of that...	**Say this...**
Numbers in the fraction Problem: Language suggests that each part of a fraction (i.e., numerator, denominator) is a separate and independent number instead of a digit (or series of digits) that comprise a fraction.	***This fraction is a number*** Solution: A fraction is a number in itself and has a magnitude on a number line. A fraction is not two separate numbers.
Top number and ***bottom number*** Problem: This suggests that the numerator and denominator are separate and independent numbers.	***Numerator*** and ***denominator*** Solution: A fraction is a number with a specific magnitude that can be represented on a number line. While a fraction may have different parts, these parts do not work in isolation but rather contribute to one number - the fraction.
2 over 3 Problem: This communicates the location of the digits but not the actual number or magnitude.	e.g., ***Two-thirds*** Solution: This is accurate and communicates the magnitude of the number.
Line Problem: Calling the fraction bar a line is inexact vocabulary.	***Fraction bar*** or ***slash*** Solution: The fraction bar or slash plays an important role in communicating the divisional relationship between the numerator and denominator.
Reduce Problem: This term (as in "reduce to the lowest term") suggests the result is less in quantity.	***Rename*** or ***find an equivalent fraction*** Solution: The quantity represented by the magnitude of fraction does not change. The only change is with the digits used to communicate that magnitude.
Point Problem: Reading a decimal as "three point four" does not support the conceptual understanding of place value of the magnitude of the decimal.	e.g., ***Three and four tenths*** Solution: This reinforces place value and supports understanding of magnitudes, values, and when to use each symbol.
Move the decimal point over Problem: This language communicates an action. This language does not promote conceptual understanding when multiplying or dividing by 10s.	Demonstrate process within Base-10 Solution: Helps with understanding the process of multiplying by 10s, 100s, etc.
Out of Problem: When talking about ratios, this language is incorrect because it does not communicate the ratio of one number to another but one number to the whole.	e.g., ***Three to four*** Solution: Although a minor change in language, the meaning is very different.

Hughes, Powell, & Stevens (2016)

Here are examples related to geometry.

Instead of that...	Say this...
Box or ***ball*** Problem: With early descriptions of shapes, children use terms that relate to real-life objects. This is permissible but formal language should also be reinforced.	***Square/rectangle*** or ***circle*** Solution: Use the formal language of shapes to confirm informal language.
Square for any rectangular shape Problem: A square has 4 equal straight sides and 4 right angles. A square is a rectangle, but a rectangle is not necessarily a square.	***Rectangle*** Solution: This helps children distinguish between square and rectangle terminology.
Corner Problem: This general vocabulary term is not mathematically accurate.	***Angle*** Solution: Reinforce that an angle is the space between two intersecting lines.
Side or ***angle*** to describe 3D shapes Problem: A 2D shape uses straight sides and the sides meet at corners. This is not true for 3D	***Edge, face,*** or ***vertex/vertices*** Solution: This reinforces understanding that 2D and 3D figures are different.
Point for 3D figures Problem: This general vocabulary term is not mathematically accurate.	***Vertex*** Solution: This is the endpoint where two or more line segments or rays meet.
Same (e.g., ***"These are the same shape."***) Problem: Too vague of a description.	***Similar*** Solution: Shapes are similar when the only difference is in size.
Same (e.g., ***"These shapes are the same."***) Problem: Too vague of a description.	***Congruent*** Solution: This term should be used to describe similar shapes that are the same size.
Same (e.g., ***"These halves are the same."***) Problem: Does not convey conceptual meaning.	***Symmetrical*** Solution: This term should be used to describe a reflection of a shape.
Flips, slides, and ***turns*** Problem: These terms help children remember the action of a transformation, but this vocabulary is not used on assessments.	***Reflections, translations,*** and ***rotations*** Solution: These are the correct mathematical terms.
Stretch or ***shrink*** Problem: These terms help children remember the action of a transformation, but this vocabulary is not used on assessments.	***Dilation*** Solution: This is the proper mathematical term.

Hughes, Powell, & Stevens (2016)

Here are examples related to measurement.

Instead of that…	Say this…
Long hand and ***short hand*** Problem: These terms describe the length of clock hands but not the properties of the hands.	***Minute hand*** and ***hour hand*** Solution: These term help students understand hours and minutes.
Less versus ***fewer*** Problem: The difference is based on grammatical rules.	***Less*** or ***fewer*** Solution: Use less when it's something that cannot be counted or is singular; use less when referring to specific numbers with measurement. Use fewer with objects that can be counted one-by-one.
Bigger or ***larger*** Problem: These are general vocabulary terms and not mathematically accurate.	***Greater*** Solution: Greater refers to quantity.
Long Problem: "It is 2cm long" becomes problematic when students describe the sides of 2D figures.	***Length*** Solution: "The length of the side is 2 cm."
Using ***weight*** and ***mass*** interchangeably Problem: Not mathematically accurate.	***Weight*** or ***mass*** Solution: Mass refers to the amount of matter in an object, whereas weight is the pull of gravity on an object.
Using ***capacity*** and ***volume*** interchangeably Problem: Not mathematically accurate.	***Capacity*** or ***volume*** Solution: Volume refers to the space of an object. Capacity refers to liquid measurement.
Distinguish ***chart*** and ***graph*** Problem: Not accurate.	***Chart*** or ***graph*** Solution: A graph presents exact numerical data. A chart presents data in an interpretable manner.
Distinguish ***picture*** and ***pictograph*** Problem: Not accurate.	***Picture*** or ***pictograph*** Solution: A pictograph is a graph with pictures to represent 1 (or multiple items).
Distinguish ***then*** and ***than*** Problem: Not grammatically correct.	***Then*** or ***than*** Solution: For comparison, use than.

Hughes, Powell, & Stevens (2016)