

I KNOW WHAT I KNOW

Formative Assessment

Connection: By quickly and thoroughly sharing what they know (including how and why their knowledge is accurate), students clarify their understanding of mathematics concepts for themselves and their teacher.

Purpose

“I don’t know.” Teachers of mathematics encounter this immediate, reflexive response from students far too often. Teachers recognize the crucial roles that accessing prior knowledge and reflection play in the learning process, but are often frustrated by their students’ reluctance to engage in reflective thinking. I Know What I Know cuts through both abstraction and resistance, providing students with an easy-to-use format that encourages reflection, celebrates prior knowledge, and builds students’ confidence in sharing *what* (sometimes *how* or *why*) they know about mathematical concepts.

Overview

I Know What I Know invites students to consider all that they know about a mathematical concept, procedure, or topic and confidently share their knowledge by completing a simple sequence of statements:

I know what I know about _____.

First, I know _____.

In addition, I know _____.

Finally, I know _____.

Now you know what I know about _____!

Alternatively, teachers may ask students to share how or why they know what they know to clarify their procedural knowledge or mathematical reasoning.

Building Common Core Thinking

I Know What I Know develops students’ capacity for personal reflection, leading to deeper understanding and improved communication about their learning. I Know What I Know supports the following Standards for Mathematical Practice (MP):

- ☛ (MP 1) *Sense*: explaining correspondences between equations, descriptions, tables, and graphs or diagrams
- ☛ (MP 2) *Reason*: making sense of quantities and manipulating them
- ☛ (MP 6) *Precision*: formulating careful explanations

Steps

1. Select a topic or concept that is important for students to know well.
2. Decide whether students will consider and share

- *What* they know, in terms of factual information (e.g., definition, characteristics).
 - *How* they know, in terms of procedural information (e.g., construction, transformation).
 - *Why* they know, in terms of mathematical reasoning (e.g., proof, explanation, logic).
3. Model or review how to complete the I Know What I Know sequence.
 4. Have students complete their I Know What I Know sequences individually.
 5. Depending on concept and purpose, have students share their statements in pairs, small groups, or with the entire class.

Note: Consider extending student thinking by having pairs of students share what they know and ask each other, “Now, what do you know that I don’t know?”

Examples

Topic: Cubes (factual knowledge \Rightarrow “know about”)

I know what I know about cubes.

- *First, I know* they make good dice.
- *In addition, I know* they have six sides.
- *Finally, I know* the volume of a cube is $l \times w \times h$ or just s^3 .

Now you know what I know about cubes!

Topic: Finding Area of a Triangle (procedural knowledge \Rightarrow “how”)

I know what I know about finding the area of a triangle.

- *First, I know how* to find a base of a triangle.
- *In addition, I know how* to find its altitude to that base.
- *Finally, I know how* to multiply $\frac{1}{2}$ times base times height.

Now you know what I know about finding the area of a triangle!

Topic: $x^2 + 5 > 0$ Must Always Be True (reasoning \Rightarrow “why”)

I know what I know about why $x^2 + 5 > 0$ must be true.

- *First, I know why* $x^2 + 5 > 0$ because x^2 is always positive and the sum of two positive numbers is another positive number.
- *In addition, I know why* $x^2 + 5 > 0$, since x^2 is always positive, then $x^2 > -5$.
- *Finally, I know why* $x^2 + 5 > 0$ because $y = x^2 + 5$ represents a parabola with vertex (0, 5) and opening upward. It is always above the x -axis and therefore $x^2 + 5 > 0$.

Now you know what I know about why $x^2 + 5 > 0$ must be true!

What do you know that I don’t know about why $x^2 + 5 > 0$ must be true?



Visit the companion website for a blank “I Know What I Know Organizer.”