



Number Talk

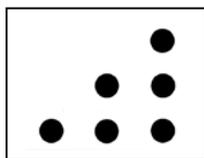
"I've come to believe my job is not to teach my students to see what I see. My job is to teach them to see." – Ruth Parker

Purpose: A Number Talk is a brief and frequent instructional routine in which students consider and discuss an image or expression. Students strengthen their understanding of number relationships and develop computational reasoning through this routine. Number Talks provide students with opportunities to articulate their thinking in a safe environment and teachers with opportunities to gain insight into student thinking which could include sound understandings, connections, and misconceptions.

Approximate Duration: 7-15 Minutes

Planning for Number Talks	
Step 0	<p>Identify the mathematics you are focusing on. <i>What mathematics will I target to help build students' flexibility and confidence with manipulating numbers? Are there opportunities to engage students with the mathematics in this unit through number talks?</i></p> <p>Choose a problem or set of problems.</p> <p>Anticipate student strategies. Do the math! <i>How might students approach the problem? What else might a student do?</i></p> <p>Consider how you will record student thinking. It is vital to record strategies precisely as students describe them in the moment. Recording methods should be considerate of individual students, however planning a general recording approach in advance may increase teacher facility with responding to students in the moment.</p>
Number Talk Routine	
Step 1	<p>Pose the problem.</p> <p>Teacher displays an image or expression.</p> <p>Students consider the problem individually. All students begin with a fist held to the chest. A thumb held up indicates the student has found one solution. Students consider other ways of seeing the problem, and hold up an additional finger for each new strategy or solution.</p> <p><i>Thumbs up on your chest when you have an answer. You may add fingers if you think of this in more than one way.</i></p>
Step 2	<p>Share Answers.</p> <p>Teacher asks students to share the <i>answers</i> to the problem. Teacher records each answer without guiding, approving, or correcting.</p> <p><i>Anyone willing to share their answer? Anyone with a different answer?</i></p>
Step 3	<p>Share Strategies and Solutions.</p> <p>After all answers have been recorded, the teacher asks for student solutions to be shared. Teacher records student solutions as accurately as possible without guiding, approving, or correcting.</p> <p>Students listen and ask questions to understand, but not correct peer thinking.</p> <p><i>Who is willing to share how they found their answer? Which answer are you defending? Can you see what ___ saw? Who saw it a different way that would be willing to share? Will this method always work? Why does that method work? How is that method connected to other methods? Did you make any interesting mistakes?</i></p>
Step 4	<p>Repeat with a related problem.</p> <p>Students engage in the process with an additional problem as time permits.</p>

Mathematically Productive Instructional Routines Process and Resources



Getting Started

When initiating number talks with students of all ages, begin with dot card images. Arithmetic problems tend to be emotionally loaded for students. Daily use of dot card images at the outset can help establish a safe culture to explore thinking in a classroom. Engage in the Number Talk routine daily for at least the first two weeks.

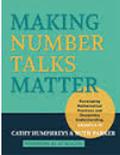
As students gain comfortability, move to subtraction with small quantities, and then with larger quantities for students in grades 1 and above. From subtraction, progress to addition or multiplication as appropriate for the grade level. Progress toward grade level content as student confidence grows.

Guiding Principles for Number Talks

Adapted from *Making Number Talks Matter* by Cathy Humphrys and Ruth Parker

<p>Students need opportunities to think about and learn to solve problems in ways THAT MAKE SENSE TO THEM. Students are listening to strategies, looking for relationships during a Number Talk. Through exploring diverse solutions a deeper understanding of mathematics is developed.</p>	<p>Not every student needs to—or should be expected to—talk in every setting. Researchers have found that stress interferes with performance as it reduces working memory. Number Talks must be a safe place to try out ideas and share thinking when students are ready to do so.</p>
<p>No strategy is efficient for a student who does not yet understand it. Encourage students to think in ways that make sense to them instead of understanding a “best” way, or how we think. Accuracy + Flexibility + Efficiency are the hallmark of numerical fluency.</p>	<p>Mistakes are necessary for learning. Shift the goal of mathematics learning from “answer-getting” to understanding the math behind right and wrong answers & analyzing procedures. Treating mistakes as an important part of learning, encourages students to persevere.</p>
<p>It is not enough for students to know what they did to solve a problem. Students must understand and be able to explain why their procedures make sense. (SMP 1 & 2)</p>	<p>Questions matter. Pose questions intentionally & follow your curiosity about student thinking. Purposeful questions elicit evidence of students’ reasoning & promote connections.</p>
<p>Students with a sense of agency recognize they are an important part of an intellectual community in the classroom, they have worthwhile ideas to contribute, and they can learn from considering, and building on, the ideas of others. Students take action as a learner defending ideas & changing ideas only when they are convinced.</p>	<p>Encountering a mathematical idea multiple times in a variety of contexts is necessary for real understanding. Encourage students to value the thinking process required to participate in Number Talks. Help students see their role in the math classroom, and support positive beliefs and attitudes about what math is.</p>
<p>Through Number Talks, students develop a disposition to listen to and build on the ideas of their peers and teachers. By listening to and building on ideas, everyone learns more deeply.</p>	<p>Be careful not to put confusion—that process of being in cognitive dissonance & not knowing—to rest prematurely. Redefine what it means to “help” students & welcome confusion as a state that precedes new understandings.</p>

References and Resources:

 <p>Making Number Talks Matter By Ruth Parker and Cathy Humphreys</p>	<p>This text details the why and how of number talks based on many of years of the authors’ experiences in classrooms. Guiding principles, implementation strategies, and a progression for exploring operations across grades 4-10 are included in this comprehensive text. Print and E-book versions accessible at: https://www.stenhouse.com/content/making-number-talks-matter</p>
<p>OSPI Number Talk Webinars http://www.k12.wa.us/Mathematics/default.aspx</p>	<p>The OSPI produced webinars include an introductory module, as well as grade band specific modules for grades K through High School. Each one hour webinar recording and the accompanying power point can be accessed at this site.</p>
<p>Number Talks Network</p> <div style="border: 1px solid blue; background-color: #e0f0ff; padding: 5px; margin-top: 10px;"> <p>New! Number Talks Network Sign up to get resources and collaborate with other educators using Number Talks in their classrooms.</p> </div>	<p>Visit the OSPI Mathematics site and look for the sign-up link to join the statewide Number Talks Network. This Canvas Course is built to compile resources and tools curated by grade-level and to foster collaboration among practitioners engaging with Number Talks around the state. Access the enrollment link at: http://www.k12.wa.us/Mathematics/default.aspx</p>
<p>Math Perspectives Website www.mathperspectives.com</p>	<p>The Number Talk Toolkit on this site provides an overview, articles, videos and other tools helpful for those getting started with Number Talks. http://www.mathperspectives.com/num_talks.html</p>