

Developing Math Understanding to Improve Student Achievement: Building Number Sense

How to Build Number Sense

From: Burns, M. (2015). *About teaching mathematics*. Sausalito, CA: Math Solutions.

- Model different methods of solving a problem
- Ask students regularly to calculate mentally
- Have discussions about strategies for computing
- Use estimation strategies
- Question students about how they reason numerically
- Pose numerical problems that have more than one possible answer

Good questions to ask students to build Number Sense

From: Schuster, L. and Anderson, N.C. (2005). *Good questions for math teaching*. Sausalito, CA: Math Solutions.

- Why do you think that?
- How did you know to try that strategy?
- How do you know you have an answer?
- Will this work with every number?
- When will this strategy not work? Can you give an example?
- Who has a different strategy?
- How is your answer like or different from another student's?
- Can you repeat your classmate's ideas in your own words?
- Do you agree or disagree with your classmate's idea? Why?

Resources for Building Number Sense, Problem-Solving and Critical Thinking Skills

[Creative Math Prompts](#)

[Estimation 180](#)

[Future City](#)

[Illustrative Mathematics](#)

[Inside Mathematics](#)

[Mathematics Assessment Project](#)

[Math Hooks](#)

[NASA, STEM](#)

[National Geographic STEM Education](#)

[National Museum of Mathematics](#)

[NCTM Illuminations](#)

Resources for Building Number Sense, Problem-Solving and Critical Thinking Skills, ctd.

[nRich](#)

[PBS Math](#)

[STEM Alive, PBS](#)

[STEM and PBL, Rutgers](#)

[Visual Patterns](#)

[YouCubed](#)

Print Resources

Boaler, J., & Dweck, C. S. (2016). *Mathematical mindsets: unleashing students' potential through creative math, inspiring messages and innovative teaching*. First edition. San Francisco, CA: Jossey-Bass; a Wiley Brand.

Dacey, L. (2018). *Why write in math class?* Portland, ME: Stenhouse.

Humphreys C. & Parker R. (2015). *Making number talks matter: developing mathematical practices and deepening understanding, grades 4-10*. Portsmouth, NH: Stenhouse.

Parker R. & Humphreys C. (2018). *Digging deeper: making number talks matter even more*. Portsmouth, NH: Stenhouse.

Parrish, Sherry. (2010). *Number talks: helping children build mental math and computation strategies, grades K-5*. Sausalito, CA : Math Solutions.

Parrish, Sherry. (2016). *Number talks: fractions, decimals and percentages*. Sausalito, CA: Math Solutions.

Shumway, J. F. (2011). *Number sense routines: Building numerical literacy every day in grades K-3*. Portland, ME: Stenhouse.

Shumway, J. F. (2018). *Number sense routines: Building mathematical understanding every day in grades 3-5*. Portland, ME: Stenhouse.