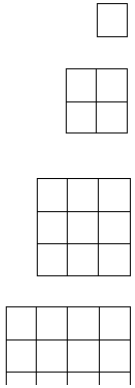
Exponents & Radicals - Engaging Resources

AN SO2 - Investigation - Entire & Mixed Radicals (Download: Entire & Mixed Radicals Investigation.docx)

Complete the table with the students to establish that the side lengths may be written as equivalent mixed radicals and entire radicals. Then let the students try to figure out the relationship with the assistance of the "*If these are true ... then ...*" side of the handout. Once students think they understand, have them quickly show you and then have some practice ready to develop speed and confidence.

Math 10-C Entire & Mixed Radicals Investigation **Name:** _____

1. Complete the table below given the information provided.
   Each of the small squares below has an area of 2. The first one is completed for you.



Total Area	Side Length (written as an entire radical)	Side Length (written as a multiple of $\sqrt{2}$)
2 units^2	$\sqrt{2}$	$1\sqrt{2}$

If the following are true ... *(verify with a calculator if you'd like)*

$\sqrt{8} = \sqrt{4} \cdot \sqrt{2} = 2\sqrt{2}$ $\sqrt{12} = \sqrt{4} \cdot \sqrt{3} = 2\sqrt{3}$ $\sqrt{24} = \sqrt{4} \cdot \sqrt{6} = 2\sqrt{6}$

$\sqrt{18} = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$ $\sqrt{27} = \sqrt{9} \cdot \sqrt{3} = 3\sqrt{3}$ $\sqrt{63} = \sqrt{9} \cdot \sqrt{7} = 3\sqrt{7}$

$\sqrt{32} = \sqrt{16} \cdot \sqrt{2} = 4\sqrt{2}$

then answer these...

$\sqrt{50} =$ $\sqrt{20} =$ $\sqrt{200} =$

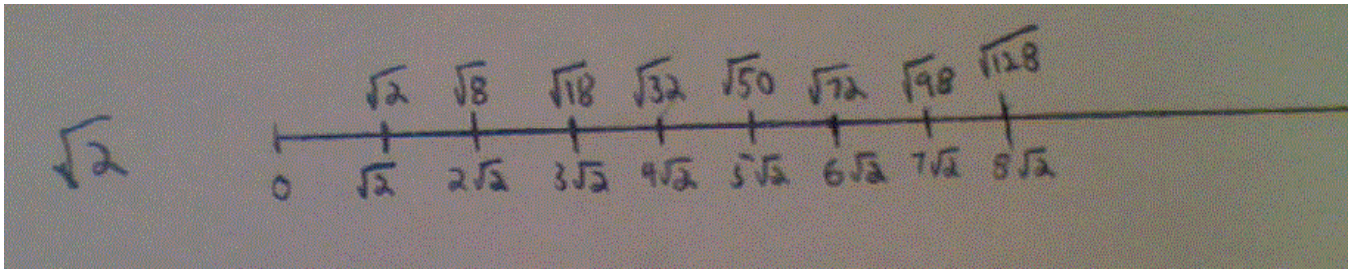
$\sqrt{72} =$ $\sqrt{45} =$ $\sqrt{300} =$

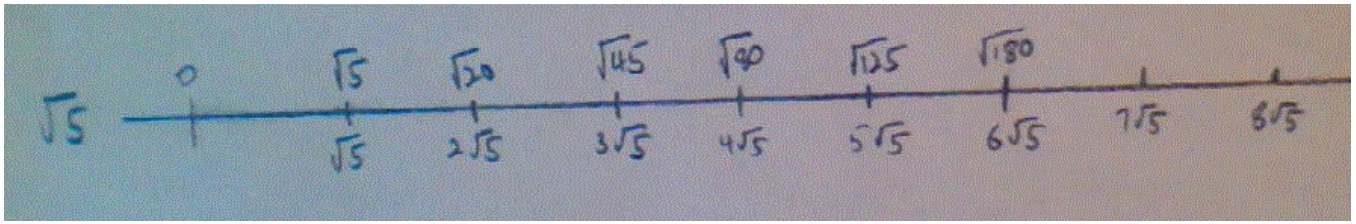
$\sqrt{98} =$ $\sqrt{500} =$

This is a great activity to allow students to practice the process of Reasoning. Visit the Reasoning Process section to explore more ways to incorporate Reasoning in your teaching.

AN SO2 - Radical Ruler

Another way to establish an equivalent relationship between certain mixed radicals and entire radicals is by using a Radical Ruler as explained by John Scammell on his blog. Developing the root 2 and root 5 number lines would be relatively simple to do and would help in establishing the equivalent relationship between entire & mixed radicals. This activity would also help students improve their number sense related to radicals.





AN SO2 - Technology - Quizlet Practice

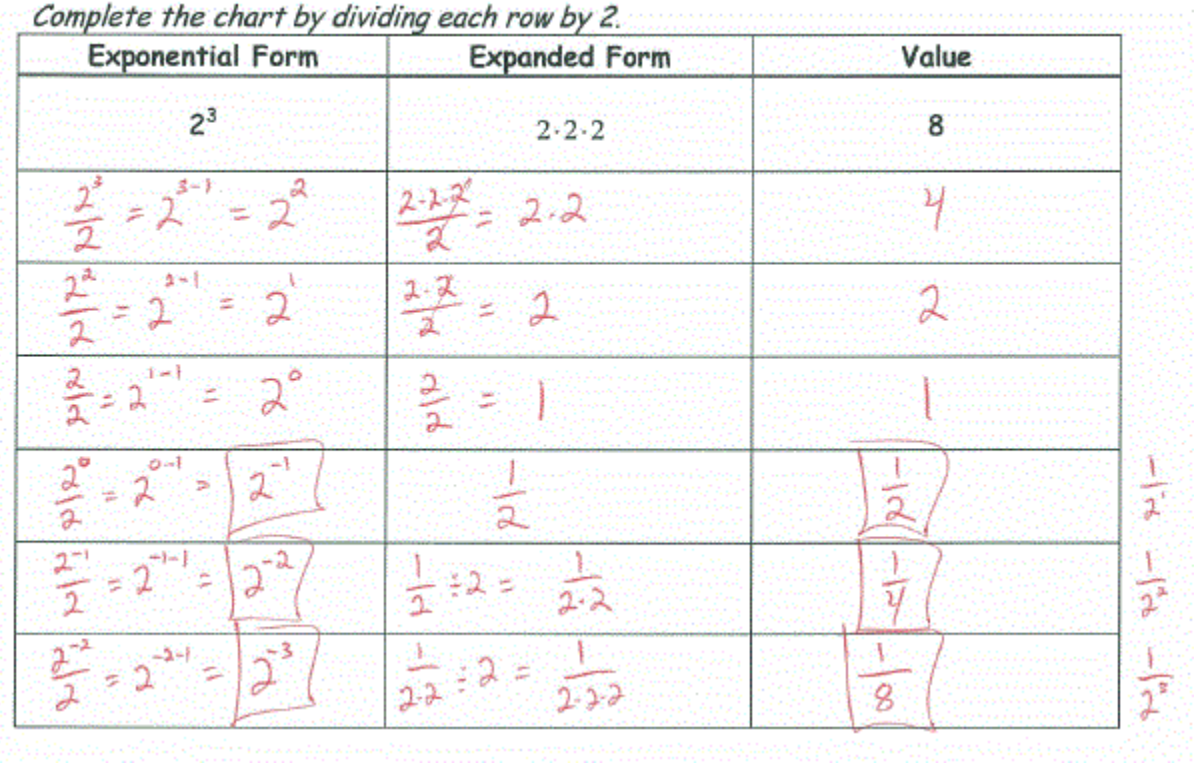
Quizlet is a useful online learning tool and is available for free. The following sets may be used by students to improve their number sense related to perfect squares, perfect cubes, square roots and cube roots.

- Perfect Squares & Square Roots Set
- Perfect Cubes & Cube Roots Set

Visit the Technology Process section to explore more ways to use technology to enhance teaching.

AN SO3 - Investigation - Negative Exponents (Download: InvestigationNegativeExponents.docx and KEY.pdf)

This investigation asks students to explore what happens when exponents become negative.
The first chart may be completed with the students and then they may complete the next chart with a base of 3 independently. Then students are expected to analyze patterns to complete the questions on the following page.



Complete the chart by dividing each row by 2.

Exponential Form	Expanded Form	Value
2^3	$2 \cdot 2 \cdot 2$	8
$\frac{2^3}{2} = 2^{3-1} = 2^2$	$\frac{2 \cdot 2 \cdot 2}{2} = 2 \cdot 2$	4
$\frac{2^2}{2} = 2^{2-1} = 2^1$	$\frac{2 \cdot 2}{2} = 2$	2
$\frac{2}{2} = 2^{1-1} = 2^0$	$\frac{2}{2} = 1$	1
$\frac{2^0}{2} = 2^{0-1} = 2^{-1}$	$\frac{1}{2}$	$\frac{1}{2}$ $\frac{1}{2^1}$
$\frac{2^{-1}}{2} = 2^{-1-1} = 2^{-2}$	$\frac{1}{2} \div 2 = \frac{1}{2 \cdot 2}$	$\frac{1}{4}$ $\frac{1}{2^2}$
$\frac{2^{-2}}{2} = 2^{-2-1} = 2^{-3}$	$\frac{1}{2 \cdot 2} \div 2 = \frac{1}{2 \cdot 2 \cdot 2}$	$\frac{1}{8}$ $\frac{1}{2^3}$

This is a great activity to allow students to practice the process of Reasoning. Visit the Reasoning Process section to explore more ways to incorporate Reasoning in your teaching.

AN SO2 - Partnered Practice - Radical SNAP

John Scammell describes an engaging activity he witnessed to practice conversion between mixed and entire radicals here.