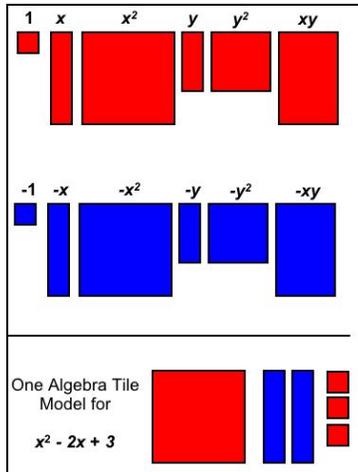


Algebra Tiles



What are Algebra Tiles?

Algebra tiles are rectangular shapes that provide area models of variables and integers. They usually consist of x sets and y sets. Different pieces are used to model 1 , x , x^2 , y , y^2 , and xy . Sets consist of two different colours to represent both positive and negative terms. Overhead versions are used for whole class learning opportunities. A clear plastic organizer prevents tiles from moving around.

How do Algebra Tiles help students?

Algebra tiles are used to build concrete area representations of abstract algebraic concepts. The concrete representations help students become comfortable with using symbols to represent algebraic concepts. Algebra tiles are typically used to explore integers, algebraic expressions, equations, factoring, and expanding. They can also be used to explore fractions and ratios.

How many are recommended?

Students usually work in pairs or small groups when using algebra tiles. Each pair of students needs an x set, a y set, and a plastic organizer. Students can use card stock to create algebra tile sets. Other representations can also be created using card stock, e.g., z sets. A transparent set of tiles is useful for overhead demonstrations by students and/or teachers. When students first use algebra tiles, allow for exploration time.

Sample Activities

- Determine the number of different ways that zero (0) can be represented using tiles from a set of 3 blue one-tiles and 2 red one-tiles.
- Use the one-tiles to model different integer values, e.g., a loss of \$4; 2 metres above sea level.
- Create models for integer operations, e.g., show that $(-4) + (+1) = -3$; show that $2(-3) = -6$
- Build an algebra tile model to show that $2x + 3 - 4x - 2 + 5x - 1 = 3x$
- Build an algebra tile model to show that $(2x + 3) + (-5x - 3) = -3x$
- Build an algebra tile representation of $2(3x + 1)$. Use the model to show that $2(3x + 1) = 6x + 2$.
- Make two different models of the ratio 3:2.
- Build algebra tile models for $(x + 1)^2$ and $x^2 + 1$. Use your models to explain why these expressions are not equivalent.
- Try to arrange two red x -tiles and three red one-tiles into one rectangular arrangement. (Note: This activity builds understanding of factoring.) Is it always possible to make a rectangular arrangement?
- Solve this problem: Jen used a set of x tiles to model $2x^2 - 3x + 4$. Can the same model be used to represent $2a^2 - 3a + 4$
- Use the red one-tiles to show all possible factors
- Build a tile train. What is the colour and shape of the 200th cube in the train?



Recommended Websites

http://matti.usu.edu/nlvm/nav/category_g_4_t_2.html Virtual Algebra Activities

<http://www.pbs.org/teachers/connect/resources/4450/preview/> Yo-yo Activity

<http://www.uen.org/Lessonplan/preview.cgi?LPid=6393> Evaluating Expressions using Algebra Tiles

<http://illuminations.nctm.org/swr/review.asp?SWR=227> Understanding Algebraic Factoring