

Tiling in a Frame: Multiplying Polynomials

Description: Students use Sketchpad algebra tiles to multiply polynomials. Using the polynomial factors as dimensions, they build rectangles out of tiles. The area of the completed rectangle represents the product.

Technology Strength: Students can easily drag algebra tiles from stacks to experiment with different arrangements. Dynamic tiles adjust to slider variables emphasizing the variable nature of the algebra tiles.

Objectives: Use an area model to understand the meaning of polynomial multiplication; learn how to multiply polynomials using algebra tiles; discover and apply patterns to multiply polynomials with multiplication tables.

Prerequisites: Familiarity with tiles as a representation of area and length; area of a rectangle; combining like terms

Suggested Grade Level: 7 to 9

Sketchpad Level: Beginning

Suggested Duration: 45 minutes. The Get Ready section of the student worksheet will take an additional 15 minutes if used as a warm-up.

Suggested Classroom Setting: Whole Class, Student Pairs. This activity, designed for use by student pairs, can be easily modified for whole-class use.

Preparation: Review the Activity Notes. Preview the student sketch. Work through the steps on the worksheet and make a copy of the worksheet for each student.

Materials: None

Student Worksheet(s): Tiling in a Frame

Student Sketch: Tiling in a Frame.gsp

Presentation Sketch: None

Vocabulary: Product, factor, area, dimension, frame

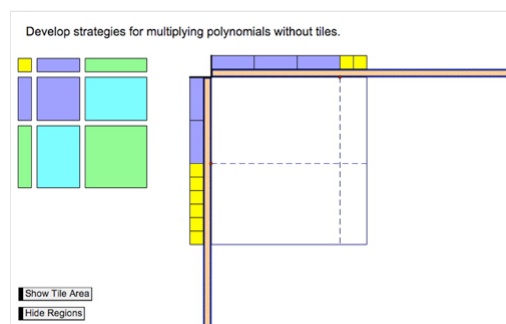
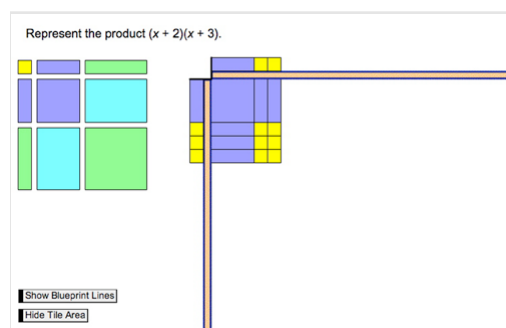
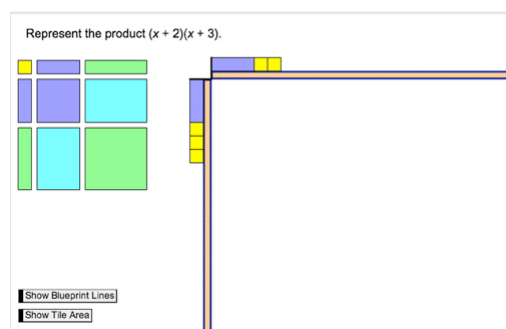
Sketchpad Version: GSP5

Using the Sketch:

The model includes stacks of Sketchpad algebra tiles on the left side and a frame in the center. Students drag tiles from the stacks and arrange them along the outside edges of the frame to represent two given polynomial factors, as shown in the first illustration.

Students then drag tiles into the frame to create a rectangle that matches the dimensions along the outside of the frame, as shown in the second illustration. The sum of the pieces inside the frame represents the polynomial product. Students express the arrangement as the multiplication equation $(length)(width) = area$.

In the Explore More, students use custom tools to build an arrangement out of dynamic algebra tiles. When they drag the sliders for x and y , the arrangement updates automatically to reflect the new values.



Sketch Tips:

Sketch Tips show skills needed in this activity, and the step at which the skill is first used.

Sketch Tip	Tip Sheet or Tip Video
Step 1: Change to a different page using page tabs	Moving Between Pages
Step 2: Select, deselect, and drag objects with the Arrow tool	Using the Arrow Tool
Step 15: Choose a custom tool from the Custom Tools menu	Using Custom Tools