



# YALE NATIONAL INITIATIVE

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Curriculum Units by Fellows of the National Initiative

2019 Volume V: Perimeter, Area, Volume, and All That: A Study of Measurement

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## **When Your Plan to Multiply Polynomials is FOILED**

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This unit has been devised to bridge the gap between arithmetic and basic numerical ideas, and the Algebra classroom. It intends to speak to the process of multiplying polynomials of various degrees, by using area models, and their schematic cousin, the box method, to elucidate the magnitudes involved when multiplying, first with base ten numbers, and then polynomials. By considering the distributive, extended distributive, commutative and associative properties of multiplication, students will make connections between the processes of multiplying polynomials and multiplying base ten numbers. These properties, and one of their notable consequences, the Law of Exponents (aka Product Rule), will allow scholars to justify their ability to multiply these algebraic terms in a variety of ways. Through a variety of activities students will explore the area model/box method way of multiplying polynomials, and participate in activities that will not only lessen their math anxiety, but enhance their growth mindsets and increase productivity in class. Scholars will be encouraged to cultivate their own ideas and allowed to show mastery in a variety of ways. This unit will act as an easily accessible resource or roadmap into some of the most complex algebraic ideas, and use basic elementary ideas to act as the GPS. Lastly, I hope that use of a geometric model to multiply polynomials will enable my scholars to continue to make associations in later algebraic studies.

(Developed for Algebra I, grade 8; recommended for Algebra I, grades 8-9, and Pre-Algebra, grades 7-8)

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