Mathematics 9
Unit 3: Introduction to Polynomials

Three Mini-Lessons to Prepare us for Working with Polynomials

Learning Targets:

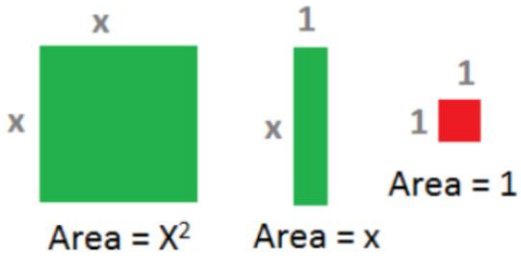
1. **Model polynomials using algebra tiles.**
2. **Gain proficiency in writing polynomials in descending degree.**
3. **Evaluate polynomials using given values for the variables involved.**

Modeling Polynomials with Algebra Tiles

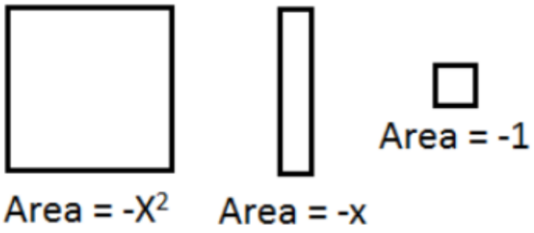
Algebra tiles are square and rectangular shaped objects whose **AREAS** are used to represent different algebraic expressions.

The ***shape***, ***size***, and ***colour*** of the objects all mean something.

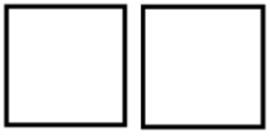
Coloured tiles represent positive values:

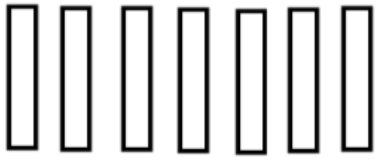


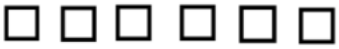
White tiles represent negative values:



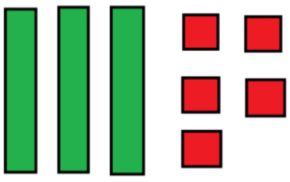
Grouping together algebra tiles of the ***same shape and size*** creates monomials whose ***coefficients*** represent "***how many*** of them are there". The coefficient will be negative if the shapes are white:







Grouping together algebra tiles of ***different shapes and sizes*** creates polynomials. The ***coefficients on each term*** represent "***how many*** of that shape and size are there". Colour (or lack of colour) tells us whether we have positives or negatives:



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Examples: **What polynomials are represented by the tiles?**

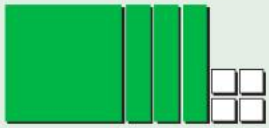
Examples: **Model each polynomial with algebra tiles:**

$2x^2 + x$ $-x + 4$ $x^2 - 2x - 1$

Show You Know

a) Model $-x^2 + 4x - 3$.

b) What expression is shown by the algebra tile model?



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Writing Polynomials in Descending Degree

When a polynomial is written in ***descending degree***, it is easier to find the overall degree of the polynomial because it will be the exponent on the first term (called the "*leading term*")

Example:
Re-write the following in descending degree. What is the type and degree of the polynomial?

$\boldsymbol{3x + 5 - 4x^2}$

Practice: Re-write in descending degree, classify and state the degree.

a) $4x + 7x^2$

b) $5x - 3x^3$

c) $-1 + 5x - 7x^2$

Evaluating Algebraic Expressions

Substitute and evaluate
- replace the variables with the numbers given
- use brackets around the substituted values
- use BEDMAS to evaluate the resulting expression

Evaluate **2x + 3y** if **x = 10** and **y = 3**

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Evaluate -**2p – 5q** if **p = 1** and **q = 4**

Evaluate **3(m + 2n) + 4** if **m = -2** and **n = 6**

Evaluate **xy + 3x - y** if **x = 2** and **y = 4**

Check your understanding:
Modeling with Algebra Tiles: pg. 179 – 180, #11 – 14,
Naming, Degree, and Descending Degree: Worksheet #1 – 30
Evaluating Algebraic Expressions: Worksheet #1 - 12