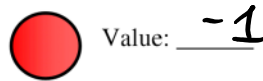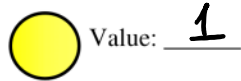# 1 Modelling Polynomials

January 1, 2020     9:22 PM
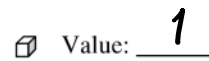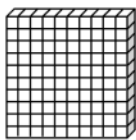
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### 5.1 – Modelling Polynomials
**Focus:** Learn vocabulary associated with polynomials and represent and identify polynomials using models

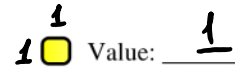**Recall:** Last year when we added and subtracted integers, we used integer chips.

Value: $1$

Value: $-1$

In Arithmetic we used 10 blocks to model whole numbers.

Value: $100$         Value: $10$         Value: $1$

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To **model Polynomials** we will use **algebra tiles**.

**Yellow** represents **positive** tiles.

$3$
$2$ → $= A = 2 \cdot 3$
$= 6$

$x$
$x$ | $x \cdot x = x^2$     Value: $x^2$

$1$
$x$ |     Value: $x$

$1$
$1$ ☐     Value: $1$
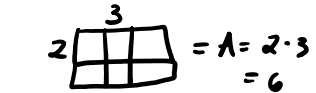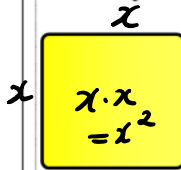
**Red** represents **negative** tiles.

Value: $-x^2$

Value: $-x$

Value: $-1$

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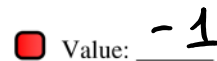
**Ex. 1:** The following tiles represent what expression?

$2x^2 \qquad -4x \qquad +6$

1
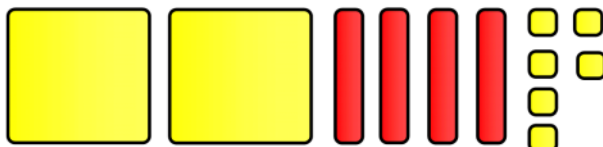
**Do the 'Investigate'**

Use algebra tiles.

➤ Model each expression. Sketch the tiles.
How do you know which tiles to use?
How do you know how many of each tile
to use?

- $x^2 + x - 3$
- $-2x^2 - 3$
- $2x^2 + 3x$
- $-2x^2 - 3x + 1$
- $-3x + 3$

➤ Write your own expression.
Have your partner model it with tiles.
Model your partner's expression
with tiles.

**We must be able to identify vocabulary associated with Polynomials.**

Let us examine the expression, $2x^2 - 4x + 12$.

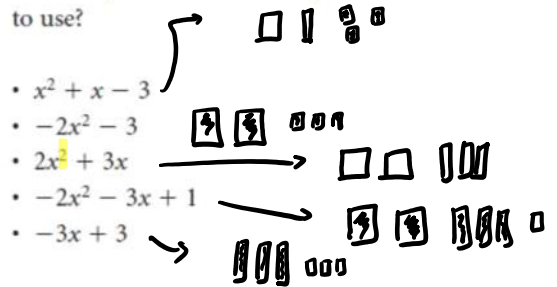1. What is a <mark>variable?</mark>

$x$
(an unknown quantity)

2. What is a <mark>Coefficient?</mark>

number that multiplies the variable
Ex: in $2x^2$ coeffient    $-4$ in $-4x$

3. What is a <mark>Constant?</mark>

number that doesn't change
(with an $x$).
Ex: 12

2

degree
$2x^{\textcircled{2}} - 4x^1 + 12$

4. What are <mark>terms</mark>?

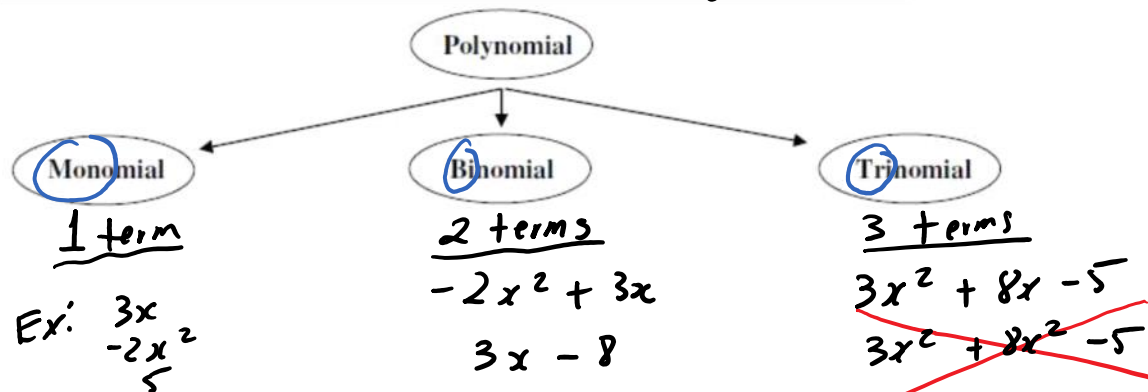Ex: $2x^2$, $-4x$, 12

4. What are terms?

Ex: $2x^2, -4x, 12$

5. What is a Polynomial?

sum of 1 or more terms
Ex.

6. What is the degree of the polynomial?    highest exponent

| A polynomial's terms are usually written in order of _decreasing_ degree. |

Polynomial

Monomial               Binomial               Trinomial

1 term                 2 terms                3 terms
                       $-2x^2 + 3x$           $3x^2 + 8x - 5$

Ex: $3x$               $3x - 8$               $\cancel{3x^2 + 8x^2 - 5}$
$-2x^2$
$5$

| Defn: | Characteristics/Uses. |
|-------|----------------------|
| Sum of 1 or more terms | — shorthand in math |

Polynomial

| Examples | Non-Examples |
|----------|-------------|
| $3x^2 - x + 8$ | $\dfrac{5}{x}$ ← can't divide by $x$   $x^{-1}$ ← no neg. exponent |
| $2x + 6$ | $x^{\frac{1}{2}} = \sqrt{x}$ |
| $3x^2$ | ↖ no fraction exp! |

**Ex. 3:** Model the following polynomials using algebra tiles. State the degree and classify the polynomial (monomial, binomial, trinomial).

a) $4x^1 + 3$

degree: _____1_____ .

classification: ____binmial____

b) $-5c^1$

$8^o = 1$

degree: _____1_____

classification: ____monmial____

c) $5a - 4a^2 - 3$

$-4a^2 + 5a - 3$

degree: __2__

classification: ____trinmial____

**Assignment:**

Sec 5.1, p. 214:          4, 5abc,

⭐⭐  9 (make a chart: polynomial, coefficients, variable, degree, constant),  10, 11ace (sketch), 12, 13

⭐⭐⭐  15, 16, 18