Section 6.1: Fractions

- **Fraction:** A fraction is a number that can be represented by an ordered pair of whole numbers a and b as

$$\frac{a}{b} \quad \text{or} \quad a/b \quad \text{where } b \neq 0.$$

- **Equivalent Fractions:** Let $\frac{a}{b}$ be any fraction and n a nonzero whole number. Then

$$\frac{a}{b} = \frac{an}{bn} = \frac{na}{nb}.$$

NOTE: When $\frac{an}{bn}$ is replaced with $\frac{a}{b}$ where $n \neq 1$ we say $\frac{an}{bn}$ has been **simplified**. A fraction is written in **simplest form** (or **lowest terms**) when its numerator and denominator have no common factors.

- **Fraction Equality:** Let $\frac{a}{b}$ and $\frac{c}{d}$ be any fractions. Then

$$\frac{a}{b} = \frac{c}{d} \quad \text{if and only if} \quad ad = bc.$$

- **Less than for fractions:** Let $\frac{a}{c}$ and $\frac{b}{c}$ be any fractions. Then

$$\frac{a}{c} < \frac{b}{c} \quad \text{if and only if} \quad a < b.$$

Example 1: Use pattern blocks to solve the following problems.

(a) The trapezoid is what fractional part of the hexagon?

(b) The blue rhombus is what fractional part of the hexagon?

(c) The triangle is what fractional part of the hexagon?

(d) The triangle is what fractional part of the blue rhombus?

(e) The triangle is what fractional part of the trapezoid?

Example 2: Use two trapezoids and one blue rhombus to construct a shape similar to the one shown below.

(a) Given that the shape = 1, what pattern block(s) would you use to represent each of the following fractions?

    (i) $\dfrac{1}{4}$

    (ii) $\dfrac{1}{2}$

    (iii) $\dfrac{1}{8}$

(b) Given that the shape = 1, what fraction is represented by the yellow hexagon?