5.1 The Language of Mathematics

Explore the Language of Algebra

The following notes provide guidelines to help you adapt the Explore the Language of Algebra section from *MathLinks 9*.

- Use the Warm Up to activate and assess prior knowledge. Encourage students to use appropriate vocabulary as they work through the chapter.
- Review the meaning of *term* and *polynomial*. You may wish to post these words with examples.
- For #3, provide students with **BLM 5–2 Section 5.1 Explore the Language of Algebra**. Have students work in pairs to create other examples in the table. Have each group share their examples with the class.

Examples

Working Example 1:

- Review the meaning of *exponents*.
- Encourage students to draw a box around each term in an expression. Each box must contain the operation sign that precedes the term. This sign becomes the sign of the term. This will help students identify the number of terms, the degree of individual terms, and the degree of polynomials. Later, students will use this method to help them identify like terms when simplifying polynomials.
- Remind students that black tiles are not always positive and white tiles are not always negative. Encourage them to always read the legend.

Working Example 2:

- Explain that constants have a degree of 0.
- Remind students that the sign before the constant tells whether it is positive or negative.

Working Example 3:

- If algebra tiles are not available, use **Master 11 Algebra Tiles (Positive Tiles)** and **Master 12 Algebra Tiles (Negative Tiles)**. Provide sets of tiles to individuals or pairs of students. Review the following:
  - Define the unit tile. Have students create various positive and negative integer values. Include zero to check that students understand zero pairs.
  - Compare the area of the x-tile to the 1-tile so students understand that the area of the x-tile is 1 by x.
  - Model three x-tiles and ask for an expression to describe the display. Example: $x + x + x$ or $3x$. Reinforce the meaning of the expression when a coefficient and a variable are written together. Be sure to include negative terms.
  - Discuss the area of the x^2-tile. Have students model various terms involving x^2. Expand to include sums and differences of various terms.

Communicate the Ideas, Practise, and Apply

- Encourage students to continue drawing boxes or circles around like terms until they can identify terms easily without the visual. Alternatively, have students represent each term pictorially to see the terms and their degree.
- For #12, remind students that part c) refers to the general formula for the perimeter of a rectangle using the conventional letters for length and width. Part d) asks about the expressions used in Ricardo's rectangle.
- Provide students who need additional practice with **BLM 5–3 Section 5.1 Extra Practice**.

Common Errors

- Some students may multiply a value by the exponent rather than apply the meaning of exponent.

R$_x$ Teach students to write a "think box" in the margin to encourage them to think about what the expression means. For example, "THINK: 3^2 means 3×3."