3.2 Exponent Laws

Explore Operations on Powers

The following notes provide guidelines to help you adapt the Explore Operations on Powers section from *MathLinks 9*.

- Read the introduction aloud and lead a short discussion while drawing a rectangle on the board.
- Use **Master 9 0.5 Centimetre Grid Paper** and have students create rectangles using powers of 2 for the dimensions. Post powers of 2 for students to use as a visual to calculate the area. For example, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, and so on.
- Ensure that students understand $64 = 2^6$ before they attempt to find a pattern.
- Post the following chart:

Dimensions	Area 1 = 64 m^2	Area 2 = 64 m^2	Area 3 = 64 m^2
Whole Dimensions	2×32	$4 \times$ _____	$8 \times$ _____
Dimensions as a Power	$2^1 \times 2^5$	$2^{\square} \times 2^{\square}$	$2^{\square} \times 2^{\square}$

- Have students do the Reflect and Check in pairs to help support students who struggle with creativity in writing and expressing problems.

Examples

- Review the meaning of *product*, *quotient*, *base*, *exponent*, and *power*.
- Remind students of the importance of brackets, especially when working with negative numbers and fractions.
- Review how to use the exponent buttons on a calculator. Remind students to enter brackets as shown in a power.
- Post each exponent law as you teach it.

Working Example 3:

- Discuss how to use square brackets.

Communicate the Ideas, Practise, and Apply

- Give students **BLM 3–3 Exponent Laws** to use as a reference, especially for homework.
- Provide students who need additional practice using the exponent laws with **BLM 3–4 Section 3.2 Extra Practice**.

Common Errors

- Some students may enter key sequences incorrectly in their calculator.

R_x Remind students that their calculator may use the negative key either before or after the number. Encourage students to always apply the bracket key when it is used in a question. Have them practise easy examples with and without a calculator so they see the correct way to use their calculator. Have students record the key sequences for their calculator to use as a reference.