3.1 Using Exponents to Describe Numbers

Explore Repeated Multiplication

The following notes provide guidelines to help you adapt the Explore Repeated Multiplication section from *MathLinks 9*.

- Use the Warm Up as a review of repeated multiplication, the integer sign rule for multiplication, and finding squares.
- Read the scenario and discuss the situation.
- Complete #1 as a teacher-led activity. Draw a table on the board and complete it with students.

Number of Pieces of Cake	Height After Eating Cake
1	$1 \times 3 =$ _____
2	$3 \times 3 =$ _____
3	$3 \times 3 \times 3 =$ _____
4	
5	

- You may wish to do the entire exercise as a teacher-led activity.

Examples

Working Example 3:

- Do several examples of powers with negative bases. Emphasize that the location of the brackets tells you whether the negative sign is included in the power. Some examples to review are

$(-6)^2 = (-6) \times (-6)$ $= 36$

$-6^2 = -(6 \times 6)$ $= -36$

$-(-6)^2 = -[(-6) \times (-6)]$ $= -[36]$ $= -36$

- Discuss what happens to a negative base with an even exponent versus an odd exponent. Show the repeated multiplication to develop this concept. For example,

$(-3)^1 = -3$
$(-3)^2 = (-3) \times (-3) = 9$
$(-3)^3 = (-3) \times (-3) \times (-3) = -27$
$(-3)^4 = (-3) \times (-3) \times (-3) \times (-3) = 81$

Communicate the Ideas, Practise, and Apply

- Students may benefit from doing #1 and #2 in pairs. Encourage them to discuss the solutions.
- Provide students who need additional practice with **BLM 3–2 Section 3.1 Extra Practice**.

Math Link

- Encourage students to start thinking about what shapes they will use to create their mobile.

Common Errors

- Some students may have difficulty determining how to use the negative sign in questions such as $(-3)^2$ versus -3^2.

R_x Remind students that when the exponent is outside the brackets, everything inside the brackets is the base. When there are no brackets, only the number beside the exponent is the base. The negative sign stands alone, so it becomes –1.