Lesson 5: Exponents

Problem Set

1. Complete the table by filling in the blank cells. Use a calculator when needed.

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| **Exponential Form** | **Expanded Form** | **Standard Form** |
| $$3^{5}$$ |  |  |
|  | $$4×4×4$$ |  |
| $$(1.9)^{2}$$ |  |  |
| $$\left(\frac{1}{2}\right)^{5}$$ |  |  |

1. Why do whole numbers raised to an exponent get greater, while fractions raised to an exponent get smaller?
2. The powers of $2$ that are in the range $2$ through $1,000$ are $2$, $4$,$ 8$,$ 16$,$ 32$,$ 64$,$ 128$,$ 256$, and $512$. Find all the powers of $3$ that are in the range $3$ through $1,000$.
3. Find all the powers of $4$ in the range $4$ through $1,000$.
4. Write an equivalent expression for $n×a$ using only addition.
5. Write an equivalent expression for $w^{b}$ using only multiplication.
	1. Explain what $w $is in this new expression.
	2. Explain what $b$ is in this new expression.
6. What is the advantage of using exponential notation?
7. What is the difference between $4x$ and $x^{4}$? Evaluate both of these expressions when$ x=2$.