Vocabulary Review Sheet

Lesson – Exponents and Fairness in Education

How to Use

- Review each vocabulary word before your quiz.
- Look at how **math examples**, **real-life examples**, and **fairness examples** connect together.
- Notice how exponents describe *how fast something grows* — and how small advantages can lead to *big differences over time*.
- Keep this sheet in your *Equity in Numbers Student Journal* to prepare for your quiz or reflection questions.

Exponent

- **Definition:** A small number written above another number that tells how many times to multiply it by itself.
- **Math Examples:**
  - $2^3 = 2 \times 2 \times 2 = 8$
  - $3^2 = 3 \times 3 = 9$
  - $10^2 = 10 \times 10 = 100$
- **Real-Life Example:** If a school doubles its computers each year, the total grows by an exponent of 2.
- **Fairness Example:** Exponents show how small advantages (like funding or technology) can multiply quickly, creating bigger gaps between schools.

Base

- **Definition:** The main number that is multiplied by itself in an exponent expression.
- **Math Examples:**
  - In 2^3, **2** is the base.

  - In 10^2, **10** is the base.
  - In 5^4, **5** is the base.
- **Real-Life Example:** The base represents what each school starts with — like 10 books or 20 laptops.
- **Fairness Example:** When schools start with different bases, even fair growth rates can lead to unfair results.

Power

- **Definition:** The result of multiplying the base number by itself according to the exponent.
- **Math Examples:**
  - $2^3 = 8 \rightarrow$ power of 8
  - $3^3 = 27 \rightarrow$ power of 27
  - $4^2 = 16 \rightarrow$ power of 16
- **Real-Life Example:** A power shows total growth — like the number of resources a school ends up with after several years.
- **Fairness Example:** Powers help compare which schools experience faster growth and which remain behind.

Growth

- **Definition:** An increase in quantity or size over time.
- **Math Examples:**
  - $10 \times 2^3 = 80$ (doubles yearly)
  - $10 \times 3^3 = 270$ (triples yearly)
  - $10 \times 1^3 = 10$ (no growth)
- **Real-Life Example:** A school that doubles its resources each year experiences exponential growth.

- **Fairness Example:** Growth should be steady and fair — all schools should rise together, not apart.

Linear Growth

- **Definition:** A pattern of increase by the same amount each time.
- **Math Examples:**
  - 10 + 10 + 10 = 40
  - 5 + 5 + 5 = 20
  - 3 + 3 + 3 = 9
- **Real-Life Example:** Adding the same number of books each year shows linear growth.
- **Fairness Example:** Linear growth is predictable and fair — progress happens step by step for everyone.

Exponential Growth

- **Definition:** A pattern of increase where each new total is multiplied by the same factor.
- **Math Examples:**
  - $10 \times 2^3 = 80$
  - $10 \times 3^3 = 270$
  - $5 \times 2^4 = 80$
- **Real-Life Example:** A school that doubles its funding each year experiences exponential growth.
- **Fairness Example:** Exponential growth can create inequality — when one school's resources multiply faster, the gap widens.

Factor

- **Definition:** A number that is multiplied in an equation.

- **Math Examples:**
  - $2 \times 3 = 6$ → both 2 and 3 are factors.
  - 10×2^3 → 2 is the growth factor.
  - 5×3^2 → 3 is the growth factor.
- **Real-Life Example:** The growth factor can represent the rate of increase in funding or materials.
- **Fairness Example:** Schools with higher growth factors (more resources) can advance much faster — showing the need for equitable support.

Gap

- **Definition:** The difference between two numbers or levels of growth.
- **Math Examples:**
  - $80 - 40 = 40$
  - $270 - 80 = 190$
  - $100 - 50 = 50$
- **Real-Life Example:** The gap between schools shows how many more resources one school has compared to another.
- **Fairness Example:** Exponential growth can cause gaps to expand quickly — fairness means closing those gaps over time.

Fairness

- **Definition:** Treating everyone equitably by giving extra support to those who start with less.
- **Math Examples:**
  - School A: $10 \times 1^3 = 10$
  - School B: $10 \times 2^3 = 80$ → support needed = 70 books
  - Adding 70 helps balance both schools.

- **Real-Life Example:** If one school grows faster, fairness means helping others catch up.
- **Fairness Example:** Fairness in education means all students should have equal chances to grow — not just those who start ahead.

Equation

- **Definition:** A mathematical statement showing that two sides are equal, often used to model real-life relationships.
- **Math Examples:**
  - $10 \times 2^3 = 80$
  - $10 + 10 + 10 + 10 = 40$
  - $2^3 = 8$
- **Real-Life Example:** Equations model how school resources grow over time.
- **Fairness Example:** Using equations helps us calculate exactly where inequality begins and how to fix it.

Summary of Math + Fairness Connections

Concept	Math Focus	Fairness Connection
Exponent	Shows repeated multiplication	Reveals how gaps can grow faster
Base	Starting point	Represents starting advantage or disadvantage
Growth	Linear vs exponential change	Shows how opportunity gaps widen
Gap	Difference between results	Helps identify inequity
Fairness	Balancing outcomes	Ensures everyone grows together