

Vocabulary Review Sheet

Lesson – Surface Area and Housing Inequities

How to Use

- Review each vocabulary word before your quiz.
- Study the **math**, **real-life**, and **fairness** examples to understand how geometry helps uncover housing inequalities.
- Keep this sheet in your *Equity in Numbers Student Journal* to refer back when exploring real-world community design.
- Remember: *Math isn't just about numbers—it's about fairness, comfort, and dignity for everyone.*

Surface Area

- **Definition:** The total area of all the outer surfaces of a 3D shape.
- **Math Examples:**
 - ($SA = 2lw + 2lh + 2wh$)
 - For a building $100 \text{ ft} \times 40 \text{ ft} \times 60 \text{ ft} \rightarrow (SA = 2(100 \times 40) + 2(100 \times 60) + 2(40 \times 60) = 24,800 , \text{ft}^2)$
- **Real-Life Example:** Finding the amount of wall and roof space on an apartment building.
- **Fairness Example:** Larger surface areas often mean more windows, light, and air—important for health and comfort in homes.

Rectangular Prism

- **Definition:** A 3D solid with six rectangular faces, such as a building or box.
- **Math Examples:**
 - Dimensions: ($l = 80 , \text{ft} , w = 30 , \text{ft} , h = 50 , \text{ft}$)
 - ($SA = 2(80 \times 30) + 2(80 \times 50) + 2(30 \times 50) = 15,800 , \text{ft}^2$)

- **Real-Life Example:** Representing an apartment tower as a rectangular prism to calculate materials or design features.
- **Fairness Example:** Comparing prisms helps visualize how low-income housing may have smaller, tighter spaces than higher-income housing.

Length, Width, and Height

- **Definition:** The three measurements used to calculate surface area or volume of rectangular solids.
- **Math Examples:**
 - $(l = 120, \text{ ft}, , w = 50, \text{ ft}, , h = 40, \text{ ft}) \rightarrow$ substitute into formula for (SA) .
- **Real-Life Example:** Measuring building dimensions for construction or renovation plans.
- **Fairness Example:** Variations in height or width can show why some apartments feel cramped while others are open and airy.

Formula

- **Definition:** A mathematical equation used to solve a specific type of problem.
- **Math Examples:**
 - $(SA = 2lw + 2lh + 2wh)$ (surface area)
 - $(A = l \times w)$ (area of one face)
- **Real-Life Example:** Builders and architects use formulas to calculate how much paint, glass, or siding they'll need.
- **Fairness Example:** Applying the same formula across neighborhoods ensures accurate, data-based comparisons in housing equity studies.

Square Units (ft²)

- **Definition:** The units used to measure surface area; each square unit represents a 1 ft × 1 ft surface.

- **Math Examples:**
 - (24,800 , ft²) = the total area of all outer building surfaces.
- **Real-Life Example:** Estimating how much exterior space needs to be painted or insulated.
- **Fairness Example:** Using consistent square units ensures fair comparisons of building sizes between different communities.

Compare

- **Definition:** To examine two or more quantities to identify similarities or differences.
- **Math Examples:**
 - Low-income tower: (15,800 , ft²); High-income condo: (28,000 , ft²).
- **Real-Life Example:** Comparing surface area of different apartment buildings.
- **Fairness Example:** Comparing buildings helps reveal inequities in access to space, sunlight, and ventilation across neighborhoods.

Equity

- **Definition:** Fair access to opportunities, comfort, and well-being for all people.
- **Math Examples:**
 - Using geometry to compare building designs for fairness.
- **Real-Life Example:** Ensuring that both low- and high-income neighborhoods have housing that promotes safety and comfort.
- **Fairness Example:** Math provides clear data for city planners and communities to advocate for equitable living conditions.

Design

- **Definition:** The plan or structure that shapes how something looks and functions.
- **Math Examples:**

- Using dimensions to draw or build proportional housing models.
- **Real-Life Example:** Architects use surface area calculations to design windows, doors, and outer walls.
- **Fairness Example:** Inclusive design ensures housing meets the needs of all families—balancing aesthetics, comfort, and sustainability.

Housing Inequity

- **Definition:** Unequal access to safe, comfortable, and healthy living spaces across communities.
- **Math Examples:**
 - Comparing total surface area per family to identify overcrowded conditions.
- **Real-Life Example:** Some communities have tall, compact apartments with less light, while others have spacious, sunlit condos.
- **Fairness Example:** Surface area helps quantify inequity—turning abstract fairness issues into measurable, fixable data.

Comfort

- **Definition:** The quality of having adequate space, light, and air for healthy living.
- **Math Examples:**
 - Larger surface area → more windows → more ventilation.
- **Real-Life Example:** Apartments with higher surface areas per unit allow better airflow and natural light.
- **Fairness Example:** Math highlights how physical comfort can depend on housing design and resource allocation.

Summary of Math + Fairness Connections

Concept	Math Focus	Fairness Connection
Surface Area	Measures all outer surfaces	Shows living space, light, and air differences
Rectangular Prism & Formula	Models building design	Reveals inequities in building comfort
Compare & Equity	Uses data to analyze fairness	Promotes design justice and housing reform
Design & Comfort	Connects geometry to experience	Supports livable, healthy environments for all