

Standards for Area and Perimeter

3.MD.5 - Recognize area as an attribute of plane figures and understand concepts of area measurement.

A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

3.MD.6 - Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7 - Relate area to the operations of multiplication and addition.

- Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
- Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8 - Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

You will then need to present a visual of the backyard with its dimensions, a price, and an explanation of how it meets their needs. Your explanation must be written in complete sentences and include appropriate math vocabulary.

Vocabulary		
area	perimeter	plane figure
square unit	tiling	overlap
square cm, square m	side length	decomposing
square in, square ft	nonstandard units	attribute
linear	polygon	rectilinear figure
dimensions		

Your Task:

You are a contractor who has three possible clients. Each client wants to build a fence to surround their entire backyard, but they all want to use their yard for different activities.

All three of the clients have chosen fencing that costs \$7 per linear foot. They also all have a budget of \$1,050.

Based on the needs of the client you choose, what is the best yard you can create that stays within their budget?

The Clients:

Client 1: Has a very active dog who needs to spend time each day chasing a ball that is thrown long distances.

Client 2: They think that an "L" shaped yard would best fit their needs. They have a pool that they would like to be placed on one side of the "L" shaped yard. The other side needs to be utilized as a patio and barbeque area.

Client 3: This client has a large greenhouse that needs to fit in the back of her yard. The greenhouse building is 20 feet long and 12 feet wide. She would like it placed in one of the corners to save room for a trampoline that she just bought for her three young children!

Where do we go from here?

- Students share their yards with other students to compare and discuss.
- Class discussion about how the perimeters are the same but the areas are different.
- Why are the areas different? When are they bigger or smaller? Why?
- Students will write a journal entry describing what they notice about the relationship between area and perimeter.