

THE GEOMETRY OF HOUSING

Overview:

This activity allows learners to utilize geometry to determine the area inside a typical hut in Africa.

What You Need:

- Background skills that learners need in advance or to be taught concurrently with the unit.
 1. How to find:
 - Area of a circle
 - Area of a rectangle
 - Area of a square
 - Perimeters of rectangles, circles, and squares
- Formulas:
 1. Area of a rectangle = length x width
 2. Area of a circle = π x radius squared (πr^2)
 3. Perimeter of a circle = diameter (or 2 x radius) x π ($2\pi r$)
 4. Volume of a rectangular prism = length x width x height (lwh)
 5. Volume of a cylinder = the area of the circle x height ($\pi r^2 h$)

Teaching Strategy:

- Provide learners with information about traditional African housing. Houses in many parts of rural Africa have a round or rectangular frame filled in with a mixture of mud and water (a method of construction called wattle and daub). The roofs are made from thatch and are conically shaped.



- Tell learners they are going to figure out which type of hut has more floor space: rectangular or circular. Learners will also determine which shape of house requires more building materials.

What to Do:

- Rectangular Hut
 1. Have learners calculate how many square feet of floor space are in a 9' x 12' rectangular hut.
 2. Next, learners should calculate the amount of matting they would need to build the walls of this hut. (Find the area of each of the four sides and add together.)
- Circular Hut
 1. Have the learners find the area in square feet of the floor of a circular hut.
 2. Next, have them find the amount of matting they would need to make the wall of a circular hut (perimeter x height).
- Based on their discoveries, have learners decide which kind of hut they would prefer. Learners should explain their reasons verbally or in writing using supporting evidence.

Extensions:

- Have learners try to build a hut in the classroom.
- Have learners find out how many square feet of space are in their houses and compare it to the space in an African house.
- Have learners find the volume of the circular and rectangular huts.

