

LAND AREAS

Subject

Mathematics

Prepared By

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Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Measurement of area of land

Objectives

Students should be able to;

1. Define basic terms
2. Convert meter to hectare

Activity Starter/Instruction

1. Area is the measurement of the surface of a space or piece of land, and to calculate it you have to multiply two of the space's sides, like the length and width of a rectangular field. The result is called squared distance because squares are two-dimensional - just like area!
2. The hectare is a standard unit for measuring an area. A hectare is equal to 100 acres, and one acre is defined as 100 square meters.
3. The first people to measure area were medieval farmers, who created the acre as a way to estimate the size of their fields.
4. The acre and hectare are two units of area. In fact, the word acre comes from the Latin word for field (ager)!
5. One acre was defined as an area of land that is 22 yards (approximately 66 feet or 20 meters) by 220 yards (approximately 660 feet or 200 meters).

Teacher Guide

Day 1/ Lesson 1: 20mins

1. These are the most common measurements of area (from smallest to largest):
 - Square Millimeter
 - Square Centimeter
 - Square Meter
 - Hectare
 - Square Kilometer
2. A square millimeter is millimeters \times millimeters, written as mm^2 . A millimeter is one-thousandth of a meter ($1/1000$ meter), so a square millimeter is $1/1000 \times 1/1000 = 1/1000000$ of a square meter. A square millimeter is one-millionth of a square meter.
3. A square centimeter is centimeter \times centimeter, written as cm^2 . A centimeter is one-hundredth of a meter ($1/100$ meter), so a cm^2 is also: $1/100 \times 1/100 = 1/10000$ of a square meter. A cm^2 is one-ten-thousandth of a square meter.
4. A hectare (ha) is an area equal to a square that is 100 meters on each side.
5. So, a hectare has $100\text{m} \times 100\text{m} = 10,000 \text{ m}^2$ (square meters)
6. Hectares are commonly used to measure land

Materials Required

- White board
- Marker
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Additional Resources

- <https://www.metric-conversions.org/area/square-meters-to-hectares.htm>
- <https://www.convert-me.com/en/convert/area/hectare.html?u=hectare&v=1>
- <https://www.inchcalculator.com/convert/area-to-hectares/>
- <https://www.thecalculatorsite.com/conversions/area/meters-to-hectares.php>
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. A hectare is a metric unit for measuring area, with one hectare equaling 2.471 acres or 10,000 meters.
2. For perspective, an American football field, including end zones, measures 0.535 hectares.

<p>3. Here's how to calculate hectares from non-metric units in three steps.</p> <p>4. Step 1: Take note of the given quantity, number and unit, and use units to solve problems first.</p> <p>5. Find the equivalents and write an identity statement. For example: 1 hectare = 2.471 acres or 107,637 square feet; 1 acre = 43,500 square feet or 4,840 square yards; 1 yard = 3 feet; 1 square yard = 9 square feet.</p> <p>6. Step 2: Divide the number of acres by 2.471 to convert acreage to hectares. For example, let's say you want to convert 320 acres into hectares. Knowing that 1 hectare = 2.471 acres, you'd divide 320 by 2.471 (320/2.471) to get the answer, 129.5 hectares.</p> <p>7. Step 3: Convert square yards into acres first and then calculate how many hectares there are if square yards is the only unit of area</p>	<p>6. These dimensions were known in medieval times as a 'chain' and a 'furlong,' respectively.</p> <p>7. This choice made sense to people of the time because it was exactly the amount of land that could be tilled by one person and one ox in a single day.</p> <p>8. During the middle Ages, defining area in terms of a long, narrow unit made a lot of sense.</p> <p>9. Acres were used commonly until the late 1700s, when the standard unit of area was updated to be a square 100 meters, or one acre.</p>	<p>7. A square kilometer is written as km². A kilometer is a thousand meters, so a square kilometer is:: 1,000m × 1,000 m = 1,000,000 m². A square kilometer I One-million square meters.</p> <p>8. A hectare is about: two and a half acres, 2.471 acres (to 3 decimal places), 100,000 square feet, and more precisely 107,639 square feet.</p> <p>Guided Practice</p> <p>Day 3/ Lesson 3: 20mins</p> <p>1. Let's take a closer look at the conversion formula so that you can do these conversions yourself with a calculator or with an old-fashioned pencil and paper.</p> <p>2. The formula to convert from m² to hectares is: hectares = m² ÷ 10,000</p> <p>3. Next, let's look at an example showing the work and calculations that are involved in converting from square meters to hectares (m² to ha).</p> <p>4. Convert 50,000 square meters to hectares m² ÷ 10,000 = hectares</p> <p>5. 50,000 m² ÷ 10,000 = 5 hectares</p>
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<p>measurement you are given. For example, if you want to know how many hectares are in 17,340 square yards, knowing that 4,840 square yards = 1 acre; then $17,340 \text{ square yards} / 4,840 \text{ square yards} = 3.583 \text{ acres}$. Now, convert acreage into hectares. Knowing that 1 hectare = 2.471 acres, divide $3.583 / 2.471 = 1.45$ hectares.</p>		
<p>Summary</p> <p>Randomly select students to solve problems and define some terms.</p>	<p>Assessment Activity</p> <ol style="list-style-type: none"> Students should be familiar with common measurement of area, how to convert and how to solve for land area in hectare. 	<p>Assessment Activity</p> <p>Assess if students can;</p> <ol style="list-style-type: none"> Measure land area correctly.