ALBERT

Name _____ Date _____

Density Worksheet

Geometry · Common Core HSG-MG.A.2

> Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

Practice

Builds the skill step by step.

1. A town of 12,000 people covers 4 square miles. What is its population density?

2. A block has a mass of 60 g and a volume of 20 cm^3. What is its density?

3. A material has a density of 2 g/cm^3. What is the mass of 15 cm^3 of it?

4. A county has 50,000 people and a population density of 250 people per square mile. What is its area?

5. Which is a unit of population density?

   A. square miles per hour

   B. people per square mile

   C. grams per square mile

   D. people per mile

6. A forest has 300 trees per acre. How many trees are on 5 acres?

7. A cube with side 2 cm has a mass of 64 g. What is its density?

8. A 100 m by 50 m field has 2,500 plants. How many plants are there per square meter?

9. Water has a density of 1 g/cm³. What is the mass of 250 cm³ of water?

10. Object A is 10 g with volume 5 cm³. Object B is 12 g with volume 8 cm³. Which is denser?

    A. A

    B. B

    C. They are equally dense.

    D. You can't tell.

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On Level

Grade-level practice.

1. 1,570 people attend a concert in a circular park with radius 50 m. Use 3.14 for π. How many people are there per square meter?

2. A room is 12 ft by 10 ft by 8 ft. A heater needs 5 BTU per cubic foot. How many BTUs does the room need?

3. A gold sphere has radius 1 cm. Gold's density is 19.3 g/cm³. What is the sphere's mass? Use 3.14 for π and round to the nearest tenth.

4. A wooden cylinder has radius 2 cm and height 10 cm. The wood's density is 0.6 g/cm³. What is its mass? Use 3.14 for π and round to the nearest tenth.

5. City A has 900,000 people on 300 square miles. City B has 500,000 people on 125 square miles. How many more people per square mile does the denser city have?

6. A rectangular region is 400 miles by 250 miles and has 6,000,000 people. What is its population density?

7. Aluminum has a density of 2.7 g/cm³. A piece has a mass of 540 g. What is its volume?

8. A 10 cm cube has a mass of 800 g. Water's density is 1 g/cm³. Will the cube float in water?

   A. Yes: its density is 0.8 g/cm³, less than water's.

   B. No: its density is 8 g/cm³.

   C. No: it is heavier than 1 g.

   D. Yes: because it is a cube.

9. A gardener plants 4 seeds per square foot in a 12 ft by 15 ft bed. How many seeds is that?

10. Two cities each have 100,000 people. Explain how their population densities could be different.

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Challenge

Multi-step and word problems that stretch it.

1. A circular region with radius 10 miles has 94,200 people. Use 3.14 for π. What is its population density?

2. Concrete weighs 150 lb per cubic foot. A slab is 10 ft by 12 ft by 0.5 ft. How much does it weigh?

3. A cylindrical tank with radius 1 m and height 3 m is full of oil with a density of 900 kg/m³. Use 3.14 for π. What is the mass of the oil?

4. A city grows from 200,000 people on 50 square miles to 270,000 people on 60 square miles. By how much does its population density increase, in people per square mile?

5. Sand has a density of 1.6 g/cm³. A cone-shaped pile has radius 30 cm and height 20 cm. What is its mass in kilograms? Use 3.14 for π and round to the nearest tenth.

6. A 300 g block with density 3 g/cm³ is glued to a 200 g block with density 2 g/cm³. What is the density of the combined object?

7. One acre is 43,560 square feet. An orchard of 87,120 square feet has 200 trees. How many trees per acre is that?

8. A pine board is 2 in by 6 in by 96 in. Pine weighs 0.02 lb per cubic inch. How much does the board weigh? Round to the nearest tenth.

9. A country is modeled as a 1,000 km by 500 km rectangle with 25,000,000 people. What is its population density?

10. A solid sphere and a solid cube are made of the same material. The sphere has twice the mass. How do their densities compare?

    A. They are equal.

    B. The sphere's is twice as large.

    C. The cube's is twice as large.

    D. You can't tell.