LESSON MAKER PRO

Density Detectives

Model amounts per square unit or cubic unit.

HIGH SCHOOL · HSG-MG.A.2

CCSS.Math.Content.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). *"

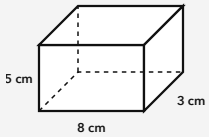
NAME _____ DATE _____

DENSITY BY AREA OR VOLUME

Density tells how much is in each square unit or cubic unit. Divide the total amount by the area or volume, then include the correct units.

WORKED EXAMPLE

The display case shown holds 240 collectible pins. Find the pin density in pins per cubic centimeter.



1. Volume = 8 × 3 × 5 = 120 cm^3.
2. Density = 240 / 120.
3. Density = 2 pins/cm^3.

Answer: 2 pins/cm^3

PRACTICE 4 problems

1 A panel has 77 stickers on an area of 11 square inches. Find the sticker density.

ANSWER _____

2 A 45 ft^3 equipment locker contains 1,350 foam balls. Find the ball density.

ANSWER _____

3 A hiking area has a density of 14 people per square mile across 15 square miles. How many people are there?

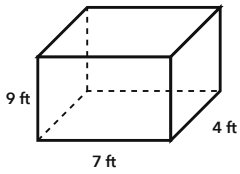
ANSWER _____

4 A scent concentration is 6 mg/m^3 in a 16 m^3 studio. How many milligrams of scent are present?

ANSWER _____

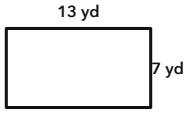
APPLY IT Show your work

1 A gaming club installs an air-cooling system in the rectangular VR room shown. The system removes 3,024 BTUs. Find the cooling capacity per cubic foot.



ANSWER _____

2 The student music festival viewing zone shown holds 364 people. Find the crowd density in people per square yard.



ANSWER _____

CHALLENGE One step up

Studio A has 52 people in 13 m^2. Studio B has 102 people in 17 m^2. A student says the combined density is 5 people/m^2 because (4 + 6) / 2 = 5. Is the claim correct? Explain.

WORK SPACE AND ANSWER

Density Detectives

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A panel has 77 stickers on an area of 11 square inches. Find the sticker density.	**7 stickers/in^2**
2	A 45 ft^3 equipment locker contains 1,350 foam balls. Find the ball density.	**30 balls/ft^3**
3	A hiking area has a density of 14 people per square mile across 15 square miles. How many people are there?	**210 people**
4	A scent concentration is 6 mg/m^3 in a 16 m^3 studio. How many milligrams of scent are present?	**96 mg**

PART 2 · APPLY IT

1. **12 BTUs/ft^3** The room volume is 7 × 4 × 9 = 252 ft^3. Divide 3,024 by 252.
2. **4 people/yd^2** The zone area is 13 × 7 = 91 yd^2. Divide 364 by 91.

CHALLENGE

No. The combined density is 154 / 30 = 77/15 = 5 2/15 people/m^2, not 5, because the two areas are different.

Accept equivalent unit forms, such as people per square yard. Require density answers to include both the amount unit and the area or volume unit.