LESSON MAKER PRO

Water in Proportion

Build number models of Earth's water

GRADE 5 · 5.13

5.13 "Construct a model to represent the distribution of freshwater and saltwater on Earth."

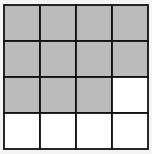
NAME _____ DATE _____

EQUAL PARTS MATTER

A model can use equal parts to show how a whole is divided. About 97 of every 100 equal parts of Earth's water are saltwater, and about 3 are freshwater. For a larger model, multiply both amounts by the same number.

WORKED EXAMPLE

A science club has 16 water samples. Of these, 11 are saltwater. Use a 16-square model to show the samples. Shaded squares will represent saltwater.

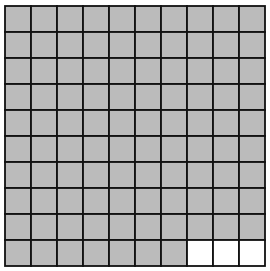


1. Use one square for each sample.
2. Shade 11 squares for the saltwater samples.
3. Leave 16 - 11 = 5 squares unshaded for the freshwater samples.

Answer: 11 shaded squares show saltwater, and 5 unshaded squares show freshwater.

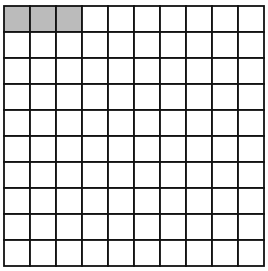
PRACTICE 6 problems

1 In this model of Earth's water, shaded squares represent saltwater. How many squares represent saltwater? How many represent freshwater?



ANSWER _____

2 In this model of Earth's water, shaded squares represent freshwater. What fraction of all the squares represents freshwater?



ANSWER _____

3 Each row is a plan for a 100-part model of Earth's water. Which plan uses the correct numbers?

MODEL PLANS

Plan	Saltwater parts	Freshwater parts
A	97	3
B	98	2

ANSWER _____

4 Plan a model of Earth's water with 300 equal parts. How many parts will represent saltwater, and how many will represent freshwater?

ANSWER _____

5 Plan a model of Earth's water with 400 equal parts. How many parts will represent saltwater, and how many will represent freshwater?

ANSWER _____

6 Two students plan 200-part models of Earth's water. Which plan is correct? Explain how you know.

STUDENT MODEL PLANS

Plan	Saltwater parts	Freshwater parts
A	194	6
B	196	4

ANSWER _____

APPLY IT Show your work

1 For a science fair poster, an aquarium club plans to print 500 equal-sized dots to model Earth's water. How many dots should represent saltwater, and how many should represent freshwater?

WORK SPACE

ANSWER _____

2 Your school makes a digital model of Earth's water with 1,000 equal pixels. A student colors 960 pixels for saltwater and 40 for freshwater. How many pixels must change from freshwater to saltwater to make the model accurate?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says, "Freshwater is 3 of every 100 parts, so a 600-part model needs 3 freshwater parts." Explain the mistake. Give the correct number of saltwater and freshwater parts.

WORK SPACE AND ANSWER

ANSWER KEY

Water in Proportion

GRADE 5 · 5.13

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	In this model of Earth's water, shaded squares represent saltwater. How many squares represent saltwater? How many represent freshwater?	**97 saltwater squares and 3 freshwater squares**
2	In this model of Earth's water, shaded squares represent freshwater. What fraction of all the squares represents freshwater?	**3/100**
3	Each row is a plan for a 100-part model of Earth's water. Which plan uses the correct numbers?	**Plan A**
4	Plan a model of Earth's water with 300 equal parts. How many parts will represent saltwater, and how many will represent freshwater?	**291 saltwater parts and 9 freshwater parts**
5	Plan a model of Earth's water with 400 equal parts. How many parts will represent saltwater, and how many will represent freshwater?	**388 saltwater parts and 12 freshwater parts**
6	Two students plan 200-part models of Earth's water. Which plan is correct? Explain how you know.	**Plan A. It has twice as many of each kind of part as a 100-part model.**

PART 2 · APPLY IT

1. **485 saltwater dots and 15 freshwater dots** Five groups of 100 parts make 500 parts. Multiply both amounts in a 100-part model by 5.
2. **10 pixels** A 1,000-part model needs 970 saltwater pixels and 30 freshwater pixels. Change 10 freshwater pixels to saltwater.

CHALLENGE

The student counted only one group of 100, but 600 has six groups of 100. The model needs 582 saltwater parts and 18 freshwater parts.

Accept equivalent explanations that scale both water amounts by the same factor. The Earth's water amounts are approximate, so the models represent the stated 97-to-3 distribution.