

Designing a Water-Conservation Plan

Lesson 7-7



NAME

DATE

TIME

Use the information from the Math Message on journal page 329 to answer the questions.

- ① Olivia's parents ask Olivia to help them cut their monthly water usage by AT LEAST 60%.

How much water would a 60% cut save?
(Round your answer to the nearest gallon.)

3,219 gallons

- ② Olivia's family told her that she could spend, at most, \$50 on water-saving devices.

Design a plan for Olivia so the family could save at least 60% on their water usage and spend no more than \$50. Use the facts below to develop your plan.

Note: The family will not change how often they shower, water the garden, or brush their teeth. They may change the amount of time for each though.

- The water flow for a high-efficiency showerhead is about 1.5 gallons per minute. This showerhead costs \$25.
- The cost of the part needed to repair a leaky faucet is \$5.
- Olivia's family can double the length of the hose (by combining two hoses they have). Then the hose will have a water flow of 5.5 gallons per minute.
- Rain barrels collect rainwater that can be used to water the garden. Olivia's family can build a rain barrel that holds 65 gallons for about \$28. Assume they can fill the rain barrel three times per month.

Sample answer:

Action	Cost	Savings (in gallons)
Rain barrel	\$28	195 (filled 3 times)
Water the garden 4 minutes	\$0	990
Fix leak	\$5	259.2
Turn water off when brushing teeth	\$0	1,000 (at least!)
Take 5-minute showers	\$0	900
Totals	\$33	3,354.2

Designing a Water-Conservation Plan (continued)

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- ③ Consider how Olivia could convince her family that her plan meets their requirements. Describe Olivia's plan using clear mathematical language. Label any rates and measurements with appropriate units.

Sample answer:

First they should build the rain barrel. If it rains enough to fill it 3 times per month, they can save 195 gallons per month. Next they should double the length of the hose by combining the two hoses they have, and cut down the lawn watering to 4 minutes per day. They can also turn off the water while they brush their teeth. The family would only use a little water to rinse—maybe 2 gallons per day or less—and that would not cost them anything. The family might also take 5-minute showers instead of 8-minute showers. Then the family only uses 1,500 gallons per month showering, so they save 900 gallons. Finally, fixing the leaky faucet would save them almost 260 gallons, and that only costs \$5. If they do all these things, they can cut their water consumption by about 60%, and spend only \$33.