





















MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 1: Water Observations

Students in my friend’s class were trying to find out how big raindrops could get. On a rainy day, they placed a cookie sheet covered with flour outside for 15 seconds. Where raindrops hit the flour, little balls of flour formed. After an hour, the students separated the flour balls from the rest of the flour with a sieve.

The circles below are the diameters of the flour balls the students measured. Use a metric ruler to measure the diameters. Record your answers on the chart.

Drop	Diameter (mm)
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	

Get a sheet of graph paper from your teacher. Use it to graph the data in the table to the left. Answer the questions.

How many drops did you measure?

What was the diameter of the largest drop?

What was the diameter of the smallest drop?

Which size raindrop fell most often?

Which size raindrop fell least often?

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Investigation 2: Hot Water, Cold Water

When my family goes camping, we freeze water for the cooler in plastic jars with lids. My mother asked me to freeze three jars of water. I filled the jars all the way to the top, screwed on the lids, and put the jars in the freezer.

Two days later I went to the freezer and found that all three jars had burst. My mom gave me three new jars. She suggested that I put in less water so that when it froze, ice would fill the jar, just to the brim.

One jar held 500 mL, one held 1,000 mL, and the third was a 2 L bottle. I remembered from science class that when we froze 45 mL of water, the ice expanded to fill 50 mL of space.

How can you use this information to figure out how much water I should add to each jar so that when it freezes, ice fills the jar just to the brim? (Show your math in the space below.)

How much water should I put in each container?

500 mL jar

1,000 mL jar

2 L bottle

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Investigation 3: Weather and Water

Some students set up an investigation to find out what effect surface area has on the rate of evaporation. They used four different containers: a round cake pan, a water glass, a soup bowl, and an olive jar. They put 100 mL of water in each container.

Container	Diameter (cm)
Cake pan	23
Water glass	7
Soup bowl	11
Olive jar	5

Students observed the containers for 6 days. They measured the water on days 2, 4, and 6. The results of their measurements are in the chart below.

Container	Water remaining on		
	Day 2	Day 4	Day 6
Cake pan	75 mL	50 mL	25 mL
Water glass	90 mL	80 mL	70 mL
Soup bowl	80 mL	60 mL	40 mL
Olive jar	95 mL	90 mL	85 mL

In which container will all of the water evaporate first? _____

If conditions stay the same, on which day will all of the water evaporate from this container? _____

Show your math on the back of this page.

In which container will all of the water evaporate last? _____

If conditions stay the same, on which day will all of the water evaporate from this container? _____

Show your math on the back of this page.

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Investigation 4: Seasons and Climate

A girl was planning to visit one of two cousins on her vacation. She was having a hard time deciding which one to visit, so she decided she would check the newspaper for the next 5 days, then visit the cousin who lived in the city with the higher average temperature.

She recorded these temperatures the third week of June.

	Dallas, Texas	Miami, Florida
Monday	31°C	30°C
Tuesday	30°C	30°C
Wednesday	36°C	36°C
Thursday	28°C	32°C
Friday	30°C	32°C

Which cousin do you think she decided to visit?

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Investigation 5: Waterworks

In the table below, column 1 lists nine things people do that use water. Column 2 shows how much water each activity typically consumes, and column 3 shows how much each activity consumes when people conserve.

Figure out the amount of water your family uses in a week and write those totals in column 4. If your family is not conserving at this time, figure out how much you could conserve. Write those numbers in column 5.

Activity	Normal use	Conservation use	Weekly family use	Amount we could save
Shower	Water running 110 L	Wet, soap, rinse 18 L		
Brushing teeth	Tap running 44 L	Wet brush, rinse 2 L		
Tub bath	Full 264 L	Low level 110 L		
Toilet flushing	Large tank 26 L	Small tank 6 L		
Washing dishes	Tap running 198 L	Wash in basin 22 L		
Electric dishwasher	Full cycle 62 L	Short cycle 48 L		
Shaving	Tap running 88 L	Fill basin 4 L		
Washing hands	Tap running 9 L	Fill basin 4 L		
Washing machine	Full cycle 154 L	Short cycle 110 L		
Totals				

Figure out the total amount of water your family uses each week and the total amount your family could conserve. Write your answers in the bottom of the last two columns.