

Using Proportions to Estimate

Lesson Plan

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Goal: Show how proportions can be useful for prediction

Grade and Course: 9th grade Pre-Algebra

KY Standards: MA-HS-1.4.1

Objectives: The student will be able to:

- 1) Given a ratio, calculate corresponding proportions
- 2) Begin to understand the error involved when using proportions to estimate
- 3) Calculate and understand the importance of unit rates

Resources/materials needed:

The attached worksheet is needed along with the following, which are classified by each station:

1. Remote Controlled Car, tape, timer
2. Timer
3. Hershey Kisses, timer
4. Pennies, jar/cup, timer

Description of Plan:

Hand out the worksheet in Appendix A. If you have three or four teachers/aids in the class, you can split the class into four groups and have them rotate by groups. If you only have one or two teachers/aids in the class, it is probably better to ask for volunteers for each station.

The rest of this description will be based upon the fact that you only have one/two teachers/aids and have asked for volunteers.

First, ask for a volunteer to time the remote controlled (RC) car. Mark off 10 feet and 15 feet before class. Have a teacher/aid drive the RC car for 10 feet and time it. Make the students use a proportion to calculate how long they think it will take for the RC car to go 15 feet. After that, time and drive the RC car for 15 feet. Ask the students how close they think their estimate was and what might have caused the error. The students can calculate all unit rates at the end of class or for homework.

Have a student volunteer to do jumping jacks for 20 seconds. Record how many jumping jacks the student performed and have the students use a proportion to calculate how many jumping jacks they think the student will complete in 30 seconds. Time the student to see how many jumping jacks the student completes in 30 seconds. Ask the students to compare their estimate and the measured number.

Have a student volunteer to see how many Hershey Kisses he/she can eat in 20 seconds. Have the students use a proportion to calculate how many Hershey Kisses they think the student will eat in 45 seconds. Experiment to see how many the student can eat in 45 seconds. Again, compare these previous two values.

Have a student volunteer to see how many pennies they can put in a cup one at a time for 30 seconds. Record this number and make the students calculate how many pennies they think

the volunteering student can put in for 50 seconds. Ask the students to compare these two values.

Lesson Source: Yours truly

Instructional Mode: Experiments

Date Given: 03-20-2008

Estimated Time: 1 class period (45 minutes)

Date Submitted to Algebra³: 03-22-2008

Appendix A:

Name: _____

Using Proportions to Estimate

While at a station answer the questions below that label. You can work problems to the right of the tables.

1. Remote Controlled Car

		Time	Unit
a	How long does it take for		

	the car to travel 10 feet?		
b	Use the ratio from the problem above to calculate how long you think it will take for the car to travel 15 feet?		
c	How long did it actually take for the car to travel 15 feet?		
d	What is the unit rate using the ratio in part a? (Hint: How far does the car travel in 1 second?)		

2. Jumping Jacks

		Jumping Jacks	Unit
a	How many jumping jacks can you do in 20 seconds?		
b	Use the ratio from the problem above to calculate how many jumping jacks you think you can do in 30 seconds?		
c	How many jumping jacks can you actually do in 30 seconds?		
d	What is the unit rate using the ratio in part a? (Hint: How long does it take for 1 jumping jack?)		

3. Hershey's Kisses

		Hershey Kisses	Unit
a	How many Hershey's Kisses can you eat in 20 seconds?		
b	Use the ratio from the problem above to calculate how many you think you can eat in 45 seconds?		
c	How many can you actually eat in 45 seconds?		
d	What is the unit rate using the ratio in part a? (Hint: How long does it take to eat one Hershey kiss?)		

4. Pennies

		pennies	Unit
a	How many pennies can you put in a bowl (ONE AT A TIME) in 30 seconds?		
b	Use the ratio from the problem above to calculate how many you think you can put in the bowl in 50 seconds?		
c	How many pennies can you actually put in a bowl (ONE AT A TIME) in 50		

	seconds?		
d	What is the unit rate using the ratio in part a? (Hint: How many pennies can you put in per second?)		

Additional questions:

1. What might have made your answer in part (b) different from your answer in part (c) for:
 - a. The Remote Controlled Car:
 - b. Doing Jumping Jacks:
 - c. Eating Hershey's Kisses:
 - d. Picking Up Pennies: