Inverse Proportionality
Extend Your Learning
Answers and Explanations

Use a table to solve each problem. Briefly explain or show your reasoning.

The National Honor Society is raising funds for a trip to Washington D.C. The manager of the UNI dome will pay the group $400 per game for cleaning up the seating sections of the dome after a football game. The manager said it should take 20 people two hours to finish the job after each game. Assume that everyone works for the entire two hours and that everyone works at the same rate.

1. How long can 16 students expect to work after one game in order to earn $400?

   With fewer students, it will take longer. If you have 4/5 as many students, it will take 5/4 the amount of time. It will take 16 students 2 1/2 hours to earn $400.

Number of People	Dollars Earned	Number of Hours
20	$400	2
16 (x 4/5)	$400	2 1/2 (x 5/4)

2. In order to earn $1200, a group needs to work three games. How many total hours can 12 students expect to work in order to earn $1200?

   The following three tables shown three different ways to think about this problem:

   Explanation 1:

Number of People	Dollars Earned	Number of Hours
20 (x 3)	$400 (x 3)	2
60	$1,200	2
12 (x 1/5)	$1,200	10 (x 5)

   Row 2: If you have three times the number of people, you can make three times the amount of money. The number of hours is not changed.
   Row 3: If you have one fifth the number of people, you need five times the number of hours. The amount of money is not changed.

Explanation 2:

Number of People	Dollars Earned	Number of Hours
20	$400	2
16 (x 3)	$400 (x 3)	2 1/2
48	$1,200	2 1/2 (x 4)
12 (x 1/4)	$1,200	10

Row 2: The numbers are from problem one.
Row 3: If you have three times the number of people, you can make three times the amount of money. The number of hours is not changed.
Row 4: If you have one fourth the number of people, you need four times the number of hours. The amount of money is not changed.

Explanation 3:

Number of People	Dollars Earned	Number of Hours
20	$400	2
16	$400 (x 3)	2 1/2 (x 3)
16 (x 3/4)	$1,200	7 1/2 (x 4/3)
12	$1,200	10

Row 2: The numbers are from problem one.
Row 3: If you have three times the amount of money, you need three times the number of hours. The number of people is not changed.
Row 4: If you have three fourths the number of people, you need four thirds the number of hours. The amount of money is not changed.

All three methods show that it will take 12 students 10 hours to earn $1200.