**Stadium Wave**

Suppose you have an internship one summer with a company that makes TV commercials. You are told to find the solutions to the following two problems:

**Problem 1**: A client who sells automobiles wants a 15 second wave made by people from all walks of life standing single file along a roadway as the car drives along in front of them. How many people do you need to hire to create a 15 second wave?

**Problem 2**: A soft drink client wants a commercial to have a video clip of a stadium wave at Fenway Park. Will the 30 second commercial be able to include a video that shows the wave sweeping all the way around the people in top row of seats at Fenway Park? If not, what fraction of the park will a 30 second wave include? (You will have to do a little research on Fenway Park.)

You can find information on stadium waves at the following Wikipedia page. <http://en.wikipedia.org/wiki/Wave_(audience)>

**PROCEDURE:**

Create a simulation in the classroom and develop a mathematical model for the wave:

1. Have 5 classmates stand up in the room and do a wave. A practice run would be useful as you decide on how to do your wave. Time how many seconds it takes to complete a wave with 5 people. Record the data in the table. Then try the wave with different numbers of students.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of people doing the wave | 5 | 6 | 8 | 10 | 13 | 16 |
| Time to do the wave  (Nearest tenth of a second) |  |  |  |  |  |  |

1. Use technology or the graph on the next page to develop a mathematical model (linear equation) relating the number of people doing the wave and the time to do the wave.
2. Write a report for you employer to answer Problem 1 and Problem 2. Be sure to include the mathematical justification for your answers to both questions. Explain if the two variables are correlated or if the number of people causes the time of the wave to change.

