

Puzzle 1:

A car travels 1 mile at a speed of 15mph. The car continues on for a second mile. Ignoring acceleration, at what speed must the car travel the second mile so that the entire trip averages 30mph?

Puzzle 2:

A school has exactly one thousand lockers, numbered from 1–1000, as well as one thousand students. Each year, the principal has closing ceremonies on the last day of school, during which she enlists the help of her students to close up the school's lockers.

She assigns each student a number, and asks him or her to help her one by one. These are the instructions she gives each of the students.

Student #1: Go to every locker and open it.

Student #2: Go to every second locker and close it.

Student #3: Go to every third locker. If it is closed, open it, and if it is open, close it.

Student #4: Go to every fourth locker. If it is closed, open it, and if it is open, close it.

This goes on until Student #1000 is finished

After all 1000 students have done their part, how many lockers are left open?