

Farewell Fargo?

The Crisis: Early last week, a meteor struck the earth, approximately 100 kilometers from Fargo, North Dakota. Shortly after the meteor hit, the local Sheriff went to investigate the impact site and noticed that there was a black, noxious slime covering the site. By the time a team of biologists from FEMA arrived, the slime had formed a circular patch 50 meters in radius and was continuing to grow in a circular fashion. Nothing stopped the slime. The Sheriff, a bit of a worry wart, asked if Fargo should be evacuated.

In order to estimate how fast the slime was spreading, the biologists (who have yet to return from the field) did a number of experiments. This is what they reported:

The slime patch consists of small cells. Left on its own, a cell assumes a circular shape and with a radius of .001 meters.

The cells reproduce at the rate of one every 2.642 hours.

Some small colonies were isolated and their populations observed over time. The results are recorded in the following table:

initial pop.	pop. after one hour	pop. after two hours
1000	1301	1598
2000	2605	3383
3000	3897	5072
4000	5201	6758

Similar to the above, the radii of some small colonies were observed over time. The results are recorded below:

initial radius (meters)	radius after one hour	radius after two hours
10	11.39	13.01
20	22.79	25.99
30	34.28	39.00
40	45.61	51.98

Has Fargo already been slimed? Based on the above information, estimate how many hours it will take the patch to reach Fargo. (Hint: Look for a relationship of the form (new population)= C (old population) where the value of C is constant. Try to find a similar relationship among the radii.)