

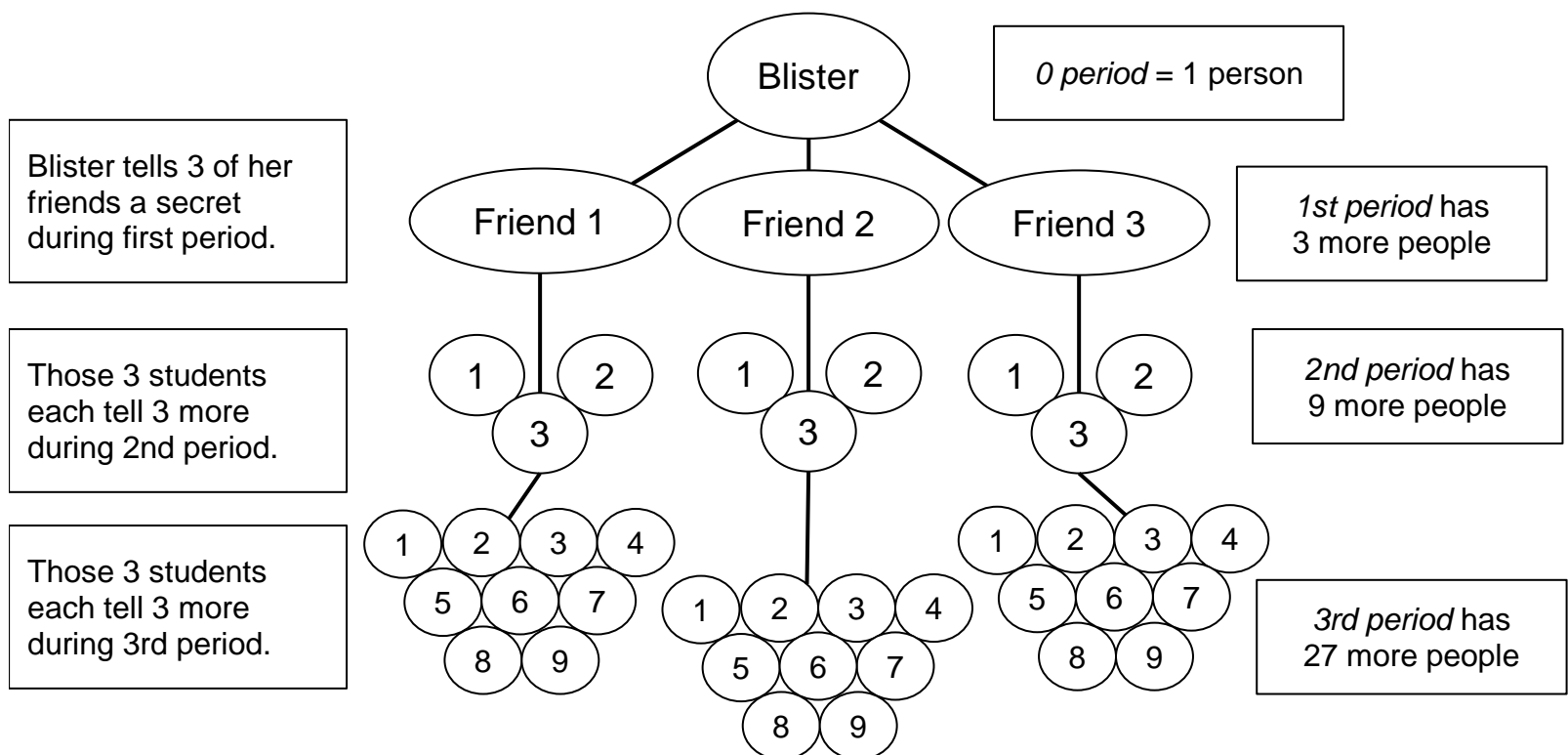
## PROBLEM OF THE WEEK - 7

## A REALLY BIG SECRET

Blister goes to a really, really big school. On Monday during first period, she told three friends a secret. During second period, each of her three friends told another three students and each one of those students told another three people during third period. Assuming there are six periods a day, each person only tells three people, and this pattern continues, how many students will know about the secret by the end of the week?



## PROBLEM OF THE WEEK - ANSWER AND HELP



This data tells us the secret is growing at a rate of  $3^x$ .

So by 3rd period  $1 + 3 + 9 + 27 = 40$  people know.

Since there are 6 periods a day and 5 school days a week,  $6 \times 5 = 30$ .

Need to add up all the 3's to the 30th power.

$$1 + 3 + 9 + 27 + 81 + 243 + 729 + \dots + 205,891,132,094,649$$

$$= \underline{308,836,698,141,973 \text{ students}}$$

or  $\frac{3^{(x+1)} - 1}{2}$

"x" represents the period and 3 is the number of people each person tells.

If you look closely you can see a pattern. If you take the exponential growth and minus one and then divide that by 2 you will get the previous period's total number of students who heard the secret.