

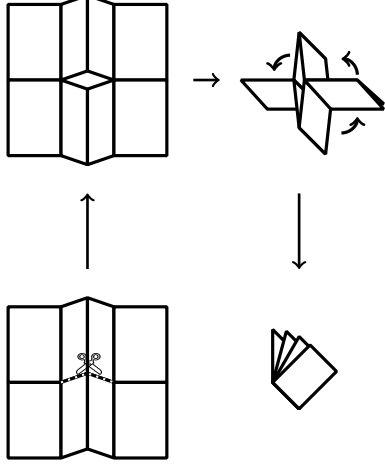
### Alternatives

If 3 extra jars are found and the bacteria are evenly distributed between the jars, then at what time will the bacteria run out of space? Explain.

### Limitation

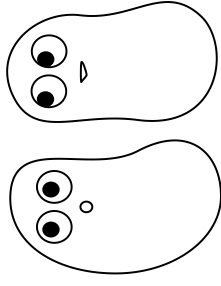
Is their any hope that more jars will allow the colony to continue its exponential growth? (Hint: By 6:30 the volume of the colony would exceed the volume of the universe)

### How to fold this book:



Name: \_\_\_\_\_

## Magic Bacteria A Cautionary Tale



Watch the video **Magic Bacteria: A Cautionary Tale** on Science Mom's YouTube channel. Then answer the questions and cut and fold the book.

*Bonus Essay Question:* Is there a lesson for people in this story about bacteria?

**When is it half-full?**  
If we put one of these bacteria into an empty jar at 1:00 and then observe that the jar is full at 2:00, at what time was the jar half full? Explain how you know.

**Recognition**  
If you were an average bacterium in that jar, at what time would you first realize you were running out of space? Why?

**Visualization**  
Suppose we had bacteria that doubled every minute. One bacterium becomes 2, the 2 become 4, the 4 become 8, then 16 and so on. Draw a picture that illustrates how these bacteria would double each minute.

5  
4  
3  
2  
1