Prokaryotic Cell Instructions and Drawings

How to create a model of a prokaryotic cell with the 3Doodler.

1. Obtain a pill bottle or a long half spherical surface like a juice bottle or perfume bottle.

2. **Making the capsule**
Begin using the 3Doodler around the edges of where you want the capsule to end. This will act as an outline to fill in the middle. Once the outline is complete, move the 3Doodler in up and down motions to fill in the rest of the capsule and to obtain the shape of the cell. Be careful not to press the 3Doodler too close to the bottle or object you are using as it may melt its material. Pause when necessary to refill the 3Doodler with a strand of ABS plastic. It may be useful to pick up the object and rotate it while holding the 3Doodler steady in one hand. It was useful for the bottle I used to move the plastic along the round parts of the bottle to fill in the gaps of the plastic where it was not round.

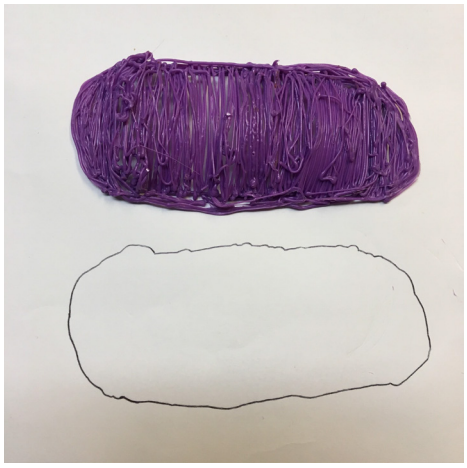
3. Once the shape is held, take the plastic off of the bottle and set it on the table. Continue using the same color of plastic to round out the ends of the capsule to make it rounded like a prokaryotic cell. This is now the capsule of the prokaryotic cell. Write down the color used for the capsule on the prokaryotic cell color chart.

4. Making the cytoplasm

Trace the outline of the capsule's rim with a pen and select a different color of ABS plastic with at least 2 strands of that color. Set the capsule aside for later use. Begin using the 3Doodler on the outside of the outline and then continue inward in a circular motion. You can fill in gaps of plastic as you go. The finished product should not have large cracks or holes. This will be the base to build on for the rest of the organelles of the prokaryotic cell. Write down the color used for the cytoplasm on the prokaryotic cell color chart.

5. Making the cell wall

Choose a different color of ABS plastic and outline the rim of the cytoplasm with at least 3 layers thick of plastic. Write down the color used for the cell wall on the prokaryotic cell color chart.



6. **Making the nucleoid**

Choose a different color of ABS plastic and begin in about the center of the cytoplasm surface. Make long streaks in a circular motion building several layers of plastic to represent the nucleoid. Write down the color used for the nucleoid on the prokaryotic cell color chart.

7. **Making the ribosomes**

Choose a different color of ABS plastic and begin making ribosomes as spherical dots all over the cytoplasm. Do this by clicking the slow button once and then again to make the spheres compact. Write down the color used for the ribosomes on the prokaryotic cell color chart.

8. **Making the plasma membrane**

Choose a different color of ABS plastic and begin making a thick line on the inside of the cell wall. Write down the color used for the plasma membrane on the prokaryotic cell color chart.

9. Connecting the capsule and the cytoplasm surface

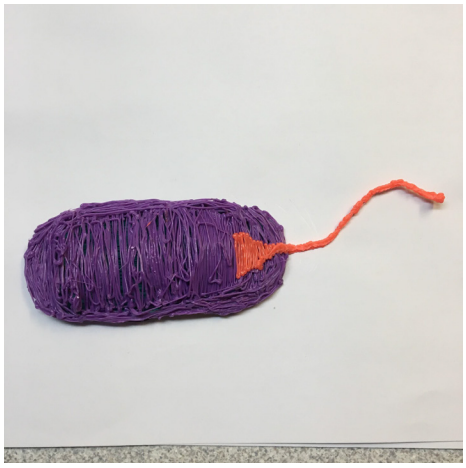
Place the cytoplasm surface face down (with the blank side facing up) and set the capsule downward so that the hole of the capsule is covered by the cytoplasm surface. Choose the same color as was previously used for the plasma membrane and begin adhering the surfaces together by going around the rim of the capsule with the 3Doodler. Once it appears fairly secured, flip it over and do a double lined layer of plasma membrane around the cytoplasm surface so it appears as though it is a cutaway of the eukaryotic cell.

10. Making the flagella

Flip the capsule over and choose the same color of plastic as was used for the plasma membrane. Use the 3Doodler to make a triangle on the back of the cell and then a curved, thick line with at least two layers of plastic for the flagella. Write down the color used for the flagella on the prokaryotic cell color chart.

11. **Making the pill**

Choose a different color of ABS plastic and begin like how you made the ribosomes except continue upward with the pen and then press the slow button and pull upward quickly. This will make it look string-like similar to how pilli look. Do this on the back a in a grid like pattern and then flip over to make some coming off of the front of the capsule as well. Write down the color used for the pilli on the prokaryotic cell color chart.



12. The cell is now complete and finish it by pulling away or cutting loose strings of plastic, such as those created by the pilli.