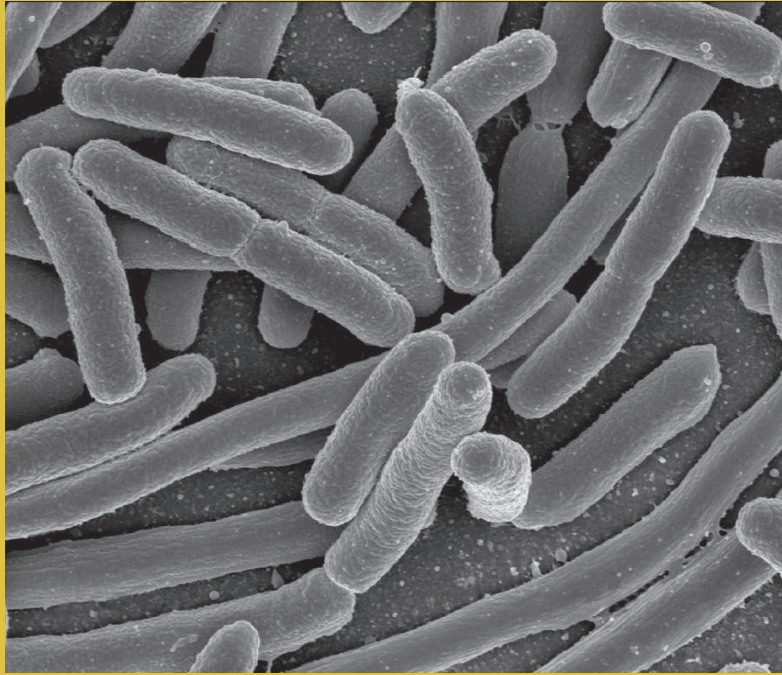


STEM *Sims*TM

Bac ID



**Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.**

Start learning right now about how bacteria impact your life. Take the following brief quiz to see how much you already know about these single-celled organisms. See the bottom of page 4 to check your answers.

1. What is the meaning of the Greek term “*bakterion*,” which is the origin of the word “bacteria?”
 - a. little ball
 - b. invisible sheet
 - c. tiny box
 - d. small staff
2. All of the following are correct regarding bacteria *except*:
 - a. bacteria do *not* have a nucleus.
 - b. bacteria have membrane-enclosed organelles.
 - c. bacteria have circular DNA.
 - d. bacteria have smaller ribosomes than other typical prokaryotic cells.
3. All of the following are characteristics used to distinguish the different types of bacteria *except*:
 - a. the number of cells in the bacterium.
 - b. the shape of the bacterium.
 - c. the gaseous requirements of the bacterium.
 - d. the composition of the bacterium’s cell wall.
4. The bacteria species *Pseudomonas natriegens* can go from birth to reproduction in as little as 10 minutes.
 - a. true
 - b. false
5. Bacteria are the oldest life form on Earth.
 - a. true
 - b. false

Build-a-Bac

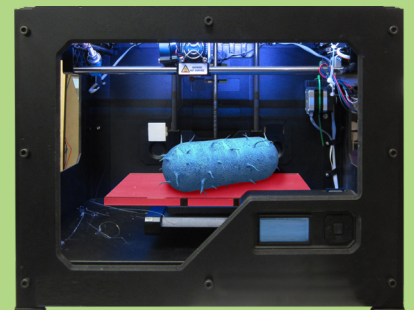
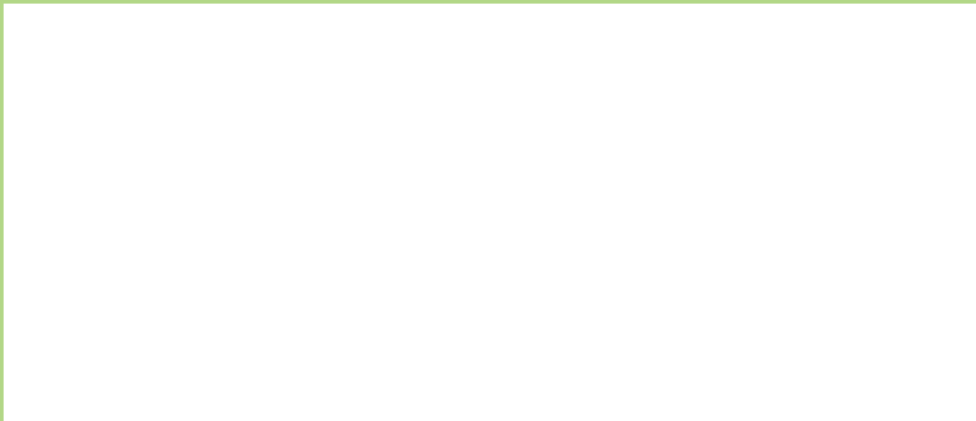
With the recent changes in pricing, access to 3D printers has become more commonplace in the classroom. Over the past half-decade, the price of a quality 3D printer has dropped from well over \$2,000 to under \$1,000. The current market offers many 3D printers for prices between \$200 - \$500. One of the limiting factors as to why many schools have been reluctant to purchase 3D printers is the lack of good directions and programs for building 3D models for students to use in their printing. The National Institutes of Health (NIH) provides one possible solution to this lack of resources. NIH offers a free repository of plans for students to use to print 3D models of many organisms and biological molecules. NIH also provides a platform for students and others interested in 3D models to add new plans for 3D builds to their site. To access the NIH site, go to:

<https://3dprint.nih.gov>

Procedure

1. If you have access to a 3D printer, go to the NIH site listed above and search for “bacteria” using the site’s search engine.
2. Choose a bacterium to build using your 3D printer.
3. Create and print your 3D bacterium model.
4. Draw a picture of your 3D model in the space below.

3D Bacterium Model Drawing



Questions

1. Use the web to look for 2D images of the specific bacterium you chose to 3D print. Describe how your 3D model of the bacterium supports or fails to support the real look of the 2D image of the bacterium.
2. Based on your answer to question #1, does your current 3D printer have any limitations?

Bac ID

National Institutes of Health

The search for cures and treatments of the myriad of diseases and disorders that affect humans and other animals requires a concentrated and well-coordinated effort. The National Institutes of Health (NIH) provides the overarching umbrella under which many of these explorations for answers are conducted. NIH's tag line states their mission very well: "*Turning Discovery Into Health.*" NIH has operated for over 100 years and currently consists of 27 different institutes and centers, all with the major goal of improving health. By the way, that's why NIH's name is the National Institutes of Health, since the organization is made up of not one, but many different institutes and centers.

Need information about allergies? NIH has an institute for that. Aging? Yep. Drug Abuse? You bet. Dental, mental, arthritis, or diabetes health? NIH has institutes that provide you with the latest facts. To find out more about NIH, go to the following site:

<https://www.nih.gov/about-nih/who-we-are>

While some of the information on the web pertaining to diseases and disorders is sometimes a little "sketchy," you can count on the correctness of the content presented on any of the NIH institute and center sites. NIH maintains its sites with the most up-to-date information to improve health.



Please visit our site for more helpful information:

STEMsims.com

Answers: Page 2 Answers: (1) d, (2) b, (3) a, (4) a, (5) a. Page 3 Answer: (1) Answers will vary based on the quality of the 3D printer. (2) Answers will vary based on the quality of the 3D printer.

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