

## Bacteria Webquest – Learn Your Germs

### WHAT ARE BACTERIA?

Resource #1: Access the on-line textbook through the Portal. Read pages 231-235. (Chapter 7, Lesson 1)  
Complete the following table questions.

1. Bacteria are prokaryotes. What is a prokaryote?
  
2. List three places bacteria are located:
  - a.
  - b.
  - c.
  
3. What is the ratio of bacterial cells to human cells found on the human body?
  
4. Bacteria Shapes: sketch these bacteria shapes.

Cocci - Round	Bacilli- rod	Sprilla- spiral

5. How many bacterial fit across the head of a pin if placed in a line? \_\_\_\_\_

6. Obtaining food: list 4 ways bacteria get food and provide an example of each.

Obtaining food

7. Reproduction:

a. **Name and describe** the process in which bacteria reproduce.

b. **Name and describe** the process that causes genetic variation between bacteria.

8. What is an endospore?

9. What do endospores protect a bacterium from?

10. How do endospores help bacteria survive?

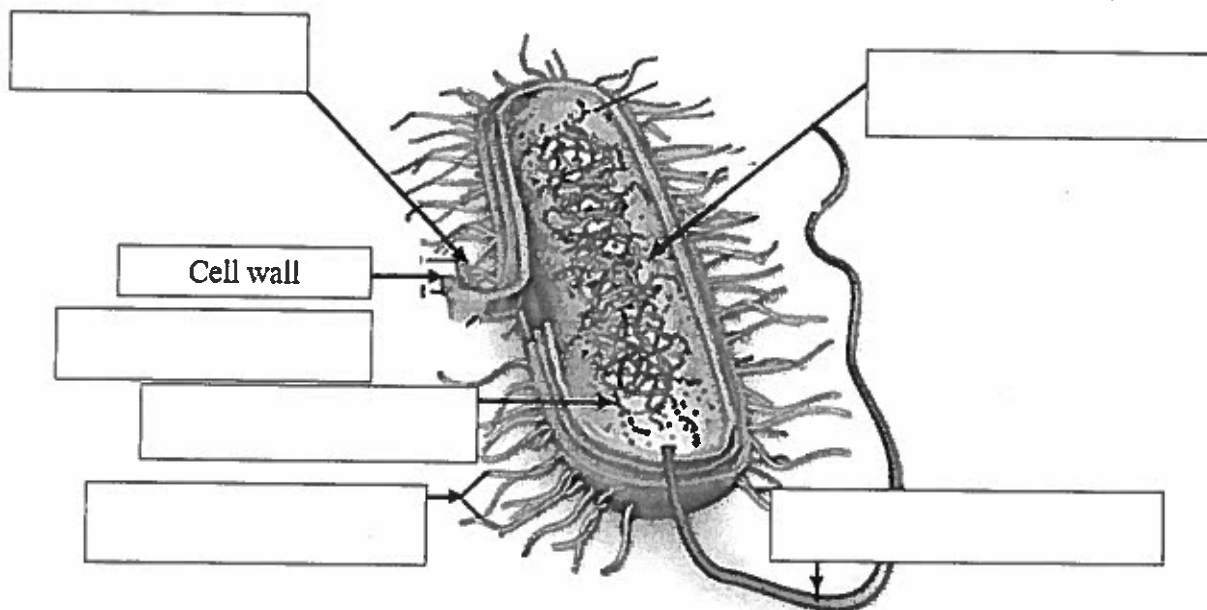
**Bacteria Structure**

Website #4: <http://www.cellsalive.com/cells/bactcell.htm>

1. Click start animation.

2. Beneath diagram, click on term to find location of each structure and label in the boxes below.

*Label the parts of the bacterium: flagella, pilli, nucleoid(DNA), ribosomes, cell membrane/envelope, capsule*

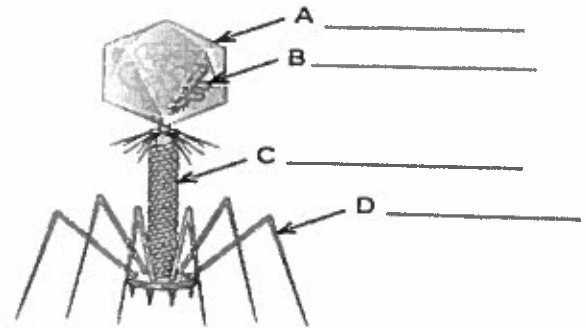


3. Do bacteria have a nucleus? Explain your choice.

**Viruses: The Smallest Microbe on Earth**

Website 9: <http://easyscienceforkids.com/viruses-the-smallest-microbe-on-earth/>

1. How do viruses move?
2. How do insects spread viruses?
3. In the diagram to the right, label the parts of the virus: *tail fibers*, *tail sheath*, *head*, *DNA*



**INTRODUCTION:** Think Bacteria and Viruses are the same?

Website #1: [http://www.diffen.com/difference/Bacteria\\_vs\\_Virus](http://www.diffen.com/difference/Bacteria_vs_Virus)

Complete the following table comparing viruses and bacteria:

Characteristic	Bacteria	Virus
Nucleus?		
Number of cells?		
What is its structure?		
Size? (nm= 1 billionth of a meter)		
Beneficial?		
Can it be treated? If yes, how?		

**Bacteria vs Virus**

Continue to look deeper into website #1. What other differences are there?

1. How many times smaller are viruses than bacteria? \_\_\_\_\_
2. What is the largest difference between viruses and bacteria?
3. Read the section titled – "Differences in Reproduction" and fill in the blanks below:

**Virus Reproduction:** DNA/RNA is packaged in a \_\_\_\_\_. The legs of a virus attach to the \_\_\_\_\_ of a host cell. The genetic material contained in the \_\_\_\_\_ of the virus is \_\_\_\_\_ into the host cell. The virus' genetic material can use the host cell to produce its own \_\_\_\_\_. When enough "baby" viruses are produced, the host cell will \_\_\_\_\_ releasing all the virus particles. Therefore, viruses are not \_\_\_\_\_ but are simply DNA/RNA that floats around until it finds a suitable \_\_\_\_\_.

4. Read the section titled- "Abundance" and answer the questions below:

How many viruses are found in one square meter? \_\_\_\_\_

How many bacteria are found in one square meter? \_\_\_\_\_

#### **What microscope do you use to see microbes?**

Website #2: <http://penpals.web.unc.edu/2013/04/14/what-microscopes-do-you-use-to-see-microbes/>

1. What type of microscope is used to see cells? \_\_\_\_\_
2. To get higher magnification of cells, which microscope would be used? \_\_\_\_\_
3. Bacteria can be seen with which microscopes? \_\_\_\_\_
4. How many bacteria fit in a single cell? \_\_\_\_\_
5. Viruses are too small to be seen with which microscope? \_\_\_\_\_
6. How many viruses fit in a single cell? \_\_\_\_\_

#### **Intro to Archaea (aka Archaeobacteria)**

Website #3: <https://www.ck12.org/c/biology/types-of-archaea/lesson/Types-of-Archaea-MS-LS/?collectionCreatorID=3&conceptCollectionHandle=biology-%3A%3A-types-of-archaea&collectionHandle=biology>

***Archaea are prokaryotes that once were considered bacteria. However, they differ from bacteria by having ribosomes that resemble those found in eukaryotes and they live in extreme conditions where no other forms of life exist.***

1. How do termites digest wood?
2. Types of Archaea: read this section and complete the chart below.

Type of Bacteria	Type of environment located	Specific example where it is located
Halophile		
Thermophile		
Methanogens	How do they get their name?	

3. List two common environments in which archaea live.

a.

b.

#### Bacteria Metabolism:

Website #5: <http://www.ucmp.berkeley.edu/bacteria/bacterialh.html>

1. What are **pathogenic** bacteria?
  
2. What do **aerobic** bacteria require?
  
3. Where do **anaerobic** bacteria live and what can they cause?
  
4. How do **facultative anaerobic** bacteria differ from the other two?
  
5. What is **decomposition** and how do bacteria play a role in the environment?
  
7. What is **nitrogen fixation** and why are bacteria crucial to this cycle of life?

#### Helpful/Harmful Bacteria –

Website #6: <https://biologywise.com/helpful-harmful-types-of-bacteria>

1. Where are bacteria located?
  
2. What percent of bacteria are helpful?
  
3. Use the text to complete the charts below:

## Helpful Bacteria

Name	Location	How is it helpful? Give one example- record as a bulleted fact
<i>Lactobacillus</i>		
<i>Bifidobacterium</i>		
<i>Escherichia coli (E. coli)</i>		
<i>Streptomyces</i>		

## Harmful Bacteria

Name	Location	Which Disease does it cause?
<i>Mycobacteria</i>		
<i>Clostridium tetani</i>		
<i>Yersinia pestis</i>		
<i>Helicobacter pylori</i>		
<i>Bacillus anthracis</i>		

**THIS SECTION IS ALL UP TO YOU!! LET'S SEE WHAT YOU'VE LEARNED!!**

Answer the following in your own words!

**Characteristics and life processes:**

Are bacteria multicellular or unicellular?

Are bacteria Eukaryotes or Prokaryotes?

Are bacteria heterotrophs or Autotrophs?

Can Bacteria move around? Explain

Describe how bacteria reproduce.

What is one adaptation that bacteria have that helps them survive?

Would you say bacteria are good or bad? Explain why.

Are bacteria and viruses the same? Use evidence to support your answer.