

Chapter 1 Homework 1 (pg. 1-9)

Name _____ Period _____ Score ___/9

Absent Date of Absence _____
Late

1. What is science?

2. What are the goals of science?

Questions 3–9 refer to spontaneous generation, the idea that life can arise from nonliving matter. Spontaneous generation was accepted by many in the scientific community up until the mid-nineteenth century. A series of simple experiments tested the validity of this idea.

3. In 1668, Francesco Redi proposed a different hypothesis to explain the specific example of maggots that appear on spoiled food. He had observed that maggots appear on meat a few days after flies have been seen on the food. He inferred that the flies had left behind eggs too small to see. Redi's experiment is shown below. What conclusion can you draw from Redi's experiment?



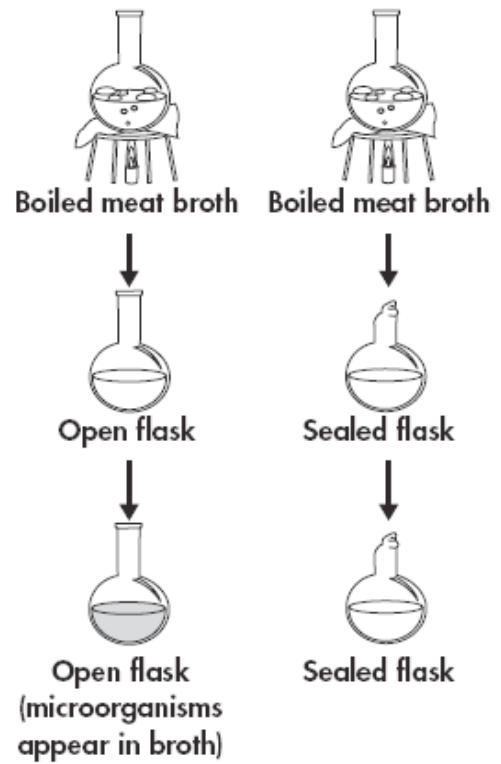
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4. In the late 1700s, Lazzaro Spallanzani designed a different experiment to show that life did not arise spontaneously from food. He inferred that some foods spoil because of growing populations of microorganisms. Fill in the information requested below.

Independent variable:

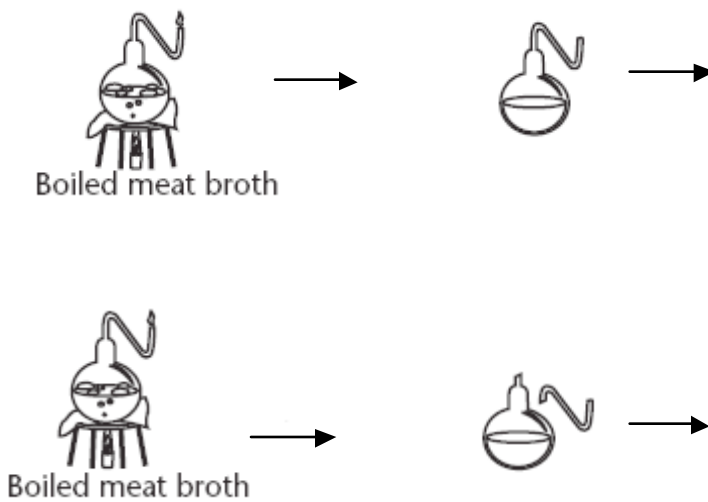
Dependent variable:

Controlled variables (identify three):



5. Critics of Spallanzini said that he showed only that organisms cannot live without air. In 1859 Louis Pasteur designed an experiment to address that criticism, an experiment that reproduced Spallanzani's results.

Draw in the third and final steps in the experiment. Use an arrow to show the path of travel of the microorganisms. Shade the broth in the flask(s) in which microorganisms grew.



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6. How did Pasteur solve Spallanzani's problem of limiting exposure to air?

7. What purpose did boiling the meat broth serve in both the Spallanzani and Pasteur experiments?

8. How did Redi, Spallanzani, and Pasteur experiments disprove the concept of spontaneous generation?

9. Today, we use a process of heating liquids to prevent spoiling by bacteria and other microorganisms, pioneered by one of the three scientists mentioned above. What is that process called and for what food it is used?

Extra Credit

10. What facts did Redi's, Spallanzani's, and Pasteur's experiments establish? What broader scientific understanding about life did the experiments explore? How does the example of these experiments demonstrate science as a way of knowing?
