

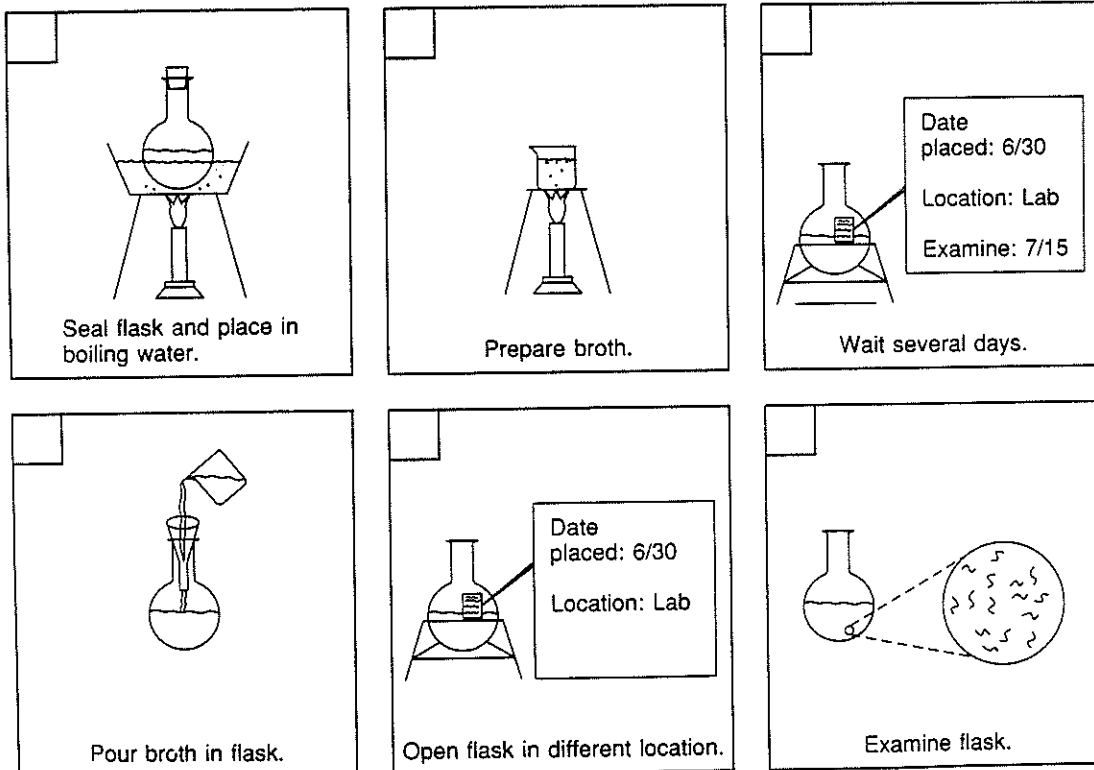
Pasteur's Experiments

Louis Pasteur was able to use the scientific method to disprove the theory of spontaneous generation. In this activity you will relate the concepts that form the basis of the scientific method to Pasteur's experiment.

1. What was Pasteur's hypothesis in his first set of experiments?

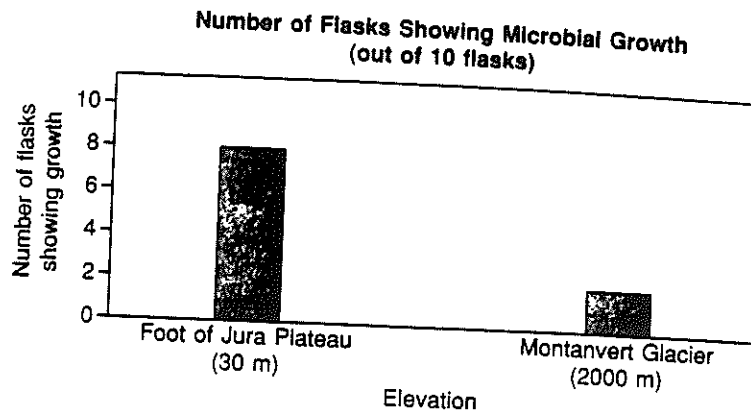
2. Shown below are illustrations of the steps that Pasteur followed in this experiment. Number the illustrations from 1 to 6 to show the correct order of the procedures that he used.

Figure 1



The graph below shows the results of one of Pasteur's experiments.

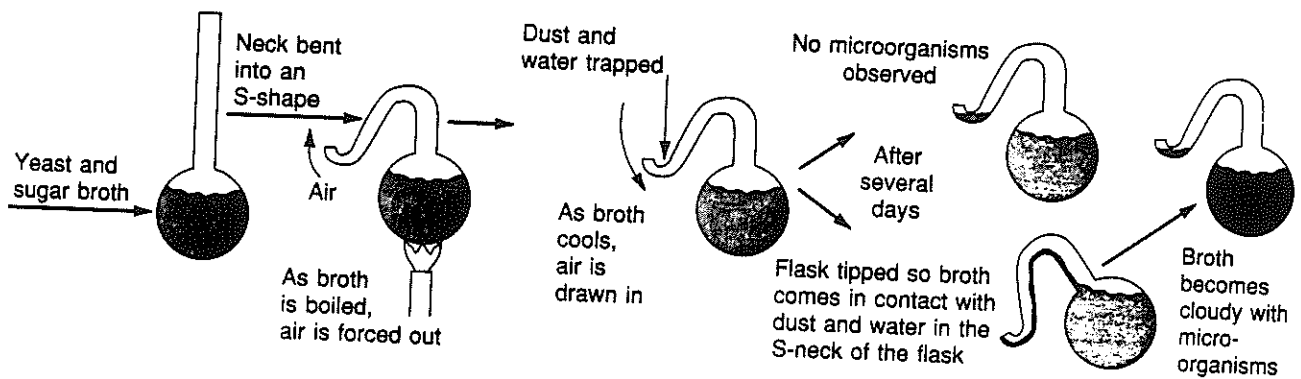
Figure 2



3. Assume that there are fewer dust particles at high altitudes than there are at low altitudes. Did Pasteur's results support his hypothesis? Explain your answer.

The following diagram shows the steps of another of Pasteur's experiments. Read it carefully to answer the questions that follow.

Figure 3



4. Which part of the experiment demonstrates an experimental setup? Which part was the control?

Name _____ Class _____ Date _____

5. Which result showed that boiling had no effect on the ability to microorganisms to grow in the broth?

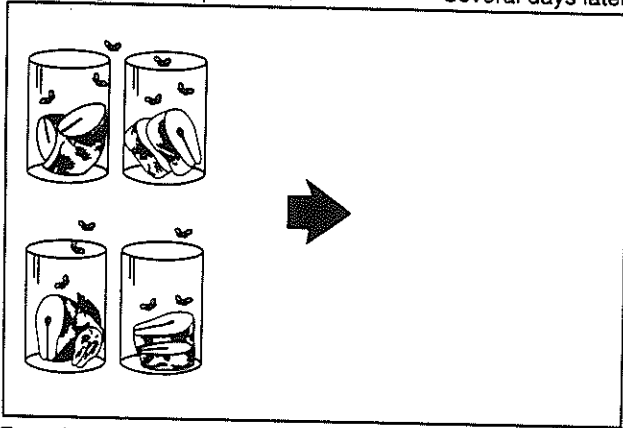
6. Which result showed that air does not contain any "vegetative force" that can give rise to life?

Testing the Hypothesis of Spontaneous Generation

For many centuries people believed that living things could originate from nonliving matter. This belief is known as spontaneous generation, or abiogenesis. In this activity you will consider Francisco Redi's experiment to disprove the hypothesis of spontaneous generation, and then devise some of your own experiments.

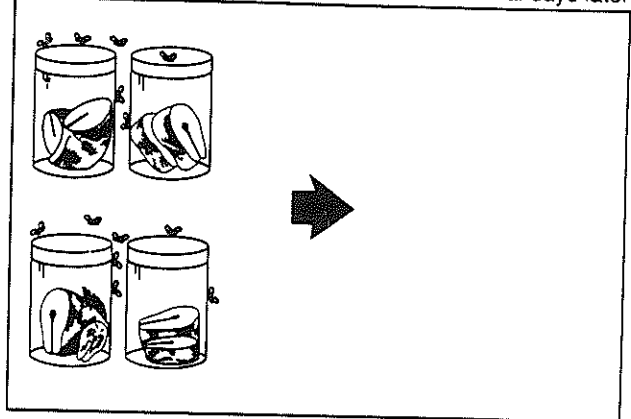
People who supported the belief in spontaneous generation often gave the example of rotting meat to support their theory. As meat spoiled, maggots appeared on the meat and eventually changed into flies. Examine the three sets of drawings below. Each set represents the beginning of each of Redi's experiments. You are to draw in the results of his experiments.

Beginning of the experiment → Several days later



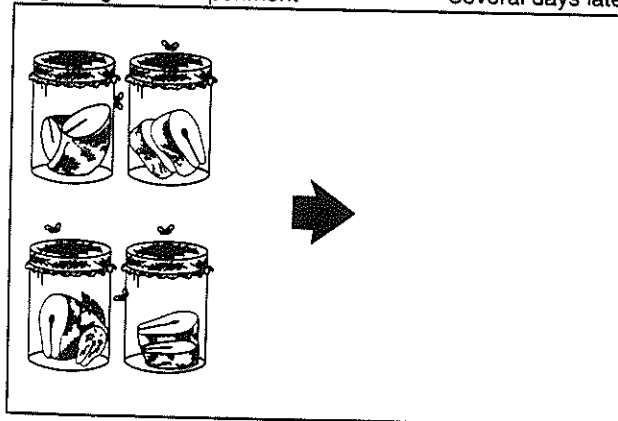
Experiment A

Beginning of the experiment → Several days later



Experiment B

Beginning of the experiment → Several days later



Experiment C

1. Briefly describe Redi's experiment and the conclusion that he reached.

People now know that living things can come only from other living things. This belief is known as biogenesis. Each of the following observations is explained in terms of spontaneous generation. For each case, explain the observation in terms of biogenesis. Then devise an experiment to test one of the hypotheses about the origin of living things in these cases.

Observation 1

After a heavy rain in the desert, frogs are seen in the newly formed mud puddles and flowers begin to grow in formerly barren areas.

Hypotheses

Abiogenesis: Frogs were spontaneously generated from mud and the flowers arose from raindrops.

Biogenesis: _____

Experiment: _____

Observation 2

Mold is growing on some forgotten leftovers in the back of the refrigerator. There was no mold on the food three weeks before.

Hypotheses

Abiogenesis: Mold appears on spoiled food through spontaneous generation.

Biogenesis: _____

Experiment: _____

Word Game

On the lines below, write the word or words that best fit the description on the left. When you are finished, the boxed-in letters will spell out one of the topics discussed in the chapter. Fill in that word or phrase in the space provided.

1. Sum total of all chemical reactions that occur in a living thing

_____ _____

2. Organism that cannot produce its own food

_____ _____

3. Molecule made of amino acids held together by peptide bonds

_____ _____

4. Process that uses solar energy to produce carbohydrates

_____ _____

5. Possible explanation for an event occurring in nature

_____ _____

6. Scientist who finally disproved the hypothesis of spontaneous generation

_____ _____

7. Compound that contains carbon

_____ _____

8. Combination of atoms that form a separate unit

_____ _____

- 9. Fossils of microscopic cells
- 10. Compound used by the first true cells the way modern photosynthetic organisms use water
- 11. One way of obtaining energy aerobically
- 12. _____ and starches are carbohydrates
- 13. Organism that can live without oxygen
- 14. One of the gases contained in the Earth's first atmosphere
- 15. Products of outer space filled with organic molecules, ice, and essential elements
- 16. Organism that can be seen only through a microscope
- 17. Cell that lacks a nucleus
- 18. Energy-storing compound
- 19. Scientist who tried to disprove the belief that maggots were spontaneously generated in meat
- 20. Layered, matlike formations
- 21. Atmospheric gas that absorbs ultraviolet radiation

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Hypothesis that life arises from nonlife
