

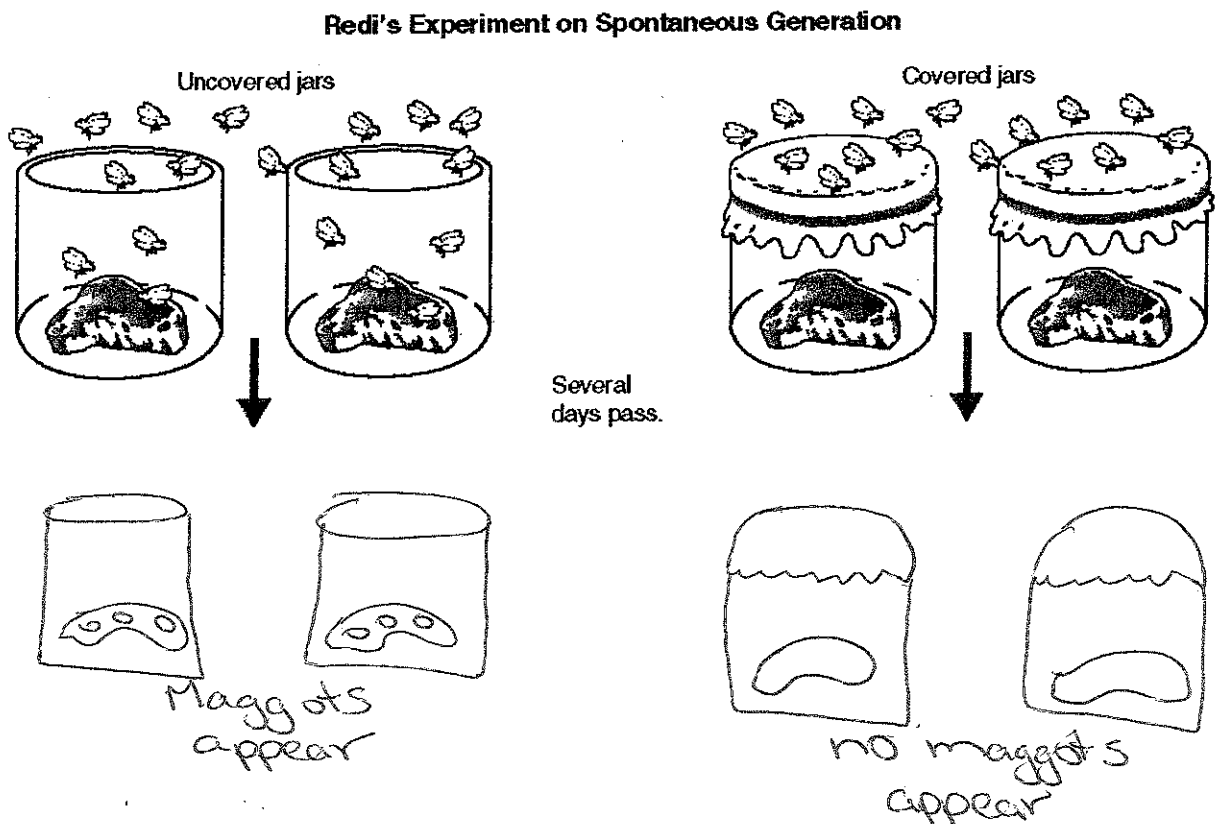
## Section 1-2 How Scientists Work (pages 8-14)

### Key Concepts

- How do scientists test hypotheses?
- How does a scientific theory develop?

### Designing an Experiment (pages 8-10)

1. The idea that life can arise from nonliving matter is called spontaneous generation (abiogenesis)
2. What was Francesco Redi's hypothesis about the appearance of maggots?  
Flies produce maggots
3. What are variables in an experiment? Factors that can change
4. Ideally, how many variables should an experiment test at a time? only one
5. What is a controlled experiment? an experiment in which one variable is changed while the other variables are controlled
6. The illustration below shows the beginning of Redi's experiment. Complete the illustration by showing the outcome.



7. Complete the table about variables.

**VARIABLES**

Type of Variable	Definition
Manipulated variable	the variable that is deliberately changed in an experiment
Responding variable	the variable that is observed and changes in response to the manipulated variable

8. In Redi's experiment, what were the manipulated variable and the responding variable?  
manipulated = presence / absence of gauze  
responding = whether maggots appear
9. For what do scientists use the data from a controlled experiment? to evaluate the hypothesis and draw a conclusion
10. When scientists look for explanations for specific observations, what do they assume about nature? the patterns in nature are consistent

**Repeating Investigations (pages 10-12)**

11. Why do scientists assume that experimental results can be reproduced?  
A key assumption in science is that nature behaves in a consistent manner
12. What did Anton van Leeuwenhoek discover? world of tiny moving objects which he called animalcules
13. What did John Needham conclude from his test of Redi's findings? little animals in a bottle of gravy could only have come from the juice of gravy
14. What did Spallanzani do to improve upon Redi's and Needham's work?  
He boiled his containers and tightly sealed his flasks
15. How did Pasteur settle the spontaneous generation argument? He designed a special flask to show that as long as broth was protected it remained free of living organisms