Evidence and Evolution

Trace how different investigations shaped ideas about life.

FB.5.1 "Investigate through research the contributions of scientists to the theory of evolution and evolutionary processes (e.g., Needham, Spallanzani, Redi, Pasteur, Lyell, Lamarck, Malthus, Wallace, Darwin)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each scientist's name and circle the observation or idea linked to that scientist. Write 1 beside tests of whether life appears from nonliving material and 2 beside ideas about how populations change over time.

Different Questions About Life

(1) Imagine a covered jar of meat on a laboratory shelf. Could maggots appear without parent flies? Francesco Redi compared covered and uncovered meat. Later, John Needham saw microbes grow in briefly heated broth and suggested that life had arisen there. Lazzaro Spallanzani heated broth longer and sealed it; no microbes grew. Heating and sealing changed the results.

TWO TESTS OF SPONTANEOUS GENERATION

Scientist	Observation
Redi	Maggots appeared on uncovered meat but not on meat covered with mesh.
Louis Pasteur	Broth stayed free of microbial growth in a curved-neck flask. Growth appeared after broth touched dust trapped in the neck.

(2) A different question asked how species change over time. Charles Lyell argued that slow geological processes can reshape Earth over immense spans. Thomas Malthus observed that populations can grow faster than their food supply. Jean-Baptiste Lamarck proposed that organisms pass on traits strengthened through use, an explanation that does not fit modern evidence for inheritance.

(3) Charles Darwin and Alfred Russel Wallace independently proposed natural selection. Individuals vary, and some inherited traits help their bearers survive and reproduce in a particular environment. Across generations, those traits can become more common. Darwin drew on Lyell's long timescales and Malthus's competition for resources. Wallace's independent work pushed Darwin to present their shared idea publicly in 1858.

2 ANSWER WITH EVIDENCE

Use the passage

1. How did Redi's and Pasteur's results both challenge the idea that life appears from nonliving material? Use a result from each test.

2. How did Needham's and Spallanzani's methods and results differ?

3. How did Lyell's and Malthus's ideas each help Darwin develop natural selection?

4. How did Lamarck's explanation of changing traits differ from the explanation Darwin and Wallace proposed?

3 YOUR TURN

Your own words

Write three sentences for a museum label about a covered meat jar beside a crowded seed tray. Explain how the jar connects to one scientist's test, how the tray could illustrate natural selection, and how one other named scientist's idea helps explain the tray.

Evidence and Evolution

PART 1 · READ AND MARK

Underline each scientist's name and circle the observation or idea linked to that scientist. Write 1 beside tests of whether life appears from nonliving material and 2 beside ideas about how populations change over time. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How did Redi's and Pasteur's results both challenge the idea that life appears from nonliving material? Use a result from each test.	**Redi found no maggots on mesh-covered meat. Pasteur found no microbial growth in broth until it touched trapped dust. Both results linked new growth to a source of living organisms.**
2	How did Needham's and Spallanzani's methods and results differ?	**Needham briefly heated broth and later saw microbial growth. Spallanzani heated broth longer and sealed it, and no microbes grew.**
3	How did Lyell's and Malthus's ideas each help Darwin develop natural selection?	**Lyell's work suggested that change could occur over immense spans of time. Malthus's work showed that limited resources could create competition.**
4	How did Lamarck's explanation of changing traits differ from the explanation Darwin and Wallace proposed?	**Lamarck proposed that traits strengthened through use could be passed on. Darwin and Wallace proposed that inherited variation affects survival and reproduction, making some traits more common over generations.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Redi's covered meat jar showed that maggots did not appear when flies could not reach the meat. In a crowded seed tray, seedlings with inherited traits that help them reach light may survive and produce more seeds. Malthus's idea that populations can outgrow their resources helps explain why the seedlings compete.

Accept explanations that distinguish tests of spontaneous generation from explanations of population change. For the museum label, require three sentences, a named scientist linked to the jar, a plausible inherited trait in the seed tray, and a second named scientist whose idea helps explain the tray.