

Name: _____ Period: _____

1.4 SCIENTIFIC TEXT ANALYSIS: THE SCIENTIFIC METHOD IN ACTION

Below are two case studies using the scientific method. For each case study, read the passage and answer the questions that follow. Be sure to use complete thorough sentences to show your thoughts! Use your vocabulary words! (Independent, dependent, and controlled variables; control group and experimental group(s).)

Case Study #1: The Strange Case of BeriBeri

In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was called beriberi. Symptoms of the disease included weakness and loss of appetite, victims often died of heart failure. Scientists thought bacteria found in an infected person's blood might cause the disease. To test this hypothesis, the scientists injected chickens with blood of patients with beriberi. The injected chickens became sick, and so the scientists inferred that the chickens had become infected with the bacteria. However, a group of chickens that were not injected with patients' blood also became sick during the experiment, which puzzled the scientists. One of the scientists, Dr. Eijkman, noticed something. Before the experiment, all the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case and found that polished rice lacked thiamine, a vitamin necessary for good health.

1. State the scientific problem or scientific question.

2. What was the hypothesis (write as ITB!)?

3. Describe how the hypothesis was tested.

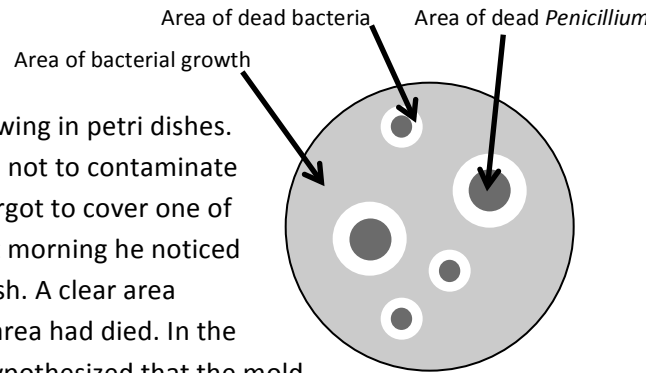
4. Should the hypothesis be accepted or rejected based on the experiment? Explain your answer.

5. What should be the new hypothesis and how would you test it?

****Turn over!****

Case Study #2: How Penicillin Was Discovered

In 1928, Sir Alexander Fleming was studying *Staphylococcus* bacteria growing in petri dishes. Normally, Fleming was very careful to keep his petri dishes covered so as not to contaminate his bacterial cultures. However, one evening he wasn't as diligent and forgot to cover one of his petri dishes before going home. When he returned to his lab the next morning he noticed that a mold called *Penicillium* was also growing in the uncovered petri dish. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, no clear areas were present. Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth. Fleming then added the nutrient broth in which the mold had grown to a culture of bacteria. He observed that the bacteria died again. This chemical substance was used to treat a variety of diseases and led to the discovery of many other chemicals that are used to treat bacterial infections and diseases.



1. State the scientific problem or scientific question.

2. What was Fleming's hypothesis?

3. How was the hypothesis tested?

4. Should the hypothesis be accepted or rejected based on the experiment? Explain your answer.

5. This experiment led to the development of what major medical advancement?

1.4 Score:			
1: Beginning	2: Developing	3: Proficiency	4: Mastery
Some questions are not answered. 50% or more of the answers are not accurate and may or may not be supported by evidence.	All questions are answered completely. Answers are 70% accurate and may or may not be supported by evidence.	All questions are answered thoroughly and thoughtfully. Answers are 90% accurate and are supported by evidenced.	All questions are answered thoroughly and thoughtfully. Answers are accurate and are supported by evidenced.