



Lesson Plan: The Development of Historic Treatments and the Scientific Method

Grade Level: Middle School

Main Theme: The organization of scientific inquiry—asking questions, forming hypotheses, testing, and recording results—improved the accuracy of medical treatments and illustrates how scientific thinking developed over time.

Learning Objectives:

1. Identify the steps of the scientific method (ask a question, make a hypothesis, experiment, observe, analyze, and conclude).
2. Explain how pharmacists in the 1800s used experimentation to test remedies (even if they didn't call it the "scientific method").
3. Compare past beliefs about disease (miasma theory) with modern germ theory and how the scientific method contributed to that shift.
4. Design their own simple experiment inspired by historical pharmacy practices.

History of How the Scientific Method Improved Patient Care

In the early 19th century, pharmacy and medicine were still deeply influenced by traditional beliefs rather than scientific testing. Many pharmacists prepared remedies based on recipes passed down for generations, guided by the miasma theory—the idea that “bad air” caused disease. Treatments were often chosen because they had been used for centuries, not because they had been tested for effectiveness. However, as the century progressed, pharmacists began adopting methods that reflected the steps of the scientific method: asking questions, forming hypotheses, experimenting with remedies, and recording observations. This shift laid the groundwork for more reliable treatments and improved patient care.

One of the first major steps toward evidence-based medicine in the United States happened in New Orleans. In 1804, Louisiana passed the first law requiring pharmacists to be licensed, marking the beginning of professional medical regulation in the country. By 1816, Louis Dufilho Jr., working at 514 Chartres Street (now the New

Orleans Pharmacy Museum), became the first licensed pharmacist in the United States. This was a groundbreaking moment in American medical history—Dufilho was legally required to demonstrate his knowledge of chemistry, botany, and compounding, proving that his remedies were based on training and observation rather than guesswork. The Pharmacy Museum stands today as a physical reminder of this shift: it represents the moment when pharmacy in America began to formally embrace the scientific method.

The movement toward standardizing medical practice continued to grow nationally. In 1847, physicians created the American Medical Association (AMA) to establish consistent medical education and encourage doctors to base treatments on scientific research rather than tradition. Pharmacists and physicians increasingly published findings, shared observations, and built a professional community committed to testing and improving their methods.

By the early 20th century, the federal government reinforced these scientific standards. In 1906, the creation of the Food and Drug Administration (FDA) marked a turning point in public health. For the first time, the government required that medicines and food be accurately labeled and free from dangerous, untested substances. This was a direct extension of scientific thinking—remedies could no longer be sold based only on promises; they had to be tested, measured, and proven safe.

By the end of the 19th century and into the early 20th century, pharmacy had transformed from an art based on tradition to a science based on experimentation. The steps of the scientific method—careful observation, testing, and drawing conclusions—became the foundation of modern pharmacy and medicine. The AMA, licensing laws, and the FDA all reflect a single idea: that organized scientific inquiry leads to better, safer treatments and healthier patients—and the Pharmacy Museum represents where that transformation first took hold in the United States.

Student Activity: Pharmacy Experiment Log

Instructions

1. Find an artifact in the museum that pharmacists in the 1800s might have used to treat illness (a jar of herbs, leeches, trephination drill etc.).
2. Imagine you are a pharmacist in the 19th century trying to figure out if this treatment actually works.
3. Use the steps of the scientific method to do a thought experiment about how you would test whether this artifact has real medicinal value.

Identify Your Artifact: What did you choose? Why do you think pharmacists believed it could help patients?

2. Ask a Question: What are you trying to find out about how this artifact would treat people?

3. Make a Hypothesis: What do you think will happen to the patient when they receive the treatment? Why?

4. Plan Your Experiment: How would you test your idea if you were a pharmacist in 1850?

- What would you do?

- What tools would you use to test your results?

- How would you measure or observe?

5. Observe & Record: What might you notice while testing the treatment? Describe and draw what you think you would see.

6. Conclusion: What would you learn from your experiment? How would that apply to how you would treat patients in the future?
