From Plant to Prescription

Trace how historical remedies became modern medicines

BOT.4.3 "Investigate historical and modern medicinal uses of plants."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle each plant name, underline its historical medicinal use, and write a number beside its modern medical use. Use your marks to trace how each plant's use changed.

Three Plants, Three Medical Histories

1. Imagine a healer stripping bark from a willow beside a river. For centuries, people in several regions used willow preparations to ease pain and fever. Willow bark contains salicin, which the body converts to salicylic acid. Studying this chemistry helped scientists develop aspirin, a manufactured medicine with a related chemical structure. Today aspirin can reduce pain and fever, and low doses are prescribed for some patients to lower the risk of blood clots. A cup of bark tea is not the same as a measured aspirin dose: the amount of active chemicals in bark can vary.

2. In the 1700s, English physician William Withering investigated foxglove after hearing about a plant mixture used for dropsy, a buildup of fluid that can occur with heart failure. He documented how foxglove could help some patients, but he also warned that too much could be dangerous. Today the medicine digoxin, obtained from foxglove plants, can help certain patients with heart failure or irregular heart rhythms. It affects how the heart beats, so clinicians measure doses carefully and watch for side effects. This history shows why observing a useful effect is only the start of testing a medicine.

3. Sweet wormwood offers another path from plant to medicine. Ancient Chinese writings described using this plant for fever. In the twentieth century, scientist Tu Youyou studied old medical texts while searching for a malaria treatment. Her team found a way to extract artemisinin, a compound from sweet wormwood that works against malaria parasites. Modern malaria treatment commonly combines an artemisinin-based drug with another drug to reduce the chance that resistant parasites survive. Drinking sweet wormwood tea is not a reliable substitute for these tested medicines. The plant's story connects historical clues with laboratory research and clinical care.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does willow's historical use connect to aspirin's modern uses, and what changed in the medicine itself?

2. What did Withering learn about foxglove, and how does modern use of digoxin address the risk he noticed?

3. How did an old use of sweet wormwood contribute to a modern malaria treatment? Identify what researchers did beyond reading the old texts.

4. Compare two plants in the passage. Why is a preparation of either plant not necessarily a substitute for its modern medicine?

3 YOUR TURN

Your own words

Choose one plant in the passage and write a five-sentence research proposal. Include its historical clue, a new testable question about a medicine linked to it, a comparison group, a measurable outcome, and a safety check.

From Plant to Prescription

PART 1 · READ AND MARK

Circle each plant name, underline its historical medicinal use, and write a number beside its modern medical use. Use your marks to trace how each plant's use changed. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does willow's historical use connect to aspirin's modern uses, and what changed in the medicine itself?	**People used willow preparations for pain and fever. Research on willow chemistry helped scientists develop manufactured aspirin, which has measured doses and is also prescribed at low doses for some patients to lower blood-clot risk.**
2	What did Withering learn about foxglove, and how does modern use of digoxin address the risk he noticed?	**Withering found that foxglove helped some patients with dropsy but could be dangerous in excess. Clinicians now measure digoxin doses carefully and watch for side effects.**
3	How did an old use of sweet wormwood contribute to a modern malaria treatment? Identify what researchers did beyond reading the old texts.	**Old writings described sweet wormwood for fever. Tu Youyou studied those texts, and her team extracted artemisinin, which works against malaria parasites.**
4	Compare two plants in the passage. Why is a preparation of either plant not necessarily a substitute for its modern medicine?	**Willow bark contains variable amounts of active chemicals, unlike a measured aspirin dose. Sweet wormwood tea is not a reliable substitute for tested artemisinin-based drug combinations.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Ancient Chinese writings about sweet wormwood and fever give a historical reason to investigate the plant, not proof that its tea treats malaria. I would ask whether a proposed new artemisinin drug combination works better than an existing combination against malaria parasites. In a laboratory, I would give equal starting samples of parasites measured concentrations of each combination. I would count surviving parasites after the same time interval. I would also test the combinations for harm to healthy human cells before considering a clinical study.

Accept proposals that use a passage-based historical clue and specify a testable comparison, a measurable outcome, and a relevant safety check. Students need not name specific laboratory equipment or drugs beyond those in the passage.