Teacher's Guide

Lesson Title

How Do Scientists Help Us Stay Healthy?

Big Idea

Biomedical scientists study our bodies and germs to figure out how to keep people healthy.

Learning Objectives

By the end of the lesson, students will be able to:

1. Explain what biomedical researchers do (in simple terms)
2. Describe how scientists ask questions and test ideas
3. Use evidence to make a simple health-related decision
4. Explain why observing is important

Alignment with NGSS

- Asking questions and defining problems
- Planning and carrying out investigations
- Analyzing and interpreting data
- Obtaining, evaluating, and communicating information

Materials (Low-Cost & Simple)

- Paper towels
- If no sink use spray bottle with water and pan to collect water
- Glitter or colored chalk dust (represents "germs")
- Soap and water (or hand sanitizer instead
- Chart paper or whiteboard
- Crayons or pencils

Vocabulary (Post on Board)

- Scientist – a person who asks questions and looks for answers
- Research – careful method of or step by step study to learn new things
- Germs – tiny living things (microbes) that can make us sick
- Evidence – clues that help us decide what are facts

Lesson Plan

Lesson Flow

(45 Minutes)

Procedure:

1. **Warm-Up: What Do Scientists Do? (5 minutes) list on board.**

Ask:

- "What kinds of scientists have you heard of?"
- Some examples: astrophysicists, chemists, geologists, marine biologists, engineers
- But today we're focusing on:
  - **Geneticist** – Investigate genes, heredity, and DNA to understand how traits are passed from one generation to the next.
  - **Laboratory Animal Veterinarian** – Oversee the health and welfare of animals used in research by providing medical care, ensuring humane treatment, and supporting ethical and regulatory compliance in scientific studies.
  - **Biologist** – Study living organisms and life processes, including their structure, function, growth, evolution, and interactions with the environment.
  - **Immunologist** – Study the immune system and how organisms defend themselves against disease.
  - **Biomedical Scientist** – Use all these fields to investigate diseases, treatments, and prevention strategies to improve human health through laboratory studies, clinical research, and data analysis.

2. **"How might these scientists help doctors or nurses?"**

Write student ideas on the board.

Some examples:

- Developing new medicines and vaccines that healthcare providers use to prevent and treat diseases.
- Studying diseases to understand how they start, spread, and affect the body, which helps improve diagnosis and treatment.
- Creating medical tests and technology (like blood tests, imaging tools, and diagnostic kits) that doctors and nurses use to care for patients.
- Researching better procedures and therapies to make treatments safer and more effective.
- Providing evidence-based data so healthcare professionals can make informed decisions about patient care.

Teacher note: Gently introduce the term biomedical scientist as someone who studies the body, germs, and health.

Biomedical Scientists develop the knowledge and tools that doctors and nurses use to keep people healthy.

3. Story Hook: A Real-World Problem (5 minutes)

Tell a short story:

"A long time ago, doctors didn't know why people got sick after touching things. Scientists wondered: *Could something tiny be spreading illness?*"

Ask:

- "How could scientists test that idea?"
- "What clues would they look for?"
- What could be done to help people if they found out what was making people sick?

3. Hands-On Activity: The Germ Experiment (15 minutes) Divide class into groups of 3–4 or more if needed. Each group should have a student be the "tester," a student to read the procedure steps, one to record results, and another to ensure the steps were completed properly. Smaller groups engage the students better.

Step 1:

- Lightly sprinkle glitter/chalk dust on one student's hands. Can do multiple students as well.
- Have them gently touch a paper towel.

Ask:

- "What do you see?"

Step 2:

- Have the student wash hands with water only and then touch a clean paper towel.

Ask:

- "Did the 'germs' go away?"

Step 3:

- Have the student wash with soap and water and then touch a clean paper towel.

Ask:

- "What changed?"

Key Point: Scientists test different ideas to see what works best.

4. "How might these scientists help doctors or nurses?"

On chart paper (or white board or overprojector), make a simple table:

QUESTION	TEST	EVIDENCE	CONCLUSION

TEACHER'S KEY:

QUESTION	TEST	EVIDENCE	CONCLUSION
How do we get rid of germs?	Water	Germs still present	Soap helps remove germs better
	Soap & water	Removed more germs	

Explain:

"Imagine that the glitter is germs. Research and testing like this is how biomedical researchers learn what makes people sick and what can also make people healthy."

5. Creative Wrap-Up: Be a Biomedical Scientist (10 minutes)

Students draw or write about:

- The question they studied
- The test they did
- What they learned

Optional sentence starter:

"Biomedical scientists help people by _____."

Assessment (Simple & Informal)

Look for:

- Correct use of words like *scientist* and *evidence*
- Ability to explain what worked and why
- Participation in discussion and activity

Extensions (Optional)

- Health connection: When should we wash our hands?
- Math tie-in: Count how many "germs" remain after each step; amount of glitter, water used ; time they washed their hands.
- Writing: Write a short note teaching someone else what they learned

Take-Home Message for Students

"Biomedical Scientists ask questions, test ideas, observe, and use evidence to help people stay healthy."