

Lesson Adapted to Different Age Level Homeschoolers



Family Biomedical Research Lesson

How Do Scientists Test Health Ideas?

Ages:

Grades 3–8

Time:

60–90 minutes total (plus short daily observations)

Shared Big Question (Everyone)

Does washing hands with soap reduce the spread of germs?

All children participate in the same experiment, but complete different thinking and output tasks.

Materials (Shared)

- Bread slices (2 per child or shared)
- Sealable plastic bags
- Soap and water
- Paper towels
- Notebook paper or printed sheets
- Crayons / pencils / ruler

Lesson Structure (Whole Family Together)

Part 1: Family Discussion (10 minutes)

Ask everyone:

- “Why do people wash their hands?”
- “How do we know it helps?”

Explain:

“Biomedical scientists test ideas to find evidence before giving health advice.”

Keep language simple; let older kids help explain.

Part 2: One Experiment, Different Roles (20 minutes)

Experiment (Done Once as a Family)

- Touch bread with unwashed hands, put in Bag A and seal.
- Wash hands with soap (20 seconds) → touch bread → put in Bag B and seal.
- Label “Bag A - Unwashed,” “Bag B- Washed,” and store safely



Assign roles:

- Younger child: materials helper & observer
- Middle child: labeler & recorder
- Older child: procedure checker & hypothesis writer

Differentiated Learning Tasks

Grades 3–4 (Upper Elementary)

Focus: Observation & Simple Reasoning

Tasks:

- Draw bread on Day 1, Day 3, Day 5
- Circle which bread changed more
- Complete sentence:
“Soap helps because _____.”

Assessment:

- Can explain what they saw
- Can say which bread had more “germs”

Grades 5–6 (Transition Level)

Focus: Basic data & evidence

Tasks:

- Write a hypothesis
- Fill in a data table
- Answer:
 - ☐ Was the hypothesis supported?
 - ☐ What could improve the experiment?

Assessment:

- Clear reasoning
- Connects evidence to conclusion
- Cause and effect thinking

Shared Observation Table (Post on Wall)

Day	Unwashed Bread	Washed Bread
1		
3		



Younger kids can draw; older kids can write descriptions.

Family Science Discussion (10–15 minutes)

Ask everyone:

- “What did we notice over time?”
- “Why do scientists repeat experiments?”
- “How could this help doctors or schools?”

Encourage older kids to explain concepts to younger ones.

Output Options (Choose Per Child):

- Drawing + oral explanation (younger)
- One-page lab summary (middle)
- Mini lab report or poster (older)

Safety & Practical Notes

- Do not open bags after sealing
- Dispose of sealed bags after observations
- This is observation, not consumption

Big Takeaway (Say Together)

“Biomedical scientists test ideas and use evidence to help people stay healthy.”

Optional Extensions (Age-Scaled)

- Younger: Practice proper handwashing song
- Middle: Graph changes over time
- Older: Research how hospitals use hand hygiene data

Parent Guide



Below is a fully scripted, step-by-step parent guide for the lesson “How Do Biomedical Researchers Test Health Ideas?”

It is written so a parent can read it aloud, with exact wording, pause points, and optional prompts, and it works for multiple children at different grade levels

FULLY SCRIPTED PARENT GUIDE

Lesson Title: *How Do Biomedical Researchers Test Health Ideas?*

Ages:

Grades 3–8 (adaptable)

Total Time:

60–75 minutes + short daily observations

Parent Role:

Guide, narrator, question-asker (not lecturer)

BEFORE YOU START (Parent Prep – 5 minutes)

- Set out materials:
 - ☐ Bread slices (2 per test)
 - ☐ Sealable plastic bags
 - ☐ Soap, water, paper towels
 - ☐ Paper, pencils, crayons
- Choose a clear workspace
- Decide roles if you have multiple children (helper, recorder, observer)

PART 1: OPENING SCRIPT – WHAT IS BIOMEDICAL RESEARCH? (10 minutes)

Parent Says (Read Aloud):

“Today, we are going to act like biomedical researchers.”

Pause.

“Biomedical researchers are scientists who study the body, health, and disease to help people make better decisions and stay healthy.”

Ask (to all children):

- What are some ways people try to stay healthy?”
- “How do we *know* those things actually help?”

(Allow all answers. Do not correct yet.)

Parent Says:

“Scientists don’t guess. They test ideas and look for evidence. That’s what we’re going to practice today.”

PART 2: INTRODUCING THE BIG QUESTION (5 minutes)



Parent Says:

"Here is today's big research question: Does washing hands with soap reduce the spread of germs?"

Ask:

- "What do you think?"
- "Why might soap make a difference?"

For Older Children (Grades 6–8), add:

"Scientists call your prediction a hypothesis. It's a testable idea."

Optional prompt:

- "Can someone say our hypothesis in one sentence?"

Example (you can model if needed):

"If we wash our hands with soap, fewer germs will spread."

PART 3: SETTING UP THE EXPERIMENT (20 minutes)

Parent Says:

"Scientists follow the same steps every time so their test is fair. Let's do this carefully."

Step 1: Unwashed Hands

Say:

"First, we are testing what happens without washing hands."

Have a child touch the bread.

Say:

"This bread represents what germs might spread onto things we touch."

Place in a bag and label:

"Unwashed hands"

Step 2: Washed Hands

Say:

"Now we test washing hands with soap, the way scientists recommend."

Have the child wash hands for ~20 seconds.

Say:

"Soap helps remove germs from skin."

Have them touch the second bread slice.

Place in bag and label:

"Washed hands"



Parent Checkpoint Question:

Ask younger kids:

- “Which bread had washed hands?”

Ask older kids:

- “What is the *one thing* we changed in this test?”

(Guide them to: handwashing)

PART 4: EXPLAINING VARIABLES (5 minutes)

Parent Says (Simple Version for All):

“Scientists change one thing and watch what happens.”

For Older Children:

“The thing we changed is called a variable. The variable here is whether hands were washed with soap.”

Optional:

“Everything else stayed the same—that helps make it a fair test.”

PART 5: OBSERVATION & DATA COLLECTION (10 minutes now + daily)

Parent Says:

“We won’t open the bags again. Scientists observe safely.”

Show the observation table.

Say:

“Each day, we will look, draw, or write what we notice.”

Assign by age:

- Younger: draw what they see
- Middle: describe changes
- Older: record patterns or comparisons

Ask:

- “What do you notice today?”
- “Do the two breads look the same or different?”

PART 6: DAILY CHECK-INS (2–5 minutes per day)

Parent Says Each Day:

“Today we are collecting more evidence.”

Ask:

- “What changed?”
- “Which bread changed more?”
- “What does that tell us?”

Encourage older kids to explain to younger ones.

PART 7: ANALYZING RESULTS (15 minutes)

After several days:

Parent Says:

“Now scientists ask: What does the evidence show?”

Ask (all ages):

- “Which bread had more changes?”
- “What evidence supports that?”

For Older Children:

Ask:

- “Was our hypothesis supported?”
- “What could we do differently next time?”

Model thinking if needed:

“Scientists don’t expect perfect experiments. They learn and improve. Scientists are always curious to know more and they ask a lot of ‘Why’ and ‘How’ questions.”

PART 8: CONCLUSION (10 minutes)

Parent Says:

“A conclusion explains what we learned from the evidence.”

Have children respond by level:

- Younger:
“Soap helps because _____.”
- Middle:
“The evidence shows _____.”
- Older:
“Based on the evidence, washing hands with soap reduces germ spread because _____.”

PART 9: REAL-WORLD CONNECTION (5–10 minutes)

Parent Says:

“Biomedical researchers don’t stop at experiments. They help people make rules.”

Ask:

- “Why do schools ask students to wash hands?”
- “Why do hospitals care so much about this?”

Optional ethics question (older kids):

- “Why is it important to test ideas before telling people what to do?”

FINAL TAKEAWAY (Say Together)

“Biomedical researchers test ideas and use evidence to help people stay healthy.”



SAFETY REMINDER (Parent Says)

“We will throw away the sealed bags without opening them. Scientists work safely.”



OPTIONAL FOLLOW-UPS

- Write a mini lab report (older)
- Create a poster explaining handwashing (middle)
- Teach a younger sibling or stuffed animal (younger)