⚗ Science in the Movies: Flubber (1997) — Teacher Answer Key

Grade Level: 4–8 | Topics: Chemistry · Material Science · Engineering Design · Innovation
Includes sample answers and teaching notes.

A. Science Connections — Suggested Answers

1. Type of Reaction: A chemical reaction — new substances form when components combine, changing properties like color and texture.
2. Unique Properties: Elasticity, high energy storage, and strong rebound (bounciness).
3. Importance of Testing: Ensures materials are safe and reliable before practical use.
4. Scientific Method: Brainard observes, tests, adjusts, and retests — demonstrating trial and error and observation.

Teaching Notes: Reinforce the difference between physical and chemical changes. Show short demos of polymer reactions (like slime or glue + borax) to connect fiction to real science.

B. Data & Analysis — Suggested Answers

1. Bounce Height: From 0.5 m → 5 m; from 1.2 m → 12 m (10× bounce height).
2. Energy Forms: Flubber stores potential energy when compressed and releases kinetic energy when it bounces.
3. Safety Steps: Wear goggles, gloves, label unknowns, and avoid contact until testing is complete.

Teaching Notes: Relate this to energy transfer and Newton's laws. Optional: have students test elasticity using different bouncy balls to collect real data.

C. Real-World Connection — Suggested Answers

1. Real Materials: Polymers like rubber, silicone, and slime show similar stretch and bounce properties.
2. Testing Materials: Engineers test elasticity, tensile strength, and durability through repeated stress tests.
3. Accidental Discoveries: Silly Putty (World War II rubber substitute), Teflon (non-stick coating), and Post-it Notes (adhesive failure turned success).

Teaching Notes: Link the movie to material engineering. Students can explore how polymers are used in sports, construction, and medicine. Great tie-in to invention and entrepreneurship lessons.

🧠 D. Reflection — Example Responses

• Flubber teaches curiosity, perseverance, and how creativity fuels innovation.
• Example response: “In science, mistakes can lead to discoveries that change the world.”

💡 Teaching Notes: Encourage students to reflect on invention stories — many scientific breakthroughs started as 'mistakes.' Have students share one modern invention that came from trial and error.

🔬 Did You Know?

Flubber behaves like a polymer — chains of molecules that stretch and store energy. This process, polymerization, is used to make rubber, glue, and plastic. Teachers can show real polymer models or videos to visualize this process.