## Core Skills Analysis

### Physics

- Learned how sound waves can transfer energy through vibration, affecting nearby objects.
- Observed resonance and how vibration frequency can cause particles like salt to move in patterns.
- Explored the relationship between wave energy and physical movement in a real-world context.
- Developed a basic understanding of the concept of frequency and amplitude impacting matter.

### Science Observation & Inquiry

- Cultivated skills in careful observation by noting how the salt responded to different sounds or volumes.
- Practiced formulating hypotheses about why salt moves or 'dances' when exposed to vibrating surfaces.
- Engaged in experimental thinking by adjusting speaker settings to see varied effects on the salt.
- Learned cause and effect by linking sound vibrations to physical particle behavior.

### Tips

To deepen understanding of sound waves and vibrations, encourage your student to experiment with different materials (rice, sand, water) on the speaker to observe diverse reactions. Discuss wave properties like frequency, amplitude, and resonance, perhaps using online simulations to visualize sound waves. Extend the activity by exploring musical instruments or creating DIY experiments that demonstrate wave interference and standing waves. Encourage documenting observations with sketches or video to enhance reflective learning and scientific communication skills.

### Book Recommendations

- The Science of Sound by Steve Parker: An accessible introduction to how sound works, including waves, vibrations, and their effects.
- Sound and Music: A First Book for Children by Shirley Duke: A child-friendly exploration of sound concepts through everyday experiences and musical examples.
- Vibrations and Waves by Ira M. Freeman: A textbook-style deep dive into wave physics, ideal for curious middle school learners.

### Learning Standards

- CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments.
- NGSS MS-PS4-1: Use mathematical representations to describe a simple model for waves.
- NGSS MS-PS4-2: Develop and use models to describe that waves are reflected, absorbed, or transmitted through various materials.

### Try This Next

- Worksheet comparing the effects of different frequencies and volumes on various granular materials.
- Drawing task: Illustrate how sound waves travel from a speaker to cause the salt to move.