

Getting a feel for the phenomenon: Activity 4: “Small Groups, Particle Interactions”

Exploring Solid, Liquid, Gas, and State Change

Goals & Rationale

- Help students experience how atoms/molecules behave in solids, liquids, and gases -- rather than only see diagrams
- Use students' bodies and movement to eternalize and explore abstract scientific ideas. This can make invisible phenomena (e.g., molecular motion, spacing, energy) accessible
- Support multiple ways of knowing (embodied, social, verbal, conceptual) -- serving diverse learners and offering culturally sustaining, engaging science learning
- Use Move About It cards to guide embodied inquiry, and encourage flexibility, creativity, and student-driven exploration.

Tips and Considerations for Implementation

- Provide plenty of physical space and clear norms for movement to ensure safety
- Combine embodied activities with reflection -- discussion, drawing, linking to diagrams/simulations -- to help students connect body experiences to scientific concepts
- Use multiple modalities (movement, talk, drawing, simulation) to support diverse learners and deepen understanding
- Consider rhythm or music (for fluid transitions or warm-ups), but ensure that movement goals remain clear
- Invite students to invent their own gestures, motions, or interpretations -- this honors student creativity, identity, and agency
- Use the cards to help students expand the ways they explore movement ideas in the space

Activity 4: “Small Groups, Particle Interactions” — Role Play & Group Movement

This activity uses small-group choreography / role-play to explore interactions among particles (e.g., attraction, collision, bonding) — helpful for pre-chemical bonding/reflection or deeper exploration of states of matter.

Setup: Break students into small groups of 4–6; open movement space. Optionally, provide “roles” (e.g., “high-energy particle,” “low-energy particle,” “sticky particle,” “fast particle,” “repelling particle”)

Movement Instructions:

- Give each student a “particle role” (with properties like energy level, attraction strength, mobility).
 - Sticky: move toward others, cling together, cluster, hold closeness
 - Repelling: move away when others come close, bounce off, avoid clustering
 - Energetic: move quickly, spread out, dart around
 - Low energy: move very slowly or barely move
- Ask the group to choreograph a short “particle interaction” — maybe representing liquid forming, gas diffusion, or a phase change — based on their roles. For example: high-energy particles bouncing, low-energy ones staying close, some particles attracting each other, some repelling, etc. (*Students can draw cards from the Move About It Deck to inspire different ways of moving. They can iterate on their choreography by choosing new sets of cards to apply to their movement phrases.*)

Facilitator Notes / Variations

- After each short movement sketch, pause and ask them to reflect: what did interactions look like? Which particles moved a lot, which stayed close? What emergent pattern emerged (clustering, dispersal, flow)?
- Have different groups “perform” their interactions and others guess which state or phenomenon they’re modeling.
- Reflection: Make connections in discussion between their embodied interactions to molecular-level phenomena (e.g., pressure, temperature, bonding, diffusion). Ask how changing one property (e.g., energy) would alter behavior.