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# Lesson Plan: Kai the Matter Explorer!

### Materials Needed:

- **For Station 1 (States of Matter):** A clear glass with a few ice cubes, a glass of water, a kettle or pot to boil water (with adult supervision), a small mirror or plate.
- **For Station 2 (Texture Test):** A shoebox with a hole cut in the top ("Mystery Box"), and a few items with distinct textures (e.g., a cotton ball, a piece of sandpaper, a smooth rock, a crinkly piece of foil, a soft piece of fabric).
- **For Station 3 (Flexibility & Shape):** A collection of small, safe items (e.g., a pipe cleaner, a rubber band, a wooden block, a paper clip, a piece of cooked spaghetti, a rock).
- **For the Grand Finale (Matter Creature Creation):** A bin of various craft supplies (modeling clay, pipe cleaners, googly eyes, fabric scraps, aluminum foil, popsicle sticks, etc.), paper, and crayons or markers.
- **"Matter Explorer" Notebook:** A simple notebook or a few sheets of paper stapled together for Kai to draw and write his observations.

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## Lesson Plan Details

### 1. Learning Objectives (The Mission)

By the end of this lesson, Kai will be able to:

- Identify and describe at least three observable properties of matter (like texture, hardness, flexibility, and state - solid, liquid, gas).
- Sort objects based on their physical properties through hands-on investigation.
- Apply his understanding of matter to creatively design and describe a unique "Matter Creature."

### 2. Introduction: The Explorer Briefing (5 minutes)

- **What to do:** Sit with Kai and introduce the big idea. Say something exciting like, "Kai, today you are going to be a 'Matter Explorer'! Your mission is to investigate the secret properties of everything around us. 'Matter' is just a science word for 'stuff.' Everything you can touch is matter, and all matter has special properties that make it different. Are you ready to explore?"
- **Key Question:** "What do you think makes a rock different from water?" (This gets him thinking about properties right away).

### 3. Instructional Activities: The Exploration Stations (25-30 minutes)

Set up the three stations around the room. Give Kai his "Matter Explorer Notebook" and explain that he will visit each station to investigate. Spend about 8-10 minutes at each station.

#### Station 1: The State of Things

- **Setup:** Place the glass of ice, glass of water, and have the kettle ready.
- **Activity:**
    1. Ask Kai to touch the outside of the glass with ice. It's a **solid**. It has its own shape. Ask him
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to draw it.
    2. Have him look at the glass of water. It's a **liquid**. Ask, "What shape is the water? What happens if we pour it into a different shaped bowl?" (Demonstrate if possible). Liquids take the shape of their container. Have him draw it.
    3. **ADULT SUPERVISION REQUIRED:** Carefully boil a small amount of water in the kettle. As the steam comes out, explain this is a **gas** called water vapor. Hold the cool, dry mirror or plate over the steam for a moment and show him the condensation (water droplets). Explain that gas spreads out to fill all the space it can.
- **Explorer's Log:** Kai draws the solid (ice cube), liquid (water in a glass), and gas (steam from the kettle) in his notebook.

Station 2: The Mystery Texture Box

- **Setup:** The "Mystery Box" with the various textured items inside.
- **Activity:**
    1. Explain to Kai that he must use only his sense of touch to investigate.
    2. He reaches into the box (no peeking!) and feels one object at a time.
    3. Ask him guiding questions: "Is it soft or hard? Smooth or bumpy? Rough or crinkly?"
    4. After describing it, he can pull it out to see if he was right.
- **Explorer's Log:** Kai can trace one of the objects and write one or two words to describe its texture (e.g., "bumpy," "soft").

Station 3: The Bend & Shape Challenge

- **Setup:** A tray with the collection of flexible and rigid items.
- **Activity:**
    1. Challenge Kai to test each object. Say, "Your mission is to see which of these objects are flexibleâ€”meaning they can bend without breakingâ€”and which are rigid, meaning they keep their shape."
    2. Let him try to bend the pipe cleaner, the rubber band, the wooden block, etc.
    3. Have him sort the items into two piles: "Flexible" and "Rigid."
- **Explorer's Log:** Kai draws a simple T-chart in his notebook. On one side, he draws an object that was flexible, and on the other, an object that was rigid.

4. Creative Application: Design a Matter Creature! (15-20 minutes)

- **What to do:** Now for the main event! Bring out the bin of craft supplies. Say, "Kai, you've explored solids, liquids, textures, and flexibility. Your final mission is to invent your very own 'Matter Creature' using these materials."
- **Instructions for Kai:**
    1. Use at least three different materials to build your creature.
    2. Think about the properties of the materials you are choosing. Is your creature's body soft like clay? Are its arms flexible like pipe cleaners? Does it have a shiny, smooth foil shield?
    3. Give your creature a name.
- **Assessment (Show and Tell):** Once he is finished, ask Kai to introduce his creature. Prompt him with questions like:
    - "Tell me about your creature. What is its name?"
    - "What properties does its body have? Is it soft, hard, squishy?" (He can point to the clay).
    - "Tell me about its legs. Are they flexible or rigid?" (He can demonstrate with the pipe cleaners).
    - "What is the texture of its wings?" (He can describe the fabric or foil).

  This is the key assessment. His ability to describe his creation using the vocabulary from the

lesson shows he understands the concepts.

5. Conclusion: Explorer Debrief (5 minutes)

- **What to do:** Admire his creature and his "Matter Explorer" notebook.
- **Review:** Briefly recap the big ideas. "Today you discovered that 'matter' is all the stuff in the world, and it has amazing properties like being a solid, liquid, or gas; having textures like smooth or rough; and being flexible or rigid."
- **Connect to the Real World:** "Look around the room! Can you point to a solid? A liquid? Something that is smooth? You're officially an expert Matter Explorer!"

Differentiation & Support

- **For Extra Support:** Provide a simple chart with pictures and words for properties (e.g., a picture of a rock labeled "Hard," a picture of a pillow labeled "Soft").
- **For an Extra Challenge:** Introduce another property, like magnetism (provide a simple magnet and items to test) or buoyancy (a small tub of water and items that sink or float). Ask "why" questions, such as "Why do you think the block is rigid but the pipe cleaner is flexible?"

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