Georgia Performance Standards Framework for Science – Kindergarten

Unit One Organizer:
(5 weeks)
Physical Properties of Matter

OVERVIEW: In this unit students will observe and experience many physical properties of various objects to better understand and differentiate matter. Students will have the opportunity to sort by color, size, shape, and other physical properties.

STANDARDS ADDRESSED IN THIS UNIT

Focus Standards:
SKP1. Students will describe objects in terms of the materials they are made of and their physical properties.
   a. Compare and sort materials of different composition (common materials include clay, cloth, paper, plastic, etc.).
   b. Use senses to classify common materials, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, texture, buoyancy, flexibility).

STANDARDS ADDRESSED IN THIS UNIT

Supporting Standards:
SKCS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.
   a. Use whole numbers for counting, identifying, and describing things and experiences.
   b. Make quantitative estimates of nonstandard measurements (blocks, counters) and check by measuring.
SKCS5. Students will communicate scientific ideas and activities clearly.
   a. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.
   b. Begin to draw pictures that portray features of the thing being described.
**ENDURING UNDERSTANDINGS**

- Objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.).
- Objects can be described and sorted by physical properties (color, size, shape, weight, texture, flexibility, etc.).

**ESSENTIAL QUESTIONS:**

- Why do we sort objects?
- How do our senses help us sort objects?
- How are objects’ materials different from one another?
- How can we describe the way objects feel?

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<tr>
<th>MISCONCEPTIONS</th>
<th>PROPER CONCEPTIONS</th>
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| - Objects of like color have like composition  
  - Objects of like size have the same weight | - An object’s composition may or may not be determined by physical attributes  
  - The weight of an object is determined by its composition as well as its size |
### Concepts:
- Classification
- Physical Attributes
- Material Composition

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<th>KNOW AND DO</th>
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| • Compare and sort materials of different composition (common materials include clay, cloth, paper, plastic, etc.)
• Use senses to classify common materials, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, texture, buoyancy, flexibility, etc.). | Sort
Describe
Color
Shape
Alike
Different | • Properly describe materials in the terms that they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, etc.). |
## EVIDENCE OF LEARNING

**Culminating Activity:** Sort materials for recycling

### GRASPS

**Goal:** To sort materials according to their physical properties

**Role:** You are a recycler

**Audience:** The recycling center

**Scenario:** Your teacher must deliver some materials to the recycling center this afternoon, and the recycling center asks that all materials be sorted before they are delivered. Your teacher will give each student a small bag of recyclable materials. She will have boxes marked “Paper, Cardboard, Plastic, Aluminum Cans”

**Product:** Items sorted correctly into the recycling bin
## Sequence of Activities, Tasks, and Assessments for Organization

<table>
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<th>TASKS</th>
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<td><strong>The collection of the following tasks represents the level of depth, rigor and complexity expected of students to demonstrate evidence of learning</strong></td>
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**Task: Describing Items**  
**EQ: How do we share what we see with others?**  
**Description:** Ask the students if they have ever played a game called “I Spy”? Demonstrate how the game works telling the students that you spy something of a specific color and ask the students to guess what you see. After using several colors as descriptors change so that it is not the color, but the composition of the item that is the descriptor (cloth, wood, metal, etc.). Explain that people who study and observe the world around them can learn a lot about how things work.

**Task: Comparing Attributes**  
**EQ: How are things alike? How are things different?**  
**Description:** Fill two bags with a number of similarly sized objects: crayons, colored pencils, popsicle sticks, straws, pipe cleaners, etc. The number of items should match the number of students. Pull an object from the bag and hand it to each child, stopping to ask the child to describe the object. When each child has an object, pass the second bag and ask the students to place their hand in the bag and feel for another object—do not let them look in the bag—when they pull the object out they must say how it is like and how it is different from the first object they were given.  
**Assessment:** Observation
TASKS ON SORTING
The following tasks require that the teacher assemble a variety of different sorting materials (counters, beads, buttons, marbles, pasta, etc.) and either commercial or teacher-made laminated sorting mats. Sorting mats may display tables with columns, Venn diagrams, or other graphic organizers. Students need multiple opportunities to engage in sorting objects. Examples below sequence from sorting by a single attribute and build to more complex sorting activities. Within a single sorting category (by a single attribute, by multiple attributes, etc.) no specific sequence is required.

Task: Sorting by a Single Attribute -- Color
Description: Students will receive an assortment of similar items that differ only by one attribute—color. Call on students to describe the items they have been given. Show the students two clear containers. The color word should be written on each of the containers. Explain that the items must be returned to their original containers. Ask the students to separate the items by their color using their sorting mats.
Assessment: Observation of objects on mats
Extension: Students can count and record the items of each color and when appropriate may be measured using measuring cups or containers of graduated sizes.

Task: Sorting by a Single Attribute -- Shape
Description: Students will receive an assortment of similar items that differ only by one attribute—shape. Call on students to describe the items they have been given. Show the students clear containers. The shape name should be written on the containers. Explain that the items must be returned to their original containers. Ask the students to separate the items according to their shape using their sorting mats.
Assessment: Observation of objects on mats
Extension: Students can count and record the number of items of each shape and when appropriate measured using measuring cups or containers of graduated sizes.

Task: Sorting by Single Attribute -- Texture
Description: Provide students with four inch squares of fabric with different textures, paper, and crayons. Have students make rubbings of each of the textures and then exchange their paper with a partner. Ask them to try and match the cloth to the appropriate rubbing.
Assessment: Ask students to describe why they think the sample matches the rubbing they have chosen—allow them to do a second rubbing to check the accuracy of their observations.
Task: Sorting with a Single Attribute -- Varied
Description: Students are given supermarket sale papers, toy catalogs, or other readily available print materials with colorful pictures. Students are asked to cut out and glue objects according to size or color. For example, students may cut out apples, tomatoes, and cherries as examples of red items. Students might cut out a car, elephant or house as examples of large items and cut out and paste photos of ants, peanuts, or raisins as examples of small items.
Assessment: Observation
Extension: Students can be asked to determine sorting categories on their own and then explain why the objects are grouped together.

Continue as above, sorting by other attributes one by one--composition, size, flexibility, buoyancy, etc.
**Task:** Sorting with Multiple Attributes  
**Description:** Students will receive an assortment of bottle caps. Some are plastic and some metal. Some are red and some are yellow. Students will be asked to sort the caps by color, then by composition.  
**Materials:** An assortment of bottle caps, some plastic and some metal with two colors. Coke products with plastic caps and metal caps can be found in red and Yoohoo products with yellow metal and yellow plastic lids can be found.  
**Assessment:** Observation  
**Extension:** Repeat with other materials and attributes, monitoring the sorting mats to assess student understanding.

**Task:** Sorting with Multiple Attributes  
**Description:** Give each student an assortment of objects (pasta, beads, counters, buttons, etc.). The teacher then gives a series of clues as to the objects he/she is seeking—the object is not yellow, the object is not made of wood, the object……until objects of only one type remain on the student’s sorting mat and the others are eliminated  
**Assessment:** Observation; students may be asked to draw or describe the remaining object(s).  
**Extension:** Repeat with other materials and attributes, monitoring the sorting mats to assess student understanding.

**Task:** The Button Box by M. Reid  
**Description:** This book is based on a child’s examination of a box of collected buttons. This book is used most effectively when the teacher has a collection of buttons similar to the ones described in the book. The teacher should read the book aloud to the whole class, then share his/her own special box of buttons. The buttons can be scooped from the box and placed on a paper plate or in a Ziploc bag and distributed to students. The students are encouraged to sort the buttons determining their own system of sorting.  
**Assessment:** Students explain or draw their sorting methods when they have separated the buttons according to attributes they determine.  
**Extension:** Students can be asked to describe items they have collected.

**Task:** Shape Sort  
**Description:** Students are given tracing patterns and must trace and cut out their own set of construction paper shapes in a variety of colors. Using those shapes the students construct a picture with glue.  
**Assessment:** The students must count and record the shapes used (3 red circles, 2 green squares, etc.). Teachers can use a copied sheet of the shape outlines so that students use matching crayons to color the shapes used in the picture which is attached to the art project the student created. This becomes an assessment tool.
**Task:** Touch Bag or Touch Box

**Description:** Students are given a brown paper bag or a small box (such as a shoe box) through which objects cannot be seen. The students are asked to stick their hand in the bag or box to use their sense of touch to determine what is in the bag. Teachers may have two of each object – placing one set on a table and an object (or objects) from the other set in the bag. Some examples of objects that might work for an activity such as this are small plastic or wood blocks, erasers, paper clips, play money coins, etc. Can students match their sense of touch to their sense of sight by making observations?

**Assessment:** If done in pairs, students could assess one another. If set up as a science center, students could self assess.

**Extension:** Students may create their own touch bag at home and bring it in to share, or may simply bring objects to contribute to the touch bag collection.

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## TEACHER INFORMATION AND RESOURCES

**Children’s Literature**
- Trumbauer, Lisa, (1997), *What is Matter?*

**Teacher Resources**