

Enhancement Activities/Strategies for Gifted/High Ability Learners: Sample Science Learning Plan

Big Idea/ Topic

Physical Attributes

Standard Alignment

SKP1. Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.

- Ask questions to compare and sort objects made of different materials. (Common materials include clay, cloth, plastic, wood, paper, and metal.)
- Use senses and science tools to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture).
- Plan and carry out an investigation to predict and observe whether objects, based on their physical attributes, will sink or float.

SKE2. Obtain, evaluate, and communicate information to describe to describe the physical attributes of Earth materials (soil, rocks, water, and air).

- Ask questions to identify and describe Earth materials – soil, rocks, water, and air
- Construct an argument supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture and color).
- Use tools to observe and record physical attributes of soil such as texture and color.

Crosscutting Concepts: Patterns, Scale, Proportion, and Quantity

Physical Attributes in Kindergarten

SKP1. 2; SKP1. 2; SKL1. 2: The important skill of sorting and classifying objects using physical attributes is prominent in each of the standards in kindergarten. In kindergarten, students will observe, compare, and contrast. Students need sufficient practice in asking questions and developing models to classify objects: those being seen in the sky (day/night/both), rocks based on their physical attributes (size, weight, texture, color), soils (texture/color), objects based on materials they are made from (cloth, clay, plastic, wood, paper and metal), common objects based on physical attributes (color, size, shape, weight, texture, sink/float), based on the relationship between an object's physical attributes and its resulting motion, objects as living and nonliving, grouping plants and animals according to their features (also noting similarities/differences between offspring and parents). Similar skills are addressed in math when students describe shapes and work with sets of objects. For the purposes of this lesson we are focusing on SKP1 and SKE2.

At home, science standards for kindergarten can be supported as students develop models to communicate the changes that occur in the sky during the day, as day turns into night, during the night and as night turns into day using pictures and words. Rocks, soil, water, and common objects should be used for sorting/classification. To study motion when force is applied, students can use personal toys, canned products, etc.

Advanced Research

- Students who are advanced thinkers always want to know WHY. These videos will help students understand the “why” behind many of the topics in this unit. (These are all video links since young students may not be able to read well.)
 - (1) Sci Show Kids’ [Why Do Ships Float?](#)
 - (2) Sci Show Kids’ [Diamonds: The Hardest Rock in the World](#)
 - (3) Sci Show Kids’ [What’s the Dirt on Dirt?](#)
 - (4) Sci Show Kids’ [Be a Rock Detective](#)
 - (5) Kid’s Academy’s [Physical Properties of Materials](#)
 - (6) Peep and Big Wide World’s [A Peep of a Different Color](#)
 - (7) PBS Learning Media’s Hero Elementary [The Blob](#)
 - (8) PBS Learning Media’s Hero Elementary [The Right Stuff](#)
- Have students conduct their own investigations to research which items float and which do not. Challenge them to research resources they could use to make non-floating objects float and test their ideas.

Communication

- Have students create Five Senses organizers to help add detailed information to their writing. Share a few objects that students can observe using their five senses. Some fun objects to explore include miniature pickles, giant marshmallows, small sugary drink bottles, blueberries, or popsicles. Have student complete a [Five Senses Observations Chart](#). Then have students write informational pieces about the items they observed using their five senses. Challenge students to always think about their senses when adding details to their writing.
- Have students practice creative writing by writing a “What does the Rock Say?” story. (You can even play the [“What Does the Fox Say?” song](#) if you want to help students get inspired.) Challenge students to think like a rock and imagine some things they would say. Encourage students to think about how they could include some of the attributes of the rocks they observed during this unit. Record ideas on [this document](#). Then have students use their phrases in a story where the main character is a talking rock.
- Make a list of the attribute words students use when describing sets of objects during this unit. Teach students that adjectives are describing words. Sort students’ words into parts of speech categories. Challenge each student to write a story using adjectives to describe the people, places, or things in his/her story. Model an example. Have students circle the adjectives they used in their stories.

Critical Thinking and Critical Problem-Solving Skills

- Play the Mystery Bag game with students to practice asking questions and using attribute phrases. Place an item in a bag and challenge students to figure out what's in your bag by only asking yes and no questions. See if students can guess the object with 20 questions or less. Have a student keep track of how many questions have been asked by using tally marks to model how to organize data.
- Think about attributes your students can explore that give them opportunities to measure. For example, measure the circumference or weight of rocks. Record each data point on a separate index card (or draggable text box for virtual students). Have students collect measurement data then sequence the items in order from smallest to largest or largest to smallest based on the data. Encourage students to look for and discuss patterns in the data as well.
- Have students collect data about their classmates, such their eye colors, hair colors, whether they have freckles or not, the types of shoes being worn, etc. Demonstrate how students can be part of different groups, depending on the attributes used to sort them. Show students how we can use a pie chart to easily compare the data we collected. Have several copies of a pie chart made that is divided into the number of sections equivalent to the number of students in your class. Explore the data from one trait together as a class example. Challenge your students to make pie charts for the other data sets. This activity also a good time to practice counting and one-to-one correspondence.
- Try the "Can you make an Egg Float?" experiment. Give students a container of water and a plastic egg. (If your eggs have holes in the end, cover them up with tape.) Have a collection of small items on hand that students could put inside their eggs (such as coins, washers, beads, paper clips, plastic cubes, etc.). Have students test the egg to see if it sinks or floats. Challenge students to see how many different ways they can make the egg sink. Have them record their findings on a data sheet (For example: My egg sank with 12 pennies / 5 washers / 40 beans, etc. You may even have students try putting different amounts of water inside their egg to see if they can get the egg to sink using only water inside. Challenge your advanced students to measure how much water they had to put inside the egg to make it sink.

Creative Thinking and Creative Problem-Solving Skills

- Help students develop creative fluency and flexibility by having them create as many different groups as possible when sorting a collection of items. Challenging students to create many different groups stretches their creative thinking. You can also challenge them to write or record as many different attributes as they can to describe an item or draw as many items as they can think of that meet a certain attribute rule. Here are a few [examples](#) students can try.
- Have students play the Opposite Attributes game to stretch their creative thinking. Use one

of their attribute lists from a previous investigation for this activity. For example, if a student described a rock as small, gray, hard, and bumpy, their challenge would be to draw and label the exact OPPOSITE object. They might, then, draw and label a rock that was large, colorful, soft, and smooth.

Awareness of Self—Student’s Well-being

- Like the items explored during the physical attributes investigations in this unit, gifted students are unique and diverse as well. These investigations provide a great time to talk about and celebrate unique talents and differences among students. Some gifted students don’t feel like they fit in because they often think very differently than their peers. This unit provides a unique opportunity to celebrate what makes each of your students unique and special.
- Be aware that some gifted students have sensory over-excitabilities. Students with sensory over-excitability receive more input from their senses than expected. This could show up as a strong reaction to sounds, light, and textures, or tastes. This reaction could be positive, with a desire to continue experiencing a sensation, or negative, driving the student away from the stimulus. (Byrd, 2020) Be sensitive to extreme reactions you may see from some students during sensory investigations throughout this unit.