

K.AP.1 Algorithms and Programming

The student will apply computational thinking to identify patterns and sort items into categories based on an attribute. (a) Identify attributes of a set of objects. (b) Compare two objects and list attributes they have in common. (c) Sort and classify concrete objects based on one attribute.



Understanding the Standard

This standard introduces students to computational thinking as a problem-solving approach in computer science. Computational thinking involves four components: decomposition, pattern recognition, abstraction, and algorithm design. At the Kindergarten level, students will practice decomposition, or breaking down a concept into smaller parts, by identifying the attributes of a set of objects. Attributes may be visual (color, shape, size), textural, or even based on movements, like rolling, sliding, turning, or stopping. When sorting objects into categories, Kindergarteners will also apply abstraction by focusing on sorting objects by one important attribute and ignoring irrelevant characteristics.

Term	Definition
Attribute	Words that describe something.
Computational thinking	A problem solving approach that involves breaking problems down into smaller steps, identifying patterns, focusing on important details and designing efficient solutions.
Compare	To look for things that are the same.

Prerequisite Knowledge

To engage with this standard, students need to be able to name and identify an object's attributes, such as color, shape, size, and texture. They should also demonstrate a working knowledge of "same" and "different."

Integration Opportunities

English K.LU.1.d Students use adjectives to describe object attributes.

Math K.MG.2b,c,f Students construct plane figures using materials such as straws, sticks, or pipe cleaners. They then describe their figures by identifying the number of sides and vertices and using terms like 'round' or 'curved' to describe a circle.

Science K.1c and K.3 Students investigate and describe the physical properties of an object, including color, shape/form, texture, size, or weight, and classify objects based on a single physical characteristic or property.

Visual Arts K.3 b Students examine objects around them based on their visual qualities (location, size, color, texture, line, shape, pattern).

Summary of a Lesson

Provide students with a set of objects to categorize (e.g., leaves from different species of plants, blocks, art supplies). Lead students to describe items as pictured so that they are considering size, color, texture, shape, and form as a whole group. Students will then receive an assortment of images and work with partners to find a way to categorize their items into two groups, based on a single attribute. This is an open-ended sort without a prescribed way to categorize items. Students may choose to focus on a specific type of sorting, such as all by color, or they may use shape, color, size, etc. Afterward, have students share their categories and explain their reasoning.



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