

2.AP.1 Algorithms and Programming

The student will apply computational thinking to identify patterns, and design algorithms to compare and contrast objects based on attributes. (a) Compare and contrast multiple ways to sort a set of objects. (b) Create a table of features to organize objects. (c) Design an algorithm to sort objects into categories based on multiple attributes.



Integration Opportunities

Understanding the Standard

Objects and actions have attributes; these attributes allow people to group items. Attributes may be physical properties, behaviors, or actions. Actions in computer science are reflected in step-by-step sequences (algorithms). Actions may include back and forth movement, turning, and stopping. Categorizing of attributes or actions relies on careful observation of patterns and similarities and differences. In this standard, students are expected to analyze groups of items and compare and contrast the attributes that led to the development of the group. In block-based programming environments, commands are grouped into categories based on function. In higher level programming languages, data are often classified by the type and format of the information.

Term	Definition
Algorithm	A list of steps to finish a task.
Attribute	Characteristic or physical description of an object (color, shape, size).
Pattern	A predictable, repeated sequence of objects or events.

Math 2.PFA.1c Create a repeating pattern using colored blocks, then sort the blocks by color and size, comparing their sorting methods and discussing which method was the most efficient.

English 2.FFR.2, 2.FFW.2 Orally identify and segment various phonemes within words. Students then use phoneme-grapheme correspondence to sort a list of words by multiple spelling patterns and/or attributes.

Science 2.3a,b Sort solids, liquids, and gases based on different characteristics.

Physical Education 2.5b,c In small groups, sort a selection of snack and hydration choices using student-selected attributes. Compare and contrast how each group sorted the items and look for common attributes. Use this information to identify healthy snack and hydration choices.

Prerequisite Knowledge

Students should have a foundational knowledge of patterns and be familiar with comparing and contrasting items. Students should also have experience with composing simple algorithms using words or symbols.

Summary of a Lesson

In this lesson, students are divided into small groups and given pictures, illustrations, or short video clips of different weather phenomena. Students observe and discuss the attributes or actions of each weather phenomenon, and create a table and a Venn diagram to organize their findings. Each group presents their comparisons to the class, and a class discussion follows to identify commonalities and differences. To extend the lesson, have the class compose an algorithm to follow in order to classify a given weather event.