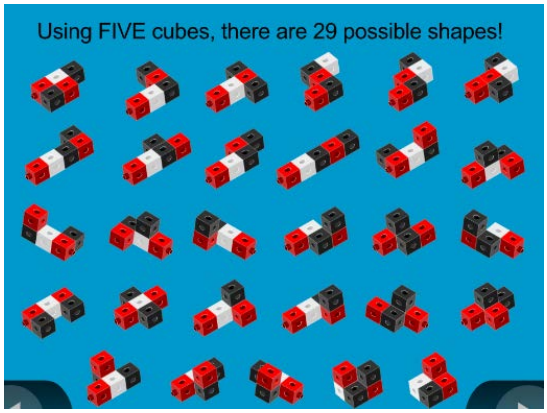
2nd Grade - Lesson 6.1
The Same Parts Can Make Many Objects
Teacher Background

In Lesson 6.1, students use Snap Cubes to create different shapes or "objects." Students realize that a limited number of units can be arranged in different ways to create many unique objects. Students probably have experience using Legos or building blocks to make different shapes, but they likely will not have tried to create and keep track of all the possible different objects that can be made.

Snap Cubes can be purchased at:
hand2mind (ETA) http://www.hand2mind.com/item/snap-cubes-set-of-100/5486
Amazon https://www.amazon.com/Learning-Resources-Mathlink-Cubes-Set/dp/B000URL296
Lakeshore Learning http://lakeshorelearning.info/seo/p%7CRA529~~.jsp
They also go by the name Pop Cubes, Linking Cubes and Mathlink Cubes.

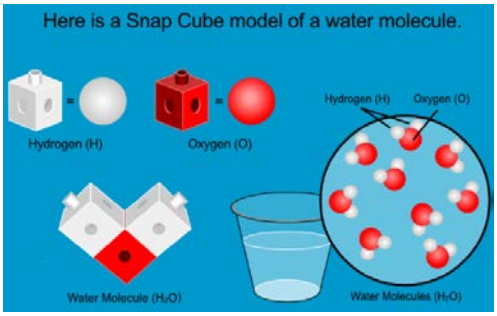
Snap Cubes as Models of Atoms



This activity can lay the foundation for introducing atoms as units or building blocks for molecules. After the class makes 29 objects from just five cubes, students should get the idea that there can be a surprising number of arrangements using relatively few units.

In the activity, the analogy of Snap Cubes to atoms is pretty inexact since the same number of cubes is simply rearranged and connected in a limited number of ways. For real atoms, there are many different types which are connected in different numbers and arrangements.

The variety of objects (molecules) that can be made from just a small set of units (atoms) can be very large. But as a beginning exercise, using a set number of Snap Cubes limits the possible permutations to a manageable number and still makes the basic point that units make up the object and that rearranging units can make new objects.



If you want to make the analogy between Snap Cubes and atoms more direct, the EXPLAIN part of the lesson helps guide students to use their Snap Cubes to make models of different atoms and molecules. Students are shown ball models and Snap Cube models of carbon atoms, and water and carbon dioxide molecules which they can make.

Letters of the Alphabet as Models of Atoms

In the "EXTEND" part of the lesson, anagrams offer an analogy for using units to make different objects. Letters (atoms) can be arranged and rearranged in various ways to make different words (molecules). For simplicity, the anagrams for students are limited to a small number of letters (atoms).

A better analogy for atoms is the 26 different letters in the alphabet being used in different numbers and arrangement to make thousands of unique words.