Resources:
https://sciencing.com/make-3d-model-atom-5887341.html

http://www.chem4kids.com/files/atom_intro.html

https://www.teachengineering.org/activities/view/cub_mix_lesson1_activity1

Materials:
https://www.amazon.com/Caydo-Assorted-Elastic-Creative-Decorations/dp/B01MTQR32W/ref=sr_1_3?ie=UTF8&qid=1542934003&sr=8-3&keywords=bulk+pom+pom+balls

https://www.amazon.com/TecUnite-Aluminum-Bendable-Skeleton-Thickness/dp/B07GL4C9R9/ref=sr_1_1_sspa?s=arts-crafts&ie=UTF8&qid=1542934140&sr=1-1-spons&keywords=bendable+craft+wire&psc=1

NGSS:

MS-PS1-1 Matter and its Interactions

Develop models to describe the atomic composition of simple molecules and extended structures

Materials List (for 60 kids):

- Jumbo Marshmallows (10 bags, ~26 per bag, 4 per kid)
- Marshmallows (2 bags, 64 per bag, 2 per kid)
- Toothpicks (300)
- Kabob skewers (120)
- Colored markers (multiple sets)
- Extra black markers
- Helium filled balloon
- Whiteboard
- Whiteboard marker ***different colors pls***

Lesson Outline:

1. Introduction/Refresh on matter and molecules
2. Atoms and Elements
3. Atomic Properties/Structure
4. Build Model
5. Review

Key Words:

Properties: the way something looks or behaves
Elements: Raw materials that can be used to make other materials or substances
Atoms: The small pieces of elements that form together to make molecules, and everything around us.
Nucleus: The center of an atom, made of protons and neutrons
Electrons: negatively charged particles that circle the nucleus of the atom
Protons: positively charged particles found in the nucleus of the atom
Neutrons: particles with no charge found in the nucleus of the atom

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Introduction:

1. **Ask:** what’s the definition of matter?
    a. What are the three states of matter?
2. What are the really small pieces that make up matter? (molecules)
3. There’s something that we haven’t explained to you guys about molecules, that we’re going to be learning about today.
    a. Molecules are made up of even smaller pieces, called **atoms,** that are microscopic to the human eye.

Atoms and Elements:

4. **Ask** if they’ve heard of atoms before, what they know
    a. Atoms are really small parts of different **elements**
    b. Elements: raw materials that are made of a singular type of atoms (so, gold is only made out of gold atoms, oxygen is only made out of oxygen atoms)
        i. There are 118 elements that have been discovered so far, and everything in the world is made out of a combination of those 118 elements!
    c. Atoms form together to create molecules
        i. For example, two atoms that are an element called hydrogen, form with one Oxygen atom, and create H_20!
            1. Ask them what H_20 is (they should already know)
5. Because everything we’re explaining to you is on a really small scale, it’s hard to picture:
    a. Write everything on the whiteboard, in order, explain as you go along:
        i. Objects
        ii. Molecules
        iii. Elements
        iv. Atoms

Atomic Properties/Structure:

1. Inside atoms, there are even smaller parts, called particles
    a. Write particles on the list from above, beneath “atoms”
        i. Does anybody know what these particles are?
            1. Electrons, Protons, Neutrons

b. Each element has a unique type of atom, with a unique number of electrons, protons, and neutrons
    i. For example, an aluminum atom has a different number of electrons, protons, and neutrons than an oxygen atom, which means those two atoms are completely different
        1. This difference causes the atom to act a certain, unique way, different from all other atoms
c. Does anybody know what an atom looks like/how all these parts are arranged?
d. Draw the nucleus, seperate circles for the protons and neutrons, one color for protons, one for neutrons
    i. Label as the nucleus
    ii. This is the center of the atom, called the **nucleus**
        1. In the nucleus are the **protons and neutrons**
            a. Label the protons as positive, don't label the neutrons
            b. Ask the kids if they know why magnets attract
                i. They should know it's because of charges
        2. **P**rotons are **p**ositive, and **neu**trons are **neu**tral (emphasize the phonetics)
e. Draw electron shells, label, draw electrons and label as negative
    i. Outside the nucleus are negatively charged electrons
        1. These electrons orbit the nucleus the same way the moon orbits the Earth

Build a Model

1. Now, we're going to build our own model of an atom using marshmallows!
    a. How many of you know what helium is?
        i. Show the helium balloon
            1. Helium is a specific element, and we're going to learn about what helium atoms look like!
    b. Draw out a model of a helium atom, but don't label anything
        i. Ask the kids what the names of all the parts are (neutrons, protons, electrons, electron shells, nucleus)
2. Pass out toothpicks (five each), jumbo marshmallows, markers
    a. First, you're all going to make your nucleus!
        i. Color you protons and neutrons different colors so you can tell the difference
        ii. Use the black marker to write plus signs on whichever marshmallows you're using to represent protons
            *1. Cover white board and **ask*** how many protons and neutrons are needed in the model
        iii. Connect all the marshmallows to form the nucleus using the toothpicks!
3. Pass out kebab skewers and regular sized marshmallows
    a. Label these electrons, too

        i. **Ask:** what's the charge of electrons?
    b. Use the kebab skewers to show the electrons orbiting the nucleus

Review:

1. Who can point out where the electrons are on their models?
    a. What about the protons and the neutrons?
2. What is the center of the atom called?
3. What part of the atom is negatively charged?
    a. What about positively? Neutrally?