Molecule Candy Fun

Appropriate age range: 6-10

Learning Objectives:
Upon completion of this activity, participants will be able to:
1. Create models of molecules
2. Explain atoms are composed of protons, neutrons, and electrons
3. Explain that molecules are made up of atoms bonded together
4. Summarize the importance of learning about molecules and atoms

Materials:
- 6 molecule cards
- Gumdrops (may use other candy with four assorted colors)
- Toothpicks
- Three books
- Word search

Overview of Atoms and Molecules:
Chemistry and molecules may sound like big, scary words meant for adults wearing lab coats, but even chemistry and molecules can be easy to understand when candy is involved!

Let’s break it down.

Everything is made up of small building blocks, and these building blocks are called atoms. Atoms don’t look like the building blocks that you are used to playing with (see fig. 1). They are made up of protons and neutrons that make up the nucleus, or center core. Then on the outside of the nucleus are electrons zooming around in an orbit. If an atom were a solar system, protons and neutrons would be the sun and electrons would be the planets orbiting around the nucleus. Up to eight electrons can be zooming around in the atom’s outer shell. When an atom does not have eight electrons filling up the outer orbit, it can share or borrow electrons from another atom which bonds them together. When two or more atoms bond together they become molecules. Microscopes can see very small things, but even microscopes cannot see molecules and atoms.

Electrons orbit around the nucleus

The nucleus of the atom is made up of protons and neutrons

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Molecules are important to study and learn about because understanding how molecules are built and interact helps explain what goes on around us. Some molecules are so important that humans could not live without them, such as water, oxygen, or DNA.

**Activity Instructions:**
Now it’s your turn to create a molecule! You should have 6 cards, each with a picture of a molecule. Use candy and toothpicks to create a 3D model of the molecule pictured on the card. Each piece of candy represents an atom of an element. The toothpicks represent a chemical bond between the atoms to create a molecule. Elements for this activity include hydrogen, oxygen, nitrogen, and carbon. Represent each element with a different color. For example, each hydrogen atom could be yellow and each carbon atom blue.

**Suggested reading:**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>ISBN</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Molecule Mayhem</em></td>
<td>Tom Adams</td>
<td>978-1848772922</td>
<td>$20</td>
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<tr>
<td><em>Why Is Milk White?: &amp; 200 Other Curious Chemistry Questions</em></td>
<td>Alexa Coelho and Simon Quellen Field</td>
<td>978-1613744529</td>
<td>$15</td>
</tr>
<tr>
<td><em>Make It Change! (Whiz Kid Science)</em></td>
<td>Anna Claybourne</td>
<td>978-1410967466</td>
<td>$15</td>
</tr>
</tbody>
</table>
Methane — CH₄
1 carbon + 4 hydrogen

Carbon Dioxide — CO₂
1 carbon + 2 oxygen

Ammonia — NH₃
1 nitrogen + 3 hydrogen

Water — H₂O
2 hydrogen + 1 oxygen

Propane — C₃H₈
3 carbon + 8 hydrogen

Methanol — CH₃OH
4 hydrogen + 1 carbon + 1 oxygen
Carbon Dioxide
Uses: It provides the sparkle in carbonated drinks like soda.
Safety: The burning of fossil fuels releases CO₂ into the atmosphere contributing to global warming.

Methane
Uses: Fuel for gas turbines or steam generators.
Safety: Methane is a gas at room temperature and is extremely flammable.

Water
Uses: Essential for life on Earth
Conservation tips: Take a brief shower instead of a bath, check pipes for leaks, and install ultra-low-flush toilets.

Ammonia
Uses: Fertilizer, refrigeration and air-conditioning coolant
Safety: Ammonia is a dangerous chemical that can be explosive and is corrosive to the skin, lungs, and eyes.

Methanol
Uses: Potential use as a biofuel.
Currently Methanol is used in the creation of other chemicals to make plastics, plywood, paints, and more.
Safety: Methanol is highly flammable and toxic.

Propane
Uses: Fuel for heating and motor vehicles
Safety: Propane is a flammable gas.
Molecule Word Search

molecule  ammonium  nitrogen  chemistry
propane  water  oxygen  atom
oxygen  methane  hydrogen  proton
carbon dioxide  toxic  conservation  electron
methanol  flammable  biology  neutron
Word Search Answer Key

Molecule Word Search

molecule  propane  oxygen  carbondioxide  methanol
ammonia  water  methane  toxic  flammable
nitrogen  oxygen  hydrogen  conservation  biology
chemistry  atom  proton  electron  neutron

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