Exploring States of Matter Web Quest

Introduction

Welcome to the *States of Matter* Web Quest! In this journey, you'll explore the world around you at a microscopic level to understand the fundamental forms matter can take. Matter is everything around us—from the air we breathe to the water we drink, and even the metal in a spoon or the flames of a fire. But did you know that matter can change its form?

In this web quest, you'll learn about the four main states of matter: solid, liquid, gas, and plasma. You'll investigate what makes each state unique, how matter can change between these states, and the physical and chemical properties that define them. You'll also discover real-life examples of these states and how they impact our world every day.

Get ready to observe, experiment, and analyze as you dive into the fascinating properties of matter. By the end, you'll understand how tiny particles in constant motion make up everything you see, touch, taste, and even feel. Let's start exploring the science of matter!

Objectives

In this lesson, you'll learn:

- What is matter
- The differences between solids, liquids, gasses, and plasma
- What is a plasma
- The changes in state of matter that a soap base goes through during the soap making process

Part 1: What is Matter?

Before we dive deeper into the states of matter, let's start with a quick video to get a clear overview. This video explains the basic properties of the different states—solid, liquid, gas, and plasma—and how they behave under various conditions. As you watch, pay attention to the ways particles move and interact in each state.

1. Watch this video about matter What's Matter? - Crash Course Kids #3.1 (3:30) and answer the following questions:
    a. What is matter?

b. What are the main states of matter? Give an example of each one.

c. How do we know that air is matter? Give an example.

Part 2: Physical Properties of Liquids, Solids, and Gasses

To understand matter better, let's start by watching a video about its physical properties. Physical properties are characteristics we can observe or measure without changing the substance itself. These include properties like color, density, mass, volume, and even texture.

1. Watch this video about the states of matter States of Matter - General Science for Kids! (9:29) and answer the following questions:

   a. What determines what state the matter is in?

   b. Name a property of a solid.

   c. Name a property of a liquid.

d. Name a property of gas:

e. What is the state of matter that results in adding a lot of energy to a gas?

Part 3: Plasma

Now let's explore plasma—a state of matter you might not encounter as often as solids, liquids, or gases, but one that plays a vital role in the universe! Plasma is an energized state of matter, where gas particles gain so much energy that they break apart into charged particles: ions and electrons. This makes plasma very different from other states of matter.

You've probably seen plasma in action without even realizing it. Lightning in the sky, the Sun, neon lights, and even plasma TVs are all examples of this extraordinary state.

1. Watch this video about plasma Watch this video on plasma
What Is Plasma | Properties of Matter | Chemistry | FuseSchool (4:11) and answer the following questions:

a. What is the difference between a gas and a plasma?

b. Name one example of a plasma:

Part 4: States of Matter in Soap Making

Soap making is the perfect way to explore the states of matter in action! From melting a solid soap base to adding liquid fragrances and observing bubbles of gas, this process involves multiple

forms of matter. Each step reveals how matter can transform and interact, giving us a better understanding of physical changes.

1. Observe the melt and pour soap in its natural state and answer the following questions:
    a. What is the natural state of the soap base?

    b. How does the soap base feel in its natural state? Is it easy or difficult to break apart?

    c. Describe the atoms of the soap base in its natural state:

2. Observe the melt and pour soap base as you heat it in the microwave and answer the following questions:

    a. What happens to the soap base when you heat it in the microwave?

    b. How does its shape and texture change as you heat the soap base in the microwave?

    d. What do you think is happening to the atoms of the soap base as it is heated?

    e. What other solids can change into a liquid when heat is applied?

3. Observe the soap base after you pour it into the molds and it cools down and answer the following questions:

a. What happens to the soap base as it begins to cool?

b. How do you think cooling changes the particles in the soap base to make it solid again?

Part 5: Reflection

Reflect on your journey through the states of matter. Write a summary about:
- What you learned about each state of matter.