**The Marshmallow Man**

1. **Before Marshmallow Man is senselessly and brutally tortured for your entertainment and education, describe his PHYSICAL PROPERTIES so that forensic scientists could construct an exact replica of him. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. **How could we observe his CHEMICAL PROPERTIES? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Action** | **Observations** | **Physical or Chemical Change?** | **Explanation/**  **Evidence** |
| **Pull** | **Is stretchy, pulls apart easily, looks gooey/sticky** | **Physical** | **Same substance before as after just looks different** |
| **Pound** | **Flattens out, cracks appeared but did not break** | **Physical** | **Same marshmallow just looks different** |
| **Amputate** | **Cuts in half easily, still white, clean cut** | **Physical** | **Same marshmallow just has some missing and a different shape** |
| **Puncture** | **Scissors go all the way through easily, sticky/gooey, marshmallow enveloped scissors, spongy** | **Physical** | **Same marshmallow with a slightly different appearance** |
| **Pressurize** | **Marshmallow expands as air is removed then shrinks when air is allowed back in- wrinkles** | **Physical** | **Same substance before as after and now has wrinkles** |
| **Boil** | **Melting occurs and looks like foam on top of beaker, liquid** | **Physical** | **Same substance before as after but now in liquid state** |
| **Microwave** | **Marshmallow expands and begins to turn brownish black in the center and on bottom & smelled sweet** | **Chemical** | **Burning occurred changing the color from white to brown/black** |
| **Torch** | **Marshmallow burned, turned black and smelled sweet** | **Chemical** | **Burning, color change, odor change occurred, black crust formed outside, new sub** |
| **Chew** | **Marshmallow became smaller, began to dissolve and liquify** | **Physical and also Chemical** | **Physically it became smaller, broken into pieces- chemically it began to dissolve due to digestive enzymes** |
| **Digest** | **Color, texture, consistency, smell changes** | **Chemical** | **Formation of a new substance with new properties** |
| **Combine with H2O2 & KI or I2** | **I2 caused it to turn black and KI caused burning and energy release** | **Chemical** | **A new substance with new properties formed, burning, energy released** |

**Reflection Questions – Must be answered in your notebook and written in complete sentences that echo the question.**

1. **Explain the difference between observing physical properties and chemical properties.**

**The difference between observing a physical property and a chemical property is that you are able to observe a physical property of matter without changing the matter. A chemical property can only be observed when another substance is present causing a change to occur. Some examples of physical properties of marshmallow man include a white color, sweet smell, and squishy texture. Some examples of marshmallow man‘s chemical properties include he is flammable, and has the ability to turn black when combined with iodine**

1. **What is the difference between physical and chemical changes?**

**The difference between physical and chemical changes is that physical changes only change the appearance of the substance whereas chemical changes will make a new substance with new properties. Some examples of physical changes in marshmallow man were he was smashed by a hammer, melted in boiling water, and he was cut in smaller pieces. Some examples of chemical changes that marshmallow man underwent include flaming up, bubbling; turning crispy black or turning brown from white when in the microwave; or turning black when contacted with iodine.**

1. **Describe the evidence you witnessed during chemical changes.**

**The evidence I witnessed during chemical changes were turning from white to black when burning, color change, energy release, and the formation of gas or a new substance with new properties when burned or microwaved.**