Title: The Sight Word Slime STEM Challenge

Estimated Time: 1-2 periods

Core Ideas (GSE Standard and elements):

SKP1. Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.

a. Ask questions to compare and sort objects made of different materials. (Common materials include clay, cloth, plastic, wood, paper, and metal.)

b. Use senses and science tools to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture).

S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.

a. Ask questions to describe and classify different objects according to their physical properties.

S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.

a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.

c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical (i.e., density, melting point, boiling point) properties of matter.

Literature Connections: Books	**Literature Connections: Close Reads**
Bartholomew and the Oobleck, Dr. Suess All About Matter, Mari Schuh	Sight Words Slime Close Read
Science and Engineering Practices: **Planning and Carrying Out Investigations:** Conduct an investigation and/or evaluate and/or revise the experimental design to produce data to serve as the basis for evidence that meet the goals of the investigation. **Constructing Explanations and Designing Solutions:** Apply scientific ideas or principles to design, construct, and/or test a design of an object, tool, process or system.	**Crosscutting Concepts:** **Structure and Function:** The way an object is structured/designed determines many of its properties and functions. **Stability and Change:** For designed systems, conditions that affect stability and factors that control rates of change are critical to consider and understand.

STEM Challenge

So in this STEM Challenge, the students' primary task to test the quality of a sample of fake snow and determine if it is good enough to use. For older or more advance students, they should also determine how much the snow powder expands in volume when it is mixed with water.

Ask	**Ask** your students if they know what snow is made of. Discuss their ideas. Ask them if they think it would be possible for a machine to make snow. Show this one minute video of a snow machine in a man's backyard. https://www.youtube.com/watch?v=hrxxUcs5j6I (the video calls it fake snow but it is really man-made real snow). Briefly discuss their ideas and questions about the video. **Ask** your students if they've ever heard of fake snow that was invented by scientists. Mention that a few types of fake (artificial) snow have been invented. Ask them to consider how they could test the fake snow to see how it compares to real snow.
Imagine/Brainstorm	Students **brainstorm** ideas for how they could test the fake snow to determine how it compares to real snow. They should consider the attributes (properties) of real snow while they think of ways to test the fake snow.
Plan/Design	In order to learn more about the topic, have them read (or read to them) the ***Does Fake Snow Really Grow*** article and discuss **mixtures**, **materials**, and **superabsorbers**. Next, have students **plan** and **design** how they will test the quality of their fake snow. As needed, discuss some of the physical attributes (characteristics) of that might be important for them to test. As part of this process, it might be good for them to draw a data table to record their results. Older students can also **plan** and **design** how they could measure the change in volume that occurs when the two substances are mixed together.
Create/Test	To start with, students should create a sample of fake snow by adding together the two parts of the mixture. They should measure out 1 teaspoon of snow powder (5ml) and 2 ounces of water (60 ml). On top of a plastic bin or paper plate, place the teaspoon of snow powder into a 2 ounce plastic cup (or any similar cup) and then quickly poor the water on top of the powder. Observe closely as the mixture combines to form the fake snow (the fake snow will expand and spill out over the cup). Students should then **test** the characteristics of their fake snow as planned. They should record which characteristics that they tested and write down their observations.
Improve	After discussing and evaluating their results, students **improve** their method for testing the snow. If time permits, let them re-test their snow.

Teacher Notes:

This is a super fun STEM Challenge that kids really love. Slime is very popular right now so why not give your students a chance to explore its awesomeness. This challenge is relatively easy to set up the slime is super fun and inexpensive. It is a great way to integrate science and literacy in a unique and engaging way. **Slime** is an interesting **mix** of **materials** that, when blended, makes a super thick liquid that is sticks together. Like most mixtures, the slime turns out well if you mix each of the parts in the correct order.

In a similar way, **words** are an interesting mix of letters that, when stuck together, can make sense and have meaning. You just have to put them together in the correct order. Before starting this challenge,

choose 8-10 sight words that are appropriate for your students and then collect the letters that you need for these words for each group of students that you have. It's okay to include a few random letters too but not very many as this can quickly become overwhelming for some of your students.

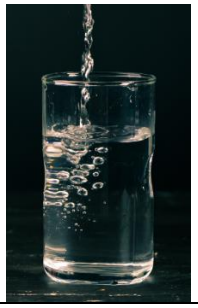
The students' first task is to make a super cool batch of slime and then test the properties of the slime. Start by adding 60 ml (2 oz) of Elmer's Clear Liquid School glue to each cup (you can measure it out closely the first time and then just eyeball after that to the same height on each cup). Pass these cups out to each group and have them observe. Next, add a small ½ teaspoon of baking soda to each cup and have the students mix this thoroughly as the second material in the mixture. The baking soda contains a crosslinker that causes the mixture to thicken. Third, add 1-2 drops of food coloring to the mixture and again have students mix well. Finally, add 1 teaspoon of saline solution as the final material and mix well. The saline reduces the stickiness of the slime and makes it easy to handle. It's sort of the magic ingredient.

After making their slime, students should observe it and test its properties. Let them stretch, roll, and gently bounce their slime.

Their second task starts by adding some letters to the slime. Have them poke each letter gently into the slime so that the letter faces up. Their challenge is to find the letters in your slime and put them together to make each word on the list. If students find them all, challenge them to find some of their own.

As time permits, we always encourage them to make at least one possible improvement to their slime. As needed, you can provide some suggestions like adding something (glitter, sand, etc.), using something instead of letters, or shaping you slime in a different way before adding the letters.

Vocabulary Cards:

mixture **a blend of things** 	**material** **the stuff things are made of** 
attribute **a feature of something** 	**word** **a mixture of letters that has meaning** 
liquid **a material that can flow** 	**slime** **a very thick liquid** 

The Super Slime Sight Word STEM Challenge:

In this STEM Challenge, your first task is to make, observe, and test, a batch of slime using a mixture of materials. Your second task is to add letters to the slime and then use these letters to spell out the sight words that have been assigned.

Task One: Making Your Slime

1. **Add** 60 ml (2 ounces) of glue to your cup.
2. **Add** ½ teaspoon of baking soda and mix well.
3. **Add** 1 drop of food coloring if you want it colored.
4. **Add** 1 small teaspoon of saline and mix it very well.
5. **Remove** the slime from the cup. If needed, add another squirt of saline to reduce stickiness.
6. **Observe** and **test** the attributes of the slime.

Task Two: Finding the Words

1. As directed by your teacher, **add** letters to the slime.
2. **Poke** each letter gently into the slime so that the letter faces up.
3. **Find** the mixture of letters needed to form each of the sight words on your list. Circle them as you go.
4. If time permits, brainstorm ways you can **improve** your slime and try at least one of these improvements.