Project FOCUS
Best Lessons
SECOND GRADE

Title of Lesson:
Chemical Changes of Matter
Theme: Physical Science
Unit Number: 1 **Unit Title: Properties of Matter**
Performance Standard(s) Covered (enter codes):
S2P1
S2E3

Enduring Standards (objectives of activity):

Habits of Mind

- ☒ **Asks questions**
- ☐ **Uses numbers to quantify**
- ☐ **Works in a group**

- ☒ **Uses tools to measure and view**
- ☐ **Looks at how parts of things are needed**
- ☒ **Describes and compares using physical attributes**
- ☒ **Observes using senses**
- ☒ **Draws and describes observations**

Content (key terms and topics covered):
Chemical changes that occur in matter

Learning Activity (Description in Steps)
Abstract (limit 100 characters): Discuss what a chemical change is. Observe a chemical change by mixing baking soda and vinegar.
Details:
Background Information:
Matter is anything that takes up space and has weight. There are three different kinds of matter: solid, liquid, and gas. The states of matter can change from one state to another; these changes can be physical or chemical. Chemical changes in matter are non-reversible and changes the matter into something different with different properties. A good example is when a cake is baked. The cake batter is a liquid and when baked at the proper temperature, it becomes a solid. This solid cannot be converted back to the liquid it was before.

Introduction / Procedure:
The children should be reintroduced to solids, liquids, and gases. Chemical changes should then be introduced to them, describing what they are and giving some examples. Try to get them to apply these new terms to things in the classroom and outside world.

Take the clear plastic bottle and add four tablespoons of vinegar into it. Ask the kids what state of matter the vinegar is in, and tell them to write it in the blank on the worksheet. Show them the baking soda, add 1 teaspoon into the balloon, and have them write down its state of matter. Show them the water and have them write down its state of matter, then add 2 tablespoons if it into the balloon with the baking soda. Without getting any water/baking soda into the plastic bottle, cover the opening of the bottle with the balloon. Tell them that the baking soda and vinegar are going to react and cause a chemical change. Tell them to write down their observations (this word needs to be defined for them) of the chemical change. Tell them if they see anything happen to write it down. Then lift the balloon up so that the baking soda/water mixture pours into the bottle with the vinegar. If the balloon does not instantly begin to inflate, swirl the mixture some to mix it all together. Ask them what they observed happening. Have them write down the states of matter of the products. Discuss the formation of carbon dioxide. Reiterate the fact that it is a chemical change and cannot be reversed.

Questions: (some are on the worksheet)
1.) What state of matter is the vinegar in?
2.) What state of matter is the baking soda in?
3.) What happened to the balloon during the reaction?
4.) Why did that happen?
5.) What filled the balloon?
6.) What state of matter is the carbon dioxide in?

Evaluation:
Have the children fill out the worksheet.
Have children ask and analyze any additional questions.

<u>Materials Needed (Type and Quantity):</u>
1.) White vinegar
2.) Baking Soda
3.) Clean, clear water/soda bottle
4.) Balloon
5.) Measuring spoons (Tablespoon and Teaspoon)
6.) Water
7.) A small funnel
Approximate time necessary: 30 minutes

<u>Notes and Tips (suggested changes, alternative methods, cautions):</u>

Safety:

Place the balloon securely around the lip of the bottle, if it is not on snuggly (and possibly even if it is) the mixture of the reaction can squirt out. Have paper towels handy just in case.

See attached worksheet.

Sources/References:

1)
2)
3)

Name: _____

Chemical Changes

Chemical changes are changes that cannot be reversed. That means that once these changes take place, they cannot go back to the way they were before.

Look at the chemicals we are using today. What state of matter is each starting chemical in?

Vinegar: _____ Baking Soda: _____

Water: _____

Write down your observations (or what you see happening) during the chemical reaction.