

Really Good Stuff 



## 15 BABY SODA BOTTLES WITH CAPS

ACTIVITY GUIDE

### OVERVIEW:

Because of its many advantages, the best lab equipment is usually made of glass. That presents obvious challenges if the lab work is being done by beginning researchers with little fingers or is in the larger hands of older, but growth-spurt bedeviled "experts." Sometimes it's just better to use plastic. Our Baby Soda Bottles are the perfect solution to lab safety!



a Really Good Stuff brand

**AGES 5+**

SKU: WBSB-150

RGS: 800097



### WARNING

**CHOKING HAZARD - Small parts.  
Not for children under 3 years.**

Adult supervision required. Made in China



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## ACTIVITY #1: Erupting, Bubbling Blobs

Density differences and color mixing come together in a single **BSB**.



**TIME:** 6 minutes



### MATERIALS

- 1 BSB and its cap
- Vegetable oil
- Room temperature water
- 1 Food coloring
- 1 Alka-Seltzer tablet



### STEP-BY-STEP INSTRUCTIONS

1. Fill the **BSB**  $\frac{3}{4}$ -full with vegetable oil. NOTE: Push the bottom of a **BSB** into its cap and it will stand hands-free.
2. Add one capful of water and watch what happens to the water.
3. Add your choice of food coloring to the **mixture** in the **BSB**.
4. Break an Alka-Seltzer tablet in half and drop one piece into the **BSB**.
5. Your patience is rewarded when the tablet finds the colored water. Behold: Bubbling Blobs!



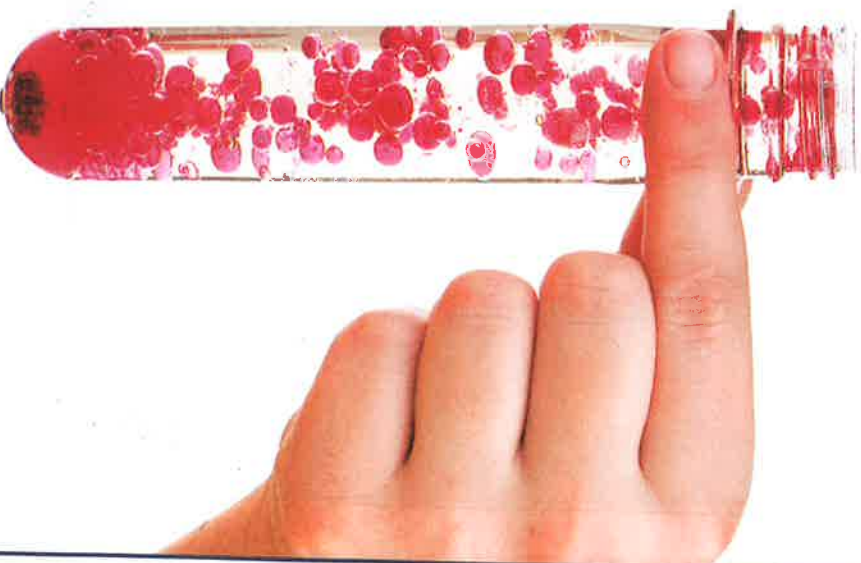
### HOW DOES IT WORK?

First of all, you confirmed what you probably already knew: oil and water do not mix and the activity shows that water is more **dense** than vegetable oil. That's why you see the layer of water on the bottom with the oil on top. The **liquids** are **immiscible** (don't mix). You also saw that food coloring mixes with water and not oil. Food coloring **dissolves** in water. Food coloring and water are **miscible** (do

### HOW DOES IT WORK? Continued

mix). Vegetable oil is not affected by the food coloring because they are electrical **polar opposites** and, literally, move away from each other.

The Alka-Seltzer tablet also reacts only with the water and makes gazillions of tiny bubbles of **carbon dioxide gas (CO<sub>2</sub>)** which are less **dense** than even the oil. The rising bubbles attach themselves to blobs of colored water and lift them to the surface. When the bubbles move up into the air, the colored blobs sink back to the bottom of the **BSB** where the **lifting process** starts over. When the **chemical reaction** between the tablet and the water is complete, the bubbling stops.



## ACTIVITY #2: A Wave Tube

You can stir tranquility into your studies of **density differences** and color mixing.

**TIME: 5 minutes**

### MATERIALS

- 1 Non-fizzing BSB (with cap) from the previous activity
- Room temperature water

### STEP-BY-STEP INSTRUCTIONS

1. When you've finished watching the Bubbling Blobs, keep the tube uncapped until bubbling stops. If you see bubbles lining the tube, flick it with a finger to loosen them so they rise to the surface and disappear. You want a bubble-free **mixture** in the **BSB**.
2. If needed, top off the tube by adding water so that the oil bulges out of the top of the **BSB** a little.
3. When you screw the cap back on, you want a little oil to run down the side so you know there's no air trapped inside it.
4. Use soap and warm water to wash the tube. Dry it and admire your new wave bottle.
5. Hold the **BSB** on its side and gently rock it back and forth. It's a relaxation miracle!



## ? HOW DOES IT WORK?

The lower **density** oil floats on the higher **density**, colored water but it's easy to imagine that all you can see is a colored ocean as it rolls peacefully, back and forth in front of you. It could also be a handheld lava lamp. (If you don't know what a lava lamp is, ask a grandparent. You'll likely get a story about the sixties. Groovy!)





### ACTIVITY #3: A Glitter Wand

It's time to make some **BSB** art!

**TIME:** 5 minutes (longer to gather the stuff)

#### MATERIALS

- 1 BSB and its cap
- Vegetable oil
- Heavy, colored beads; glitter; Mylar confetti

#### STEP-BY-STEP INSTRUCTIONS

1. Fill the **BSB**  $\frac{3}{4}$ -full with vegetable oil.
2. Add a few heavy, colored beads, a small amount of glitter, and/or a little Mylar confetti. You don't need much stuff in the oil.
3. You may have to help the items sink by pushing them down. The pieces need to move easily in the oil.
4. Completely fill the **BSB** with more oil so there's no air trapped inside it.
5. Cap the **BSB** tightly. Wash it to remove dribbled oil if necessary.
6. Gently tip the tube back and forth to showcase its sparkling contents. Science and art are best friends!

#### HOW DOES IT WORK?

If the materials you used move freely, you can see another example of **density differences** in the **BSB**. They fall slowly but their higher **density** means they will fall. The best part is that they twist and turn and **collide** as they fall and reflect light hitting them. It's fun to enjoy the flashes and colors in slow motion!



## STEM CONNECTIONS

### FOR TEACHERS, PARENTS, GRANDPARENTS, & ALL-AROUND SCIENCE ADULTS

We haven't forgotten about the new STEM and STEAM initiatives you've been hearing about in our schools, bringing Science, Technology, Engineering, (Art), and Math together to make young scientists real thinkers! Look what your young scientist(s) integrated into the Baby Soda Bottle activities.

- **Science** – density, immiscible, miscible
- **Technology** – have young scientists create step-by-step video records of their creations to share with family
- **Engineering** – have young scientists build a holder for their BSBS
- **Art** – create a hands-on “liquid” art exhibit by lining up the BSBs and tilting them one after the other in a long snake-like wave
- **Math** – measuring, fractions



## NGSS CONNECTIONS



And just for teachers – as you know, the Next Generation Science Standards (NGSS) set expectations for what science concepts students should understand. These Baby Soda Bottle activities start young scientist(s) on the way to meeting those standards. Take a look and see what can be accomplished!

Young scientists (**grades K-2**) who demonstrate understanding can:

- Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. (**NGSS 2-PS1-1.**)
- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem (**NGSS K-2-ETS1-2.**)

Young scientists (**grades 3-5**) who demonstrate understanding can:

- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. (**NGSS 3-PS2-1.**)

- Conduct an investigation to determine whether the mixing of two or more substances results in new substances. (**NGSS 5-PS1-4.**)

Young scientists (**grades 6-8**) who demonstrate understanding can:

- Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. (**NGSS MS-PS1-2.**)

