

SICK!
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SUMMER SCIENCE SURVIVAL GUIDE

as seen on



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A WORD ABOUT THIS ACTIVITY HANDBOOK

Great teachers never miss the opportunity to create a learning experience out of something that kids love – and that’s exactly what this experiment guide is all about; connecting some fun science with summer play. The activities all have that great “gee-whiz” factor, plus they introduce children to cool scientific principles in such a sneaky way that they won’t even know they’re learning! It’s important to read through the brief instructions that accompany each activity to get the “flavor” and story before you begin.

SAFETY!

Everything in this handbook has been thoroughly tested and is not considered to be hazardous, if used with adult supervision. That’s right, the activities in this handbook require adult supervision. This handbook is not intended to be tossed at a kid with the instruction, “Have fun.” Instead, you might want to use this opportunity to interact with a few ankle-biters and learn a little science at the same time.

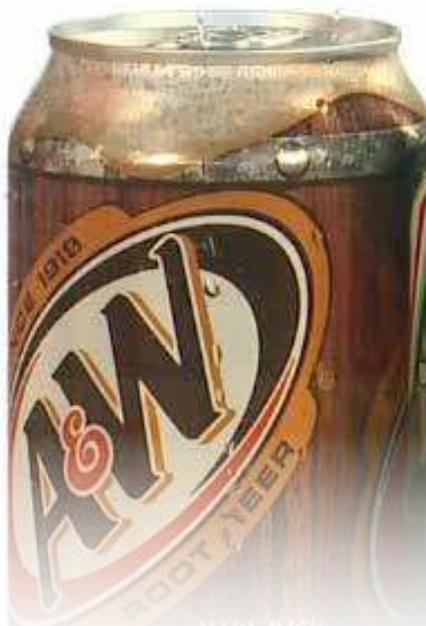
Remember that this is a science handbook and science can be messy. There are liquids, so you will get wet. Stuff falls on the floor, so you will need to clean it up. Don’t put chemicals in your eyes or ears and don’t eat your experiment. Trust us, they don’t taste good and it’s a bad thing to do. The bottom line is that this experiment handbook requires adult supervision and common sense – simple concepts to ensure a fun and safe experience.



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SINKING SODA SURPRISE



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WHAT YOU NEED

WATER

UNOPENED DIET SODA CAN

UNOPENED REGULAR SODA CAN

VARIOUS UNOPENED CANS OF SODA

ADULT SUPERVISION



1 Place the regular soda into the water. Be sure to release all air bubbles from under the can of soda.



2 Now add the diet soda.



! Try adding several kinds of soda cans.

HOW DOES IT WORK?

This demonstration is an excellent way to learn about density. We are all familiar with the basic concepts of sinking and floating: objects that are less dense than water float, and objects that are more dense sink. Empty cans float, rocks sink. If both diet and regular soda cans are placed on a double pan balance scale, it would be clear that the regular soda is heavier than the diet soda. This demonstrates the difference between mass and volume. Mass refers to how much stuff exists within an object. If something is heavier than another object, it contains more mass. Mass is measured in grams. Volume, on the other hand, refers to how much space an object occupies. For fluids, volume is usually measured in liters (L) or milliliters (mL). There are 1000 mL in one liter. This is what we were referring to when we told you that the cans contained the same amount of liquid - 355 mL. Since both cans have the same volume, the heavier can must have a greater mass. We can now conclude that the heavier can is more dense than the lighter can.

Diet sodas usually contain aspartame, an artificial sweetener, while regular sodas use sugar. Take a look at the nutritional information on the side of the cans. Notice how much sugar is in a regular soda (look under carbohydrates). Most regular sodas have about 41 grams of sugar. How much is 41 grams? Try 18 packets of sugar like the ones you might find at a restaurant! Yikes! That's a lot! Diet soda, on the other hand, is flavored with a relatively small amount of an artificial sweetener (like aspartame) which is 200 times sweeter than an equal amount of sugar. Therefore, only a tiny amount of aspartame is needed. Both sugar and aspartame are more dense than water, which can be easily demonstrated by adding small amounts of each to a container of water (they sink). So it is actually a matter of how much of each is used. The 41 grams or so of sugar added to a can of regular soda make it sink. The relatively tiny amount of aspartame used in diet sodas will have a negligible effect on the mass, enabling the can to float.



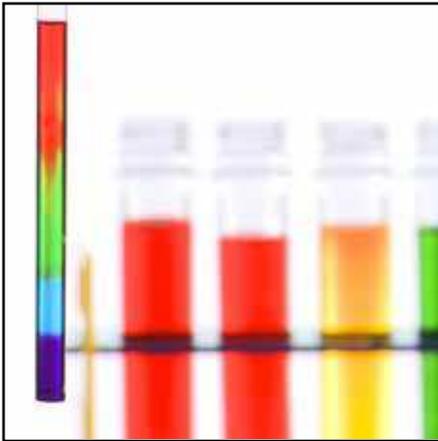
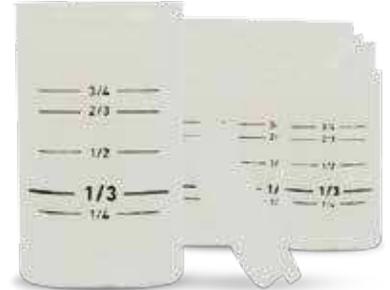
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