CURIOSITY ZONE™
• Ever wonder? •

WONDER WIRE™

December 2005 ideas to inspire curious kids Vol. 2 No. 4

EVER WONDER . . . HOW TO MAKE EDIBLE DOMINOES -- OR A BANANA ROCKET SHIP?

EXPLORE. At the C-Zone, we teach kids that science is in everything, all the time. You don't need to look much further than your own kitchen cabinets to explore chemistry, physics, math and more! This Wonder Wire focuses on teaching kids science through hands-on cooking projects. Whether you're baking, boiling, braising or broiling (or doing the projects below!), take time to focus on the science involved. Even if you don't know exactly what's happening, it's fun for kids to make predictions (it will melt; it will separate; it will harden; it will evaporate) and test them out. Cooking also presents lots of opportunities to teach fractions and measurement, and can open the door to discussing all kinds of new and interesting things!

DISCOVER. **Whip up some edible dominoes (and learn about energy transfer and math). Materials:** Graham crackers, white icing, black shoestring licorice, mini chocolate chips, real dominoes (or empty boxes). **Procedure:** Break a graham cracker into its 4 individual sections. Frost each with white icing. Use a small piece of licorice to divide each piece in half. Put anywhere from one to nine mini chocolate chips on each half of the "domino" (or leave it blank) to finish your playing piece. Make as many as you'd like, then start playing by lining up your dominoes end to end, matching the number of chips on each end. (See complete directions for playing dominos on the back of this Wonder Wire.) When you're done playing, go ahead and gobble up your game! (For a cool variation, try using different colors of icing for your dominos, and use mini white chocolate chips or drops of white icing to make the dots).

Dominos can also be used to demonstrate the principle of energy transference. Set up a domino run by putting one standing domino just behind another (or you can use empty boxes). When you knock one domino over, it falls and hits the next one, and so on until the entire line of dominos is knocked down. Scientifically speaking, this is what's happening: the energy from the force you used to knock over the first domino is being transferred from domino to domino until it reaches the end of the line. This is sometimes called a "chain reaction." This concept of energy transference is an important principle in physics.

Design a fruit rocket (and learn about chemistry and the laws of motion). Materials: Banana, apple wedges, lemon juice, raisins, popped popcorn, plate (blue is best), white paper, scissors, empty squeeze bottle with nozzle (e.g., dish soap bottle), tape, ribbon, markers. **Procedure:** Cut cloud shapes out of the white paper and place on your plate. Cut your banana in half longwise to make the fuselage of the rocket and place in the middle of the plate. Use the apple wedges to make the base of the rocket, and raisins to make "windows" in the fuselage. Paint the banana and apple wedges with lemon juice to prevent them from turning brown. Use popped popcorn to make the blast cloud at the base of the rocket. Once you're done admiring your artwork, enjoy your healthy snack!

C-ZONE NEWS

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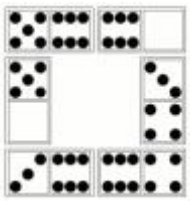
TERM OF THE MONTH: CHAIN REACTION. USE IT IN A SENTENCE AT LEAST ONCE A DAY!

Now that you've made an edible rocket, spend a few minutes making one that's air-powered! Cut a circle out of a sheet of white paper. Cut one slit from the edge to the center, then fold the edges over until the circle becomes a cone; secure with tape. Place the cone on top of the empty squeeze bottle (be sure the pull top is open) and squeeze the bottle with a sudden motion. The blast of air from the bottle should make your rocket blast off into the air! Have fun decorating your rocket with markers and ribbons. Also, try making different sizes and shapes of rockets, and using different squeeze bottles. Which one makes the rocket fly the highest? Blast off the fastest?

LEARN. Dominoes are small tiles traditionally carved from ivory or bone with small, round spots of inset ebony. They go back more than a thousand years, and appear to be a Chinese invention. They were apparently derived from cubic dice – each domino originally represented one of the twenty-one results of throwing two dice. One half of the domino is set with the spots from one die, and the other half contains the spots from the second die.



The traditional game of dominos is known as "Five-Up," "Muggins" or "All Fives." In Five-Up, each player starts out with five dominoes, and the player with the highest double (a tile with the same number of spots on both sides) goes first. During each player's turn, he or she adds a domino with an end that matches the end of a domino already on the table, forming a chain. A player scores when the outside ends of the dominoes add up to a multiple of five. This is a great game for teaching kids addition!

In the fruit rocket project, you used lemon juice on the fruit to prevent a chemical reaction that would have turned the fruit brown. Many fruits, when sliced, react chemically with the air and turn brown. This is called "oxidation." The vitamin C found in lemon juice is an antioxidant -- it stops the oxidation process. Do you think orange juice would work in place of the lemon juice? How about grapefruit juice? Apple juice? Chop up an apple, brush different pieces with different juices and see what happens overnight! What connection, if any, is there between the amount of vitamin C in the juice and the brownness of the apple slice? (This would make a great science fair project!)

Answer this riddle: What's inside an empty bottle? No – the answer isn't nothing. There's air inside! Even though air is invisible, it is physical matter -- it has weight and it takes up space. If the bottle truly had nothing in it, it would be crushed under the weight of gravity. That's why, for example, when you suck or squeeze the air out of a bottle, the sides smush down. When you let go, and the air moves back in, the sides push back out. In our rocket experiment, it's the air moving out of the bottle that displaces your rocket and forces it to move. (Think: Would this also work with water squirting out of a bottle?)

SECRET SCIENCE AGENTS: WINTER MISSION

Your mission is to create the biggest chain reaction you can using dominoes, empty boxes or anything lightweight that you can tip over (don't use anything breakable!). Can you design a chain that has loops and branches? How about one that takes up the entire floor?? Bring in or email pictures to the C-Zone – we'd love to see them!

The way a rocket blasts off is a great demonstration of Newtonian physics. Sir Isaac Newton spent much time studying the world around him, and came up with some rules about the way different things behave. One rule (or "law") is that for every action, there is an equal and opposite reaction. So, when a rocket blasts air behind it, the force moves the rocket in the opposite direction.

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