Chapter 1 : Slippery Science: Explore Friction by Launching Stuff - Scientific American

P of science is that it generates theories and laws that must be consistent with observations save time and money shopping for science supplies with a.

Stack of five or six quarters Scotch tape Smooth wooden surface, such as a table or floor If you do not have a wooden surface, you can use any other type of smooth countertop or table. Rough carpeted surface If you do not have access to carpet, you can tape down several paper towels on top of your smooth surface. Ruler optional Preparation Stack your quarters on top of one another. Wrap them in tape so they are secured together. Make sure the bottom of the stack is smooth, with no sharp corners of tape sticking out. These could get caught on the carpet. Make sure the wooden and carpeted surfaces you will work with are free from any other objects or obstructions. Form a "C" shape with your index finger and your thumb. Carefully stretch the rubber band between your index finger and thumb to form a slingshot. Still carefully holding the rubber band, turn your hand upside-down and touch the tips of your finger and thumb to the wooden surface so the rubber band rests just above the surface. Load the stack of quarters into your slingshot and pull back on the rubber band. Pay attention to how far you pull back the rubber band; it is important to pull back the same amount each time. What do you think will happen when you release the quarters? Let go of the quarters to launch them. Watch closely to make sure they slide across the wood and do not get launched into the air or tumble. Repeat the launch several times and watch how far the quarters go. Remember to make sure you pull the rubber band back the same distance each time. Do the quarters slide very far or do they come to a stop quickly? What do you think this tells you about friction between your stack of quarters and the wooden surface? Now, repeat the same process on the carpet. Be careful not to let any corners of the tape get stuck on the carpet. How far do the quarters go on carpet? Do they go farther or less far than they did on wood? What does this tell you about friction between the stack of quarters and the carpet? Is it higher or lower than on wood? Use a ruler to record how far the quarters go each time. Record all your results in a table and then calculate an average distance for each surface. How far do the quarters go on average for the wood surface? How far do they go on average for the carpet? Try out more test surfaces in addition to wood and carpet. What if you go outside and try the experiment on a hard, rough surface, such as the sidewalk or driveway? What about other surfaces you can find in your home? How far do the quarters slide on different surfaces? Can you guess whether a surface will have high or low friction just by looking at it? Repeat the activity using different objects instead of your stack of quarters. For example, how do your results change if you try the experiment with a large rubber pencil eraser? You can use a kitchen scale to weigh different objects. Can you find an object that always slides farther than the quarters? Observations and results Did the quarters go farther on the smooth wooden surface or on the carpet? You should have found that the quarters went much farther on the smooth wooden surface than they did on the carpet. Depending on the strength of your rubber band and how far back you pulled it, you might even have launched them all the way off the table or countertop! Because there is less friction slowing them down, the quarters can slide farther on the wood before they eventually come to a stop.

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Sponge and clean-up cloths What You Do: Ask your child to help find a good spot for her lab. Since many science activities involve the use of sunlight and the observation of weather conditions, a window is important. If you have a window, place the table and chairs in front of it. This gives your scientist a well-lit workspace for the activities. Use the window half of the table to grow plants. For example, make one boundary the wall, the second a bookshelf placed perpendicular to the wall, the third smaller bookshelf placed parallel to the wall, and the fourth a piece of colored tape on hard floor or hook-side velcro on carpet. If your lab is in a corner, you can use another wall as the fourth boundary. Stock one of the bookshelves with activities and the materials required to complete them. Also include pencils and paper in case your child needs to write, draw, or chart something. For example, if two children can use the lab at one time, have five choices available on the shelves. This seems to be the magic number in keeping children productively and actively involved in what they are doing. Use trays, baskets, buckets or tote trays to contain all the materials and instructions for each activity. This will make it easy and intuitive for your child to put the materials back where they belong so she can find them again next time. With a prime workspace like this, your child will become an independent and self-directed learner. Here are just a few of the important concepts that your child can learn from working in her lab: When a hammer strikes a rock and the rock breaks open, your child observes causality, or cause and effect. When she pours water on a plant, allows the plant to have sunlight and watches the plant grow, she is learning that she can influence events and that she and other living things are also influenced by events. She will learn that things do not happen immediately; Sometimes there is a time delay between an event like watering a plant, and the resultâ€”a growing plant. This will teach her to be patient and to notice the long-term results of her efforts. When your child looks at the life-rings in the cross section of a tree trunk, she sees the patterns that exist in nature. She may begin to see other patterns, like in butterflies and beehives. Patterns are basic to the understanding of modern science. When your child observes a butterfly or a chick evolve from a cocoon or an egg, she is learning about the life cycle. When she observes ice melting, water brought to a boil and steam rising from the boiling pot, she is observing the water cycle. Encourage her to look for other cycles inside and outside her new laboratory. Everyt time your child pours, scoops and touches things, or when she notices texture, color, size and shape, she is learning about the qualities and the properties of things and about scientific observation. Make sure to tell her that her discoveries are important. Her curiosity will teach her some wonderful things. Using only the elements in your backyard, make paintbrushes with your child and create truly homemade works of art.

Chapter 3 : Catalog Record: Exploring science in your home laboratory | Hathi Trust Digital Library

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Chapter 5 : Explore Science - Home 2

Richard Harbeck is the author of Exploring Science in Your Home Laboratory (avg rating, 2 ratings, 1 review, published

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Chapter 8 : Richard Harbeck (Author of Exploring Science in Your Home Laboratory)

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