

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

# STEM SCAVENGER HUNT



Recording sheet

Write what you're looking for on the dotted line. Use the space below to record what you found. Write or draw!

Blank recording box with a blue border and a horizontal dashed line near the top.

Blank recording box with a green border and a horizontal dashed line near the top.

Blank recording box with a red border and a horizontal dashed line near the top.

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## STEM SCAVENGER HUNT

If you're really feeling stuck, refer to the answer sheet for some inspiration & learning.

**DISCLAIMER:** The answers are by no means comprehensive. There are more possibilities.

**AN EXAMPLE OF THERMAL CONDUCTION:** From the beach sand to our feet. Hot compresses to muscles. From the hand to an ice cube. From the engine of a car to the hood. From an iron to a shirt. From drinks to ice. From the flame to the pot and the pot to the water

**A THERMAL INSULATOR :** Water, Plastic, Paper, Glass, Styrofoam, Dry air, Dry cotton, Oil, Rubber

**A MAGNETIC OBJECT:** Paper clips, scissors, screws, nuts, needle, thumb tacks, a US nickel and bolts. Steel objects like tools and silverware are usually magnetic.

**A REFLECTIVE OBJECT:** Mirror, Foil, Smooth water, Polished Metal, Tinted glass

**SOMETHING TRANSLUCENT :** Frosted glass shower door, Tinted car windows, Sunglasses, A single piece of tissue paper, Vegetable oil, Stained glass, Butter paper, Some fabrics are translucent

**AN OBJECT THAT ABSORBS ALL COLOURS :** All things that are black- a black shirt, black shoes, black bag etc

**AN OBJECT THAT REFLECTS ALL COLOURS :** All things that are white- a white hat, white tablecloth, white bedsheet, white mug etc

**A MEASURING INSTRUMENT:** Ruler & roll meter, Angle ruler/protractor, weighing scale/ balance, thermometer, beaker glass, stopwatch/clock, KWH Meter, Speedometer, Blood Pressure Monitor

**ITEM THAT USES CODING IN EVERYDAY LIFE:** Traffic light, Coffee Machines, Facial recognition Doorbells, Smart ovens, Washing machine, Cellphone, TV, Scanners at shopping store, Printers, Computer software, Web browser, Video games and animations for entertainment

**A COMPLEX MACHINE:** A pair of scissors is a compound simple machine that uses levers to force wedges (scissors blades) onto something to cut it. In bicycles, the pedals and wheels form cooperating wheel and axle systems, the brakes are levers and the parts are held together with multiple screws. Pliers are constructed with multiple levers. A wheelbarrow is a combination of a lever and wheel and axle.

**SOMETHING THAT NEEDS A BATTERY:** Torch, Remotes, Watch, Alarm clock, Toys, Laptop

**AN EXAMPLE OF ELASTIC ENERGY:** Rubber band powered car, Toys with squashed or stretched springs, An archer's stretched bow, Wind-up mechanical watches, elastic band catapult

**SOMETHING WITH A TESELLATION PATTERN:** Floor tiles, Mosaics, Window panes, A brick wall, A checker board, A fabric pattern, Stained glass windows. Tesellation in Nature- Reptile and fish scales, Honeycomb, Sunflower, Turtle shells, Raspberries, Pineapples

**SOMETHING THAT USES A GEAR:** Bicycle, Car, Some rides at an amusement park, Wind turbines, Music boxes, Remote controlled cars, Clocks, Motors in cars, Motors that make your toys move.

**AN INSTRUMENT USED TO MEASURE WEIGHT:** Spring balance, Analog weighing scales, Digital weighing scales, Balance, Weighbridge

**SOMETHING TRANSPARENT :** Air, Water, Plastic, and clear glass are transparent. Spectacles, Clear glass windowpane, Cling wrap, Cellophane, Clear glass lightbulb

**AN OBJECT THAT IS SYMMETRICAL:** Spectacles, Lock, Glass, Ball, Pot, Sunflowers, Starfish, Butterflies, Dragonflies, Birdhouse



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**AN EXAMPLE OF ROBOTICS IN EVERYDAY LIFE:** Consumer electronics: Household robot, Roomba vacuum cleaner, Robotic lawnmower, Automatic car wash, Speeding and red light camera, Automatic door, Elevator, Popular children's toys

**AN INCANDESCENT OBJECT:** Sun and other stars, Fire, Torch, Light bulb, Electric lamp, Candlelight

**SOMETHING THAT CAN BOTH ROLL & SLIDE:** Coin, Bowl, Wheels, Pen, Can, Button, Bottle caps

**SOMETHING YOU CAN BOUNCE:** The shuttlecock isn't round, but it bounces. Basketball, Tennis ball, Ping-pong ball, Balloon, Marbles

**SOMETHING THAT PRODUCES SOUND:** Air conditioner, Fan, A balloon popping, A buzzing bee, Doorbell, Dripping faucet, Windchime, Sizzling on the grill, TV, radio, A whistle

**SOMETHING THAT IS WATERPROOF:** Waterproof materials include: Plastic, Rubber, Wax, Silicone & Latex. Examples: Wellington boots, Raincoats (note: these are also often referred to as waterproof jackets), Rubber ducks, Umbrellas, Leaves, Rubber gloves, Foil

**A SIMPLE MACHINE:**

Lever- Pliers, seesaw, crowbar, nail clippers, tweezers

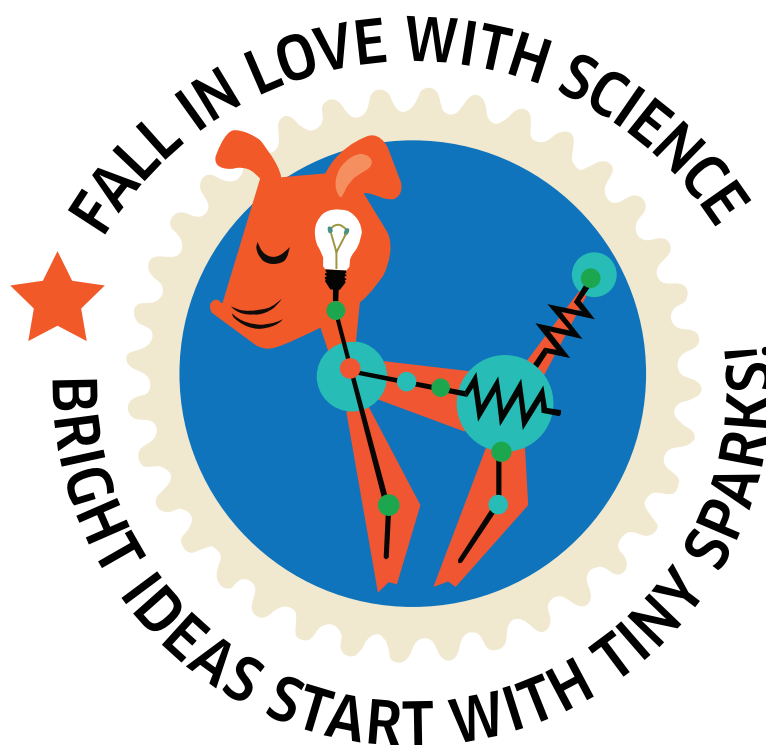
Inclined plane- ramp

Screw - Jar lid, Bottle cap, Faucet, Car jack, Light bulb, Corkscrew

Wheel and Axle - Steering wheel, faucet, screwdriver, drill, doorknob, and rolling pin

Pulley- Curtain, elevator, outdoor clothesline.

Wedge - Door wedge, axe, knife, needle.





## STEM SCAVENGER HUNT

**AN EXAMPLE OF A PURE ELEMENT:** Mercury is in some thermostats and in switches in space heaters that turn off when tipped over. Copper is used in electrical wiring and in some water pipes. Carbon in the form of soot, or in the form of graphite in pencil lead, or a diamond. About 20% of air is oxygen & about 80% is nitrogen. Phosphorus is in the tips of matches. Gold is found in jewellery and in the circuit boards in computers & small electronics. Zinc is used as a coating on nails and screws & in water heaters to prevent galvanic corrosion. You'll find argon & tungsten in incandescent light bulbs. Aluminum cans and foil are not actually pure aluminum, but rather aluminum alloys that are only made up of 90 to 99% aluminum metal.

**A COMPOUND:** Water ( $H_2O$ ), salt ( $NaCl$ ), baking soda ( $NaHCO_3$ ), Sugar ( $C_{12}H_{22}O_{11}$ ), soap, mouthwash Hydrogen peroxide ( $H_2O_2$ ), Acetone ( $CH_3COCH_3$ ) nail paint remover

**AN ACID:** Citric acids are found in fruits like oranges, lemon, and other citrus fruits. Carbonated drinks (carbonic acid), Vinegar (acetic acid), Car batteries, fertilisers (Sulphuric Acid). Coffee and yoghurt contain weak acids

**AN EXAMPLE OF A CHEMICAL REACTION:** Baking a cake, Rising bread, Caramelisation, Leaves changing colour, Foods going sour, Car rusting, Combustion, Food cooking, Rust formation, Tarnish forming on doorknobs, Fuel burning for heat, Tarnished penny

**AN EXAMPLE OF A PHYSICAL CHANGE:** Crushing a can, Melting an ice cube, Mixing sand and water, Breaking a glass, Dissolving sugar and water, Shredding paper

**SOMETHING THAT SINKS IN WATER:** Coin, stone, rock, marble, and most objects made of metals like paperclips and keys. Any packed solid material will most likely sink in water e.g. phone, bar of soap, a full bottle of shampoo

**SOMETHING THAT FLOATS IN WATER:** Leaves, Wooden stick, Paper, Ship, Plastic bottle, Bubble wrap, Oil, Ice-Cubes, Balloons, Plastic ball, Cork

**HETEROGENEOUS MIXTURE:** Concrete, Sugar & Sand, Salt and pepper, Chocolate chip cookies, Snack mix, Pizza, Tossed Salad, Ice cubes in soda

**HOMOGENEOUS MIXTURE:** Sugar, Water, Rainwater, Vinegar, Dishwashing detergent, Steel, Mouthwash, Cologne, Air

**SOMETHING THAT'S SOLUBLE:** Salt, Sugar, Coffee, Food coloring, Milk, Vinegar

**SOMETHING THAT'S MADE OF AN ALLOY:** Automobiles & building metals are made of alloys. Bronze-sculptures, Musical instruments, Medals, Steel appliances & cookware, Brass-lock, Zipper, Gears, Doorknobs, Cast-iron cookware, Sterling silver- cutlery, Jewellery, Coins

**SOMETHING MADE OF METAL:** Jewellery, Wires, Utensils, Foil paper, Statue, Gate, Nail, Car, Chain, Knife

**SOMETHING THAT CONTAINS A PRESERVATIVE:** Crackers, Pickles, Cereals, Bread, Snacks, Ready-to-eat meals, Cheese, Yogurt, Deli meats, Sauces, Soups and some medicines may contain preservatives.

**SOMETHING THAT MELTS:** Ice cubes, Snow, Chocolate, Butter, Cheese, Candle, Crayon, Popsicle

**SOMETHING THAT'S HIGHLY FLAMMABLE:** Petrol, Flour, Cooking oil, Nail polish remover, Dried orange peels, Sanitiser, Powdered sugar, Moth balls, Aerosols, Silk & Nylon fabrics

**CONDENSATION:** Clouds in the sky, Morning dew, Foggy car windows, Sweaty Drink-Cans, Foggy glasses, Visible Breath in Cold Conditions, Steamy Bathroom Mirror



## STEM SCAVENGER HUNT

**A NON-NEWTONIAN FLUID:** Ketchup, Oobleck/Slime, Silly putty, Blood, Whipped cream, Paint

**AN EVERYDAY LIFE EXAMPLE OF EVAPORATION:** Drying of Wet clothes, Formation of Salt, Working of a Pressure Cooker, Cooling Down of Hot Tea and Other Hot Liquids, Melting of ice cubes, Drying of wet hair

**SOMETHING BRITTLE :** Bone, Cast iron, Ceramic, Concrete are examples of brittle materials. Fire extinguisher boxes, Bus windshields, Brick, Ceramic pottery

**AN OBJECT THAT CONTAINS AN ELEMENT NAMED AFTER A HEAVENLY BODY:** Mercury thermometer, Helium filled balloons

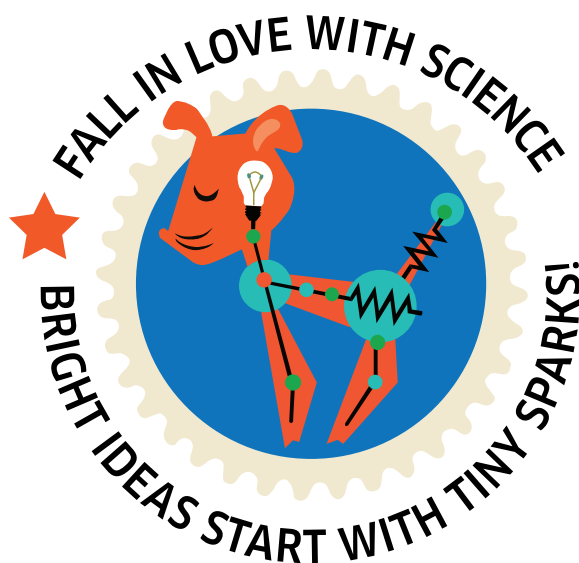
**SOMETHING THAT ABSORBS WATER:** Sponge, napkin, paper towel, face cloth, sock, paper, cotton balls, porous rocks-pumice, sandstone

**AN OBJECT CONTAINING A NON-METAL:** Oxygen cylinder, Chlorine is a powerful disinfectant, Sulphur is used to make gunpowder, fireworks, an insecticide or a fumigant. Bromine is used in dyes and pesticides; hydrogen is used in balloons & as a fuel; Fluorine is used in toothpaste; Carbon-diamonds, jewellery, Graphite is used as the lead in your pencils.

**AN EXAMPLE OF AN IRREVERSIBLE CHANGE:** Burning of paper, Burning of fuels (like Wood, Coal and LPG), Cooking of food, Rusting of iron, Grinding of wheat grains into flour, Growth of a plant, Ripening of fruits, Weathering of rocks; Printing of paper; Souring of milk; Making cheese from milk; Baking a clay pot in an oven.

**A SYNTHETIC PRODUCT:** Plastic bag, Plastic bottle, Disposable diaper, Synthetic fiber/cloth (polyester, nylon, or rayon), Artificial sweetener, Synthetic fuel (Synfuel), Synthetic rubber, medicines

**AN EXAMPLE OF MALLEABILITY:** Aluminium foils are used for wrapping food stuffs, silver foils are used for decorative purposes on sweets and fruits; gold & silver jewellery





## STEM SCAVENGER HUNT

**SOMETHING THAT GROWS:** Soil, seed, egg, plants, animals, insects, humans, all living things, fish, amphibians, mammals, birds, reptiles, fungi, bacteria, worms

**NON-LIVING THING:** Cars, water, fire, mountains, table, rocks, water, man-made things

**SOMETHING YOU CAN EAT THAT GROWS ON A CREEPER:** Pumpkin, strawberry, watermelon, cabbage, cucumber, bottle gourd

**SOMETHING THAT CAN BE RECYCLED:** Paper: office paper, magazines, newspapers and junk mail, Cardboard, Green, clear and brown glass bottles and jars, Juice and milk cartons, All hard plastic bottles and containers, but no lids, Steel (tin) and aluminium cans, empty aerosols

**A FOOD THAT'S A SOURCE OF CARBOHYDRATES:** Starches in whole grains, nuts, seeds, legumes, and vegetables. Sugars in milk, fruit, and other naturally sweet plant foods, bread, cereal, pasta, rice, potatoes. Most processed foods like pizza, burger, jams, jellies, and noodles are rich in carbohydrates.

**A SOURCE OF PROTEIN:** Meat, fish, eggs, legumes/beans, nuts, grains, tofu, seeds, milk, cheese, yoghurt

**A PLANT THAT NEEDS SHADE TO THRIVE:** Peperomia, Syngonium, Hydrangea, Poinsettia, Aglaonema, Heucheras, Begonia, Lady ferns

**A PLANT THAT CAN GROW WITHOUT SEEDS:** Ferns, Mosses, strawberries. Mushrooms grow from spores. Potato, onion, and ginger grow from buds. Rose, jasmine, hibiscus grow from stem cuttings.

**A COLD-BLOODED ANIMAL:** Butterfly, spider, cockroach, ants, all Insects, worms, fish, amphibians, and reptiles - all creatures except mammals and birds

**AN ARTHROPOD:** Spider, ant, crab, bumblebees, crayfish, cockroach, butterflies, beetles. Arthropods are a group of invertebrates, which include insects, arachnids, crustaceans, millipedes, centipedes, and others.

**AN EXAMPLE OF WEATHERING & EROSION:** Broken rocks, pot holes that form in road during winter, marble stones damaged by acid rain. Plant roots in between small cracks in rocks. Exposed tree roots, crumbling sidewalk or pavement. Sand on the beach is created from ocean waves pounding on rocks and eventually creating sand.

**HERBIVORE:** Grasshopper, elephant, rodents, rabbit, cow, horse, tortoise, camel, Guinea pig

**ANTISEPTIC:** Commonly used antiseptics include alcohol, iodine compounds, boric acid. Turmeric, Witch hazel, thyme, calendula, tea tree and lavender have natural antiseptic properties

**AN EXAMPLE OF BIOMASS FUEL:** Wood, manure, yard clippings, garbage. Some crops, like corn and sugar cane, can be converted into a biofuel called ethanol.

**A SIMPLE LEAF:** Maple, sycamore, sweet gum, pear, maple, hibiscus, mango, guava, black oak

**AN EXAMPLE OF A HETEROTROPH:** All animals and fungi, and some bacteria are heterotrophs

**AN OBJECT THAT IS BIODEGRADABLE:** Food Waste, Animal And Human Excrement, Manure, Sewage, Slaughterhouse waste, Most paper products, Egg shells, Grass, Flower/brush clippings

**SOMETHING NON-BIODEGRADABLE:** Plastic Cups and straws, Styrofoams Cups and Plates, Plastic bottles, Metal, Tetra packs, Medical waste, Carbon paper, Batteries, Glass



## STEM SCAVENGER HUNT

**NON-FLOWERING PLANT:** Ferns, mosses, coniferous trees such as pine, fir

**SOMETHING THAT'S GOOD FOR YOUR BONES:** Vitamin D, Sunlight, Calcium, milk, cheese and other dairy foods, green leafy vegetables, such as broccoli, cabbage and okra, but not spinach, soya beans, tofu, nuts, bread and anything made with fortified flour, fish where you eat the bones, such as sardines and pilchards

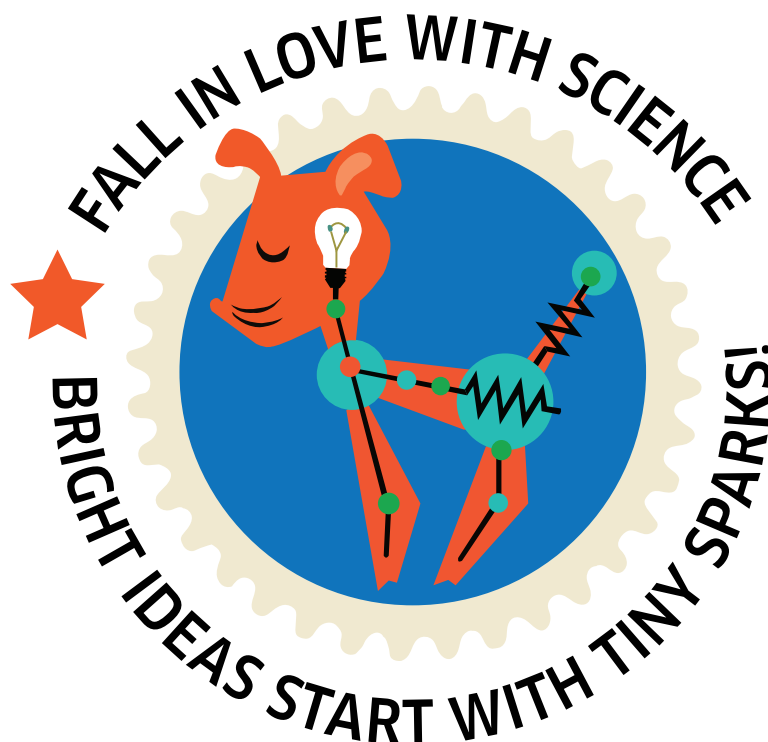
**AN ANIMAL THAT HIBERNATES:** ladybird, frog, bats, hedgehogs, ground squirrels, groundhogs, marmots, box turtle, bumblebee, snail, lizard, butterfly

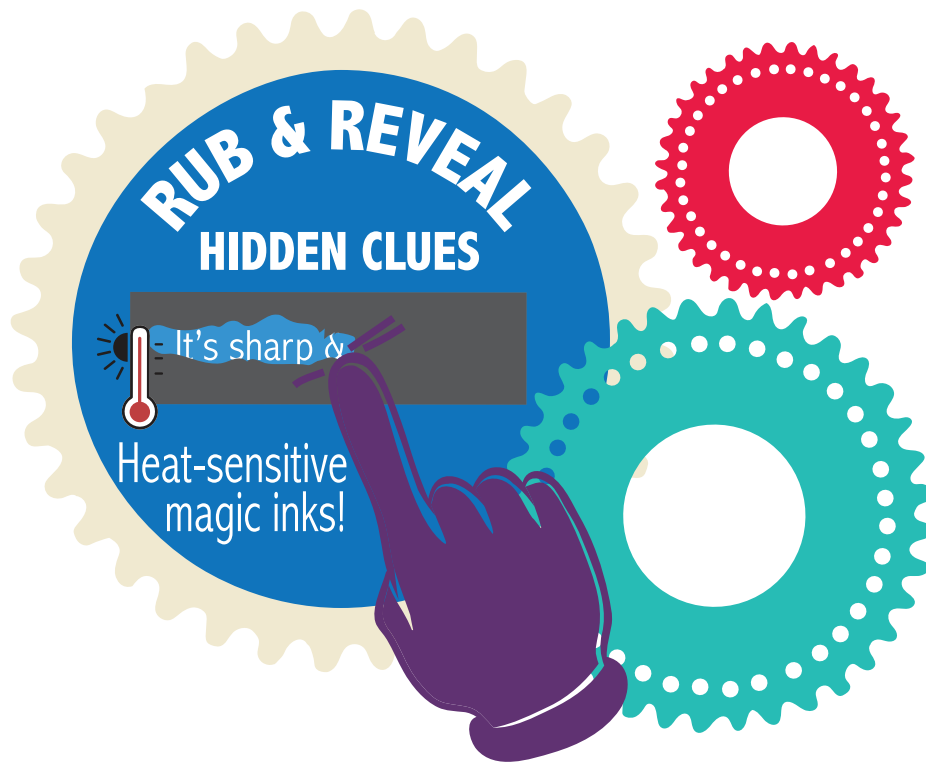
**AN EXAMPLE OF FIBONACCI SEQUENCE IN NATURE:** A few examples include the number of spirals in a pine cone, pineapple or seeds in a sunflower, or the number of petals on a flower. The numbers in this sequence also form a unique shape known as a Fibonacci spiral, which we see in nature in the form of shells and the shape of hurricanes. In trees, the Fibonacci begins in the growth of the trunk and then spirals outward as the tree gets larger and taller.

**AN EXAMPLE OF A REPEATING PATTERN IN NATURE:** Fractals in nature- snowflakes, trees branching, lightning, and ferns. Concentric circles in the layers of an onion, an orb spider web, and the rings of trees that form as it grows and ages. Spirals- pine cones, pineapples, hurricanes. Tessellations- honeycomb, pineapple, turtle shell

**A SEED:** Most fruits and vegetables will have seeds

**A SIGN THAT AN ANIMAL HAS PASSED BY:** A sign is anything that is indication of an animal. This could be almost anything: footprints, tooth marks, feathers, hair, nest, eggshells, nutshells, scratchings, even poop.





## THE SCIENCE BEHIND RUB & REVEAL

The clues are printed under a block that's printed with a special thermochromic ink. **Thermochromic** describes the ability of something to change color with changes in the temperature. Thus, when thermochromic ink is used on a material, the part where the ink is will change colors with fluctuations in temperature. Thermochromic ink contains leuco dye, a pigment that responds to temperature change. Leuco dyes can acquire two different molecular forms: a colorless form and a colored form. At warm temperatures, the thermochromic ink is colorless, and at cold temperatures, the thermochromic ink is colored. How cool!

So when you rub the black strip, you are generating heat and the colour will disappear to reveal the clue below. If you find yourself struggling to reveal the clue, rub your fingertips together to generate heat and then rub on the black strip.

