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Session	Material Needed	Experimental Procedure	
Session 1 Milk the Cow Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● Rubber glove ● Water or milk ● A cup ● Flour (optional)	1. Fill the glove with either water or milk. Tie the open end of the glove, so that it holds the liquid without spilling. 2. Take a needle and prick the end of 1 finger of the rubber glove. Depending on the thickness of your gloves, you may need to stretch the hole with the needle in a circular motion to widen the hole. 3. Allow the child to grasp and squeeze the finger downward to simulate milking a cow. You can attempt to fill a small glass with the milk. 4. Hold the glove while the child squeezes, or if they can, encourage the child to use 2 hands for the activity.	
		Image Example	Learning Outcome
			Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=YiKPUTspGVE>

Book: A Birthday for Cow! by Jan Thomas <https://www.amazon.com/Birthday-Cow-board-book/dp/0544174240>

Session	Material Needed	Experimental Procedure	
Session 2 Water Suspension Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● Large bowl of water (preferably a clear bowl for maximum visibility) ● Food coloring ● Small clear drinking glass	1. Add food coloring to the water 2. Submerge your glass into the bowl (which is filled with water) 3. Turn the glass upside down, keeping it fully submerged 4. Slowly lift the glass up, without letting the top of the glass rise above the surface of the water 5. Try lifting the glass fully above the bowl, breaking the surface	
	Image Example 	Core Science Concepts ➤ Pressure ➤ Gravity	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=Qawrsk79YKs>

Book: Miss Smith Under the Ocean by Michael Garland <https://www.amazon.com/Smith-Under-Ocean-Michael-Garland/dp/0525423427>

Session	Material Needed	Experimental Procedure	
Session 3 Don't Topple the Teepee Fine Motor Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. How to change it: ◆ Vary how the kids are positioned for the game by changing their base of support and challenging their body control and strength in different ways (e.g., on their tummy, on their knees, standing up, etc.). ◆ You can also time the game to increase the speed and the challenge.	- Sticks (chop sticks, wooden skewers, small twigs, unsharpened pencils, straws, etc.) - A loop to place the sticks inside (scrapbook paper, a cut up toilet paper roll, ring cut from the bottom of a plastic cup, etc.)	- Take a bundle of sticks and place them inside of a loop. - Use as many as needed to make the teepee stand up. - Take turns pulling out 1 stick at a time. The first 1 to crash the teepee loses!	
	Image Example	Core Science Concepts	Learning Outcome
		- Forces - Interactions	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video reference: <https://www.youtube.com/watch?v=G6CU5uHltIw> (how to build the teepee)

Book: Machines at Work by Byron Barton <https://www.amazon.com/Machines-at-Work-Board-Book/dp/069401107X>

Session	Material Needed	Experimental Procedure	
Session 4 Leak Proof Bag Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	Gallon size storage bag ● Sharpened pencils	1. Fill a gallon size storage bag about half full with water. 2. Poke a pencil straight through the bag; in one side and out the other size. Make sure the tips of the pencils are sharpened to a point.	
		Image Example	Learning Outcome
			Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=z-MsYagHs10>

Book: Goodnight, Goodnight Construction Site by Sherri Duskey Rinker

<https://www.amazon.com/Goodnight-Construction-Sherri-Duskey-Rinker/dp/1452111731>

Session	Material Needed	Experimental Procedure	
Session 5 Skittles Rainbow Science Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● White plate ● Warm water ● Skittles (try different colors and flavors)	1. Grab your plate and organize the Skittles in a circle around the edge of the plate. Kids can try different color patterns each time they do the experiment! 2. Gently pour water in the center of the plate. Warm water works better than cold. Make sure there is enough water to go past the Skittles while filling the plate. 3. Wait and watch the Skittles colors move towards the center of the plate with beautiful rainbow streaks.	
	Image Example	Core Science Concepts	Learning Outcome
		➤ Dissolve ➤ Diffusion ➤ Interactions	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=sYLium30mbE>

Books: Planting a Rainbow by Lois Ehlert <https://www.amazon.com/Planting-Rainbow-Lois-Ehlert/dp/015204633X>

Session	Material Needed	Experimental Procedure		
Session 6 Rainbow Walking Water Science Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask: ◆ What do you think will happen to the water? ◆ What is happening now? ◆ Why do you think the colors are changing? ◆ Why might the water be able to move up against gravity like that?	● 6 identical cups or jars (glass or clear plastic so you can see the height of the water) ● Paper towels ● Food coloring ● Water	1. Fill three cups about 3/4 full of water 2. Add a few drops of food coloring and stir. (you can use the primary colors red, blue, and yellow to get the rain effect) 3. Place the empty cups between the cups filled with water 4. Fold the paper towel lengthwise until it's about 1 inch wide 5. Put one end of the paper towel in the cup with the colored water and the other end in the empty glass. * Tips: you may want to trim your paper towel if it's sticking up in the air too much		
	Image Example 	Core Science Concepts ➤ Dissolve ➤ Diffusion ➤ Adhesion ➤ Interactions	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).	

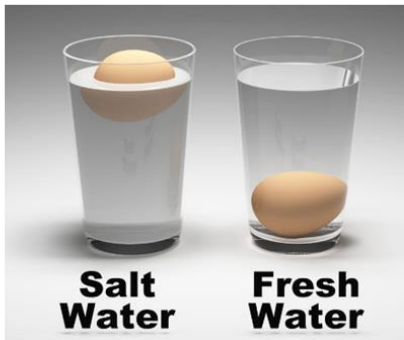
Video Reference: https://www.youtube.com/watch?v=fYniUL4l_BA

Book: Mouse Paint by Ellen Stoll Walsh <https://www.amazon.com/Mouse-Paint-Ellen-Stoll-Walsh/dp/0152002650>

Session	Material Needed	Experimental Procedure	
Session 7 Lava Lamp Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. How to change it: What happens if you put the cap on after dropping the fizzy tablet in? What if you drop a whole tablet in? When it stops bubbling, try sprinkling some salt into your lava lamp. What happens?	● A clean plastic bottle (try to use one with smooth sides) ● Vegetable Oil (or you could use mineral or baby oil instead) ● Fizzing tablets (Alka Seltzer) ● Food coloring ● Water	1. Fill the bottle up about 1/4th (1 quarter) with water 2. Pour the vegetable oil in the bottle until is almost full. You may want to use a measuring cup with a spout or a funnel and wait a couple of minutes for the oil and water to separate 3. Add a few drops of your favorite food coloring. Watch as the color sinks through the oil 4. Break your fizzy tablet in half and drop part of it into the bottle 5. You can even get a flashlight, turn off the lights and drop in another half tablet.	
	Image Example 	Core Science Concepts ➤ Dissolve ➤ Dense ➤ Interactions	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=qULZM7GdYMA>

Book: Fire Truck by Peter Sis <https://www.amazon.com/Fire-Truck-Board-Book-Peter/dp/0060562595>

Session	Material Needed	Experimental Procedure	
Session 8 Floating Egg Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask ♦ Do you think that the eggs will sink or float when placed in water? ♦ Do you think it's possible to make them float? If so, how? ♦ What do you think will happen if you place the egg into the glass with the salt water? ♦ Why do you think one egg sinks and the other egg floats?	● Two glasses 2/3 full of water ● Salt ● Two eggs	1. Fill a tall drinking glass about 3/4 full of water and carefully place the egg into the glass 2. Fill another tall drinking glass about 3/4 full of water 3. Add 3 Tablespoons of salt to the water and stir until it is completely combined. 4. Next carefully place the second egg into the glass with the salt water.	
	Image Example 	Core Science Concepts ➤ Dissolve ➤ Density	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=gfuLoaEYKis>

Book: Ready for Anything! by Keiko Kasza <https://www.amazon.com/Ready-Anything-Keiko-Kasza/dp/0399252355>

Session	Material Needed	Experimental Procedure	
Session 9 The Pepper and Soap Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask ◆ What do you think will happen when you touch your soapy toothpick to the water? ◆ How will the pepper flakes react?	● A plate or a bowl ● Dish soap ● Black pepper ● Water	1. To start, get a plate or a bowl and fill it with enough water to reach the edges, but not overflow it 2. Sprinkle black pepper across the surface of the water. Note how the surface tension of the water causes the pepper flakes to float 3. Stick your finger in the center of the dish 4. Dip the tip of your finger into the liquid dish soap * you don't need much 5. Stick that finger into the center of the dish	
	Image Example 	Core Science Concepts ➤ Surface tension ➤ Hydrophobic ➤ Dissolve ➤ Interactions	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

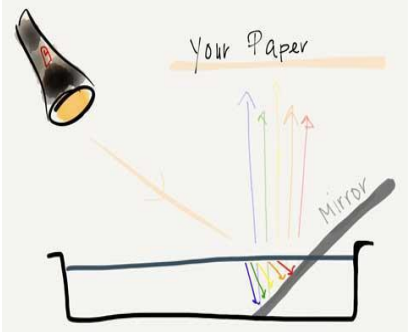
Video Reference: <https://www.youtube.com/watch?v=rpnGeWUSYV4>

Book: Press Here by Herve Tullet <https://www.amazon.com/Press-Here-Board-Herve-Tullet/dp/1452178593>

Session	Material Needed	Experimental Procedure	
Session 10 Refraction of Light Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask ◆ How is refraction demonstrated in light? ◆ Why does an arrow change direction behind a glass of water? ◆ What is the science behind refraction? ◆ What causes refraction?	● A piece of paper ● Marker ● A glass or jar ● Graphic designed papers ● Water	1. Fill the glass jar carefully with the clean and clear water 2. Get a piece of paper and ask student to draw an arrow. Let students draw the arrow in any direction (any direction of arrow works out) and hold it vertically. 3. Now place the water filled jar in front of the paper (exactly focusing) just before the arrow. Adjust the glass jar between the glass and the arrow on the paper until the image (arrow) can be seen clearly through the glass. 4. Ask students to come in front of the glass jar and see what happens. Here ask them a few questions like ‘what did they observe’, ‘is there any direction changes’, if the answer is yes (from students), then ask for any clues or reasons to explain why it happened.	
	Image Example	Core Science Concepts	Learning Outcome
		➤ Refraction	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=9n362snGUdw>

Book: Found by Salina Yoon <https://www.amazon.com/Found-Salina-Yoon/dp/0802735592>

Session	Material Needed	Experimental Procedure	
Session 11 Making Your Own Rainbow Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● A shallow pan ● A flashlight or sunlight ● A white surface or piece of paper ● A mirror ● Water	1. Fill the shallow pan about halfway full of water. 2. Place the mirror in the water at an angle. 3. Shine the light into the water where the mirror is under water (or, using the sunlight, bring the pan and mirror outside so the sun can shine on the mirror underwater) 4. Hold the white paper above the mirror; adjust the angle until you see the rainbow appear!	
	Image Example	Core Science Concepts	Learning Outcome
		➤ Refraction ➤ Reflection	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=Cm9ZkYTnCNE>

Book: Dog's Colorful Day by Emma Dodd <https://www.amazon.com/Dogs-Colorful-Day-Counting-Picture/dp/0142500194>

Session	Material Needed	Experimental Procedure	
Session 12 Floating Fry Erase Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● A glass plate, bowl or picture frame ● Dry erase marker ● Water	1. Draw a simple picture on the glass. A stick figure is a good one to start with 2. Pour water onto the plate or into the bowl slowly to lift up the drawing 3. Swirl the water around to make the picture dance and move	
	Image Example	Core Science Concepts	Learning Outcome
		➤ Dissolves ➤ Neutralization reaction	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

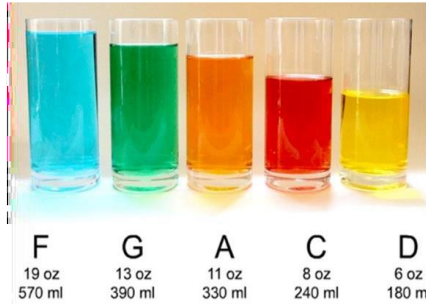
Video Reference: <https://www.youtube.com/watch?v=FoNQjx9wqH0>

Book: Blue Sea by Robert Kalan <https://www.amazon.com/Blue-Sea-Robert-Kalan/dp/0780718615>

Session	Material Needed	Experimental Procedure	
Session 13 Dancing Raisins Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask ♦ What other materials might ‘dance’ in the bubbly water? Why? ♦ Try this experiment, but instead of using carbonated water, use a mixture of baking soda and vinegar. What happened? ♦ Time how long it takes one raisin to rise after being dropped in the water. Does the time increase, decrease or stay the same over time? Why?	● Raisins ● Two clear glasses ● Rubber wrap ● Carbonated water and regular tap water	1. Pour some carbonated water into a clear glass 2. Add some raisins and watch what happens 3. Then hot out a glass of regular, non-carbonated water to see what would happen and make comparisons	
	Image Example 	Core Science Concepts ➤ Sink ➤ Density	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: https://www.youtube.com/results?sp=mAEB&search_query=Dancing+Raisins+Science

Book: Five Little Monkeys Jumping on the Bed by Eileen Christelow <https://www.amazon.com/Five-Little-Monkeys-Jumping-Story/dp/0547896913>

Session	Material Needed	Experimental Procedure	
Session 14 Making Music with Water Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Tips: F : 19 oz (570 mL) G: 13 oz (390 mL) A: 11 oz (330 mL) C: 8 oz (240mL) D: 6 oz (180 mL)	● 5 or more drinking glasses or glass bottle ● Wooden stick such as a pencil ● Water	1. Line the glasses up next to each other and fill them with different amounts of water. The first should have just a little water while the last should almost full, the ones in between should have slightly more than the last. 2. Hit the glass with the least amount of water and observe the sound, then hit the glass with the most water, which makes the higher sound? 3. Hit the other glasses and see what noise they make, see if you can get a tune going by hitting the glasses in a certain order.	
	Image Example 	Core Science Concepts ➤ Vibration ➤ Wave ➤ Speed	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=iFwtybB3R6Q>

Book: The Doorbell Rang by Pat Hutchins <https://www.amazon.com/Doorbell-Rang-Pat-Hutchins/dp/0688092349>

Session	Material Needed	Experimental Procedure	
Session 15 Magic Star Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● 5 toothpicks ● Small plate ● Medicine dropper ● Water	1. Take the 5 toothpicks and bend them until they bend in half but be careful not to let them break fully apart. 2. Arrange the toothpicks so they create a closed star pattern. 3. Fill up the medicine dropper with water. 4. Slowly add drops of water to the center of the toothpicks and watch the star move!	
	Image Example	Core Science Concepts	Learning Outcome
		➤ Capillary action ➤ Adhesive forces	Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=X0CmhY098mQ>

Book: Happy Birthday Moon by Frank Asch <https://www.amazon.com/Happy-Birthday-Moon-Moonbear-Frank/dp/0689835442>

Session	Material Needed	Experimental Procedure	
Session 16 Invisible Ink with Lemon Juice Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them.	● Lemon (1/2) ● Small bowl ● Cotton swabs ● Paper ● Heat source (like a candle or an incandescent light bulb)	1. Gather your materials 2. Squeeze the juice of the lemon into a small bowl. 3. Using the cotton swab as a pencil, write a secret message on the paper. Then, let the paper dry completely. 4. Bring your heat source close to the paper and watch as your secret message magically begins to appear!	
	Image Example 	Core Science Concepts ➤ Chemical reaction ➤ Acids	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).

Video Reference: <https://www.youtube.com/watch?v=AOVD7WgFP2s>

Book: Bunny Mail by Rosemary Wells <https://www.amazon.com/Bunny-Mail-Ruby-Lift-Flap/dp/0670036307>

Session	Material Needed	Experimental Procedure		
Session 17 Magic Milk Key Details develop an understanding of the four disciplinary core ideas: Physical sciences; Life sciences; Earth and Space sciences; and Engineering, Technology, and Applications of science. In the earlier grades, students begin by recognizing patterns and formulating answers to questions about the world around them. Questions to ask ◆ What did you notice? ◆ What happened when you put the cotton swab in the milk? ◆ Why do you think that happened? ◆ Why do you think it stopped moving around after a period of time? ◆ What else did you observe?	● Lemon (1/2) ● Small bowl ● Cotton swabs ● Paper ● Heat source (like a candle or an incandescent light bulb)	1. Pour a thin layer of milk in a shallow pan 2. Have the kids add drops of food coloring all around in the milk 3. Then the kids will pick up a cotton swab and dip it in the dish soap 4. Then put the cotton swab in the milk – pressing it down in one spot and holding it there for about 15 seconds		
	Image Example 	Core Science Concepts ➤ Mineral ➤ Protein ➤ Molecule	Learning Outcome Students can demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s).	

Video Reference: <https://www.youtube.com/watch?v=kS10IugFrnI>

Book: It Looked Like Spilt Milk by Charles Shaw <https://www.amazon.com/Looked-Like-Spilt-Milk-Board/dp/069400491X>

Other Books list you can check by the book list from Kmind.

Link:

<https://drive.google.com/drive/folders/1sa7hTChsSwvYrTaVvkfHi15U6zlO9aes?usp=sharing>