

## 1. What Does a Scientist Look Like?

Have children draw a picture of what they think a scientist looks like. Have real pictures of real scientists blown up and hung on the wall, covered by pieces of papers. Kids can lift up to see if their picture matches.

Ask questions like:

Does your scientist have glasses? Is your scientist young or old? Is your scientist a man or woman?

Place near a display about scientists in the field.

## **PAUSE**

## 2. The Lab

Set up an area in your library that can be the lab for the summer. Things you will need: plastic table cloth, wet wipes, lab coats, safety goggles, pencils, scrap paper.

Can be placed next to a bulletin board with a title; Near a place you can put books; or have more than one station. A shorter center for preschoolers and a taller one for teens.

You could even create “lab notebooks” for kids to keep at the library and use each time they come to the library. Take notes, make predictions.

Bulletin Board Idea: Prediction Wall – If you plan on doing a crazy scientist program, choose one of the experiments and have kids predict what will happen. They will need to come to the program to find out!

## **PAUSE**

## 3. Forces and Motion

Design and Test a Parachute (Surface Area, Resistance): You will need Plastic Bags; scissors; string; permanent markers; small object to act as the weight (figurines, washers)

Build parachute then test. Have a few step stools for kids to drop parachutes from. How big does the parachute need to be? Try different cloths.

Resistance – Have a race with kids holding pieces of cardboard. Give kids different sizes – how does that affect their ability to run?

Balloon Noise Maker (Centripetal Force): You will need balloon; hex nut; other things to try...marble, size of the balloon, rice

Bucket of water....

Pencil Strength (Friction): Use a pencil to pick up thousands of grains of rice: You will need plastic bottle; pencil; rice; a funnel

Blow (Air Pressure): You will need straws, several small things that could be blown across a table. Arrange in order from easiest to hardest. Grab some friends, how many people does it take to blow it?

Parachute Play for younger children.

Cone and Straw w/ tinfoil ball

Get Revved Up (Newton's Law of Motion): You will need open space; hardcover books of varying sizes; small wheeled vehicles; marble or small ball Arrange books to form an incline, roll balls/vehicles down the slope, experiment with different angles, materials, compare vehicles, set up races, which will go faster?

HOT WHEELS PROGRAM

ANGRY BIRDS LIVE

Balloon Hovercraft (Friction): You will need CD; Balloon; Pop-top cap from a liquid soap bottle or water bottle; hot glue gun put a piece of tape over the hole of the soap bottle and poke some holes in it to make hovercraft go longer.

Paper Airplanes – Use books in the library, hire someone to do origami, challenge participants to create an airplane that will fly the farthest. Test and rebuild. (share story about school enrichment class)

Air pressure – cut a strip of tissue paper and place it below your lower lip and blow steadily. The paper should rise. This is because the air above the paper is moving faster and therefore has lower pressure. Similar to airplane wing.

Streamlining – using clay and a tall glass jar filled with water have participants create different shapes with the clay to see how affects them moving through the water (round, square, thin and pointy at each end...)

Testing the strength of Cardboard (Force/Gravity): You will need several pieces of cardboard, cup, marbles, two blocks of wood. Place the cardboard over the two blocks of wood like a bridge. Place the cup on top of the cardboard. Add marbles until the cardboard bends. Try different shapes of cardboard, put the blocks closer or farther apart

Bend the thinner cardboard so that it is rounded between the stacks of books. Retest with the cup and marbles.

Building with gumdrops and toothpicks, building with spaghetti and marshmallows – test different shapes (triangle, square, with diagonals, etc..) Test each building with cup and marbles.

Legos: Build a bridge spanning a specific width of books, test for strength. Do with cardboard.

## PROTECT YOUR PEEPS

Gravity Art – Have kids stand on a small ladder and drop colored sponges onto a big sheet of paper.

## PAUSE

### 4. Light and Mirrors

Flashlight Fun: You will need black circles, flashlights, mirrors  
Cut out several black circles and hang up around the room. Have children try to hit the targets with the flashlights, then use the mirrors to try to hit the targets.

Prisms

Pictures of different light sources have kids sort them into natural and man-made.

Variety of Objects, shine the light through, sort into transparent, translucent, and opaque.

Sky and Sunset Jar: Jar, water, ½ teaspoon of milk, flashlight Shine flashlight through glass (looks blue), shine flashlight behind glass towards you (looks red)

Shadows: Shine light at objects...can you make the shadow longer? Shorter? Disappear? Place object at the edge of a piece of paper and shine light, trace around the object. You can do or have kids do it. If you do it, have the kids guess what the pictures are.

Mirror Drawings: Looking only at a mirror, try to navigate a maze, draw a picture, write your name. Draw only half of a picture and hold up to a mirror.

## PAUSE

### 5. Measurements

Does it Fit?

Which is Heavier?

Wrap several boxes of varying sizes with items inside...make a small box VERY heavy and a big box very light. Without picking up the boxes, arrange from lightest to heavies. Pictures of what is the box, can you guess which box has what?

Are You a Square?

Make a Bungee Scale: You will need a rod, bucket, bungee cord, various objects including a heavy one. Place items in the scale, how far does the cord stretch? Test the strength of rubber bands.

Measuring with Objects such as m&m's, paperclips, clothespins, feet, etc... have a chart with different things they can measure. Will it take more paperclips or clothespins to measure how tall you are.

At a program, lay out a long sheet of paper that is taller than the tallest child. Have each child lie on the paper with their feet at the edge and measure how tall they are. Mark a line on the paper and have the child write their name. Who is the tallest? Shortest?

Play a game by hiding different lengths of string around the room. Break into teams. Each team will have a different color of string. Team members race to find the string then come back together to tie them...whose is the longest?

Game Show like: How many paperclips will it take to stretch across this room? Each team can guess and then try it! Race to build a tower so many feet tall?

# PAUSE

## 6. Our Senses

### Sound

Cup Telephone: Two Cups on a String, play telephone, have a variety of string lengths,

The Cone: Have kids create cones to hold by their ears. Work with a partner, have your partner move across the room and say a word, whisper it, then use the cone, can you hear them better? Have partners stand behind you, use the cone to see if you can still hear them when you can't see them.

Shaker Match: Place a variety of objects in a film canister or covered toilet paper roll. Label them 1, 2, 3 etc. Have kids guess what is inside. Or make pairs and have kids try to find their partner.

### Hex Nut Balloon

Sound Waves: Cover a large bowl with saran wrap and pull tight. Place rice, pom poms, or raisins on top of the saran wrap. Using a small drum, tap next to the bowl...what happens? Place a radio or CD player on the table next to the bowl. Play different types of music, what makes the items move the best?

### Squawking Cup

Sound Effects: Guess what the sound is.

Group Games: Dance to the music and freeze, blindfolded Marco Polo,

### Touch

Braille: Put out a display of Braille books if you have them, books about deaf people, etc... Have kids make a Braille name tag. Print out a copy of the Braille alphabet. Create a Braille Cell, have kids make the letters by filling in the correct part of the cell. (Mancala Board has 2 perfect cells)

What's in the Box? Create a sensory box by cutting a hole in the side of a box large enough for a child to put their hand in. Place an item in the box and have

them reach in and try to guess what it is. Or use a bag. Play a game: Can you pull out the?

Touch Maze: Use a blank bingo like board. Use tapes of varying textures, scotch, masking, duct... Create a maze through the board. Close your eyes, using only your fingers can you make your way through the maze?

Masking tape lines with string underneath.

Sensitive Skin: Make a Von Frey Device (measures skin's detection threshold) You will need 5 popsicle sticks and 5 different widths of fishing line. Cut a 2" length of fishing line, attach to Popsicle stick, and label the width on the stick. Test different areas of a partner's skin : palm, pinkie tip, inside forearm, outside forearm, back of neck, cheek and elbow. Works best if kids are wearing just a t-shirt.

Slime/Oobleck: Millions of recipes. Make in plastic bags, premeasure ingredients.

Test Reaction: Have a bowl of ice, plate with rice. Place hands in ice for a few minutes. Now, try to pick up the rice. What happens?

Catch the Ruler: Have a friend hold a ruler up. Place your hand around the zero mark. Have your friend drop the ruler. Where do you catch it? Test various people. Close your eyes. Can you improve?

## Sight

Spinning Colors – Cardstock circle, toothpick, straw. Divide circle into 8 segments and color in this pattern G, R, B. Poke toothpick through the middle, place in straw and spin. What happens?

## Memory Games

I Spy: Create a I Spy board, use I Spy books, Let kids create their own.

Optical Illusions: print online, use books

Nose to Nose: Two pictures, touch them together, close an eye and try again.

Eye charts

## Smell

Cotton Balls with extract

Several items from nature, what do they smell like? Different flowers? Instead of carnations in colored water, would it work to put them in scented water?

Place a piece of fruit/squeeze some juice into a container. Can you guess?

Interesting Facts: You cannot smell when you are asleep.

Scratch and sniff art: Paint a picture, cover small part with glue, and sprinkle with cinnamon. Spice painting (glue, water, spice)

Whose nose is it?

Taste

Candy Check – Taste different types of candy, can you guess what it is?

Edible Fear Factor

Ice Cream Inventors

Cupcake Wars

## **PAUSE**

### 7. Crazy Concoctions (see sheet for recipes)

Fizzy Sidewalk Paints

Alka Seltzer Lava Lamps

Invisible Inks

Henna Tattoos

Crayon Shaving Art

Baking Soda/Vinegar

Slime/Bouncy Balls

Lip Gloss, Fizzy Bath Salts, Jello, Finger Paints, Play-dough, Bubbles, Recipes, Paper Mache

## **PAUSE**

## 8. Our Bodies

Test your dominate side (see sheet)

Genetics – Have teens survey their family to see what they have in common.

Questions like: What color hair do you have? Do you have freckles? Do you have cheek dimples when you smile? Are your earlobes attached or do the ends hang free? Can you roll your tongue up into a tube? Are you double jointed? If so, in what part of your body? What color are your eyes? Do you have a widow's peak?

Heartbeat – Measure your Pulse with a straw You will need clay, straw, stop watch. Follow directions on the sheet. Have kids perform a variety of activities such as: jumping jacks, sitting quietly, running in place, reading a book, etc.. have them recheck their pulse after each activity. Compare to friends.

Busy Body Challenges – Make cards with different body parts. Have children pull a card and perform a movement using that body part. After a while have them pull two cards and perform an action using both body parts.

Fantastic Finger Feats – Do a variety of challenges using different fingers. Pick up a pencil, carry a small ball, lift a mug, snap fingers, flick a coin, press buttons on a calculator with strong hand vs. weak hand,

Brain Science – Puzzle books, possible specimens from local college? If you do a body program maybe you can ask a local butcher for a cow brain? Teen Personality Quizzes/Astrological

Bet you can't! - <http://www.arvindguptatoys.com/arvindgupta/betyoucant.pdf>

Minute-2-Win-It

## **PAUSE**

## 9. Classifying

Sorting

Venn Diagrams



Living/Nonliving

Colors/Shapes/Textures

## **PAUSE**

### 10. Magnifying

Close Up Pictures – Take pictures around town and blow them up, have kids try to guess where they are.

Microscope – Slides for kids to see

Tiny Pictures: Mary Tooley's idea of giving kids little pieces of paper to make art.

Diseases – Teen Program

Yellow Fever Tag (Mosquitos) Small Dot Stickers

Botulism (Food) – Berries/Balloons with slips of paper inside that say dead or alive, stomp a balloon  
break it open, see if you live or die

Spanish Flu (Germs) – One teen is (secretly) chosen as It, dust hands lightly with germs. Everyone closes their eyes and walks around shaking hands. When done, whoever has glitter on their hands is out.

Polio (Nervous System) – Some sort of game where their legs are tied?

Diarrheal Diseases – Something with Toilet Paper, Musical chairs as toilets?

## **PAUSE**

### 11. Bubbles (oriental trading)

Big Bubbles – kids pool and hula hoop

Little Bubbles – straws and cups – how big can your bubble tower get?

Bubble Painting – thinned down paint with water and soap, blow with straw, pat with paper

Bubble Tray – use a cookie sheet with bubble solution, blow onto the tray, and connect bubbles

Bubble Bottle – Fill a bottle with bubbles

Can you make shaped bubbles? Try making bubbles with just your hands? Different size bubble wands.

## **PAUSE**

### 12. Natural Science

Science of Dirt – Looking at Dirt, Worms, Egg Geodes, Dirt Catchers

Gardening -

Animal Adaptation / Camouflage

Life Cycles – Butterfly lifecycle, Meal Worms (Preschool Program)

Rocks & Gems – samples from somewhere, patron collection,

Pet Rock craft idea, Rock Cycle Game

Skeletons – samples from somewhere

Science Discovery Table: Write to librarians from different areas of the country and ask them to send you something from nature.

## **PAUSE**

### 13. You Tube Film Festival

Crazy Science Videos

## **PAUSE**

### 14. Magnets

Magnet along a line

Magnet races across a table

What is magnetic?

Paperclips in a 2 liter bottle

How many paperclips can you pick up?

Magnetic toys

## **PAUSE**

### 15. Static

Balloon & Paper Pick Up

Tissue paper spiral snake – static pick up

Make it a math game – write numbers on pieces of paper and have kids add or subtract

Make it a shape game – only pick up a certain shape

Make it a spelling game

Salt & Pepper – charge a ruler,

Tinsel Orb – Take six strands of tinsel, tie a knot at each end, cut off excess near knot, charge a pvc pipe by rubbing it on your hair, drop orb over pvc pipe and it will float.

Group Game – break into two teams, blown up balloons in two different colors, for 1 minute each team finds their color balloon, rubs it on their hair and sticks the balloons to the wall. Whoever has the most after 1 minute wins.

## **PAUSE**

### 16. Misc.

Chromatography

Tie-die w/ Sharpies

What floats? / Flinkers

Gummy Bear Science – Dissect, try to dissolve them in different liquids, classify, taste test

Mythbusters: watch a show, come up with your own myth to bust?

Robots – pen bots, movable toys

How many drops of water will fit?