

Observation Station Ideas

1. Worms—Children use plastic spoons to dig worms from school yard. Place in clear plastic tub so children can see from beneath.
2. Playdough—In cooking center, make a different playdough recipe each day for a week and observe the differences in texture.
3. Pumpkin planter—Hollow out some of the seeds and flesh. Fill with moist dirt and place in sunny spot. Observe how a new pumpkin plant begins to sprout.
4. Frozen squid or fish—Order a squid from the butcher counter at the grocery store. Place the frozen squid in a bin of cold water. Whole frozen or fresh fish are available year-round in the meat department. Children observe anatomy, texture, and scent!
5. Rotting food—Children compare the decomposition of bread, bananas, and fruit snacks.
6. Butterfly feeder—Place feeder outside classroom window for quick observations multiple times a day.
7. Melting ice—As a class, create an ice sculpture with colored water and forms such as bowls and bundt pans. Children observe changes to the sculpture as the ice melts.
8. Pond water—Children use digital magnifier (available at school supply stores or online for about \$40) to project the image onto a laptop, projector, or tablet.
9. Tree cookies—Children make an observational drawing of a set of tree cookies and compare the number of rings.
10. Leaves—Children gather leaves from the playground and observe color, shape, texture, size, scent.

Using the Sensory Table to Learn Science Concepts and Processes

Sound at the Sensory Table

1. Children make shakers by filling empty playdough cans with a variety of stuff (metal washers, cotton balls, rubber pencil erasers, paper clips, etc.) and comparing the sounds.
2. Children slide vibrating and nonvibrating objects down a metal toilet paper holder and compare the sounds.
3. Children use paper towel tubes, pencils, and wooden spoons to beat on empty oatmeal (cardboard), peanut butter (plastic), and soup (metal) and compare the sounds.

Scent at the Sensory Table

1. Children dig for craft sticks scented with peppermint extract, vanilla, orange extract and vinegar hidden among unscented sticks. They add their own descriptive words to a poster for each scent.
2. Children squeeze mostly-empty lotion containers to get a whiff of scents.
3. Children dig in scented rice to find themed objects. For example, rice scented with peppermint extract containing holiday miniatures.

Taste at the Sensory Table

1. Children use tweezers to pick up ingredients for a custom-made trail mix of raisins, dry cereal, chocolate chips, mini marshmallows, and banana chips. Eat!
2. Children use eye droppers to fill a small cup with juice to taste. Try unusual juices such as carrot, pickle, pear, prune, and grapefruit. Sip!
3. Children use eye droppers to add lemon juice to a cup of sweetened water. Repeatedly tasting the lemonade, children decide when it has just the right flavor for them. Slurp!

Sight at the Sensory Table

1. Children practice visual discrimination by sorting dry pasta shapes (bowtie, rigatoni, shell, etc.) into muffin cups.
2. Children match up nuts and bolts and screw them together. Then put an eye patch over one eye and have them repeat the activity to observe how the eyes work together for depth perception.
3. Children use eye droppers filled with vinegar to squirt ice cubes made with baking soda and observe the fizzy chemical reaction.

Touch at the Sensory Table

1. Children compare and sort strips of sandpaper, fabric, ribbon, and crepe paper by width, color, or texture. Add a laundry basket with holes for children to weave ribbon through.
2. Children use plastic hammers to break ice and free objects frozen in ice cube trays or ice cream buckets.
3. Children squish water beads and shaving cream between their fingers.

How to Plan Science Investigations with Preschoolers

- Listen to children then plan investigations based on their interests.

- Use Prekindergarten Guidelines to identify relevant content knowledge.
- Ensure children are active rather than passive.
- Set up materials so children can be decision makers about tools and procedures.
- Arrange the environment to ensure safety.

Analog Technology: Tips for Using Ramps

- Be patient and allow children to figure out how to use the ramps on their own.
- Allow adequate time for children to explore the ramps.
- Build ramps outside, too. Use sand, gravel, water, balls and ice cubes.

Investigating How a Pulley Works

- Stack up 4-5 heavy books. Tie together with rope, leaving 6 feet rope dangling.
- Have children try to lift books over their heads by pulling up on the rope.
- Loop the rope over a doorknob. Children take turns pulling down on rope to raise the stack of books.
- Ask: Does it seem easier to lift the books now than it did to push them up with their hands or pull them up using the rope? Why?
- Ask: Where can we put the rope if we want to raise the books over our heads?

Engineering Design Challenges and Tips for Preschool Engineering Centers

1. Block Center

- a) Supply ample blocks and ramp pieces. A good rule of thumb is 200 blocks for a group of 3-year-olds, 300 for 4-year-olds, and 400 to 600 for 5-year-olds.
- b) Introduce balls and marbles of varying weights to test ramps.
- c) If children do not seem to be visiting the block center, paste children's photos on blocks to encourage social-dramatic elements such as a castle for Lily and Max to live in or a racetrack for Emily and Carlos to speed around.
- d) Use a tabletop fan to test the stability of structures.
- e) Take photos of children's structures and include them in a book that is kept in the center. Children can look through the book to find structures to re-build.

2. Math/Science Center

- a) Provide children with squeezable condiment bottles and an assortment of items. Challenge children to find out which 3D shapes can be blown across a finish line by squeezing the bottles.
- b) Construct a maze by taping obstacles on a tabletop. Blow air to move a ping pong ball through the maze. Use thicker and thinner straws and compare the ease of blowing.
- c) How far can you blow the ping pong ball UP an incline? Build a ramp and tape a ruler or number line to the side to measure. Graph the results of ten trials.

3. Sensory Table

- a) Design a scoop to dig for treasure.
- b) Design a pan balance to compare the weights of treasure finds.
- c) Design a boat that can carry a plastic animal across the water.

4. Dramatic Play Center

- a) Engineering Theme: Design and create a toolbox with either a handle that can support the weight of five pounds or a drawer that works.
- b) Auto Shop Theme: Design and create a cardboard car with a hood that opens and closes. Design and create a lever to lift your car so it can be worked on from underneath.
- c) Pet Store: Design and create a pet carrier for an animal of their choice that can support 5 pounds. Refine the pet carrier design to include a working door and a usable handle.

Design Challenges for Fairy Tales

1. Three Little Pigs--Build a house of straw with drinking straws, a house of sticks with sticks from the playground, and a brick house with wooden blocks. Use a fan to see if the houses can withstand the big bad wolf's huffing and puffing.
2. Three Little Kittens—Design a device to keep mittens in pairs when they are put in the washing machine. Try out the device by shaking the paired socks in a closed box to model the agitating washing machine.
3. Goldilocks and the Three Bears—Design a chair for baby bear that can support a five-pound weight. Use repurposed items, recyclables, and only a limited supply of tape.
4. Three Little Pigs—Design a mask for the big bad wolf so that he cannot blow the pigs' houses down. How will you get the mask to stay on? Test the mask by having a friend try it on and blow as hard as he/she can. Refine your design.
5. The Gingerbread Man—Make a playdough gingerbread man that can float. How thin does the gingerbread man need to be to float on top of the water?
6. The Elves and the Shoemaker—Design a trap for the elves. The trap must have a pulley that opens and closes the door. How will you keep the door from closing before the elves come at night?
7. Thumbelina—Thumbelina needs a new home. Design and create a hanging home made from recycled soda bottles. The home must have an opening large enough for Thumbelina but too small for the sparrow to enter.
8. Little Red Riding Hood—Design and create a basket for Red to put Grandmother's goodies in. The basket must be large enough and strong enough to hold a loaf of bread and five cookies.
9. Jack and the Beanstalk—Design a ladder for a beanstalk measuring 24 inches. The ladder must support the weight of a plastic toy figure.
10. Princess and the Pea—Design a bed for the princess that has enough padding that she can't feel the pea or design a ramp for the pea to roll down from the bed to the floor. The ramp must have at least three changes of direction.

A Few Tips for Math Centers and Games

- Math is not about worksheets and memorizing.
- Small groups allow almost any activity to be a more meaningful learning experience for children than a whole-group version of the same activity. To keep children's interest, choose activities that are open, rich, and worthwhile.
- Choose activities that children can do (mostly) independently—like those in today's session.
- Keep groups small so that children do not have to wait long for a turn.
- Introduce the game/activity to the whole group. Play first with one partner. Everyone watches. Then that person picks a friend and plays the game while you play with a new partner. Everyone watches. Finally, the four original players choose a partner and play.
- Make yourself one of the math centers, when possible. Encourage self-regulation in the rest of the classroom. Practice routines and expectations so that interruptions are kept to a minimum.

Preschool Math Tasks Your Children Will Love

[Wrapping Paper Sets](#)

Materials: wrapping paper or wallpaper with sets--flowers, dots, snowflakes, hearts, cakes, stars, balls, etc. cut into sheets about 2-foot square.

Instructions: Have children circle sets of two objects, such as two teddy bears, two presents, or two balloons—whatever pattern is found on the wrapping paper. Next time, have students circle sets of three, four, or five.

[Birthday Candle Counting](#)

Materials: birthday candle picks with digits 0-9, regular birthday candles, paper cupcake cups, playdough

Instruction: Children roll playdough into ball and place in cupcake cup. They poke a digit in the dough and the correct number of candles.

[Hole Punch of Fun Counting](#)

Materials: hole punchers, quarter-sized sheets of construction paper

Instructions: Write a number on the paper. The child punches the correct number of holes in the paper. Don't forget zero!

[Shark Teeth](#)

Materials: gray paper, white paper, glue, and scissors.

Instructions: Draw a wide oval on a sheet of gray paper. Cut out some medium-sized triangles from white paper. Have your child snip off the ends of these triangles to make tiny triangles. Glue the triangles onto the oval to make shark's teeth.

[Lose a Tooth Counting Game](#)

Materials: small marshmallows, drawing of mouth with spaces for about 20 teeth, die

Instructions: Children place marshmallows in mouth for top and bottom row of teeth. Roll the die and remove that many teeth from the mouth. Place the removed teeth in a cup. Whoever loses all their teeth first is the winner. Eat the marshmallows!

[Tinfoil Boats](#)

Materials: tinfoil, flat-sided glass marbles or plastic counters, shallow pan of water

Instructions: Children form boats out of heavy-duty tinfoil and place them in a water-filled pan or sensory table. They count and place counters in the boat until it starts to sink.