



YOUNG SCIENTISTS IN ACTION: EXPLORATIONS OF LIGHT, COLOR & AIR

Learning Objectives Successful participants will:

- List the steps in the scientific process of inquiry
- Be able to implement at least 5 science activities for children to explore air, light and color

THE SCIENTIFIC PROCESS

1. HAVE A QUESTION
2. MAKE A PREDICTION
3. DESIGN AN EXPERIMENT
4. TEST YOUR IDEA
5. RECORD YOUR RESULTS

EXPLORATIONS:

LIGHT & COLOR

CONCEPTS CHILDREN CAN LEARN

- Colors mix to make other colors
- Colored lights mix to make other colors, too
- Light has colors in it
- Light can shine through some things and not others
- Bending light (refraction) shows the colors
- A prism is a tool that bends light
- Light can shine through some things and not others

Light Table or Window Collage

Materials:

- Light table or window with laminating film to cover
- Various cut-out shapes of cellophane
- and tissue paper in a variety of colors
- Glue sticks

Procedure: The children glue the cellophane and tissue paper shapes onto the laminating film. Encourage them to layer the pieces to create new colors.

Mixing Colors

Materials:

- Eye droppers
- Food coloring in water (red, blue, yellow)
- White divided trays
- Large clear plastic trays
- Round palette paint trays

Use a strong concentration of food coloring in water. Provide one eye dropper in each color.

The children use the eye droppers to put two or more primary colors into one of the circles in their palette.

When palette is full, they may dump it into their large tray and start again.

RAINBOW IN A BOTTLE

Materials:

- tall glass jar or vase
- water
- food coloring
- vegetable oil

Procedure:

Pour equal amounts of water and oil into vase, filling it almost full. Squeeze a few drops of each color food coloring into the vase, then just watch! After a few minutes, the drops will slowly sink through the oil. When they reach the water, they disperse and swirl through the water. The children enjoy lying on their stomachs to get a good view! (Jane Kelley)



Make a Rainbow

Materials: 1 prism, 1 piece of white paper, crayons or markers in the colors of the rainbow

Procedure: Hold the prism in the sun over the white paper. Explain how the prism works. Let the children draw the rainbow they see. (Warn them to never look directly at the sun.)

You may follow up using a water hose outdoors to make rainbows.

- Flashlights & things to shine light through
- Hidden colors
- Flashlights with colored cellophane
- Shadow box with colored lights (red, blue, green)
- Rainbow pudding
- Color Mixing with paint

AIR



GOALS & CONCEPTS

- Air takes up space.
- Air pushes.
- Slow-moving air pushes more strongly than fast-moving air. This helps planes fly.
- Goal: Experiment with moving air.

ACTIVITIES

Hanging Water

Fill a firm plastic cup to overflowing and lay a small plastic plate on top of it. Put one hand over the plate and turn the cup upside down. Take your hand away from the plate. It will stay on the glass, and the water won't come out!

Diving Cup

Push a tissue into the bottom of a firm plastic cup. Turn the cup upside down, and carefully immerse it in water. It won't get wet (unless you go really deep).
(Press 1976, p. 58)

Windbag Experiment

Materials: 1 WINDBAG or diaper genie

Procedure:

Tie a knot at one end of the bag. Have a partner hold the closed end of the bag straight out. Hold the windbag about 10" away from your mouth. Using one breath, blow into the bag as hard as you can. Quickly close the bag so no air escapes.

Pom-Pom Races

Materials:

- pom-poms of various sizes
- Straws (paper-wrapped)
- Cardboard tube "track"

Procedure:

The children may use straws to blow the pom-poms across the track. Be sure each child gets a wrapped straw and throws it away when done. This activity sometimes gets a little "slobbery", so have your sanitizing spray ready! This activity may also be done with battery-operated foam-blade fans.

Experimenting with Fans

Materials:

- battery-operated fans with foam blades
- Clipboards and pencils
- Paper: "Things that Air Pushes..."

Procedure:

You may gather some items for testing, or let the children explore items in the classroom. The children use their fans to test whether an item moves and record their results on the paper with a drawing or tally mark.

Bernoulli's Funnel

Materials: 1 ping-pong ball , 1 funnel

Procedure:

Put the ping-pong ball in the funnel. Lean back and try to blow the ball out of the funnel. It's impossible!

Put the ping-pong ball in the funnel again and hold it there while you flip the funnel upside down. Place your lips over the small end of the funnel and blow air through it. Remove your hand while blowing air. The ball will stay in place as long as the air is moving!

(From Economou, Gison, & Torres, "Science goes to preschool" Presented at the 2003 CMAEYC Conference)

OTHER ACTIVITIES

- Water & Air (Let out air from a bag while it is under water)
- Make and fly paper airplanes
- Bernoulli's Paper, Raise the wing
- Balloon-powered "jet"
- Construct an airplane
- Marshmallow masher (Pump air into bottle of marshmallow)

RESOURCES

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