



Early Childhood
Hands-On Science

Astonishing Air

Integration Cards, or *iCards*, may be used as enrichment activities by the teacher, teacher's aide or volunteer, in any sequence, to integrate Language & Literacy, Math and Creative Arts into the science content presented in this unit.

Language & Literacy

- L1. Fingerplay
- L2. Sing Along Song
- L3. Picture Walk
- L4. Read Aloud

Math

- M1. Simon Says
- M2. Balloon Match
- M3. Flight Test
- M4. Windy? How Windy?

Creative Arts

- C1. Air Bubble Prints
- C2. What Can Fly in the Air?
- C3. Fan Fun
- C4. Inflated Balloons

Fingerplay

Guidelines

1. Children should be standing, use a large open space for body movements.
2. Introduce the fingerplay words and hand motions one line at a time. Tell the children: **Say it after me.**
3. Use rhythm and hand motions to engage the children.
4. As the children recite the fingerplay chant, ask them to use soft voices, then loud voices.

The Wind

Sung to the tune of "Row, Row, Row Your Boat"

Wind, wind, hear the wind,

(Cup hand to one ear.)

Hear it blow and blow,

(Cup hand to the other ear.)

Up and up and down below,

(Lift both arms up and then lower them to the floor.)

Feel it come and go!

(Swing both arms from side to side.)

Wind, wind, hear the wind,

(Cup hand to ear.)

It is moving air.

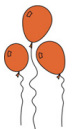
(Wiggle your fingers around the sides of your body with both hands.)

Side to side and all around,

(Swing both arms from side to side and spin around once.)

Wind is everywhere!

(Bring arms together in front of chest to make a large circle and then open arms to the sides slowly.)



Sing Along Song

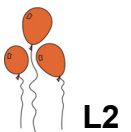
Guidelines

1. Introduce the song and motions one line at a time. Tell the children: **Sing after me. Do what I do.**
2. When children know the words, sing the song together.

My Balloon

Sung to the tune of "Twinkle, Twinkle Little Star"

Here I have a red balloon,	<i>(Pretend to hold a deflated balloon with one hand.)</i>
Watch me while I blow it up,	<i>(Pretend to blow up the balloon by taking a deep breath.)</i>
Small at first, but then gets big,	<i>(Hold hands wide open with fingertips touching then pull them apart a little.)</i>
Watch it as it grows and grows,	<i>(Keep moving hands apart from one another.)</i>
Do you think it's big enough?	<i>(Shrug shoulders, but continue "holding" a big balloon.)</i>
Maybe I should stop...	<i>(Make a stop motion with one palm of hand flat.)</i>
Or it will POP!	<i>(Clap hands together and shout ending.)</i>



Picture Walk

Guidelines

1. Choose a book.

Select a book from the *Astonishing Air Picture Walk Books* list. If these books are not available, find another content-related book filled with rich, detailed pictures.

2. Get to know the book.

Read the story to yourself before sharing the book with the children. Notice how the illustrations tell the story.

3. Enjoy reading time!

Make sure everyone is comfortable and able to see the book. If needed, establish rules for good behavior.

Taking a picture walk through a book is one of the earliest stages of reading. It enables children to “read” books by looking at the pictures. Ideal picture walk books have rich illustrations. When a book has too much text to hold children’s attention, use it to show just the pictures. Wordless books are also a great choice for Picture Walks.

1. Before conducting the picture walk:

Let the children know you are going to read this book by looking at the pictures.

- Show the cover of the book.
- Read the title, the author’s name, and the illustrator’s name.
- Ask children to predict what they think the story will be about based on the cover and the title.

2. While conducting the picture walk:

- Slowly go through the book, page by page.
- Ask a few questions about each picture. For example:

When did that happen?

What do you think will happen next?

Why do they want to do that?

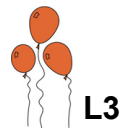
Where is this part of the story taking place?

Where do you think they are going?

3. Share the book again and again.

When children like a book, they want to “read” it over and over.

4. Leave the book in the science or book area for the children to enjoy.



Picture Walk Books

Lesson 1: Going on an Air Hunt

Air Is All Around You by Franklyn M. Branley

The concept of air and its presence all around us is introduced. Air is everywhere—it fills your house, your car, and even your empty milk glass.

Lesson 2: Air Takes Up Space

Pop! A Book About Bubbles by Kimberly Brubaker Bradley

Simple text explains how soap bubbles are made, why bubbles are always round and never square, and why they pop.

Lesson 3: Air Moves Things

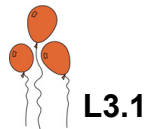
Wind (Weather Basics) by Erin Edison

This book explores how air can move objects, such as kites and leaves.

Lesson 4: Air on the Move

Feel the Wind by Arthur Dorros

Air is always moving. This book introduces fun illustrations that explain what makes the wind blow all around us.



Read Aloud

Guidelines

1. Choose a book.

Select a book from the *Astonishing Air Read Aloud Books* list. If these books are not available, find another content-related book.

2. Get to know the book.

- Read the story to yourself before reading the book to your class.
- Plan ways to change your voice to fit the plot and characters.
- Gather props.

3. Enjoy reading time!

Make sure everyone is comfortable and able to see the book. If needed, establish rules for good behavior.

When children are read to, they are likely to grow into good readers. As they listen to stories, children hear rich vocabulary and proper language structure, and learn new information about the world. Being read to increases imagination, creativity, and curiosity. When selecting a book for a Read Aloud, consider the amount of text and the children's attention span.

1. Before reading the story:

- Show the cover of the book.
- Read the title, the author's name, and the illustrator's name.

2. While reading the story the first time:

- Focus on the flow of the story.
- Read with expression, change your voice for different characters.
- Vary the reading speed: fast for exciting parts, slow for scary or quiet parts.

3. After reading the story:

- Ask a few questions about the book. For example:

Who would you like to be in the story?

What would you have done?

Where did the story happen?

When did the story get exciting/scary?

Why did they do that?

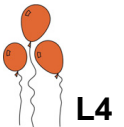
How would you change the ending?

- Have the children re-tell the story or act out their favorite part.

4. For additional readings:

- Invite children to ask questions or discuss the story.
- Encourage children to say words they remember from the story as you read them.
- Assist children in recognizing the sounds that make up words.

5. Leave the book in the science or book area for the children to enjoy.



Read Aloud Books

Lesson 1: Going on an Air Hunt

Air Around Us by Luana K. Mitten

Introduces young readers to the importance of air for breathing, how it can move things, and its effect on the weather.

Lesson 2: Air Takes Up Space

ECHOS Book: *Bye-Bye Bubbles* by Romina Pastorelli

In this picture book a big brother helps his little sister learn why air is important for balls, balloons and bubbles.

Lesson 3: Air Moves Things

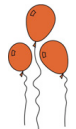
The Wind Blew by Pat Hutchins

A hilarious adventure of what happens when the wind blows, snatches objects up, turns umbrellas inside out and creates all kinds of mischief for the town folk.

Lesson 4: Air on the Move

Gilberto and the Wind by Marie Hall Ets

A young boy discovers that the wind is a close friend and playmate that helps to fly kites, sail toy boats, and give rides on a gate.



Simon Says

Materials

- clear, plastic, quart size, resealable sandwich bag with a zipper lock for the teacher

For each child:

- clear, plastic, quart size, resealable sandwich bag with a zipper lock

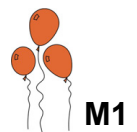
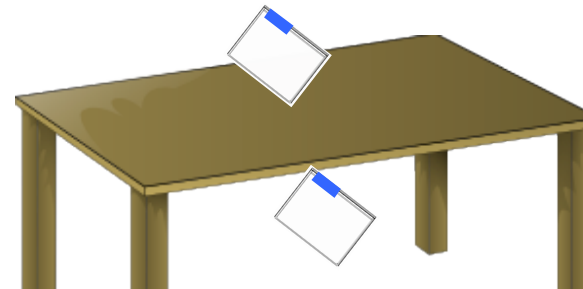
Preparation

Place the bags in the activity area.

Children use a plastic bag filled with air to understand position words *over* and *under*.

Procedure

1. Hold up a flat plastic bag. **Is this bag inflated and filled with air?** Listen to the children's responses. **No, it is not. It is *deflated*.** Say: **Today we will fill this bag with air and play a game of "Simon Says."**
2. Demonstrate how to catch the air with the bag and close it tight. Ask children to fill their bags with air. Assist as needed. **Is this bag inflated and filled with air?** Listen to the children's responses. **Yes, now it is! It is *inflated*.**
3. Review the position words *over*, *under* and *on* with the children. Hold the bag *over* the table. **The inflated bag is over the table.** Hold the bag *under* the table. **Now the inflated bag is under the table.** Place the bag *on* the table. **Now the inflated bag is on the table.**
NOTE: Depending on the developmental level of each child, add more position words as needed.
4. **Let's start the game!** Begin by saying: **Simon Says hold the bag over your head. Simon Says put the bag under your chin.**
5. **Now, each of you will get to be "Simon."** At their turn, remind each child to use a position word, either *over*, *under* or *on*. Allow children time to think about where they can position the bag when it's their turn. Repeat the game until each child has had a turn.



Simon Says

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clear, plastic, quart size,
resealable sandwich bag with
a zipper lock for the teacher

For each child:

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a zipper lock

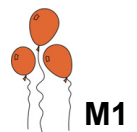
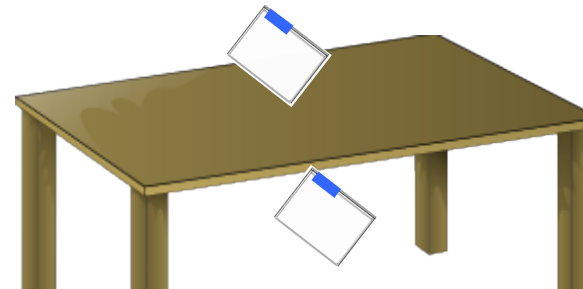
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Balloon Match

Materials

- *Balloon Cards* page
- scissors
- red, yellow, green and blue crayons or markers
- permanent marker

For each child:

- set of three pairs of balloon cards (red pair, yellow pair, green pair)

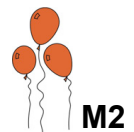
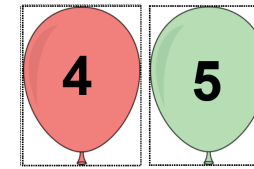
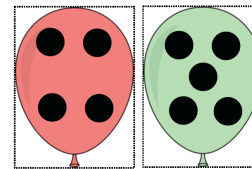
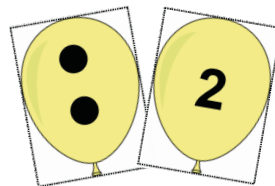
Preparation

1. Make copies of the *Balloon Cards*, one copy per child and one for the teacher.
2. Color the balloon cards to make sets of three pairs, each pair a different color.
3. On each pair of cards, write a number on one card, and draw a matching number of dots on the other. For example, one yellow balloon card will have two dots, and the other yellow balloon card will have the number "2" written on it.

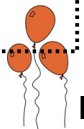
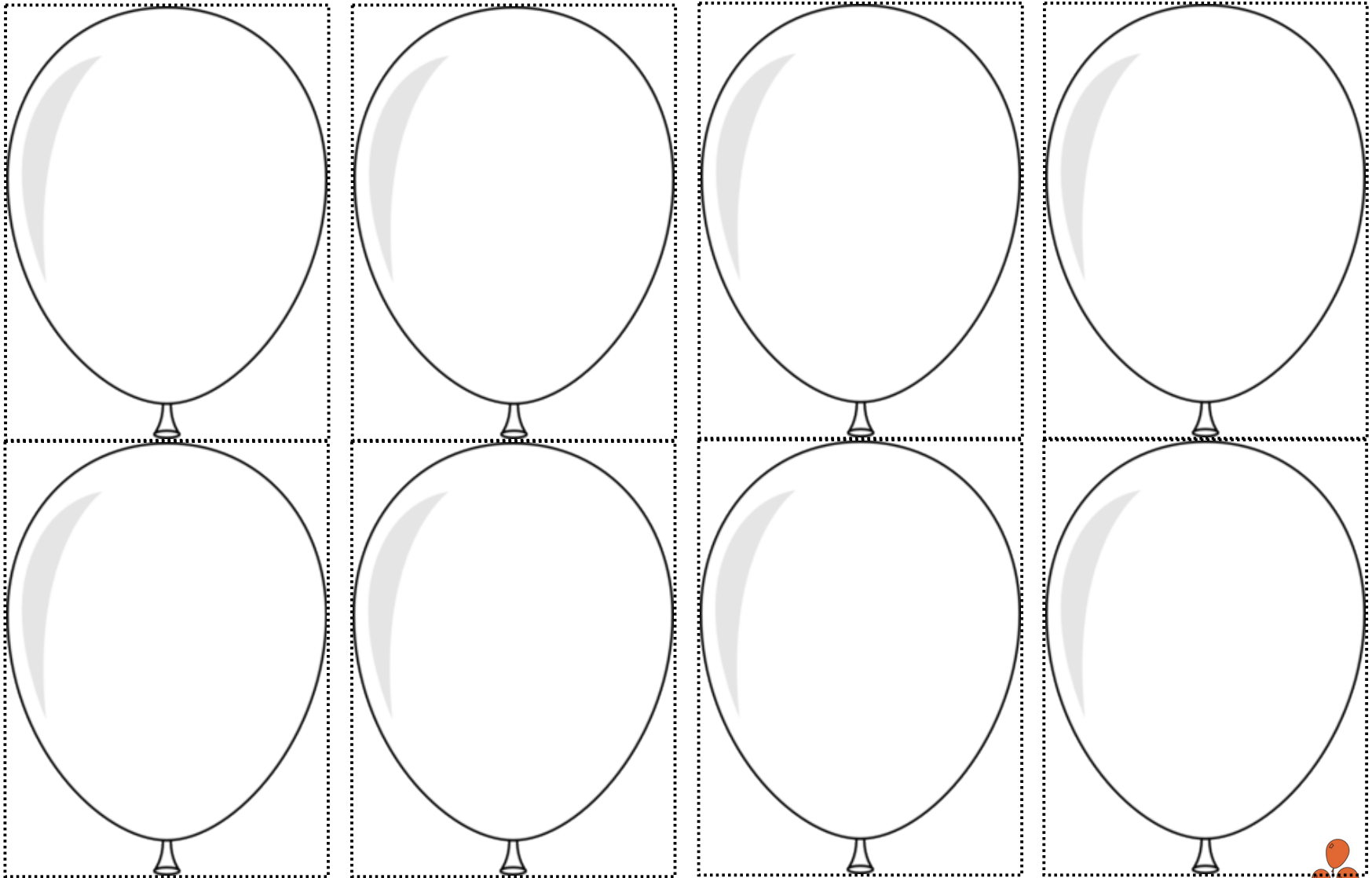
Children match number cards and recognize numerals.

Procedure

1. Say: **Today we will play a matching and counting game.**
2. Give each child six balloon cards (a set of four matching pairs). Assist the children as they lay the cards out in front of them on the table.
3. **What do you notice is different about the balloon cards? Yes, they are different colors. Look closely at your cards. What else do you see? Yes, numbers and dots.**
4. **Hold up a yellow balloon card. How many dots can you count? Count with the children. Yes, two dots. Can you find a card that matches the yellow balloon card and has the number "2" written on it?**
5. Guide the children as they find the matching card. Repeat for the other pairs of cards.
6. Select numbers that are within the children's abilities.
7. To increase the level of difficulty, make additional copies of the *Balloon Cards* and follow the *Preparation* instructions without coloring the balloons. Children will have to match the dots and the numerals without the matching colors.
8. Place the cards in the science area so the children can play the matching game on their own.



Balloon Cards



Materials

- Paper Airplane Instructions page
- sheet of 18" x 24" chart paper or poster board
- Shoe Cutouts page
- copy paper
- masking tape
- permanent marker

For each child:

- sheet of 8½" x 11" copy paper

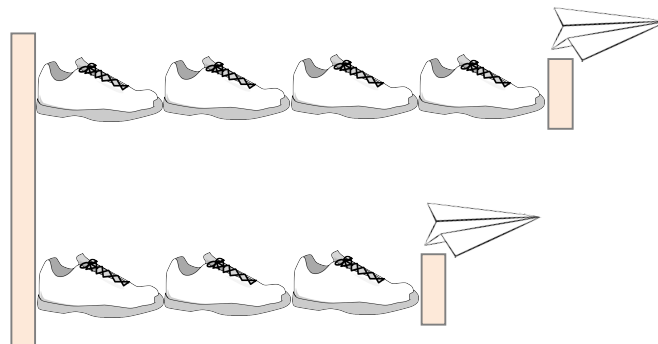
Preparation

1. Designate a large, open area in the classroom to conduct the flight tests.
2. Use masking tape to mark a line where the airplanes will take off.
3. Make a *Flight Chart*:
 - Create a two-column chart on chart paper.
 - Label the first column *Name*, and write each child's name in the column.
 - Label the second column *Distance* and paste one *Shoe Cutout* on each row.






Children create paper airplanes and count how many steps their airplanes traveled.

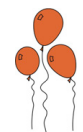
Procedure

1. Say: **Today we will make paper airplanes and count how many steps the airplanes traveled.**
2. Give each child a sheet of paper. **Let's make paper airplanes.** Follow the *Paper Airplane Instructions* to assist each child to make a paper airplane. Write each child's name on one of the airplane's wings.
3. Once every child has created a paper airplane, go to the "flight test" area.
4. Call two children at a time to stand on the "take off" line and throw their airplanes.
5. Give each child a piece of masking tape to mark the place where his/her airplane landed. Assist them to walk heel-to-toe from the "take off" line to the landing mark, counting the number of steps their airplane traveled.
6. Use the Flight Chart to record the number of steps each child's airplane traveled in the "Distance" column, next to the child's name in the "Name" column.

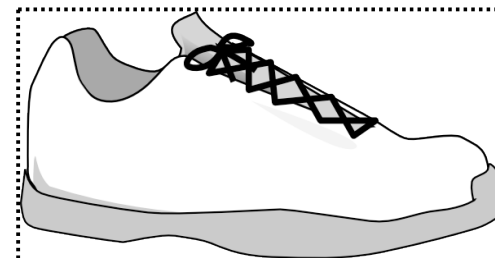
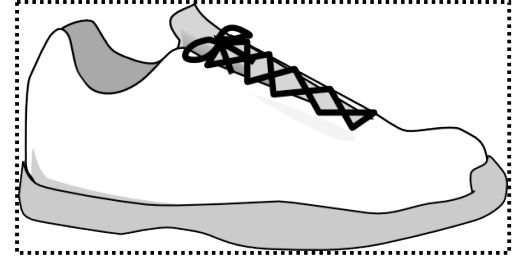


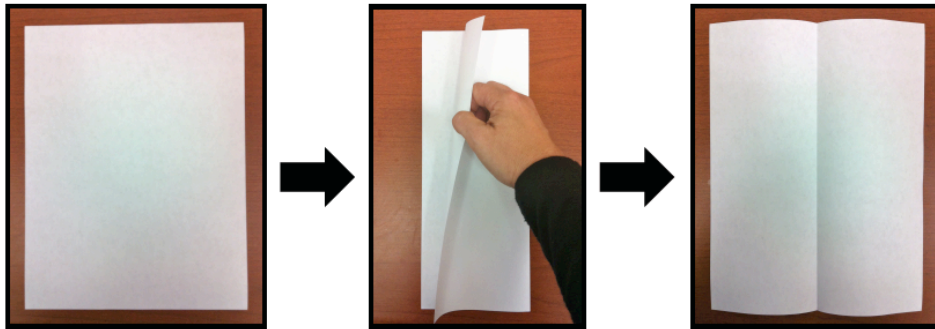
Flight Chart

Name	Distance
Carlos	4 
Rene	3 
Taylor	3 
Jennifer	5 
Daniel	6 

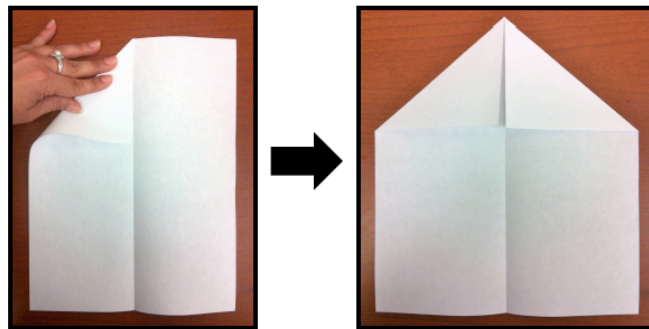


Shoe Cutouts

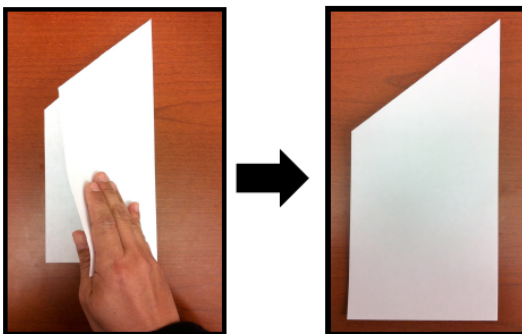


Paper Airplane Instructions

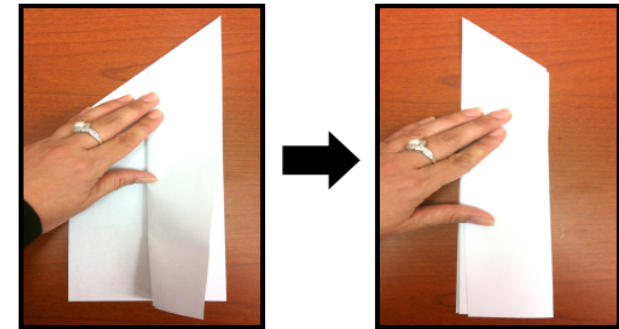
1. Fold sheet of 8.5" x 11" in half lengthwise and then unfold the paper.



2. Fold the two top corners to make a triangle at the top of the page.



3. Fold the paper again in half lengthwise.



4. To make wings, fold one side back lengthwise as shown; then flip over and repeat.



5. Paper airplanes can be adjusted to fly better. Try adding a paper clip to adjust the weight. If the plane climbs sharply, then slows down and drops, move the paper clip forward. If the plane dives sharply to the ground, move the paper clip backwards.

Windy? How Windy?

Materials

- toy pinwheel
- two straws
- two sheets of 8½" x 11" copy paper
- two thin paperback books

Preparation

Fold each sheet of paper back and forth in one-inch folds to create two paper fans.



Children measure and compare wind.

Procedure

1. Say: **Today we will make a pinwheel spin by using different types of pretend wind (gentle and strong).**
2. Select two children to create wind using deep breaths. Hold up the pinwheel in front of the two children. **Both of you will take deep breaths and blow out at the same time to spin a pinwheel. Ready, set, blow!** Provide time for children to blow, and then prompt them to stop. When the pinwheel stops spinning, ask: **Was the wind gentle or strong?** Listen to the children's responses. Repeat until all children have had a turn.
3. Select two children to blow into straws to create wind. Give each child a straw. **Both of you will create wind at the same time.** Hold up the pinwheel in front of the two children. **Aim your straws at the pinwheel. Ready, set, blow!** Provide time for children to blow, and then prompt them to stop. When the pinwheel stops spinning, ask: **Was the wind gentle or strong?** Listen to the children's responses.
4. Select two children. **Both of you will use fans to create wind at the same time.** Hold up the pinwheel in front of the two children. **Ready, set, go! Wave your fans.** Provide time for children to fan, and then prompt them to stop. When the pinwheel stops spinning, ask: **Was the wind gentle or strong?** Listen to the children's responses. Repeat until all children have had a turn.



Air Bubble Prints

Materials

non-toxic bubble solution
water
plastic spoon
blue food coloring (or other
dark color)

For each child:

small bowl of non-toxic
bubble solution mixture
straw
two pieces of 6" x 6" white
construction paper

Preparation

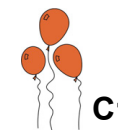
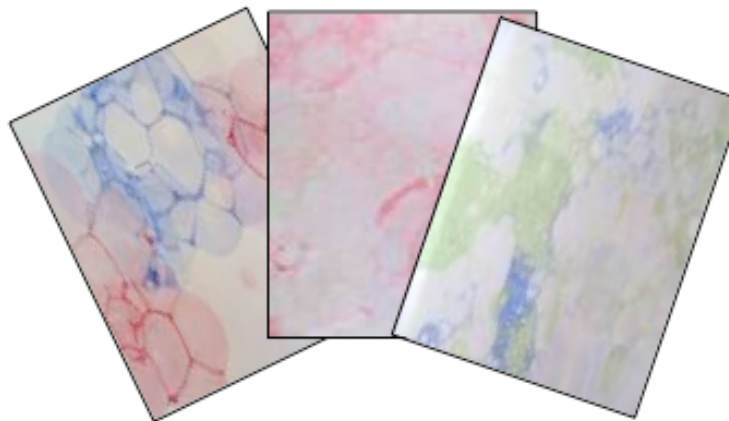
1. Fill each small bowl half full with non-toxic bubble solution and a drop or two of blue food coloring.
2. Place bowls, straws and drawing paper on the table.
3. Prepare one example of a bubble print in advance:
 - Use straw to blow bubbles in bowl of bubble solution.
 - Lightly place paper over top of bowl to form bubble print.

Children blow bubbles to explore how air takes up space.

Procedure

1. Say: **Today we will use air to make bubbles. Then we will make bubble prints.**
2. Hold up one example of a bubble print. **This is a bubble print. You can make one, too.** Give each child a small bowl of non-toxic bubble solution and one straw. Guide them to blow out with their mouths through the straw to make bubbles that fill up their bowl.

NOTE: Show the children how to blow out with their mouths to avoid swallowing the bubble solution.
3. Once the bubbles fill the bowl, tell the children to lightly place a piece of paper over the top of the bubbles and then quickly remove it.
4. If there is enough bubble solution, children can make more than one bubble print. Empty, then refill, each child's bowl and add a different color to the mixture.



What Can Fly in the Air?

Materials

- *Picture Cards* page

For each child:

- picture card

Preparation

Make enough copies of the *Picture Cards* for each child in the group to have one card. Cut out the cards.

Children learn the names of objects that fly in the air.

Procedure

1. Say: **Today we will play a game called “I see.”**
2. Have the children sit in a circle. Introduce the picture cards for things that fly in the air: a *balloon*, a *bird*, an *airplane*, a *bee*, a *butterfly*, a *kite*, a *bat*, and a *fly*.
3. After introducing each card, give a card to each child to hold during the chant. Start a call-and-response chant. The group chants to one child at a time, and that child responds. Each child’s response will include the picture word on the card held by the child to his/her left. The response of the last child in the circle will include the picture word on the first child’s card.

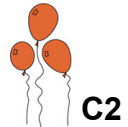
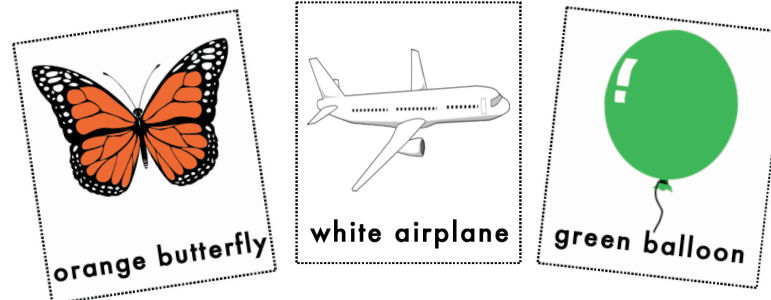
Group:

[Name], [Name], what do you see?

Child:

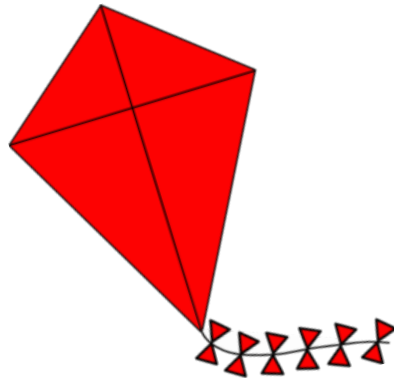
I see [the next child's object] flying over me.

4. Leave the cards in the science area for the children to use.





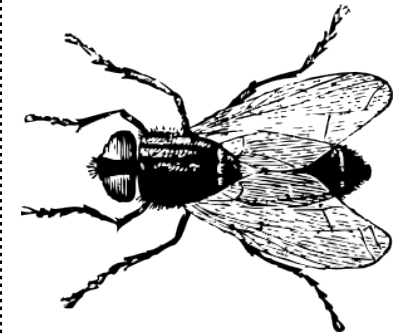
blue bird



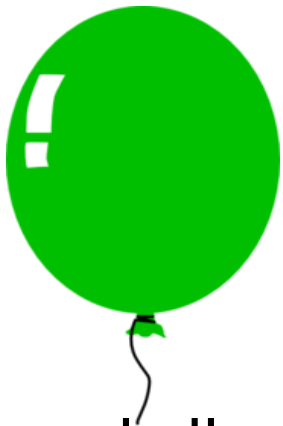
red kite



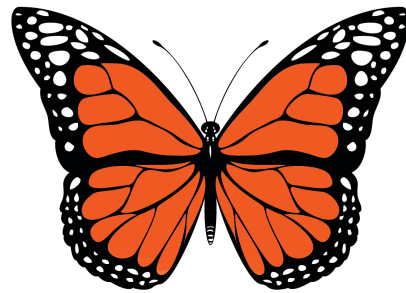
white airplane



black fly



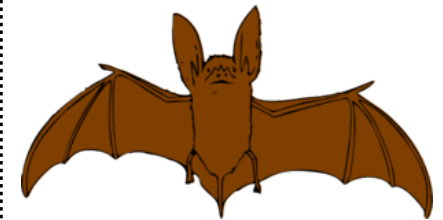
green balloon



orange butterfly



yellow bee



brown bat

Materials

- one sheet of 8½" x 11" copy paper
- crayons or markers

For each child:

- one sheet of 8½" x 11" copy paper
- small bowl containing a set of objects: a feather, a small scrap of paper, a penny or game chip, a small seashell, large wooden block

Preparation

Fold each sheet of paper back and forth into one-inch folds to create a paper fan.

NOTE: You may substitute a thin paper book for a paper fan.

Children use a paper fan to create wind and try to move various objects.

Procedure

1. Say: **Today we are going to use a paper fan to create wind.**
2. **Watch me move this feather with my paper fan. Do you think the feather will move far away with a little bit of wind? Let's see.** Wave a paper fan toward a light object such as a feather.
3. Give each child one paper fan. Ask them to unfold it and use crayons or markers to create a design. When they finish decorating their fan, encourage the children to fold the fans again; assist as needed.
4. **Now your fan is ready to create wind strong enough to move things. Some objects will move far and some will not. I wonder which objects will not move at all. Let's find out.**
5. Guide the children as they explore the materials. Comment on which objects are moving far away and which are not moving at all.



Inflated Balloons

Materials

- variety of colors of tempera paint
- crayons or markers

For each child:

- one paper plate
- one sheet of 9" x 12" white construction paper, cut in half
- one paper towel

Preparation

1. Drop a little of each different color of paint onto each paper plate, one per child.
2. Make one example of a thumb print balloon shape to show the children.

NOTE: You may substitute an inkpad to make fingerprints instead of using tempera paints.

Children use their thumbprint to make the shapes of inflated balloons.

Procedure

1. Say: **Today we will dip our thumbs in paint to make fingerprint shapes that look like inflated balloons. Here's one that I made.** Show the children your sample.
2. Give each child a sheet of white construction paper and a paper plate with several different drops of paint on it.
3. Direct the children to press their thumbs into one color of paint then press on a sheet of white construction paper to make a thumb print. Encourage them to try different colors.
4. **Now let's turn our thumbprint into a balloon filled with air. Does anyone remember what we call a balloon filled with air? Yes, it's an inflated balloon.** Give the children crayons or markers to draw lines down from their thumbprint shapes, turning them into balloons with strings.
5. **Wow! Look at how many inflated balloons we made!**

