Big Science Little Hands II: Community Connections

Together, the Nanaimo Science and Sustainability Society (NS3) and Science World BC worked with Early Childhood Educators to complement the original Big Science for Little Hands activity book, with additional hands-on science resource materials. Our goal is to make science fun, hands-on, accessible to educators and to provide examples on how to link science concepts to the local community. We hope that these resource materials complement what you are already doing and offer additional ideas for making local connections.

The activities described in this book were designed with the help of nine Early Childhood Educators on Vancouver Island. Activities were tested at 54 pilot programs with 484 young children.

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Introductions — Introduction activities are low-preparation, low-mess activities that can set the stage for the topic to be explored and work well for large groups.

Explorations — Explorations are an opportunity to discover, explore and get little hands dirty. Explorations involve open-ended activities that are appropriate for smaller groups and have questions associated with them for enhanced learning.

Make This — Children take their experiences home for further exploration, with this make-and-take activity.

Community Connections — Connect your explorations to the environment around you! Community Connections provide guides on how to connect these activities to the world around you.

All Together — This group activity makes a great wrap up to your topic of exploration.
A path through The Air Up There

Here’s one possible way to put the activities in this resource together:

- Do an *Introduction* at circle time in a large group.
- Have the children try out the *Make This* in smaller groups at stations around the room.
- Try *All Together* just before the end of the school day, or at the end of a few days on the topic.

**INTRODUCTION:**
Invisible Art

**MAKE THIS:**
Parachutes

**ALL TOGETHER:**
Balloon Rockets
Big Science for Little Hands supports the learning goals outlined in the British Columbia Early Learning Framework, particularly those in the area of Exploration and Creativity.

To promote exploration and creativity, adults provide an environment where young children can do the following:

- Explore the world using their bodies and all their senses
- Build, create and design using different materials and techniques
- Actively explore, think and reason
- Identify and try possible solutions to problems in meaningful contexts and situations
- Be creative and expressive in various ways
- Develop a sense of wonder for natural environments
- Express a zest for living and learning

(BC Early Learning Framework: bced.gov.bc.ca/early_learning/)

Share with us!

Help us to improve Big Science for Little Hands by submitting feedback:

scienceworld.ca/bslh/feedback
The Air Up There

Introduction

Invisible Air!

Challenge your expectations with this activity. When a glass is placed upside down in a bowl of water, the air in the glass prevents water from entering the glass, thus keeping anything inside it dry.

What you need

- Large deep bowl
- Water
- Clear, tall drinking glass
- Food colouring (optional)
- Paper towel

Hands on

1. Fill the bowl with water and bright food colouring.
2. Push a piece of paper towel into the bottom of the glass.
3. Turn the glass upside down and put it in the water.
4. Remove the glass without tilting it.
5. Check to see if the paper towel is wet or dry.
The Air Up There

Introduction

Questions to ask
1. What will happen when we turn this glass upside down and put it in the water?
2. Will the paper towel be wet or dry when we pull the glass out?
3. Is the cup under the water? Does water go into the cup? What's in the cup already that keeps the water out?

What’s next?
• Try the activity with different sized containers (glasses) and different kinds of paper. Does it work every time?

Vocabulary: air, volume, wet, dry, empty, full, submerge

Notes for next time:
**Parachutes**

Create your own parachute, using simple household items.

**What you need**

- Thin string
- Hole punch
- Small paper cup (a ketchup cup works well)
- Paper bags—the thicker the better. Do not use paper towel
- Tape

**Hint:** Have younger children experiment with and modify pre-made parachutes.

**Hands on**

1. Cut a square piece of paper from a paper bag.
2. Punch holes in the corners of your paper square.
3. Attach string through each hole and then attach the string to the ketchup cup, with tape.
4. Float your parachute from different heights.

**Questions to ask**

1. How could we make the parachute stronger?
2. How could we make the parachute fall more slowly or more quickly?
What’s next?

- Use fleece, scrap cloth or plastic (from a grocery bag) instead of paper for your parachute. How is this new parachute different?
- Add weight to the ketchup cup. How does this affect the parachute?

Notes for next time:
The Air Up There
All Together

Balloon Rockets

Use air to propel a rocket! As the air rushes out of the balloon, it pushes the balloon forward. This is the same principle that makes rockets and jet engines work.

What you need

- Balloons
- Straws (if using a straw that contains a bend, trim to remove)
- Nylon or other smooth string
- 2 chairs, or something to tie string between
- Cardstock (for extension)
- Tape

Preparation

1. Tie one end of the string to a chair, door knob or other support.
2. Put the other end of the string through the straw.
3. Pull the string tight and tie it to another support in the room.

Hands on

1. Blow up the balloon (but don’t tie it).
2. Pinch the end of the balloon, to prevent air from escaping, and tape the balloon to the straw.
3. You’re ready for launch. Let go of the balloon end and watch the rocket fly!
Questions to ask
1. Which way did the rocket move? What pushes the balloon forward?
2. How far do you think the rocket could go, if you blew the balloon up a little more or a little less?

What’s next?
• Use cardstock to make fins for the rocket and tape them to the straw. Do they make a difference?
• Invent a way to attach a load to your rocket balloon. Can it carry a block or a toy animal across the room?
• Read The Flying Machine by Bobby Mercer.
• Try Blown Away! Moving Air from the “Air Up There” in the first edition of Big Science for Little Hands (scienceworld.ca/bslh).

Community connections: Observe aircraft that you see flying in your sky. Are they planes, helicopters or float planes? Ask a local pilot from a flying group or Air Force personnel to come visit your class.

Vocabulary: propel, deflate, expel

Notes for next time:
Teacher Resources

- Air by Daniel Nunn
- Air by Alice Harman and Angela Royston
- Air by Vic Parker
- Air: Outside, Inside, and All Around by Darlene R. Stille
- The Things in the Air by Carmen Gil and Omar Alberto Turcios
- Air is All Around You by Franklyn Branley
- How Do Hot Air Balloons Work? by Buffy Silverman

Literature for Children

- Paddington Takes to the Air by Michael Bond
- Everything Goes: What Flies in the Air? by Brian Biggs
- Curious George and the Hot Air Balloon by H. A. Rey
- Bear in the Air by Susan Meyers and Amy Bates
- Pierre in the Air! by Andrea Beck
- Violet the Pilot by Steve Breen

Online Resources

- Weather-related, animated videos, featuring Peep and his friends.
  - Video about Chirp learning to fly during a windy day—“The Windy Day” (youtube.com/watch?v=2qm9BbhEXxg&list=PL8DB16B01C34AAFD0).
  - Video about Peep’s first encounter with an electrical storm—“Stormy Weather” (youtube.com/watch?v=7Li59FFilYQ&list=PL8DB16B01C34AAFD0).
- Three activities with instructions and videos of children explaining the activity at Peep and the Big Wide World (peepandthebigwideworld.com/en/parents/activities/search/)
  - Exploration of wind, bubbles and streamers. Find under “Blowing in the Wind”
  - Children explore different ways of flying. Find under “Flying Paper Airplanes”
  - Play with leaves on a windy day. Find under “Floating in the Wind”
- Animated game where children put together a plane then fly it by PBS and Sid the Science Kid (pbskids.org/sid/letsfly.html).
- An animated game where children earn and throw Frisbees for Martha in PBS Kids, Martha Speaks (pbskids.org/martha/games/catch/index.html).
The Air Up There
Songs & Rhymes

Windy

Tune: Bingo

There's a weather
That I like
And Windy
Is its name-o.
W-I-N-D-Y,
W-I-N-D-Y,
W-I-N-D-Y,
And Windy
Is its name-o!

Wind, Wind

Tune: Row, Row, Row Your Boat

Wind, wind, blow the clouds
Fast across the sky.
Blow the branches back and forth
In the trees so high.

Hats are Blowing

Tune: Frere Jacques

Hats are blowing,
Hats are blowing,
In the air,
Everywhere!
Every time the wind blows,
Someone's hat, away it goes.
Hold on tight
And you'll be all right!
The Air Up There
Songs & Rhymes

I See the Wind (Rhyme)

I see the wind when the leaves dance by,
I see the wind when the clothes wave “Hi!”
I see the wind when the trees bend low,
I see the wind when the flags all blow.
I see the wind when the kites fly high,
I see the wind when the clouds float by.
I see the wind when it blows my hair,
I see the wind most everywhere!

Notes for next time: