

Exploring The Exposome and Our Health

Lesson Overview

The purpose of this lesson is to introduce students in Grades K–6 (ages 5–12) to how the environment and chemicals in everyday products can impact health through discussion, hands-on experiments, interactive demonstrations, and games.

Total lesson time: 60 mins

Note: this lesson plan was developed when working with an Atlanta community-based youth club where students aged 5-12 participated in an environment club lesson for 1 hour after school. Please adapt this lesson plan for your context (e.g., the ages and duration).

Full Materials List

Introduction & Activity 1:

- Sponge
- Water + bowl
- Giant sticky note
- Chart Marker(s)
- Note cards (optional)
- Colored pencils

Activity 2 (Atmotube):

- Household scented items
- Atmotube Device + app (Tablet or phone)

- Scented dish soap
- Unscented liquid castile soap
- 1-2 containers with lids, big enough for Atmotube
- 1-2 small dishes to hold soap samples

Activity 3 (Laundry soap):

- Tablespoon scoops (4)
- ½ Tablespoon scoop (1)

- Plastic sandwich bags (1 per student)
- Washing soda
- Soap flakes
- Coarse sea salt
- Baking soda
- 5 tubs/containers (for detergent ingredients)

Closing:

- Prizes for Bingo
- [Bingo Sheet](#) (1 per student)

Handout/Print Sheets

Home items bingo sheet: <https://tinyurl.com/HomelItemsBingo>

Atmotube app: <https://tinyurl.com/AtmotubeApp>

Recipe sheet:

<https://drive.google.com/file/d/1Exh1jb5blw4H5OOyJ07RNRiknqKtVrq1/view?usp=sharing>


Everyday toxicants handout:

<https://emoryhercules.com/community-engagement-activities/research-translations/everyday-chemicals-in-your-exposome-toxicants-in-our-homes/>

Optional external resource for parents: <https://www.safecosmetics.org/black-beauty-tips/>

Set-Up for Lesson	Time	Materials Needed
<ol style="list-style-type: none"> 1. <i>Place each laundry soap ingredient in its own labeled tub at a front table or station.</i> 2. <i>Put a tablespoon scoop in each tub (or have shared scoops available). ½ tablespoon scoop will be needed for sea salt.</i> 3. <i>Place enough plastic bags for each student at the start of the table. (Optional: label each bag with the laundry soap recipe and/or instructions)</i> 4. <i>Have recipe sheet available for reference. Optional: print for each student to take home.</i> 5. <i>Print enough bingo cards to have one per student. Page 17 is the “caller” and should be cut up to draw from a bowl/hat in Activity 4.</i> 	5 mins	<input type="checkbox"/> 5 tubs <input type="checkbox"/> Marker(s) <input type="checkbox"/> Tablespoon scoop(s) <input type="checkbox"/> Plastic bags <input type="checkbox"/> Soap flakes <input type="checkbox"/> Baking soda <input type="checkbox"/> Washing soda <input type="checkbox"/> Coarse sea salt <input type="checkbox"/> Recipe sheet <input type="checkbox"/> Bingo Sheet
Introduction	Time	Materials Needed
<ol style="list-style-type: none"> 1. Essential Question: What is the “environment”, and how can it impact your health? <ul style="list-style-type: none"> • Have you ever been somewhere and noticed it was hard to breathe outside? What was happening? <ul style="list-style-type: none"> ○ Examples: wildfire smoke, pollution from traffic • What about places with fresh air? • How do you think these different environments can change or affect our health? 2. <i>Our bodies are like sponges</i> <ul style="list-style-type: none"> • Everything around us can shape our health. Imagine if you were a sponge. <i>*Hold up a sponge*</i> • Everything around you – what you eat, breathe, touch, and do – gets soaked up in your body. <i>*Dip sponge into water*</i> • The air outside, the food you eat, the soap you use to clean your skin, even how much you play outside or sleep – all of that can shape how you grow and feel. That’s the exposome! It’s like your body’s story of how everything around you can shape your health. 	5 mins	<input type="checkbox"/> Sponge <input type="checkbox"/> Water
Activity #1 - Think, Pair, Share	Time	Materials Needed

<p>1. <i>Ask the students to think about these questions (2 mins):</i></p> <ul style="list-style-type: none"> ● What are some different ways the environment, meaning anything outside of our bodies, can impact our health? <ul style="list-style-type: none"> <input type="checkbox"/> Try to think of your five senses (see, smell, touch, hear, taste) <input type="checkbox"/> <i>Encourage positive and negative impacts</i> <input type="checkbox"/> <i>Have students write or draw their ideas on a note card</i> <p>2. <i>Next, instruct them to form pairs and share their ideas with a neighbor (1 min).</i></p> <p>3. Now it is time to share! <i>Choose students to say their ideas out loud and write them on a big sticky note (7 mins).</i></p>	10 mins	<input type="checkbox"/> Giant sticky note <input type="checkbox"/> Chart Marker(s) Optional: <input type="checkbox"/> Note cards (optional) <input type="checkbox"/> Colored pencils
Activity #2 - Exploring the Exposome Through Our Senses	Time	Materials Needed
<p>1. <i>Show and explain to the students:</i></p> <ul style="list-style-type: none"> ● Some items around the home have smells/fragrances that are supposed to smell good (breathing it in) – Show perfume, laundry sheets, candles, lotion ● We can smell these products because of their ingredients floating into the air in tiny bits that we can't see! <ul style="list-style-type: none"> ○ Have you ever noticed when something smells strong? For example: using too much perfume or too many scented things in the same room. ● These smells all together can make our nose, head, or tummies feel sick! We might even sneeze! ● It is important to pick scented products that are gentle or to use unscented products if we can. <p>2. <i>Explain the Atmotube Pro air monitor:</i></p> <ul style="list-style-type: none"> ● <i>Hold up the Atmotube Pro</i> ● This device is kind of like an electronic super nose. It “breathes” in air and tells us what the air is made of. ● The air around us has oxygen for us to breathe and keep us healthy, but it can also have other compounds, like smoke from wildfires or even the gas from cars! <ul style="list-style-type: none"> ○ Ask if they've ever noticed smells at a gas station ○ Refer back to earlier Think Pair Share activity 	15 mins	<input type="checkbox"/> Scented household items like perfume, laundry sheet, candle, scent boosters, lotion, dish soap (from below) <input type="checkbox"/> Atmotube Pro <input type="checkbox"/> Atmotube app <input type="checkbox"/> Phone or Tablet to display app <input type="checkbox"/> Scented dish soap <input type="checkbox"/> Unscented castile soap <input type="checkbox"/> 1-2 containers with lids, big enough for Atmotube <input type="checkbox"/> 1-2 small dishes to hold soap samples

<ul style="list-style-type: none"> • This device tells us what is in the air, because we can't see it with our eyes or tell by our noses alone. It can tell us when the air is less healthy. <p>3. <i>Show them the dish soap example:</i></p> <ul style="list-style-type: none"> • When you squeeze the air out of this dish soap, it smells like "Green Apple". • Fragrances or scents in products can be harmful to us if we breathe it in a lot or over a long period of time. • We wouldn't ever want to be surrounded by these harsh smells, because they can make it harder for our lungs to breathe. Our bodies want clean and fresh air! <ul style="list-style-type: none"> • <i>Squeeze a bit of scented dish soap into dish and place in tupperware. Repeat with castile soap.</i> • <i>Place Atmotube in the tupperware container with the scented dish soap; close container with lid.</i> • <i>Show students how the air quality dips on the app and explain that a lower score means the air can be harmful to breathe.</i> • <i>Remove the Atmotube from the scented dish soap, and "air it out". Place the device in the tupperware with the unscented castile soap. Observe.</i> • <i>Ask students what they noticed.</i> 		
Activity #3 - Laundry Activity	Time	Materials Needed
<p><i>Tip: If short on time, complete this activity alongside Activity #2 and split students into two groups.</i></p> <p>1. <i>Review the laundry soap recipe with the group:</i></p> <ul style="list-style-type: none"> • 2 tablespoons of soap flakes • 2 tablespoons of washing soda • 1 tablespoon of baking soda • 1 tablespoon of citric acid • ½ tablespoon of coarse sea salt <p>2. <i>Explain to the students that they will take turns coming to the front table to scoop their ingredients.</i></p> <p>3. <i>Call students up by small groups or by tables.</i></p> <p>4. <i>Help them seal their plastic bags.</i></p>	15 mins	<input type="checkbox"/> Plastic sandwich bags <input type="checkbox"/> 5 Containers/bowls <input type="checkbox"/> Tablespoon(s) <input type="checkbox"/> Soap flakes <input type="checkbox"/> Baking soda <input type="checkbox"/> Citric acid <input type="checkbox"/> Washing soda <input type="checkbox"/> Coarse sea salt

5. Once the students are back at their seats, they can gently shake their sealed bags to mix the ingredients.		
Activity #4 - Bingo	Time	Materials Needed
<p>1. As students are settling back in from the activities, <i>hand out colored pencils and bingo sheets</i> so they can start coloring in the icons. Students will color any item they use at home</p> <p>2. <i>Pull bingo icons from a hat.</i> To “win” bingo, students must have a row of items called out. Play until everyone wins or there’s no more time left <i>*Optional: have students pick a prize when leaving.*</i></p> <p>3. Handouts to go home with each student:</p> <ul style="list-style-type: none"> • Laundry recipe (optional) 	10 mins	<input type="checkbox"/> Bingo sheet <input type="checkbox"/> Hat or bowl <input type="checkbox"/> Colored pencils <input type="checkbox"/> Bingo prizes (e.g., stickers, pencils, swag, etc)
Resources		
Morteza. (n.d.). <i>Editable Daily Lesson Plan Template Google Docs, Word & PDF</i> . TPT. https://www.teacherspayteachers.com/Product/Editable-Daily-Lesson-Plan-Template-Google-Docs-Word-PDF-14246850		