Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Snapshot

This lesson looks at our homes and the steps to take to keep the air healthy and avoid chemical exposure. We explore the makeup of the air that we breathe, how to keep it clean, and how to reduce asthma triggers in our homes. We also explore what lead is and where it might be found in our homes.

Preparation and Materials:

- Posters 1–3, Asthma Triggers Hunt Handout, Take-Home Talk
- Stirring (coffee) straws – enough for each child to have several
- Flip chart and markers
- Black or white board
- Large sheets of paper or the coloring page for each child to make a poster
- Markers or crayons

Note: This lesson includes an activity that is not suitable for children with asthma or other breathing issues. In order to prepare for the activity, do the following:

- Review your list of students with asthma.
- Make sure that each of them has a quick-relief bronchodilator inhaler.
- Discuss with your organization's health care professional the appropriateness of this exercise for any students with health conditions. ***Students with asthma should not participate in this activity.***
- Consider co-teaching the exercise with your organization's health care professional.

Objectives—Students will be able to:

- define *asthma, breathing, secondhand smoke,* and other triggers;
- list three asthma triggers and how to avoid them;
- list three things that they can do to keep the air in their homes healthy;
- explain how lead can impact children negatively; and
- list steps to avoid exposure to lead in our homes.

Vocabulary: asthma, secondhand smoke, asthma triggers, lead

Procedure:

1. Introduction *(10 minutes)*
2. Asthma and Breathing Difficulties Activity *(10 minutes)*
3. Stopping Triggers at Home and at School *(15–20 minutes)*
   Optional Activity: Creating Smoke-free Signs *(10–15 minutes)*
4. Lead *(10 minutes)*
   Optional Activity: Asthma and Lead Exposure Patrol *(10–15 minutes)*
5. Close and Take-Home Talk *(10 minutes)*

EPA U.S. Environmental Protection Agency
Office of Children's Health Protection
EPA-100-K-13-002
April 2013
www.epa.gov

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

1. Introduction

(10 minutes)

Review

Ask several students to share something that they remember from the previous lesson.

Prompts: What did you learn that you didn't know before? What did we talk about that you already knew? What surprised you from our last lesson? What are some of the new words you learned from our last lesson? What can you do to positively impact the issue that we learned about?

Do
Ask

[Take an exaggerated deep breath.] Take a deep breath. What did we just do?

Prompts: As the air entered our lungs, what did it accomplish? Why do we need to breathe?

Explain
Ask

When we take air in, the oxygen in the air passes throughout our body through our blood and allows us to live. Remember that air is one of the four things that we need to stay alive. What are the other three? *[Food, water, and shelter.]*

Ask

Is the air that we breathe 100 percent oxygen?

Prompts: When we breathe out, do we breathe oxygen out?

Explain
Do

The air that we breathe in is only about 20 percent oxygen. *[Show **Poster #1** (illustration of the makeup of air).]* Most of the rest of our air is nitrogen, which is another invisible, odorless gas, like oxygen.

(continued on other side)

1. Introduction *(continued – page 2)*

Ask

What else is in our air?

Prompts: When you see trucks on the road that send out black smoke, does that become part of our air? What comes out of a car's tailpipe? What about after it rains on a hot day and you see steam rising off of the sidewalk? What about when you spray something from an aerosol can and it creates a fine mist? What about when there are huge fires—is that smoke part of our air? What about smokers who send smoke out into our air? Do you think some of the things entering our air can harm us?

Explain

All of these things create changes in our air and those changes can impact us significantly. Today, we're going to talk about the air in our homes and our schools and how we can make sure that it's as healthy as it can be.

Ask

Can we see all of these things in the air?

Prompts: Can you see car exhaust? Or smoke? Can you see aerosol mist? You can sometimes see it for a second, but it lingers in the air and becomes invisible to us.

Ask

How can we tell that these things are there?

Explain

One of the ways that we can tell that these things are in the air is that they irritate our lungs—we cough, our throats feel scratchy, and some people can even have a hard time breathing. But sometimes we don't know that these irritants and pollutants are in the air.

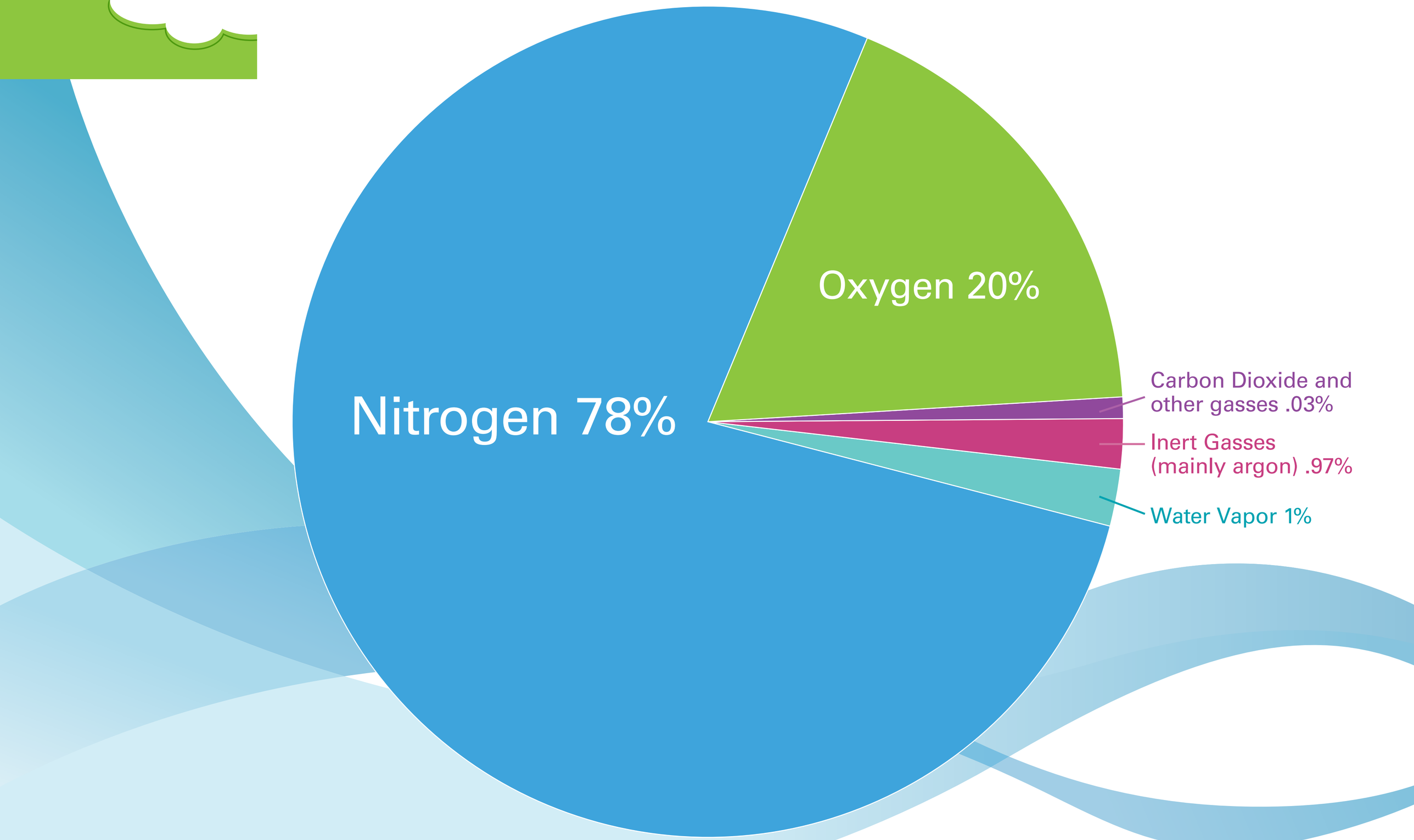
Lesson 3:
Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Poster #1

U.S. Environmental Protection Agency
Office of Children's Health Protection
EPA-100-K-13-002
www.epa.gov
April 2013

Printed on 100% recycled/recyclable paper with a minimum 50% post-consumer waste using vegetable-based inks.

Composition of Air



EPA

2. Asthma and Breathing Difficulties Activity

(10 minutes)

Explain
Ask

More than 25 million people in the United States have asthma, including 1 out of every 10 school-aged children. Do any of you know someone with asthma? A lot of people have breathing difficulties and problems other than asthma.

Ask
Explain

Most of us know someone with asthma. Raise your hand if you have or know someone who has asthma. Asthma is a serious, sometimes life-threatening, respiratory disease. Although there is no cure for asthma yet, asthma can be controlled through medical treatment and management of environmental triggers. What's an environmental ***trigger***?

Prompts: If you trigger something, what do you do? An environmental trigger is something our body takes in that can cause a response, like coughing or having trouble breathing.

Explain
Do

*[Show **Poster #2** (illustration of the lungs of an asthmatic and non-asthmatic).]* This image shows the inside of our lungs. When a person has asthma, the muscles in the pathways that send air into his or her lungs become inflamed and it can be difficult for him or her to breathe.

Limiting exposure to the things in our environment that trigger asthma and other breathing difficulties, there are medicines that can be used to help control the symptoms of asthma and make breathing easier.

Explain
Do

We're going to do a quick exercise so that we can get a sense of what an asthma attack might feel like. This is important: ***IF YOU HAVE ASTHMA, YOU SHOULD NOT PARTICIPATE IN THIS ACTIVITY.*** We are going to do a burst of exercise and then try to breathe through restricted "lungs." *[Pass out a stirring straw to each child. Have everyone stand up and run in place or do jumping jacks for a full minute. It's important to do this for a minute in order for heart rates to rise. At the 1-minute mark, tell students to place the stirring straws in their mouths and pinch their noses closed. They should try to breathe only through the stirring straw. Comment on the breathing difficulties that you see in the group.]*

(continued on other side)

Ask

How did you feel? *[Respond to the answers.]*

Ask

So, who knows what causes asthma?

Explain
Ask

We don't actually know what causes asthma, but we do know what can trigger an asthma attack. There are certain things in the air that we breathe that can trigger an asthma attack.

Explain
Ask

While you can't control what's in the air everywhere, you can control much of what is in the air in your home and school. What do you think might trigger someone's asthma?

Prompts: What might make breathing difficult for someone with asthma or even without? What about smoke?

Explain
Do

*[Show **Poster #3** (list of asthma triggers).]* Dust and dust mites, pollen, mold, mildew, cold air, exercise, pet dander, secondhand smoke, and cockroaches are the most well-known triggers.

Ask

How can we avoid some of these triggers?

Explain

Dust mites are teeny tiny little insects that are nearly impossible to see. We can use protective covers for pillows and mattresses to reduce our exposure to dust mites while we sleep. We spend one-third of their lives sleeping! And stay indoors when the pollen count is really high in the spring. Remember how we learned about limiting pests in Lesson 2? Well some of the most common pests, like cockroaches, can also be an asthma trigger. Here's the thing, it's hard to avoid all of these things. It gets cold in most places for at least part of the year. And most places have pollen.

Ask

Of these triggers, which things can you avoid most easily?

Prompts: Can you avoid pets? What is pet dander? When pets shed their fur, they also shed skins cells called dander, which can irritate our lungs when we breathe it in. Can you avoid secondhand smoke? Can we create a home that is free of mold and cockroaches?

Teacher Note: The issue of secondhand smoke may be a sensitive one for students who have a family member who smokes. As you are leading this discussion be aware that this issue may cause some tension and refer to your organization's policy and practices for addressing sensitive issues.

Ask

What is secondhand smoke?

Prompts: Have any of you ever experienced secondhand smoke?

Explain

Secondhand smoke is a mixture of the smoke given off by the burning end of a cigarette, pipe, or cigar, and the smoke exhaled by smokers. Exposure to secondhand smoke is sometimes called involuntary or passive smoking because if you're breathing secondhand smoke it's like you're smoking. Secondhand smoke contains more than 4,000 substances, several of which are known to cause cancer in humans and animals.

Ask

What can you do if you're around secondhand smoke?

Prompts: Ask the smoker to go outside; leave the home.

Explain

We have just learned how to reduce or eliminate pests in our homes, and we'll learn how to control moisture and avoid excess mold in our homes in the coming weeks. We can avoid secondhand smoke by encouraging anyone we know who smokes to stop. If someone in your family smokes and isn't interested in quitting, he or she should smoke outside, away from children. No one should ever smoke in the car. Even the smoke odor that lingers in the upholstery in our cars or homes and on our clothes can damage our health. Let's look at some ways that we can avoid some of these triggers in our homes and schools.

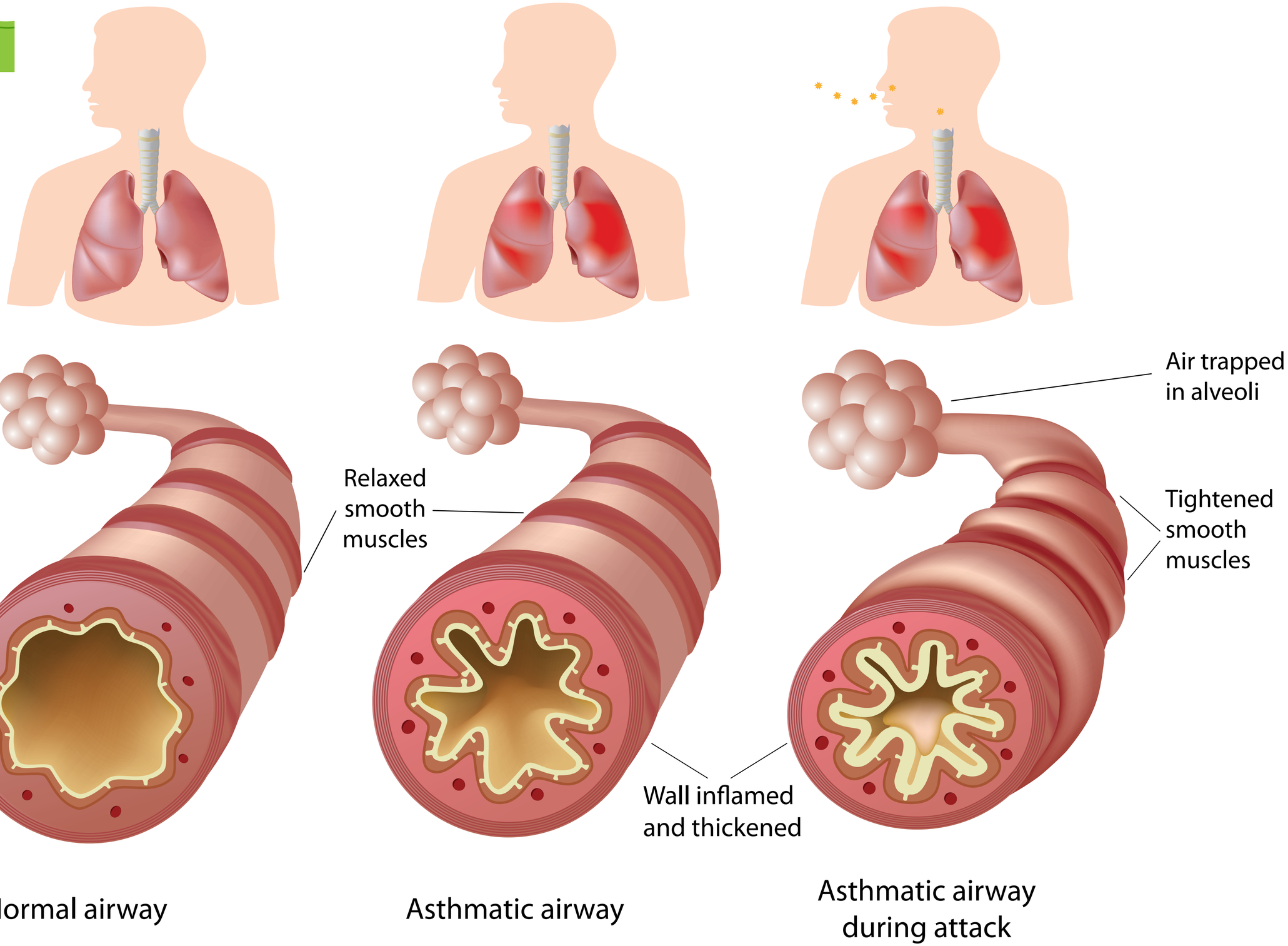
Lesson 3:
Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Poster #2

U.S. Environmental Protection Agency
Office of Children's Health Protection
EPA-100-K-13-002
www.epa.gov
April 2013

Printed on 100% recycled/recyclable paper with a minimum 50% post-consumer waste using vegetable-based inks.

The Pathology of Asthma



EPA

Lesson 3:
Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Poster #3

U.S. Environmental Protection Agency
Office of Children's Health Protection
EPA-100-K-13-002
www.epa.gov
April 2013

Printed on 100% recycled/recyclable paper with a minimum 50% post-consumer waste using vegetable-based inks.

Asthma Triggers

Dust Mites

Pollen

Mold

Cold Air

Cockroaches

Pet Dander

Secondhand Smoke

Exercise

EPA

3. Stopping Triggers at Home and at School

(15–20 minutes)

Do

*[Break the class up into five groups and give each group a copy of the **Asthma Triggers Hunt Handout**. Ask each group to find the triggers in the picture. For each trigger that they identify, they should also determine a way to make the air cleaner. Bring the class back together and review the Handout. The answers can be found at the end of this Lesson.]*

Prompts: How do we keep pollen out? What about secondhand smoke?

Optional Activity: Creating Smoke-free Signs *(10–15 minutes)*

Explain

Coloring or creating Smoke-free signs for use in the teaching space or at home. Now that we know how important it is to keep our spaces smoke free, we want to share that knowledge. Each of you (or in pairs) will make a poster that announces this is a smoke-free space.

Do

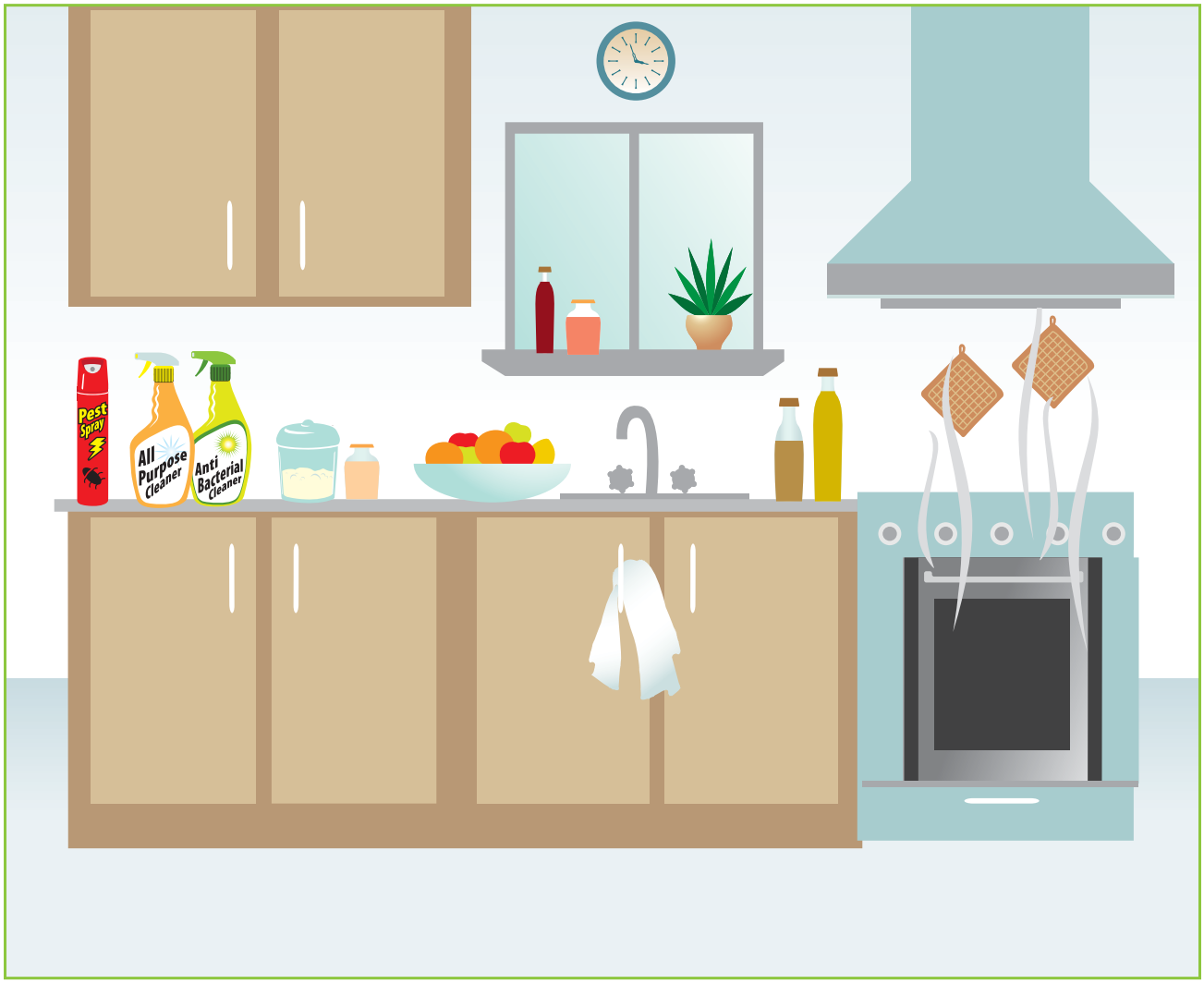
Pass out large sheets of paper or the coloring page and markers or crayons.

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Asthma Triggers Hunt

Can you identify the asthma triggers in the image below?

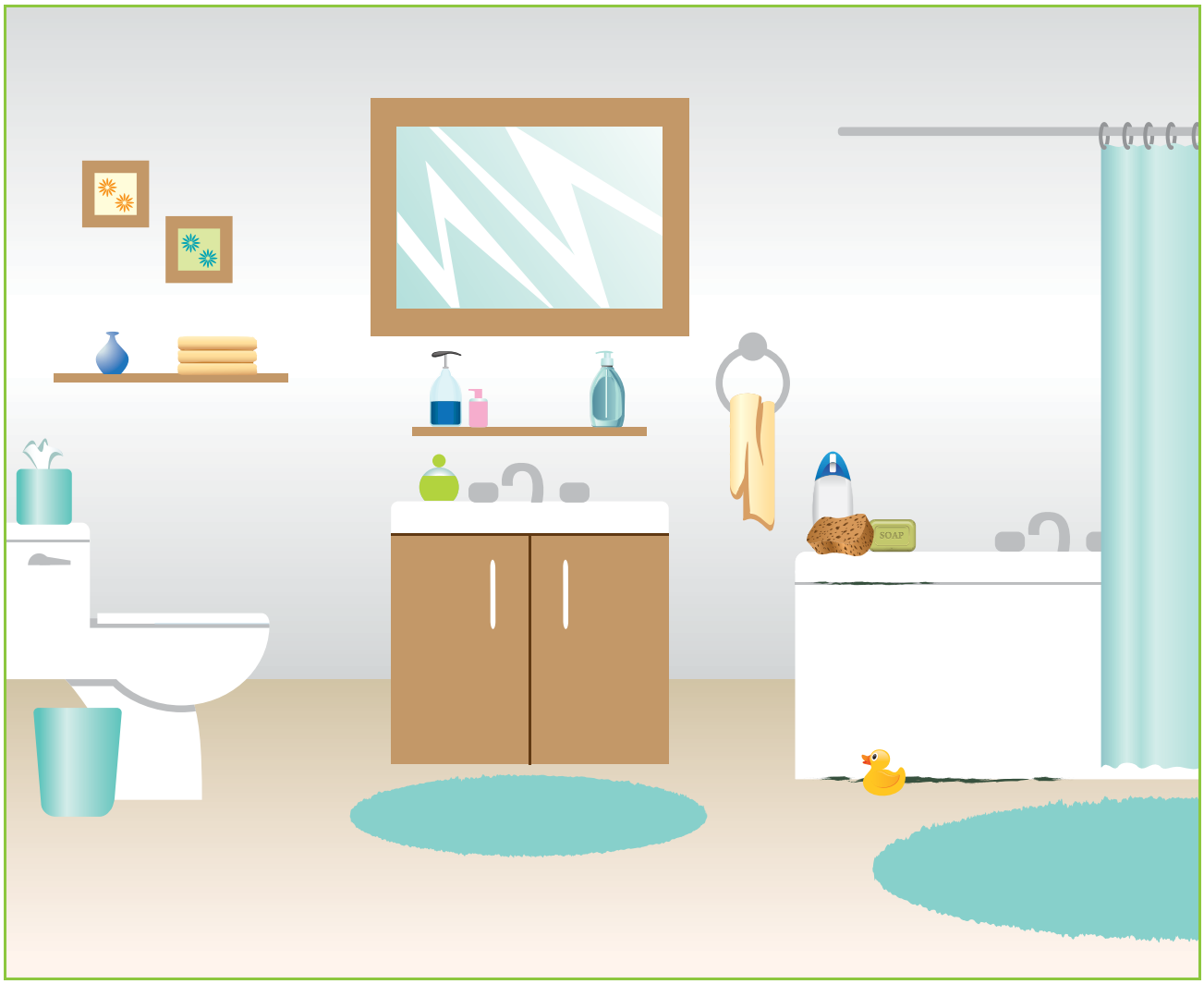
Hint: There are 3 asthma triggers in the kitchen.



(continued on other side)

Can you identify the asthma trigger in the image below?

Hint: There is 1 asthma trigger in the bathroom.



Can you identify the asthma triggers in the image below?

Hint: There are 3 asthma triggers in the living room.

(continued on other side)

Asthma Triggers Hunt *(continued – page 4)*

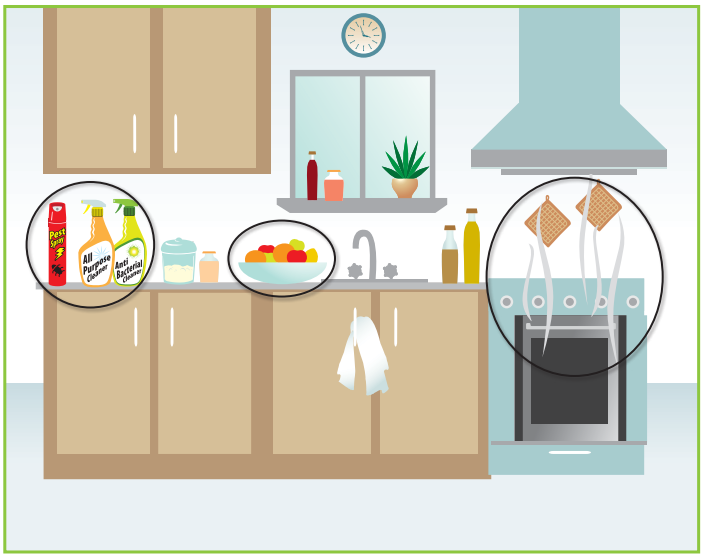
Can you identify the asthma triggers in the image below?

Hint: There are 2 asthma triggers in the bedroom.

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

Asthma Triggers Hunt Answers

Kitchen

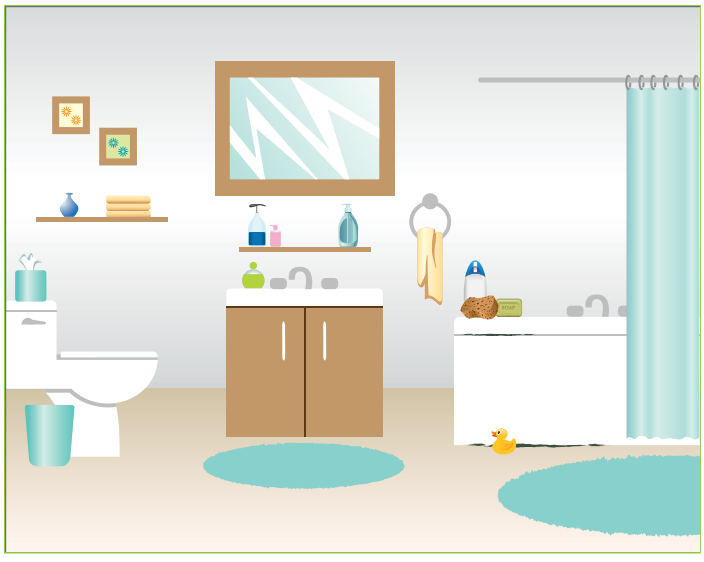


Cleaners used to clean the kitchen and pesticides used to keep pests away from produce can irritate your lungs and cause breathing difficulties.

- **Some things you can do:** Keep the kitchen clean and free of food crumbs. If you are using cleaners or pesticides, be sure to ventilate the room. Buy produce that is organic and pesticide free.

Stoves that use gas create a risk for carbon monoxide poisoning.

- **Some things you can do:** Adults should ensure that stoves vent to the outside and that all appliances are used properly.



Bathroom

Bathrooms are a common source of mold and mildew that can cause asthma or allergy attacks.

- **Some things you can do:** Install and use a bathroom fan to control moisture and help stop mold growth.

(continued on other side)

Living Room

Pets can trigger asthma and allergy attacks because of the dander in their fur.

- **Some things you can do:** Keep pets out of sleeping areas and off furniture, vacuum carpets, and clean upholstered furniture often.

Secondhand smoke can trigger asthma attacks and other breathing illnesses.

- **Some things you can do:** Encourage smokers to quit; adults shouldn't smoke inside.

Fireplaces and leaking chimneys are sources of carbon monoxide poisoning.

- **Some things you can do:** Rooms with fireplaces should be well ventilated and adults should be sure to open the flue damper and properly seal the chimney.

Bedroom

Dust mites are found in pillows, blankets and other bedding, stuffed animals, carpets, and furniture and can trigger an asthma attack.

- **Some things you can do:** Wash your bedding once a week in hot water, keep stuffed animals off of your bed, use an allergen-free mattress cover, keep the humidity in your house low (between 30% and 50%), vacuum once a week, and wipe down hard surfaces with a damp cloth.

SMOKE FREE SPACE

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

4. Lead *(10 minutes)*

Teacher Note: There is a belief that lead is only an issue in "old homes." In reality, there are many sources of lead in our daily lives. Yes, lead can be found in the paint and pipes of older homes, but it can also be found in schools, dirt and soil, water and toys, to name a few places that children may come into contact with lead every day. While this topic might not at first glance seem to relate to your organization's population, everyone can be impacted by lead.

Explain

We can easily see and take action to prevent some things that are dangerous in our homes. We can easily see secondhand smoke and we know that we need to keep chemicals, such as cleaning products, locked up and out of reach of small children. But there are some things that can harm us that we can't see.

Ask

What is lead? Where have you heard about it? What is it used for?

Explain

Lead is a metal that has many uses and is in a lot of places that we might not realize—like paint in older homes and soil in cities. But lead can be dangerous for humans if it's in our air, water, or food. It's especially dangerous for babies and children under age 6. We are not talking about the lead in your pencil. Pencils are safe for kids and adults to use.

Ask

Why do you think that might be?

Prompts: Remember that we talked about how children can be more easily affected than adults by the environment because they are still growing and developing.

Explain

When babies, toddlers, and kids are exposed to lead, it can have some serious effects on their brain development and lead to learning problems.

Explain

In our shelters—our homes and schools—we might find lead in two main places. First, in paint. Lead used to be an ingredient in household paint. About 30 years ago, the laws changed so that lead isn't in the paints that we buy today. But if you're in a building that was built before 1978, it probably has some lead paint in it and the lead from paint can get into the air.

(continued on other side)

Ask

Let's think about paint for a second. When you paint a room, what happens to the old paint? Do you take the old paint off?

Explain

Because we put a new coat of paint over the old one, many homes built before 1978 still have some paint with lead in it. As paint chips or flakes off the wall, the dust from lead paint is released and can get into the air and onto the floors and other surfaces nearby, like window sills and toys. One of the most common ways that lead dust gets into the air is from windows sliding open and shut. Lots of very small particles of lead are released that we can't see. So, what do you think happens when sandpaper is used on surfaces with lead paint? Will there be dust? What do you think is contained in the dust and how will humans be exposed? Babies and toddlers, who love to put their hands and things in their mouths, might also eat the paint chips. And sometimes lead dust even gets on our food, pillows, and other things that affect us.

Ask

What about outside the home? Lead paint was used on porches, railings, and on houses and buildings, and it can chip off and fall on the ground near homes and schools where children play in the dirt. How can we make sure that we keep our homes safe from lead?

Explain

Here are some easy ways that we can stay safe from lead at home:

1. Find out how old your home is, and if it is older than 1978, tell your parents that there is a good chance that there is lead paint in your home.
2. Make sure that any paint that is chipping or wearing and paint dust are cleaned up right away—look around window sills and baseboards inside, and around the house outside. Parents and guardians should always be in charge of cleaning up any paint or lead dust.
3. Change air filters regularly so that you don't breathe in lead.
4. When old homes are being renovated or workers come in to repair walls in homes, there is a danger of lead paint chips and dust being scattered. Be sure to stay away from areas where construction is being done.
5. Wash hands, bottles, pacifiers, and toys often.
6. Eat foods rich in calcium, iron, and vitamin C. These foods help the body absorb less lead.

Ask Can you think of anywhere else that we might find lead in our homes?

Prompts: What are the four things that we need to live? *[Air, water, food, and shelter.]*

Explain Lead can also be in the water that comes from our taps, especially in older buildings, because pipes used to be made out of lead. There are simple ways to test for lead in tap water, and states and counties run quality control checks for lead in the water.

Ask Are there any other ways that we can protect ourselves from lead?

Explain We can eat foods that are rich in calcium, iron, and vitamin C. These foods help the body absorb less lead.

Ask What are some calcium-rich foods?

Explain Milk, yogurt, cheese, and spinach.

Ask What are some iron-rich foods?

Explain Lean red meat, chicken, fish, raisins, beans, eggs, spinach, broccoli, and kale.

Ask How about some foods that are rich in vitamin C?

Explain Oranges, orange juice, and grapefruit.

(continued on other side)

Optional Activity: Asthma and Lead Exposure Patrol *(10–15 minutes)*

Ask

We know that pollutants like secondhand smoke and car exhaust can harm our lungs. And we know that older buildings have a greater chance of having issues with lead. Where do we find these things more often—in cities or suburbs, or in the country?

Explain

Because cities house more people in a smaller space, pollution and pests and older homes with lead can be more commonly found in cities than in the country. This means that if you live in a city, you need to be especially aware of these pollutants and take extra precautions. There are wonderful things about living in a city, but pollutants are something you need to be vigilant about in a city environment.

Do

Take the students on a search to answer the question: How can we make the air we breathe healthier? Start in the space you're in and tell the students to look around.

Prompts: How do we keep cold air out? How do we keep pollen out? Do you see layers of paint? Is there a lot of dust in the building? How do we identify if there are pests like cockroaches here? Ask the students where lead might be an issue in the building.

Prompts (if the facility is older than 1978): Do you see any chipping or peeling paint, especially around the windows or doors? Is there any repair work going on in the building?

5. Close and Take-Home Talk

(10 minutes)

Explain Do

Close your eyes and take a nice deep breath. We've covered a lot today. We talked about what is in our air and how our lungs work. Go ahead and open your eyes. We learned what asthma is—who can raise your hand and tell me what asthma is?

Explain Ask

We also learned the key triggers for asthma and how to avoid them. Who can name a trigger and how to avoid it? *[Go through as many triggers as the class can remember and supply the ones that they miss.]* We learned about the dangers of lead. Who can name an effect of lead poisoning that may happen to children? Lead exposure can lead to health problems and learning disabilities.

Take-Home Talk

The coolest part about learning something new is sharing the knowledge. Tonight, when you get home, I want you to talk with your family about the things we learned today. What will you tell them? Will you talk about how our air is only 20 percent oxygen? Will you explain the triggers for asthma and how to keep the air in our homes nice and clean? Look around your home and see if there are any triggers and work with your family to clean them up. Ask your parents if your house was built before 1978 and tell them about the possible risks from lead paint. Look for any peeling paint in your home, especially if you have young brothers or sisters. Talk to your parents about the importance of cleaning those areas to avoid spreading harmful lead dust.

Explain Do

*[Pass out **Take-Home Talk**.]* This Take-Home Talk sheet has some things that you can share with your family and some activities that you can do at home. See what you can accomplish on the sheet and we'll talk about it the next time we meet.

Take-Home Talk

Lesson 3: Breathing Easy: Keeping the Inside of Our Homes Healthy and Clean

To Share:

- When we take air in, the oxygen in the air passes throughout our bodies through our blood.
- The air we breathe in is only about 20 percent oxygen. Most of the rest of our air is nitrogen, which is another invisible, odorless gas, like oxygen.
- Lead is a metal that has many uses and is in a lot of places that we might not realize—like paint in older homes and soil in cities. But lead can be dangerous for humans if it's in our air, water, or food. It's especially dangerous for babies and children under age 6.

To Do and Talk About:

- **Get the Straight Scoop!** More than 25 million people in the United States have asthma, including 1 out of every 10 school-aged children. Many more people have breathing difficulties and problems other than asthma. Does anyone in your family or someone you know have asthma? Interview them about what they do to stay healthy. Do they have special precautions that they take? Do they take medicine? Have they had to change their lifestyle at all?
- **Asthma Triggers Tracking!** Even if you don't have asthma, it's important to keep the air in your home healthy and clean. There are a few things that you and your family can look for and can do to breathe a little easier. Below is a list of the most well-known asthma triggers and some steps to take to avoid them. Once you've talked about these triggers and investigated ways your family can address them, check it off!
  - ❑ Dust and Dust Mites – Keep your space clean and consider covering mattresses and pillows with airtight bedding. Wash sheets and bedding regularly.
  - ❑ Pollen – On days when the pollen count is very high, stay indoors and close the windows.

(continued on other side)

- ❑ Mold and Mildew – Clean up mold and mildew in bathrooms and keep it away by running the fan in the bathroom during and after showers.
- ❑ Pet Dander – Many folks are allergic to pets and find it difficult to breathe around them. If you have pets, brush them outside instead of inside.
- ❑ Secondhand Smoke – Smoking and secondhand smoke are bad for everyone. If someone in your family smokes, encourage them to stop.

- **Lead Paint Patrol!** Find out if your home was built before 1978. If it was, be extra careful with flaking paint. Get an adult's help to clean up dust and paint chips right away.

To Take Back:

- What was the coolest thing that you learned from talking about this topic with your family and friends?