

# ACTIVITY #1: BREATHING EASY

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**TIME** 50 minutes

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## **REQUIRED RESOURCES**

### **Activity**

- “Breathing Easy Student Worksheet,” one for each student
- Gymnasium or outdoor area
- One straw for each student

### **Making it Real**

- Projecting online Asthma video and AQHI website (computer, projector, screen)
  - Paper and pencil for interview
  - “The Basics of Asthma, Allergies and Anaphylaxis Fact Sheet,” one for each student from <http://www.asthma.ca/allergies/resources.html>
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## **Objectives**

1. To analyze the effects of physical activity on the respiratory system.
2. To monitor breathing during physical activity.
3. To understand asthma (e.g., triggers and symptoms) and to understand the connections between allergies and asthma.
4. To simulate the effects of asthma on breathing.
5. To understand the benefits of active living and clean air.

## **Curriculum Connections**

This activity is designed for Grades 6 to 9 Physical Education. It also covers some Health topics. Curriculum connections are listed by province, grade and subject on the Air Aware website,

[http://www.cleanairchampions.ca/programs/air\\_aware/teacher\\_zone/curriculum\\_connections.php](http://www.cleanairchampions.ca/programs/air_aware/teacher_zone/curriculum_connections.php)

## **Activity**

1. In the gymnasium or outdoor area, begin with a discussion about active living. Ask: “What is active living?”
2. Distribute the “Breathing Easy Student Worksheet.”
3. Have students complete the chart on the worksheet estimating the amount of time they participate in moderate-intensity physical activity (walking, skating, bike riding) and/or vigorous-intensity physical activity (running, soccer).

4. Ask students to complete question 1 on the “Breathing Easy Student Worksheet” to compare their estimates to the recommendations in *Canada’s Physical Activity Guidelines* for 60 minutes of moderate- to vigorous-intensity physical activity daily, as explained on the worksheet.

<http://www.csep.ca/english/view.asp?x=804>

5. Share the following information about active living:

*Active living is a commitment to incorporate physical activity into one’s daily lifestyle. Active living can occur in all aspects of our everyday routine, including activities at home, work, school and leisure.*

*One way to have an active lifestyle is to include active transportation in our daily lives. Depending on where you live, you may be able to choose more active transportation (walking, biking). Sports and other extracurricular activities and even shopping are also ways to get some exercise. Other examples include shoveling snow or raking leaves instead of relying on snow or leaf blowers, using a push mower, or taking the stairs instead of the elevator.*

*Making small changes such walking or biking instead of driving will contribute to active living and in turn benefit our environment by keeping our air free of harmful pollutants. Encourage students to increase their daily activity in increments of 5 to 10 minutes — make it easy to increase in small steps instead of one big leap.*

6. Share *Tips to Get Active* from the Public Health Agency of Canada at:

<http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/06paap-eng.php>

7. Ask students to complete questions 2 and 3 on the worksheet. Ask them to discuss their answers with a partner.

Invite students to share the conditions that affected their breathing. Share the following information about air quality and health.

*There are many things that have a negative effect on the respiratory and cardiovascular system such as smoking, second-hand smoke, inactive lifestyles and air pollution. Air pollution can have a negative and detrimental effect on the respiratory system (lungs and airways), cardiovascular system (heart function and blood circulation) and major organs (heart and lungs). Air pollution:*

- *makes it harder to breathe and irritating your respiratory system*
- *triggers asthma attacks and other lung diseases*
- *makes existing heart and lung conditions worse*
- *causes premature death.*

*Everyone reacts differently to air pollution depending on his or her personal health. It is important to know if you are especially sensitive to air pollution. Groups of people that are especially at risk include children, the elderly, and those with pre-existing cardiac (heart), and respiratory diseases such as coronary artery disease (angina or heart attack), heart*

*rhythm problems, heart failure, chronic obstructive pulmonary disease and asthma, to name a few.*

*During exercise, athletes take more breaths per minute than the average person, and they also take deeper breaths. High performance athletes, such as the Clean Air Champions, spend countless hours training outdoors — it is their office! Air quality is very important to maintaining their good health and for allowing them to perform at their best. The same applies to anyone exercising outdoors — we all need clean air to have healthy bodies.*

*Negative health effects increase as air pollution worsens. Studies have shown that even small increases in air pollution can cause small but measurable increases in emergency room visits, hospital admissions and death. In fact, it has been shown that even small increases in air pollution levels for a short period of time can worsen illness among sensitive or at-risk people.*

- 8.** Explain to students that they will monitor their breathing while they are doing various activities (Breathing When Active section of worksheet). They will work in pairs and perform each activity for one minute. While they are doing their activities, they are to carry on a conversation with their partner. They will rank each activity according to their breathing.
- 9.** Ask the students to complete the activities and ranking on the worksheet.
- 10.** After they have completed the ranking, discuss with the students the activities that had the biggest impact on their breathing. Share with students that as their fitness levels increase, their breathing rates also change. During exercise, they will still breathe more often and take deeper breaths, but they will gasp less and be able to carry on a conversation.
- 11.** Share with students that using the ability to talk while exercising is an easy and general method for determining activity level. Target heart rates are a more accurate way of determining activity level.
- 12.** Refer to the discussion regarding when their breathing has been affected. Share this information about asthma from the Air Aware website.

[http://www.cleanairchampions.ca/programs/air\\_aware/fact\\_sheets.php](http://www.cleanairchampions.ca/programs/air_aware/fact_sheets.php)

*Asthma is a "chronic inflammatory disease of the airway" that causes the following symptoms: shortness of breath, tightness in the chest, coughing, and wheezing. Asthma can vary in its severity, can vary from person to person, and can flare up from time to time. The cause of asthma is not known and currently there is no cure. People with asthma often have trouble breathing when they are in the presence of what are called "triggers." When someone has asthma and their symptoms are "triggered," it means that the flow of air is obstructed as it passes in and out of the lungs. There are two types of asthma triggers:*

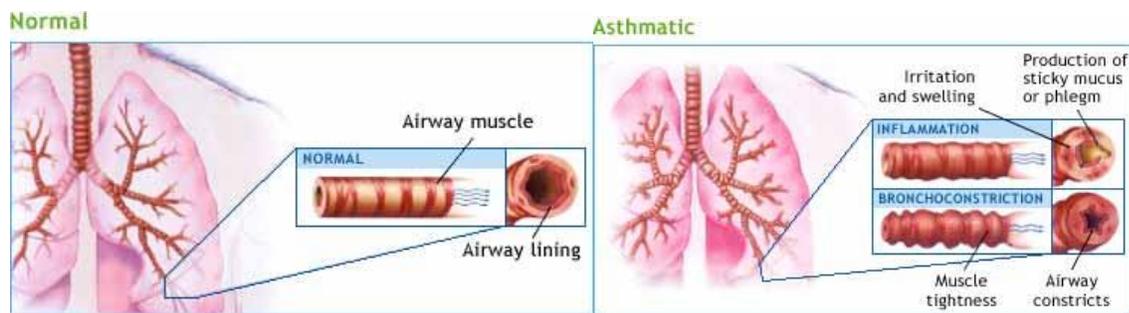
- *allergic triggers that cause inflammation of airways — dust mites, animals, cockroaches, moulds, and pollen*
- *non-allergic triggers that can irritate airways that are already inflamed — viral infections, smoke, exercise, cold air, chemical fumes and strong-smelling substances, certain air pollutants and intense emotions*

*Many people with asthma also have allergies. People with allergies and asthma that come in contact with their allergic triggers will have a reaction in their airways as well as the usual*

*allergy symptoms (itchy, watery eyes, etc.) An allergy is an abnormal reaction by your body to things that your body becomes sensitive to. These are called allergens. There are two types of allergens: ingested allergens (food, drink and medicines) and inhaled allergens (pollen, dust, animal dander, mould, etc.) Inhaled allergens are the most common cause of allergy problems in people with asthma.*

*Viral infections such as the common cold are one of the most common non-allergic triggers. Another non-allergic trigger is exercise, and this is often referred to as exercise-induced asthma. Cold, dry air is believed to be the main cause of exercise-induced asthma. When exercising, we tend to breathe quickly, shallowly and through the mouth. The air reaching the lungs misses the warming and humidifying effects of breathing through the nose. Smoke from smoking cigarettes, inhaling second-hand smoke or smoke from fires is another non-allergic trigger. Strong-smelling substances such as perfume can be another trigger. Air pollution is also a non-allergic trigger — ground level ozone, particulate matter and nitrogen dioxide are three pollutants that can trigger non-allergic asthma symptoms.*

*Asthma can affect anyone. Most people with asthma can live full, active lives. Asthma symptoms can be managed and the goal is to be symptom-free by avoiding asthma triggers, by taking medication, by following an asthma action plan, and by following-up regularly with your doctor. More than 80% of people with asthma also have allergies, so they need to manage both their asthma and allergies.*



Source: Asthma Society of Canada, <http://www.asthma.ca/adults/about/whatIsAsthma.php>, The Lung Association, [http://www.lung.ca/diseases-maladies/asthma-asthme/allergies-allergies/index\\_e.php](http://www.lung.ca/diseases-maladies/asthma-asthme/allergies-allergies/index_e.php) .

- 13.** Explain that the next activity will help students understand what it feels like to breathe with asthma symptoms. Invite students to complete the Breathing Through a Straw Activity. Review the safety precautions that are provided on the “Breathing Easy Student Worksheet” and demonstrate how the students should complete the activity. Ask students to indicate their experience using a thumbs up if it remains easy to breathe or a thumbs down if it gets harder to breathe. Remind students that if anyone is having difficulty breathing or feeling light-headed or dizzy, they should stop breathing through the straw, sit down and regain normal breathing. NOTE: Ensure you are following the safety guidelines for your school board/district and/or province to know the medical background and physical limitations of your students. You must be aware of which students have asthma or any other lung condition.
- 14.** Monitor students closely or ask students that may not be able to participate to help you monitor the other students.

15. Have students complete questions 1 to 4 on the Breathing Through a Straw section of the worksheet.
16. Discuss how breathing through a straw is similar to how people with asthma feel when their asthma is triggered. Remind students of the two categories of asthma triggers: allergic and non-allergic. Point out that certain air pollutants are non-allergic asthma triggers. If students indicated that their breathing has often felt similar to when they were breathing through a straw you can refer them to the Asthma Society of Canada website, *How to Tell if You Have Asthma*.  
<http://www.asthma.ca/adults/about/howToTell.php>
17. When air quality is very poor, everyone is affected, and people with lung diseases and asthma are put “at risk” for their symptoms to worsen. Hospital visits increase during poor air quality, and it can even lead to unexpected death. Reinforce the importance of air quality for individuals with active lifestyles and discuss how air quality might affect those who often train outdoors, such as elite athletes or those who suffer from lung disease such as asthma. Exercise has many benefits for everyone, including people with asthma.
18. Lead a discussion on what people who train outdoors or who do outdoor activities could do to ensure they remain active while also reducing their exposure to poor air quality.
19. Submit a summary of what students learned about their activity levels, asthma and allergies to Air Aware’s National Program Coordinator, Angela Melhuish, at [angela@cleanairchampions.ca](mailto:angela@cleanairchampions.ca). You can share a simple summary or specific example of what you saw from students while doing the activity. All classes that submit information on the impact of the program will be entered in a draw to win for a Giant Bike! Visit the webpage below for more information and to enter.  
[http://www.cleanairchampions.ca/programs/air\\_aware/enter\\_our\\_giant\\_contest/for\\_schools.php](http://www.cleanairchampions.ca/programs/air_aware/enter_our_giant_contest/for_schools.php)

## Extension — Making it Relevant

- Use the online video from the Asthma Society of Canada to illustrate the respiratory system and the effects of asthma on breathing.

<http://pubmodules.machealth.ca/asthma/management/player.html>

On the website, select *Asthma Myths & Facts* and then select *Breathing with Asthma*. Ensure speakers or headphones are turned on.

- Ask students to interview someone they know with asthma. If they don’t know anyone with asthma, they could refer to The Lung Association’s — Faces of Asthma website:

[http://www.lung.ca/diseases-maladies/asthma-asthme/faces-visages/index\\_e.php](http://www.lung.ca/diseases-maladies/asthma-asthme/faces-visages/index_e.php)

Students can use the following questions to guide their interviews. Remind them that when they gather private information from the people they interview, they should not share it with others.

*When were you diagnosed with asthma?*

*How has it impacted your life?*

*How do you treat your asthma?*

*What are the triggers (things that can lead to an asthma attack) for your asthma?*

Encourage students to also make up their own question(s) based on what they would like to know about living with asthma.

- Download “The Basics of Asthma, Allergies, and Anaphylaxis Fact Sheet” at

<http://www.asthma.ca/allergies/resources.html>

Print one copy for each student to take home. Ensure you know the students in your classroom that have allergies, asthma and anaphylaxis. Take steps to allergy proof your classroom.

- Explore Canada’s Air Quality Health Index (AQHI), a scale to help people understand their local air quality and its connection to their health. The AQHI is a health protection tool designed to help people make decisions to protect their health by limiting short-term exposure to air pollution and adjusting activity levels during increased levels of air pollution. In class, project the website, show the scale, check the current and forecasted AQHI rating for a location close to your school, and review the health messages:

[http://www.cleanairchampions.ca/programs/air\\_aware/the\\_aqhi.php](http://www.cleanairchampions.ca/programs/air_aware/the_aqhi.php)

## Extension — Being Active

1. Knowing your heart rate helps you measure your exercise level and progress in a fitness program. Ask each student to develop a personal physical fitness goal. Ask them to pick one moderate- to vigorous-intensity physical activity to focus on over a period of weeks. Over a period of weeks, students measure and record their breathing and heart rate during this activity, and then analyze the impact of regular physical activity on their breathing and heart rate. With the class, discuss the principles of fitness training — FITT — frequency, intensity, time and type. Share information about target heart rates during exercise using the Target Heart Rate Calculator. You can enter the age level of students in the class for each of the levels of fitness to provide a target heart rate zone.

[http://exercise.about.com/cs/fitnesstools/l/bl\\_THR.htm](http://exercise.about.com/cs/fitnesstools/l/bl_THR.htm)

To monitor their heart rate, students count their heart rate for 10 seconds and then multiply by 6 to record their heart rate per minute. To find their pulse:



- Radial Pulse: Using the tips of your middle and index finger of the right hand, place these fingers on your other wrist (palm facing up) just below the base of the thumb.
- Carotid Pulse: Using the middle and index finger of the right hand, find the carotid artery. This artery is found on the neck between the windpipe and neck muscle, just under the lower jawbone.
- Students will feel a pulse once they have found the artery. Have them hold the two fingers in place while counting the pulse for 10 seconds.



2. Refer to the Clean Air Champions website for other active games:

[http://www.cleanairchampions.ca/programs/air\\_aware/quizzes\\_activities\\_and\\_games.php](http://www.cleanairchampions.ca/programs/air_aware/quizzes_activities_and_games.php)

# ACTIVITY #1: BREATHING EASY

## STUDENT WORKSHEET

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**Did you know?** *Canada's Physical Activity Guideline* for youth ages 12 to 17 recommends 60 minutes of moderate- to vigorous-intensity physical activity each day. The *Guideline* also recommends that of those seven days:

- vigorous-intensity activities should occur at least three days per week
- activities that strengthen bones and muscle should occur at least three days per week

### Daily Activity Estimate

Record the amount of time you spend doing moderate (walking, skating, bike riding, chores, vacuuming, raking leaves, shoveling) and vigorous activity (running, rollerblading, soccer) each day and calculate your daily total.

	Mon	Tues	Wed	Thu	Fri	Sat	Sun
Moderate							
Vigorous							
Total							

**Did you know?** Only 7% of Canadian youth (ages 6 to 19) meet the recommended 60 minutes of moderate to vigorous physical activity (MVPA) 6 days a week and less than half meet the 60 minutes of MVPA 3 days per week. Source: Canadian Health Measures Survey, 2007 to 2009.

1. How does your daily total compare to the "Did you know?" recommendations above?
2. What type of activities do you prefer (e.g., swimming, walking, biking, shoveling snow, gardening, team sports, badminton, dancing, hiking, fitness center workouts, gymnastics, table tennis, etc.)? How could you increase your activity level for next week? How confident are you that you will do it (e.g., 50%, 85%)? The higher your confidence levels, the more likely it is that you will increase your activity level.
3. When exercising outdoors, have you experienced a time when your breathing became more difficult? What do you think made your breathing more difficult?

## Breathing When Active

- Work with a partner to complete each of the activities listed below for one minute.
- As you are doing the activity, continue talking with your partner.
- On the table below, rank the activities according to your breathing while you were doing the activity and talking with your partner.
- If you have to stop talking while doing the activity before your reach one minute, you may stop doing the activity.

Activity	Ranking – circle 1 if your breathing remains normal, 2 if it is still easy to talk while doing the activity, 3 if it gets difficult to talk, and 4 if you have to stop talking			
	NORMAL BREATHING	EASY TO TALK	DIFFICULT TO TALK	HAVE TO STOP TALKING
Walk normally	1	2	3	4
Walk quickly	1	2	3	4
Hacky Sack/Bean Bag*	1	2	3	4
Jog	1	2	3	4
Run quickly	1	2	3	4

\* Hacky Sack/Bean Bag: with your partner, try to keep the hacky sack/bean bag off the ground using only your feet for the one minute.

- If you circled 1 or 2, the activity would be considered light.
- If you circled 3, the activity would be considered moderate.
- If you circled 4, the activity would be considered vigorous.

**Note:** Measuring your activity level based on your ability to talk is an easy and general guideline. Target heart rates for exercise is more accurate and a better guideline to determining your exercise levels.

### Did you know?

- Adults generally take fewer breaths per minute than young people.
- When we exercise, we take more breaths than we do when resting.
- During exercise, athletes take more breaths per minute than the average person, and they also take deeper breaths.

