



Physical Education 9

Breathe Easier

Abstract

Students review their daily activity levels, learn about the respiratory system, asthma and allergies and simulate what it feels like to breathe with asthma.

Logistics

Time Required

- **Class Time:** One 50 - 60 minute class. Extensions will take additional time.
- **Prep Time:** 20 minutes

Materials

Contents of this lesson:


- one per class: **Teacher's Active Living Information Sheet**
- one per student: **Breathe Easier Student Worksheet**
- one per class: **Teacher's Air Quality and Health Information Sheet**
- one per class: **Asthma Fact Sheet**
- one per student: **Breathing When Active Student Worksheet**
- one per student: **Breathing Through a Straw Student Worksheet**
- optional: **Student Reporter Tip Sheet: Interview Strategies**
- one standard size straw per student
- one stopwatch per pair of students, if available
- one beanbag per pair of students

Classroom Requirements

- Gymnasium or outdoor area

Learning Objectives

- To analyze the effects of physical activity on the respiratory system.
- To monitor breathing during physical activity.
- To understand asthma (e.g., triggers and symptoms) and to understand the connections between allergies and asthma.

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- To simulate the effects of asthma on breathing.
 - To understand the benefits of active living and clean air.

Prescribed Learning Outcomes, BC Curriculum

- Formulate a rationale for active living.
- Explain how physical activity relates to health-related components of fitness (muscular strength, muscular endurance, cardiovascular endurance, and flexibility).
- Skill-related components of fitness (e.g., agility, speed, reaction-time, co-ordination, balance) movement concepts (body awareness, spatial awareness, qualities of movement, relationships).
- Analyze how principles of training relate to components of fitness.
- Monitor their rate of exertion during physical activity.
- Pursue personal physical activity goals related to health-related components of fitness (muscular strength, muscular endurance, cardiovascular endurance, and flexibility) and skill-related components of fitness (e.g., agility, speed, reaction time, co-ordination, balance).
- Exhibit leadership in a range of physical activities.
- Apply safety procedures in all physical activities across the activity categories

Preparation

- Assemble necessary materials.
- Print copies of worksheets for students.
- Gather the equipment: stopwatches, straws and beanbags.

Classroom Implementation – Part A

Students begin to think about active living and their own activity levels.

1. In a gymnasium or outdoor area, begin a **discussion about active living**. Ask, for example: “What is active living?” Share information about active living found on the **Teacher’s Active Living Information Sheet**.
2. Seize students’ attention by sharing an interesting fact or giving them a challenge. If you cycled 5 km to and from school every day you would cycle 2000 km over a school year, about the distance from Abbotsford to Winnipeg.
3. Hand out the **Breathe Easier Student Worksheet**.
4. Instruct students on how to **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).
5. Have students complete question 1 of the 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 in the ‘Did you know?’ boxes.
6. Ask students to complete questions 2 and 3 and encourage them to discuss with a partner.
7. Invite students to share the conditions that affected their breathing. Follow this by sharing information from the **Teacher’s Air Quality and Health Information Sheet**.

Classroom Implementation – Part B

Students explore activity intensity and are introduced to asthma.

1. Explain to students that they will monitor their breathing while doing various activities found on the **Breathing When Active Student 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, then rank each activity according to their ease of breathing.
2. Allow the students time to complete these activities. Make beanbags and stopwatches available at this time.
3. Discuss which activities had the biggest impact on breathing. Inform students that as fitness levels increase, the rate at which they breathe will also change (e.g., gasp less and be able to carry on conversation).

4. Explain that assessing the ability to talk during an activity is one way of measuring its intensity. However, a more accurate method would be measuring heart rate.
5. Have students review information on asthma from the **Asthma Fact Sheet**.

Classroom Implementation – Part C

Students explore what it would be like to breathe with asthma.

1. Introduce the breathing through a straw activity. Review the safety precautions found on the worksheet and demonstrate how to conduct the activity. Remind students that if anyone has difficulty breathing or is 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 which students have asthma or any other lung condition.

2. Monitor students closely or ask students who may not be able to participate to help you monitor the other students.
3. Ask students to complete **questions 1 to 4** on the **Breathing Through a Straw Student Worksheet**.
4. Discuss how breathing through a straw is similar to how people with asthma feel when their asthma is triggered. Remind students of two categories of asthma triggers: allergic and non-allergic. Point out that certain air pollutants are non-allergic asthma triggers.

NOTE: If students indicate that their breathing has often felt similar to when they are breathing through a straw, you can refer them to the Asthma Society of Canada website, *How to Tell if You Have Asthma*, www.asthma.ca/adults/about/howToTell.php

5. When air quality is very poor, everyone is affected. Those with lung disease and asthma are 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, too. 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.
6. Lead a discussion on what people who train outdoors or engage in outdoor activities could do to ensure they remain active while also reducing their exposure to poor air quality.



Teacher's Active Living Information Sheet

What is 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 ways to get some exercise.

Other examples include shoveling snow or raking leaves instead of relying on gas-powered snow or leaf blowers, using a push mower, or taking the stairs instead of the elevator.

Making small changes such as walking or biking instead of driving will contribute to active living and benefit our environment by reducing greenhouse gas emissions and pollutants in the air.

Encourage students – and yourself! – 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.

See 'Tips to Get Active' from Public Health Agency of Canada at:

<http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/04paap-eng.php>



Tips to Get Active

> Physical Activity Tips for Youth (12-17 years)

Be active – at home, at school, at play – inside or outside – with family and friends.
You'll have more energy, feel healthy and strong, and good about yourself!

1

Every step counts.
Try to do **an hour every day** of moderate- to vigorous-intensity activity. Choose vigorous activities at least three days a week.

2

Get stronger by doing activities that **build muscles and bones** at least **three days** a week.

3

Combining **aerobic and strengthening activities** will improve your health and well-being.

Tips to help you get active

What activities you choose to do is up to you:

- Walk, run or bike instead of getting a ride
- Do something you enjoy — run, jump, swim, skateboard, snowboard, ski, skate, toboggan
- Check out yoga, hip-hop, or aerobics classes
- Try indoor rock climbing, play soccer, ride a bike
- Take the dog for a walk
- Dance to your favourite music
- Rake the leaves, shovel snow, carry the groceries home
- Join a team at your school
- Choose activities you like or be creative and try something new
- Set physical activity goals with your friends and family
- Reduce screen time



Be more active
after school.
Every step counts!



Public Health
Agency of Canada

Agence de la santé
publique du Canada

Canada

Breathe Easier Student Worksheet

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 for every week:

- Vigorous intensity activities should occur at least three days per week
- Activities that strengthen bones and muscles should occur at least three days per week

Daily activity estimate

Record the amount of time you spend doing moderate activity (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 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. Write down which activities you prefer – such as swimming, walking, biking, shoveling snow, gardening, hockey, skating, snowboarding, badminton, dancing, rock climbing, gym workouts, gymnastics. How could you increase your activity level for next week? How confident are you that you will do it (50%, 90%)? The higher your confidence level, 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?



Teacher's Air Quality & Health Information Sheet

There are many factors that may 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 irritates your respiratory system
- May trigger asthma attacks and other lung diseases
- Makes existing heart and lung conditions worse
- Can even cause 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 who 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 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 spend countless hours training outdoors; it is their workspace. Therefore, air quality is vital to maintaining their good health and 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.

Asthma

What is Asthma?

Asthma is a chronic inflammatory disease of the airways – the small tubes that carry air in and out of the lungs. The short story is that having asthma makes it harder to breathe. The long story is that it can be challenging to manage and it significantly impacts the quality of life for many Canadians. In rare cases an asthma attack can be fatal. The good news is that asthma can be treated.

Asthma is caused by swelling and inflammation of the airway lining. Increased mucus production and tightening of muscles around the airways blocks the flow of air through the lungs. In people with asthma, the lining of the airways is more sensitive to things such as cold air, exercise, and allergens, which can cause asthma attacks.

What are the symptoms?

When someone is suffering from asthma, their symptoms could include:

- Shortness of breath
- Tightness in the chest
- Coughing
- Wheezing

Asthma symptoms can be very unpredictable, which can create challenges for those learning to control them. Symptoms may vary over time and will vary from person to person. The severity of episodes can fluctuate from mild to moderate or severe.

Who gets it and why?

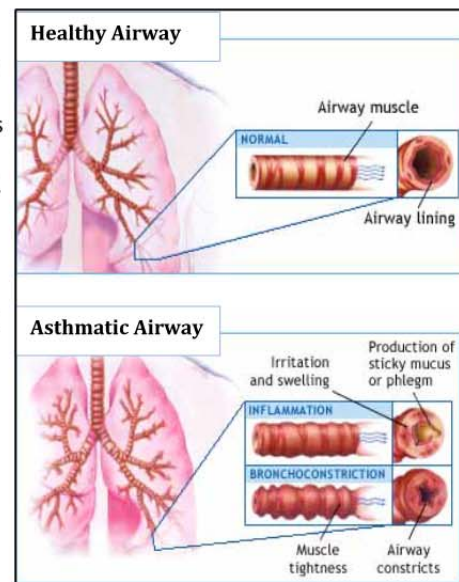
Anyone can develop asthma at any age, though it is most often diagnosed in children and youth.

The causes are not well understood although asthma can run in families (i.e. have a genetic connection), and is often associated with allergies. Environmental factors may also play a role in some cases, with repeated exposures to certain substances or pollutants believed to cause asthma in some individuals.

What triggers an attack?

While triggers will be different for every person, most people with asthma will be triggered by at least one of the following:

- Air pollutants
- Animals
- Cold temperatures
- Dust mites
- Exercise
- Mould
- Pollen
- Stress/anxiety
- Tobacco smoke
- Viral infections



Images courtesy of Asthma Society of Canada

The Top 10 Asthma Myths*

1. Asthma is all in your head.
2. Asthma can be cured.
3. Everyone who has asthma is the same.
4. I only have asthma when I have trouble breathing.
5. I only need to take my medication when I have trouble breathing.
6. I can stop taking my controller medication as soon as I feel better.
7. My child will outgrow her asthma.
8. Steroids are dangerous, so I do not want my child taking them.
9. Steroids will stunt my child's growth.
10. If I have asthma, I have to avoid sports and physical activity.

*Courtesy of National Asthma Patients



Controlling asthma

Asthma is controlled best through a combination of asthma medications and good lifestyle choices like healthy diet, adequate rest, and keeping a lid on stress. Doctors and certified asthma educators will work with patients suffering from asthma to develop a customized asthma action plan (AAP). The AAP describes when to increase or decrease medications, and when to seek emergency help.

Successful asthma control means:

- No daytime symptoms
- No nighttime symptoms
- No need to use reliever medication more than 4 times in a week
- No school or work absenteeism due to asthma
- Normal breathing tests



Asthma and allergy

People with asthma may also have allergies that make their asthma worse. For people with both conditions, effective management of allergies will support better asthma control. The essentials are to know and avoid allergy triggers, take allergy medicines as prescribed by a doctor, and follow the AAP. For more information on allergy, see our Allergy Fact Sheet.

The benefits of clean air and active lifestyles

Being physically active is a key building block of health. It's especially important for children who need it for growth and development. Research is showing that regular activity can help support better asthma control. Exercise also reduces the risk of developing other chronic diseases, reduces stress, and supports better sleep and well-being.

Anyone with asthma can exercise safely but it's important to work with a doctor or health care professional to get it right. Be sure to check the Air Quality Health Index to choose when and where to exercise.

Fast Facts on Asthma

- Affects 3 million Canadians and 10-18% of Canadian children
- Well controlled asthma enables totally normal lifestyles and activity levels – yet more than half of asthma sufferers don't have it under control
- It's the leading cause of school absenteeism, and third leading cause of work absenteeism
- The prevalence of asthma is twice as high in boys as it is in girls under 14 years of age.
- Women aged 40 years have a greater prevalence of asthma than do men of the same age.

For more information on asthma:

[Asthma Society of Canada](#)
[Asthma Kids](#)

[Canadian Lung Association](#)
[National Asthma Patients Alliance](#)

Breathing When Active Student Worksheet

- 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 you reach one minute, you may stop doing the activity.

Activity	NORMAL BREATHING	EASY TO TALK	DIFFICULT TO TALK	HAVE TO STOP TALKING
Walk normally	1	2	3	4
Walk quickly	1	2	3	4
Bean bag*	1	2	3	4
Jog	1	2	3	4
Run quickly	1	2	3	4

*Beanbag: with your partner, try to keep the beanbag off the ground using only your feet for the one minute.

Ranking – circle 1 if your breathing remains normal, 2 if it's still easy to talk while doing the activity, 3 if it gets difficult to talk, and 4 if you have to stop talking.

- 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.



Breathing Through a Straw Student Worksheet

- With a partner, take turns walking quickly for one minute while breathing through a straw. Try to breathe through your mouth as much as possible. Then switch so the other person walks quickly while breathing through a straw.
- Periodically, signal to your partner, using a thumbs up to indicate if your breathing remains easy or a thumbs down to indicate if your breathing becomes more difficult.

Safety First

If at any time you are feeling light-headed or dizzy, stop breathing through the straw, and sit down until your breathing returns to normal.

Let your teacher know if you have health concerns that would prevent you from participating in this activity.

1. How did you feel during the breathing through a straw activity?
2. Has there ever been a time that your breathing felt similar to when you were breathing through the straw? If yes, how often has this occurred and when?
3. Have you ever been diagnosed or tested for asthma?
4. How are allergies connected to asthma?

Did you know? In the 2006, 2008 and 2010 Olympic Games, approximately 7% of athletes had asthma, making it the most common medical condition experienced by the Olympic athletes. Source: Australian Association for Exercise and Sport Science's Position Statement on Exercise and Asthma (2011).

Extension

Option 1: Interview

Ask students to interview someone with asthma. Hand out the **Student Reporter Tip Sheet: Interview Strategies** for students to use to plan and prepare for the interview. This activity or homework assignment could be done in connection with another course, such as Language Arts where the students develop the guide themselves to conduct the interview.

Option 2: Being Active

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 or FITT – frequency, intensity, time and type. Monitor heart rates with the Target Heart Rate Calculator, http://exercise.about.com/cs/fitnesstools/l/bl_THR.htm

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

To find the radial pulse, place the tips of the middle and index fingers of the right hand on the other wrist (palm facing up) just below the base of the thumb:



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Carotid Pulse: Use the middle and index finger of the right hand to find the carotid pulse in carotid artery in the neck. This artery is found on the neck between the windpipe and the 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.

Give the daily activity handout for students to take home for the duration of this assignment.

When the period of weeks is complete, ask students to return the handout to class and discuss the results together during a class period.

Student Reporter Tip Sheet: Interview Strategies

Successful reporters plan their interviews. The tips below will help you plan and conduct effective interviews.


1. To plan your interview, ask yourself such questions:

What do I need to find out? Who will want to read this, who is my audience? What should my readers know?	Who should I contact to be interviewed?
What questions should I ask? Examples: <ul style="list-style-type: none">• <i>When were you diagnosed with asthma?</i>• <i>How has it impacted your life?</i>	What do I need to say when I make appointments for the interviews?

2. Conduct the interview(s). Ask and record responses for about 10 questions.

3. Remember to thank the persons you interviewed and share something you learned from their responses.

4. Record and organize the information you gather. Create a T-chart to record responses to interview questions. Return your organized information from the interview by the indicated deadline (due date).



For additional lessons and to complete an evaluation survey, visit: www.fvrd.ca/airquality

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