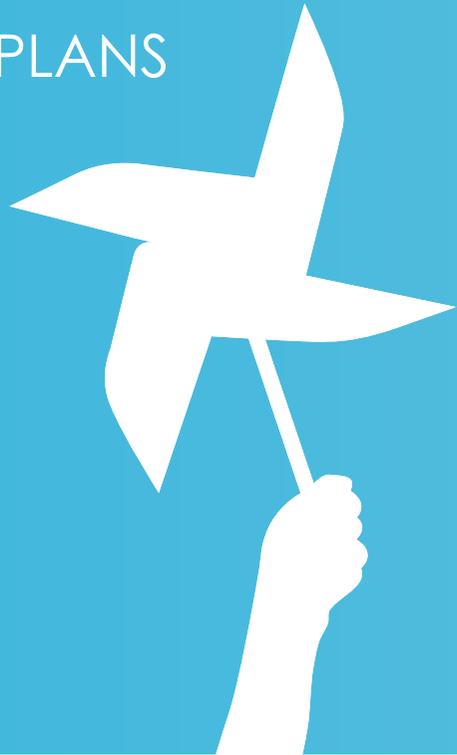


Clean air for better breathing

Resource Kit for
Middle/Secondary Levels

LESSON PLANS



INTRODUCTION

Clean Air for Better Breathing brings together knowledge and resources from both the AirWatch and Asthma Friendly Schools programs to provide schools with learning opportunities to link concepts about the environment and health, and better understand the relationship between air quality and respiratory health (in particular asthma).

Clean Air for Better Breathing objectives:

- to raise school community awareness of the relationship between air quality and respiratory health (particularly asthma)
- to increase school community understanding and willingness to adopt practices which improve their local air quality and reduce asthma triggers.

These lesson activities are supported by resources available on the Environment Protection Authority and Asthma Foundation of South Australia websites:

www.epa.sa.gov.au

www.asthmasa.org.au

Acknowledgements

Air quality content (with the exception of the audit tool activity) have been adapted with permission from: 'Clean Air – What's in it for us? – An Air Pollution Program for Secondary Schools', written and compiled by Jennifer Anderton, Margot Finn and Gabrielle Robertson, Western Australian Department of Environment and Conservation and 'Who Cares About Our Air? – A Workbook on Air Pollution for Primary Schools', written and compiled by Jennifer Anderton and Gabrielle Robertson, Western Australian Department of Environment and Conservation



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TEACHERS NOTES

LEARNING ACTIVITY 1: THE AIR WE BREATHE

EARTH'S ATMOSPHERE

The atmosphere is a layer around the earth hundreds of kilometres thick with air surging, flowing, swirling and mixing at different depths above the surface of the earth. The layer closest to the ground contains the air which maintains all life.

Air is colourless, odourless and tasteless and is, in fact, made up of a mixture of gases, some of which, such as oxygen, are essential to life.

Air exerts a pressure around us and affects many of our everyday activities. The gases in air are essential for the survival of plants and animals. These gases are important for many things which we take for granted, such as the transmission of sound and the use of fire.

Generally, because we can't see air, taste it or smell it, we ignore it and take it for granted. We become concerned only when its quality is severely diminished but by then, the efforts required to fix the problem are often complex and expensive.

Before the industrial revolution, nature's own air-conditioning managed to keep the air fairly clean. Wind mixed the gases and spread them out, rain washed the dust and other substances to the ground, and plants absorbed carbon dioxide and replaced it with oxygen.

In the post-industrial revolution years, considerably more pollution has been added to the air by industrial, commercial and domestic sources. When nature can no longer manage these pollutants they become concentrated and exceed safe limits. This is air pollution.



TEACHERS NOTES

LEARNING ACTIVITY 1: THE AIR WE BREATHE

ASTHMA AND OUR BODY

Refer to the DVD slide, 'Where Does Asthma Occur?'

Asthma occurs in the small airways (called bronchioles) in the lungs. The thickness of the bronchioles is approximately that of a human hair ($1/2$ mm in diameter). Imagine the significant effect that reducing the passage of air through such small airways could have.

Our Respiratory System: the pathway for the air we breathe

Breathing in:

1. by tightening the diaphragm muscle (under the lungs) air enters the body through the nose (filtered and warmed) and mouth
2. goes through our largest airway, the trachea (windpipe)
3. branches into left and right bronchi and enters the lungs
4. further branches into smaller bronchi
5. branching continues to smaller airways – bronchioles (blow up diagram)
THIS IS WHERE ASTHMA OCCURS
6. bronchioles to alveoli (air sacs at the end of the airways – round shapes in blow up diagram).

Breathing out:

Relaxing of the diaphragm expels air from the body – reverse of above.

Oxygen in the air enters the bloodstream through the alveoli and is distributed throughout the body to 'fuel' our cells.

LEARNING ACTIVITY 1: THE AIR WE BREATHE

KEY MESSAGE: Air is important for the survival of people, plants and animals

Part 1: Earth's Atmosphere

LEARNING OBJECTIVES	ACTIVITY TASK	RESOURCES
<p>1. Clean air is a valuable resource</p>	<p>Ask students to fill out Student Survey Activity Sheet and follow-on questions about air pollution in their local area.</p> <p>EXTENSION ACTIVITY (optional) Students can debate the issue of air quality, either as a formal debate or a class discussion. It might be worth using at least one lesson to prepare a well reasoned and logical argument. Some debating topics could be:</p> <ul style="list-style-type: none"> • Our city does not have an air pollution problem • I'm not interested in anyone trying to clean up the air if my family's taxes increase • People should be made to use their cars less to help overcome the air pollution problems in our city. <p>Answers to questions 2-7: 2=T, 3=T, 4=T, 5=F, 6=T, 7=T (Other questions are attitudes or beliefs, and therefore cannot be right or wrong).</p>	<p>Activity Sheet 1: Student Survey</p>
<p>2. Air is made up of a mixture of gases; The Earth's atmosphere is made up of different layers and pollutants can be found in both the troposphere and the stratosphere</p>	<p>Students to read the About Air Pollution Activity Sheet and answer questions. Discuss answers with the class.</p>	<p>Activity Sheet 2: About Air Pollution</p>



LEARNING ACTIVITY 1: THE AIR WE BREATHE

Part 2: Asthma and Our Body

LEARNING OBJECTIVES	ACTIVITY TASK	RESOURCES
<p>1. Asthma affects our respiratory system and occurs in the small airways of the lungs</p>	<p>Brainstorm with the class the parts of the body that help us breathe. These make up our respiratory system. Establish the pathway through the parts of the respiratory system for breathing in and breathing out. Show the slide 'Where Does Asthma Occur?' and relate to discussion. Reinforce that asthma occurs in the small airways of the lungs.</p>	<p>'Where Does Asthma Occur?' slide</p>
<p>2. To explore information students believe about asthma and to consider some of the impacts of the condition</p>	<p>Small group activity</p> <p>Ask students to work in small groups and consider what they know about asthma. Have them record all responses.</p> <p>There are myths about asthma that may be amongst their responses (eg people with asthma cannot play sports). Working as a whole class group, organise the responses into headings of:</p> <ul style="list-style-type: none"> • What we know is true • What we believe to be true • Not sure <p>Explore asthma impacts by discussing:</p> <ul style="list-style-type: none"> • Who is affected? • When does asthma occur? • How does asthma affect a person? • What is the physical impact of asthma? • What is the medical impact of asthma? • What is the social impact of asthma? <p>Add any new responses to the know / believe / not sure record (This record can be kept to revisit at the end of this set of lessons to highlight what has been learnt).</p>	

TEACHERS NOTES

LEARNING ACTIVITY 2: AIR AND HEALTH

There is great concern over deteriorating air quality as it can contribute to health problems in our community, especially for the very young, the elderly and those who already have respiratory problems.

Common effects of air pollution include changes in heart and lung function with increases in associated medical conditions such as asthma, bronchitis, and heart disease. Air pollution can also contain compounds which can affect the nervous system and are carcinogenic.

Air pollution not only has a real health cost, it also has an economic and environmental cost. Economic effects include the increased use of the health system and reduced activity of affected people. Environmental effects include damage to plants, animals and man-made structures, such as buildings and monuments.

People with asthma have more sensitive airways, their lungs responding more strongly to the effects of pollutants in the air.

Outdoor air pollutants

Important outdoor air pollutants that can have an effect on people with asthma include particles, sulphur dioxide, nitrogen oxides and ozone. Pollutants carbon monoxide and lead, while are not especially associated with asthma, can still impact on health. More information about these pollutants and their health effects can be found in the teaching notes for Learning Activity 3.

Indoor air pollutants

Indoor air quality is an issue of increasing concern, especially as some studies estimate that we spend 90% of our time indoors. Associations between indoor air pollutants and asthma have not been confirmed, however, environmental tobacco smoke and mould growth are consistently associated with asthma. Important indoor air pollutants associated with asthma, including environmental tobacco smoke, nitrogen dioxide and volatile organic compounds, are all discussed in more detail in the teaching notes for Learning Activity 3.

Allergens

When people are 'allergic' their immune systems react in an abnormal way to these specific particles when they inhale or touch them. In a person with asthma they cause the airways to narrow and make it harder to breathe. Other people may experience sneezing, blocked nose, itchy eyes and throat or get a rash on their skin. Several allergens and micro-organisms have been identified inside the home, including house dust mite, fungi, moulds and animal fur.



LEARNING ACTIVITY 2: AIR AND HEALTH

KEY MESSAGES:

People breathe air into their body through their respiratory system; therefore if the quality of the air is reduced this can impact on people's health; Air pollutants and allergens can impact on human health, particularly for sensitive groups within the population, including the elderly, people with existing illnesses (for example, asthma) and children.

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
1. Our lungs are part of our respiratory (breathing) system	Using the information on the Human Respiratory System Activity Sheet and reference materials, students are to label the parts of the respiratory system and describe each one's function.	<ul style="list-style-type: none"> Activity Sheet 3: The Human Respiratory System
2. Particles in the air, when breathed in, can cause health problems	<p>Students to answer questions relating to air pollution and respiration on the Air Pollution and Respiration Activity Sheet.</p> <p>Explain to students how particles in the air enter the respiratory system using the diagram on The Human Respiratory System Activity Sheet.</p> <p>Students to answer questions relating to air pollution and respiration on the Air Pollution and Respiration Activity Sheet.</p>	<ul style="list-style-type: none"> Activity Sheet 4: Air Pollution and Respiration

LEARNING ACTIVITY 2: AIR AND HEALTH (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>3. To undertake a practical to simulate a range of levels of difficulty breathing and for students to consider their physical and emotional responses; To develop an understanding of the signs of asthma.</p>	<p>Provide each student with 2 straws.</p> <p>Experiment 1: Airway Narrowing</p> <ol style="list-style-type: none"> 1. Place both straws in mouth side by side, pinch nose and breathe through the straws for 10 seconds 2. Remove one straw from mouth, keep nose pinched and breathe through the remaining straw for 10 seconds 3. Join the 2 straws together (tape or slide one into other), pinch nose and breathe through end to end straws for 10 seconds. <p>Discuss the level of difficulty breathing using these various methods (gets progressively more difficult). Point out that there are different levels of an asthma attack (mild, moderate and severe) associated with the difficulty breathing.</p> <p>Experiment 2: Exercise and Asthma</p> <ol style="list-style-type: none"> 1. Students cut a straw in half 2. Students jog on the spot for 1 minute 3. Have them place the half straw in their mouth and pinch nose. Breathe through the straw while jogging on the spot for another 10 seconds <p>Discuss how much harder it is to breathe when exercising. Point out that 'exercise induced asthma' is a common trigger for many people with asthma.</p>	<ul style="list-style-type: none"> • Straws – 2 per student



LEARNING ACTIVITY 2: AIR AND HEALTH (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>3. (continued)</p>	<p>Get students to reflect on their reactions during the experiments. Brainstorm to make a list of their reactions. Help students to classify these into two categories,</p> <p>PHYSICAL: what happened to their bodies (eg faster breathing rate) EMOTIONAL: how they were affected (eg worried, surprised)</p> <p>Whole class discussion</p> <p>How might these reactions further affect your breathing? How would it feel to often not be able to breathe properly? What do think it's like for people when they have an asthma attack?</p> <p>Having considered these, develop a list of Signs of Asthma (ie what you might see or hear; ensure that both physical and emotional aspects are covered)</p> <p>Show the slides: 'Where Does Asthma Occur?' and 'What is Asthma?'</p>	<ul style="list-style-type: none"> • 'Where does Asthma Occur?' slide • 'What is Asthma?' slide

ASTHMA SYMPTOM SIMULATION:

THESE EXPERIMENTS WILL PROVIDE A FIRST-HAND EXPERIENCE OF HOW IT FEELS TO NOT BE ABLE TO BREATHE PROPERLY.

WARNING: *This could cause discomfort for students with asthma and we advise that they should be exempted from the activity, remaining involved as observers. It is important that all students do these activities for no longer than the 10 seconds indicated and know that they can stop if they experience any discomfort (if they do get anxious, sit students down and get them to take slow breaths, counting these out loud. Reassure them that their discomfort will quickly disappear and breathing return to normal)*



TEACHERS NOTES

LEARNING ACTIVITY 3: AIR POLLUTANTS AND THEIR SOURCES

TYPES OF POLLUTANTS

There are hundreds of pollutants that float around in the air that we breathe. Australia has established National Air Quality Standards for six of these pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter, sulphur dioxide and lead. These air quality standards are designed to protect the health and welfare of people, plants and animals, and to protect our water, buildings, monuments and other resources.

Air pollution can be broken into two kinds of sources:

- a) **Point sources** – where pollutants come directly from one identifiable place, such as a chimney stack
- b) **Diffuse sources** – where the pollutants are emitted from over a wide area, such as emissions from cars in the metropolitan area

Ozone:

Ground level ozone (not to be confused with ozone which is a natural part of the upper levels of the atmosphere) forms in the air when pollutants known as volatile organic compounds (VOCs) and nitrogen oxides (NOx) mix together. Ozone is often invisible to the naked eye.

The higher the temperature and the more direct the sunlight, the more ozone is produced. In large Australian cities this tends to happen in late spring, during summer and early in autumn when there is lots of sunlight, high temperatures and calm weather. The effects of ozone include eye, nose and throat irritations, damage to our respiratory tracts, chest tightness and wheezing. There is also evidence that ozone can increase our sensitivity to allergens, trigger asthma attacks and increase our susceptibility to infection.

Carbon monoxide:

This is a colourless, odourless and very toxic gas, which comes from incomplete burning, industrial processes and biological decay. Motor vehicles contribute most carbon monoxide. Other sources such as from our homes, gardens, schools, shops, service station and industry are also contributors.

One of the most significant individual sources of carbon monoxide is cigarette smoke. Scientific research indicates that smokers and passive smokers are exposed to four times more carbon monoxide than people in a smoke free environment. Low levels of carbon monoxide can reduce our ability to carry out exercise. Greater levels reduce our ability to concentrate and cause headaches. Very high levels can be fatal.



TEACHERS NOTES

LEARNING ACTIVITY 3: AIR POLLUTANTS AND THEIR SOURCES (continued)

Oxides of nitrogen:

The most common of these are nitric oxide and nitrogen dioxide. These help form photochemical smog and also have significant impacts on health. The largest human-made source of nitrogen oxides is the combustion of fossil fuels, mostly from motor vehicles and industry. While nitric oxide is relatively safe, it is converted into nitrogen dioxide in the atmosphere. At certain levels, nitrogen dioxide can affect our respiratory system and increase our susceptibility to infection. This is a real problem for infants, older people or for those people with problems such as bronchitis and asthma. There is evidence that nitrogen dioxide can trigger asthma attacks and long term exposure can irreversibly damage our lungs.

Particulate matter:

Also called PM, these are small particles of tiny solids or drops of liquids that can enter the air from both natural and human-made sources. Natural sources include bushfires, dust storms and pollens while human-made sources include motor vehicle emissions, incinerators and wood heaters. With time, PM settles on the ground or on surfaces or is washed out of the air by rain. When particles are breathed in, they can cause health problems, especially in the very young, the elderly or people with lung or heart disease. Very small particles make health problems like bronchitis, emphysema and asthma worse and can cause 'premature' death. These particles can also bring in carcinogens with them when they enter the body.

Sulphur dioxide:

This is a colourless, irritating and reactive gas with a strong odour. In Australia, sources of sulphur dioxide come primarily from industrial operations that burn fuels such as coal, oil, petroleum and gas, and from wood pulping and paper manufacturing. It is also emitted from motor vehicles. Sulphur dioxide irritates the eyes, nose and throat, and people with impaired lungs or hearts and asthmatics are particularly at risk of exacerbating existing health problems.

Lead:

Is a soft bluish white silvery grey metallic solid and can be released into the air from industry and the burning of fossil fuels or waste. There has been less and less lead in Australia's air since the introduction of unleaded petrol in 1986 and the phase out of leaded petrol which was completed in 2002. Lead levels in major cities and towns are now very low, however lead remains a problem where smelters are located close to urban areas. Lead can affect almost every organ and system in the body. Exposure to high levels of lead can affect the nervous system, brain and kidney function as well as a child's mental and physical development.

TEACHERS NOTES

LEARNING ACTIVITY 3: AIR POLLUTANTS AND THEIR SOURCES (continued)

Environmental tobacco smoke

Asthma can be triggered by many things and cigarette smoke, with its 400 harmful chemicals is a major trigger. People who have asthma and smoke can:

- make their asthma worse
- increase their chances of having asthma attacks
- make their day to day asthma control harder to achieve
- increase their chances of permanently damaging their airways.

Tobacco smoke also damages the little hair-like structures, called cilia, which move dust, pollens and other irritants from your lungs. This means that the normal cleaning actions of the lungs is damaged and a person becomes more prone to chest infections, which in turn brings on or worsens asthma.

Passive smoking occurs when a non-smoker breathes in the harmful side stream smoke of others. For people with asthma, being near someone who is smoking can:

- trigger an asthma attack
- increase the number of asthma attacks that person may have
- increase the need for asthma medications
- increase the person's sensitivity to other environmental triggers (for example, pets, pollens and chemicals)
- reduce lung function.

Volatile organic compounds

Building materials, insulation, furniture and carpets emit high levels of chemicals collectively known as volatile organic compounds (VOCs). Other sources of VOCs in the home include household cleaners, hairsprays, nail polish, perfumes, deodorants, hair dyes, soaps and correction fluid. Generally the levels of emissions from new building materials will decrease with time and this will also depend on the adequacy of ventilation.

Health effects that can occur with either high levels of exposure of VOCs) or being exposed for a long period, vary from skin, eye, nose and throat irritation to nervous system problems (headaches, fatigue, increased chemical sensitivity).



LEARNING ACTIVITY 3: AIR POLLUTANTS AND THEIR SOURCES

KEY MESSAGE: Substances from a variety of sources (natural or from human activities) can be added to the air contributing to poor air quality both outside and indoors including:

- wood smoke (from domestic heaters and bush fires)
- vehicle emissions
- industry emissions
- dust and pollen
- chemicals (for example, perfumes and cleaning products)
- direct and passive smoking

(most of these substances can be titled as sources of 'air pollution' while pollen, for example is more often known as an 'allergen')

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
1. There are many different types of air pollutants.	Provide each student with the Air Pollutants and Their Sources Activity Sheet. This activity requires students to use the library or internet to find out about different air pollutants, their source/s and health effects.	<ul style="list-style-type: none"> • Activity Sheet 5: Air Pollutants and Their Sources
2. Air pollutants come from a variety of sources.	<p>Referring to the drawing of a local area on the Sources of Pollution Activity Sheet, have a class discussion about the different sources of pollution shown in the picture and the differences between point and diffuse sources of pollution.</p> <p>Questions for discussion:</p> <ol style="list-style-type: none"> 1. What are possible sources of pollution shown in the diagram? 2. Are these sources point sources or diffuse sources? 3. What pollutants may be being emitted from these sources? 	<ul style="list-style-type: none"> • Activity Sheet 6: Sources of Pollution

LEARNING ACTIVITY 3: AIR POLLUTANTS AND THEIR SOURCES (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
3. A visible pollutant in the air is particulate matter (PM).	Provide students with the Activity Sheet – Making a Particle Collector. Have students answer the questions after doing the experiment.	Activity Sheet 7: Making a Particle Collector Rulers, compasses, cardboard, scalpel, sticky tape, string, marker pens, plastic bags



TEACHERS NOTES

LEARNING ACTIVITY 4: ASTHMA TRIGGERS

Although we don't know what causes asthma, we do know that under certain circumstances the airways react and asthma symptoms develop. We refer to the stimuli that can lead to asthma as 'triggers'.

Different people react to different asthma triggers and many people with asthma react to a variety of triggers. Asthma may develop from exposure to one trigger or from a number of triggers simultaneously (e.g. a student with a cold goes into a change room where deodorant has been sprayed). For some people it is difficult to determine what triggers their asthma.

Avoiding or reducing exposure to known asthma triggers for an individual is one form of control, but is not always possible. Asthma medications can reduce the likelihood of asthma developing.

Colds and Flu:

The most common trigger, particularly for children. When a student with asthma has a cold or the flu it is highly probable that they will develop asthma symptoms.

Exercise/activity:

A trigger for many people with asthma. Students with asthma should be encouraged to take part in school based exercise and physical activity to contribute to their cardiovascular fitness and their general well-being. People with asthma should be able to participate in almost any sport or exercise. Most individuals with EIA can exercise to their full potential if the condition is properly treated. Many top athletes competing at national and international level have asthma. Scuba diving is the only activity not recommended for people with asthma.

Smoke:

As well as active and passive cigarette smoke, woodsmoke from open fires, burn-offs or bushfires can trigger asthma.

Pollens/moulds:

Pollens from flowers, grasses and weeds carried in the air are difficult to avoid, particularly in spring and summer. At times, staying indoors is the best measure. The airborne spores of moulds may be encountered in wet areas of houses as well as in mulch, potting soil, compost and leaf litter.

Exercise is an important part of health and fitness and should be encouraged for all children. Children whose asthma is affected by exercise should have a written Asthma Action Plan completed by their doctor to help minimise and prevent asthma symptoms.

Exercise induced asthma is common and can be more of a problem when other asthma triggers are present, eg. if a student has a cold or flu, on cold days, or when high levels of pollen or pollution are present.

Although asthma can develop during exercise, exercise induced asthma is also likely in the period directly following the activity.

TEACHERS NOTES

LEARNING ACTIVITY 4: ASTHMA TRIGGERS (continued)

Animals/pets:

Animal hair, skin (dead flakes), urine and saliva may trigger asthma. Cats and dogs are a major source (sweat and saliva); other animals include guinea pigs, birds, mice & rats, rabbits and horses.

Changes to weather/air temperature:

Changes in air temperature in the order of 10 degrees (either way, cold to hot or hot to cold) can aggravate asthma, e.g. moving from a heated classroom to cold outdoors. Significant shifts in weather can have the same affect. It is the change of temperature of the air entering the lungs and passing through the airways that can trigger asthma.

Dust and dust mites:

Dust in the air, particularly on hot, dry and windy days, and household dust that may become airborne from “dusting”, sweeping or vacuuming can bring on asthma. Dust mites are microscopic creatures that are a common asthma trigger. Dust mites tend to be prevalent in carpets and bedding, liking moist conditions and feeding on shed skin. Stuffed toys can be a source of dust mites.

Deodorants/perfumes:

Personal hygiene products can be a trigger for asthma, including perfumes, after-shaves, hair sprays and deodorant sprays. Some schools have banned the use of anti-perspirant deodorant sprays, even in sports change rooms.

Chemicals:

Certain strong smelling household chemicals can trigger asthma, including paints, adhesives, ammonia and bleach. Strong smelling chemicals used in the classroom, eg. glue, can trigger asthma – it's worth considering ventilation options that may help overcome this.

Foods/additives:

Fairly rare and usually affects very young children, but reactions can be extreme and even life-threatening. Triggers can be peanuts, shell fish, dried fruits (sulphur dioxide), mono sodium glutamate (MSG) and yellow food colouring (Tartrazine 102).

Certain medications:

Medications known to trigger asthma include aspirin, anti-inflammatories (non-steroidal, e.g. ibuprofen) and beta blockers (used for heart conditions and high blood pressure). Individuals with asthma should always ensure that the doctor or pharmacist is made aware of their asthma when considering a new medication and monitor themselves for any asthma signs.

Emotions:

Emotional reactions such as laughter, crying, excitement and stress related can trigger asthma. For students, stress from the pressure of exams is a known factor.



LEARNING ACTIVITY 4: ASTHMA TRIGGERS

KEY MESSAGES: People with asthma have sensitive airways in their lungs, and when exposed to certain triggers their airways narrow, making it hard for them to breathe; Air pollutants and allergens can act as a trigger for people with asthma (air quality related triggers include smoke, pollens, moulds, dust, deodorants/perfumes and chemicals).

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
1. Asthma can be started by different triggers	Ask students to read the People and Pollen Activity Sheet and using the diagram, answer questions on the sheet.	• Activity Sheet 8: People and Pollen
2. Asthma is brought on by a range of factors called “triggers”	<p>Class discussion on common triggers: Using the teacher notes, talk about each asthma trigger. Which do they think is the most common trigger? (Exercise is the most common trigger – affects 80% of people with asthma)</p> <p>EXTENSION ACTIVITY (optional) DUST MITES Dust mites are microscopic creatures invisible to the naked eye. To give an idea of their size, up to six mites could fit on the head of a pin. Research dust mites on the internet. Use a piece of clear tape to collect microscopic particles from your bedsheets first thing in the morning – view under microscope to see if you can identify any dust mites.</p>	
3. Exercise is a common asthma trigger. Exercise induced asthma can be controlled and sport and exercise should not be avoided as they are an essential part of healthy living.	<p>Class discussion: Explore the following statements using a ‘for’ and ‘against’ approach, <ul style="list-style-type: none"> • ‘Physical activity is good for everyone.’ • ‘People with asthma should not play sports.’ • ‘Physical activity can help someone’s asthma.’ Show the ‘<i>Exercise Induced Asthma</i>’ slide. Reinforce the messages from the class discussion and the teacher notes.</p> <p>EXTENSION ACTIVITY (optional) Students research sporting personalities and athletes who have asthma.</p>	• ‘ <i>Exercise Induced Asthma</i> ’ slide.

LEARNING ACTIVITY 4: ASTHMA TRIGGERS (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>4. Most asthma triggers can be avoided or controlled</p>	<p>Copy as necessary and cut up the Asthma Trigger Cards Activity Sheet Provide each student with a trigger card List the following categories of asthma triggers on the board,</p> <ul style="list-style-type: none"> • Infections • Allergies (from animals) • Allergies (other than animals) • Physical activity • Emotions • Irritants. <p>Have students form groups by finding others with triggers in their category. Each group uses the butcher paper / card poster to identify,</p> <ul style="list-style-type: none"> • Their category (title) • Where the triggers can be found – home, school &/or community • If the triggers can be avoided • Ways to avoid the triggers • Reasons why it is difficult to avoid the triggers • For triggers that cannot be avoided, how might these be controlled? <p>Groups present their information to the class.</p> <p>As a class, collate the information by placing the triggers under the headings HOME, SCHOOL and COMMUNITY on the board (lots of triggers will fit in more than one category).</p> <p>Discussion:</p> <ul style="list-style-type: none"> • Which triggers can be crossed out because they can be easily avoided? (cross these out as the class responds and agrees) • Which triggers can be controlled by good asthma management? (cross these out as the class responds and agrees) <p>Examine the remaining triggers and discuss how these would affect someone with asthma.</p>	<p>Activity Sheet 9: Asthma Trigger Cards</p>



LEARNING ACTIVITY 5: AIR AND ASTHMA ACTION

KEY MESSAGE: Actions can be undertaken to reduce air pollutants and allergens within the school environment to improve the quality of air and minimise asthma triggers; When someone has an asthma attack they may need help to take asthma emergency medication.

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>1. To gain an understanding of the air quality issues in the school's local area that may impact on people with asthma and develop actions to improve air quality and minimise asthma triggers.</p>	<p>Use the 'Air Quality and Asthma School Audit' available on the websites and follow the activities</p>	<p>'Air Quality and Asthma Audit'</p>
<p>2. There is an asthma first aid plan for treating an asthma attack.</p>	<p>Class discussion: What is first aid?</p> <p>Display either the Slide – Asthma First Aid Poster or use an Asthma Friendly Schools asthma first aid poster to refer to. With a blue reliever puffer and a spacer, go through the asthma first aid plan for someone having an asthma attack with the class.</p> <p>Have two volunteers from the class act out the procedure (involve a school nurse or other health professional if at all possible). Repeat with different volunteers if necessary.</p> <p>Discussion:</p> <ul style="list-style-type: none"> • What do you think the medication does? (opens the small airways) • What colour is the asthma reliever medication for use in an emergency? (these are blue or blue-grey in colour [NOTE: exception is Symbicort which can be prescribed to students 12 and over as their reliever – it is a white and red turbuhaler device]) 	<p>'Asthma First Aid Poster' slide (or poster from around the school)</p> <p>Asthma Emergency Kit contents – puffer and spacer (use a placebo puffer if available)</p> <p>'Spacers' slide</p>

CONTINUED OVER

LEARNING ACTIVITY 5: AIR AND ASTHMA ACTION (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>2. (continued)</p>	<p>Discussion (continued)</p> <ul style="list-style-type: none"> • When should reliever medication be used? (in an emergency, when someone with asthma has symptoms or before sport / exercise) <p>Show the slide – Asthma Reliever Medication</p> <ul style="list-style-type: none"> • Why do we use a spacer? (makes it easier; helps more medication to get to the small airways) <p>Show the slide – Spacers</p> <ul style="list-style-type: none"> • Where does our school store its Asthma Emergency Kits? • Is our school part of the Asthma Friendly Schools program? How do we know this? (window sticker in office entrance; certificate in front office; articles in the school newsletter; check school's status on AFS website). 	
<p>3. To understand the importance of having an Asthma Action Plan; to be aware of the different types of asthma medications, particularly those for use in an emergency.</p>	<p>Explain that the 'good practice' standard for an individual's asthma management is to have an Asthma Action Plan developed with their Doctor. This plan encourages people with asthma to assume greater control of their condition by taking on greater responsibility guided by a medical professional's advice.</p> <p>Whole class discussion</p> <ul style="list-style-type: none"> • What would you expect to be included in an Asthma Action Plan? (Prompts could be, symptoms; triggers; medication; emergency response; when to seek medical aid) • Does asthma management involve more than just taking medication? (Yes! Also, avoiding triggers; taking 'peak flow' measurements) • How is the type(s) of asthma medication needed for a person determined? (by a Doctor) • What types of asthma medications have we come across in our discussions? <p>Show the slides listed in the resources column</p>	<ul style="list-style-type: none"> • 'Asthma Action Plan' slide • 'Asthma Medications – Relievers' slide • 'Asthma Medications – Preventers' slide • 'Asthma Medications – Combination Medications' slide

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LEARNING ACTIVITY 5: AIR AND ASTHMA ACTION (continued)

LEARNING OBJECTIVE	ACTIVITY TASK	RESOURCES
<p>3. (continued)</p>	<p style="text-align: center;">EXTENSION ACTIVITY (optional)</p> <p>HISTORY OF A PERSON WITH ASTHMA</p> <p>Find someone you know who has asthma and interview them about their condition.</p> <p>Using this information, pretend you have asthma and prepare a talk to help others understand what it is like to have asthma.</p> <p>Questions you might ask could include:</p> <ol style="list-style-type: none"> 1) When were you first diagnosed with asthma? 2) How frequent are your 'attacks'? 3) Would you describe them as mild, moderate or severe? 4) What triggers your asthma? 5) Describe what you experience when affected by asthma? 6) What do you do to treat your asthma? 7) What type(s) of asthma medication do you have? When do you take these? 8) Does exercise make your asthma worse? 9) Do you smoke? Do others smoke around you (passive smoking)? 10) Do you miss work or school because of you asthma? How often? <p>Give a profile of your interviewee using information such as age, gender, type of work / school, etc in your presentation.</p>	





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