Classroom Activities

Activity - Motivational set (anticipatory set)
To get students thinking about air quality, consider:

- have students simulate asthma – breathe through a straw, or have a guest in with breathing difficulties
- brainstorm: do a KWL chart: what do we know, what we want to learn about air quality
- take a tour/field trip to a local air monitoring station

Activity - Kites and Downdrafts Game

Have students play the Kites and Downdrafts game on environmental impacts and mitigation factors.

See Master #3 - Kites and Downdrafts Game

Activity - Video Anticipation Guide

In pairs, students answer 10 true or false statements before watching the video, then watch the video, then check their answers.

See Master #4 - Video Anticipation Guide

Activity - Crossword Puzzle

Complete a crossword puzzle on air quality vocabulary.

See Master # 11 - Crossword Puzzle

See also Glossary

Activity - Word Game

Have students complete the Air: Our Invisible Connection Word Game.

See Master #8 - Word Game

Activity - Word Search

Have students complete the Air: Our Invisible Connection Word Search.

See Master #9 - Word Search

Alberta Program of Studies Outcomes

Students will:

1. Investigate and describe, in general terms, the role of different substances in the environment in supporting or harming humans and other living things.

- describe and illustrate processes by which chemicals are introduced to the environment or their concentrations are changed

- identify questions that may need to be addressed in deciding what substances-in what amounts-can be safely released into the environment

Activity - Discussion Starter

Have students list at least 20 factors shown on the poster that affect air quality (5 minute time limit), divide into categories

(could be natural and human, divide into positive and negative impacts) describe and defend the categories you chose to use.

See master #10 - Factors Affecting Air Quality

Activity - Data Conversion

From the Fort Air Partnership web site (www.fortair.org) find an example of an air pollutant reported in parts per million and convert the data into parts per billion.

Activity - Acid Rain

In small groups, research acid rain. Describe how it is formed, and the effects it has on living things. Identify some of the pollutants monitored by the Fort Air Partnership that are components of acid rain.

Alberta Program of Studies Outcomes

Identify processes for measuring the quantity of different substances in the environment and for monitoring air and water quality

- identify chemical factors in an environment that might affect the health and distribution of living things in that environment
- apply and interpret measures of chemical concentration in parts per million, billion or trillion
- describe effects of acids and bases on living things

Activity - Discussion Starter 2

Looking at the poster, identify as many factors as possible that transfer pollutants through air.

Activity - Research

Identify and evaluate information and evidence that vehicular, industrial and household emissions affect our air quality.

What are the emissions, what are their effects?

Alberta Program of Studies Outcomes

Analyze and evaluate mechanisms affecting the distribution of potentially harmful substances within an environment.

- describe mechanisms for the transfer of materials through air, water and soil; and identify factors that may accelerate or retard distribution (e.g. wind speed)
- investigate and evaluate potential risks resulting from consumer practices and industrial processes, and identify processes used in providing information and setting standards to manage these risks

- identify and evaluate information and evidence related to an issue in which environmental chemistry plays a major role

Activity - Defend Findings
Defend a given position on an issue or problem, based on your findings:

Based on what you've found on the Fort Air Partnership website (www.fortair.org) research this statement: "The outdoor air in our area is healthy." (tip: air quality index)

Compare to three other Alberta communities and provincial standards to defend your position.

Alberta Program of Studies Skill Outcome

(focus on the use of research and inquiry skills to inform the decision-making process):
Initiating and Planning

Students will:

Ask questions about the relationships between and among observable variables, and plan investigations to address those questions

- identify science-related issues
- identify questions arising from practical problems and issues
- state a prediction and a hypothesis about the concentration or dispersal of a chemical substance within an environment
- select appropriate methods and tools for collecting data and information and for solving problems

Activity - Displaying Data

From the Fort Air Partnership web site (www.fortair.org), select one air-borne pollutant that is monitored by one of the monitoring stations. Display one month of data in a variety of ways (i.e. charts, various graphs). Determine which is the best way of displaying the data. Identify the strengths and weaknesses of different ways of displaying data.

Activity - Research Questions

Looking at the front of the poster, come up with three questions concerning air quality that you'd like to research.

Alberta Program of Studies Outcomes

Skill Outcome: **Analyzing and Interpreting**

Students will:

Analyze qualitative and quantitative data, and develop and assess possible explanations

- identify strengths and weaknesses of different ways of displaying data
- identify and suggest explanations for discrepancies in data (e.g., identify possible reasons for variation in the measured concentration of a chemical, where one sample is very different from others or where one group has a very different result from others)
- identify the line of best fit on a scatterplot, and interpolate or extrapolate based on the line of best fit

- apply given criteria for evaluating evidence and sources of information
- identify new questions and problems that arise from what was learned

Activity - Stewardship

Provide students with information about the skill outcome "Communication and Teamwork" and the attitude outcomes "Collaboration" and "Stewardship" before beginning your coverage of air quality. Let them know that they will be evaluating their small groups on each element at the end of the air quality section. Have them complete one evaluation per small group.

See Master #2 - Group Evaluation Form

Alberta Program of Studies Outcomes

Skill Outcome: Communication and Teamwork

Students will:

- work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results
- work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise
- receive, understand and act on the ideas of others, defend a given position on an issue or problem, based on their findings

Attitude Outcome: Collaboration

Students will be encouraged to:

Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., assume responsibility for their share of work in preparing for investigations and in gathering and recording evidence; consider alternative ideas and approaches suggested by members of the group)

Attitude Outcome: Stewardship

Students will be encouraged to:

Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., show respect for all forms of life; modify their behaviour in light of an issue related to conservation and protection of the environment; recognize that the materials people use may have environmental consequences when people dispose of them)

Activity - Air Quality and Values

Viewing the poster, can you identify an activity that shows people value:

- Recreational values
- Economic values
- Environmental (ecological) values
- Political values
- Egocentric values
- Educational values

- Health values
- Scientific values
- Technological values
- Ethical values

Alberta Program of Studies Attitude Outcome: Mutual Respect

Students will be encouraged to:

Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., consider more than one perspective when formulating conclusions, solving problems or making decisions on environmental quality issues).