

## Lesson 3: The Earth's blanket

Student worksheet; vocabulary builder



***Have you ever snuggled up with a blanket to keep you warm?*** The Earth does that all the time. Of course, the Earth's blanket, called the atmosphere, looks different from yours. In fact, the Earth's blanket is almost invisible and is made from gases.

These gases are called greenhouse gases. Without these gases, the Earth would be too cold for us. BUT, too many greenhouse gases make it too hot. There must be a balance. It seems that the gases are off balance and this has resulted in climate change.

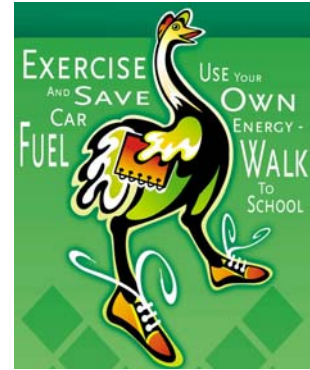
***What puts the gases off balance?*** It takes energy to drive our vehicles, to heat or cool our homes, and to power our computers and televisions. Every time we use energy, we are burning fossil fuels including gas, oil and coal. Burning fossil fuels sends pollution and greenhouse gases into the air. ***This is what puts the gases off balance*** and contributes to smog and climate change.



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### Student worksheet; vocabulary builder (continued)

How many of the following words do you know?  
 Look up those that you don't know in the dictionary or the 20/20 Glossary of Terms. Add to the chart any other words you know that are related to the atmosphere or energy use.



	Vocabulary	Definition
1	Fossil fuels	
2	Smog	
3	Pollution	
4	Greenhouse gases	
5	Climate change	
6	Energy consumption	
7	(Your choice)	
8	(Your choice)	

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### Teacher instructions

*(Note: this lesson requires the 20/20 Glossary of Terms)*

#### Introducing the activity

- You may wish to bring in a blanket as a prop to bring this activity to life. Ask students how it feels when they snuggle up with a blanket? Why does the blanket feel warm? Is the blanket warm without them? (*No*) What warms the blanket? (*Our bodies!*)
- Explain the following: The Earth has something that keeps it warm too – it has an atmosphere. Like the blanket, the atmosphere itself is not warm but it holds the heat that is released from the Earth. The Sun heats the Earth and the Earth releases the heat back into space. Some of the heat is caught by the atmosphere and some is caught by the clouds. Gases in the atmosphere (*called greenhouse gases*) trap the heat that comes from the Earth the same way a blanket traps heat that comes from your body.  
**(For a visual, see Encyclopedia Britannica Student Edition:**  
<http://cache.eb.com/eb/image?id=91945&rendTypeId=34>)
- Ask the following: What happens to the temperature when the heat-absorbing gases increase? If vehicles are partly responsible for putting greenhouse gases in the atmosphere, then what happens when more vehicles are added to the roads? What happens when we take cars off the road? What other activities add greenhouse gases to our atmosphere? (*Using energy in our homes.*)
- Additional challenge: Ask students to name some types of greenhouse gases. (*Water vapor, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons.*)

#### Ideas for teaching the article and worksheet

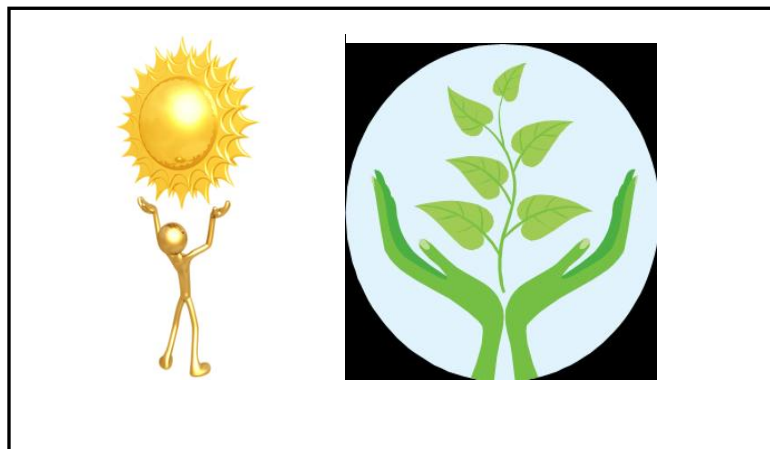
- Copy and distribute Lesson 3: The Earth's blanket and the 20/20 Glossary of Terms.
- Ask students to look at the image on the top of the article and have them explain the connection between this and the title of the worksheet. Ask them also why they think certain words are underlined. These words may be new to them and are important to learn.
- Review the article aloud with students, stopping to check comprehension after each paragraph. Ask students if they were surprised by anything that they heard and record their responses on the board. Finally, ask if they think that what they read in the article is true. After a few responses, tell them that the government (public health) worked with a teacher to develop this unit. This exercise gets students into the habit of thinking critically about what they read as not everything will be true.

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### Teacher instructions

#### Ideas for teaching the article and worksheet (continued)

- Have students complete the worksheet definitions. Encourage them to use the 20/20 Glossary of Terms to find the words but then to use their own words to create their own definitions. This makes the exercise more interesting by encouraging creative thinking! There are two additional spaces on the worksheet for students to add their own vocabulary.
- Additional challenges for students!
  - ♦ How does the amount of energy they use today affect the amount of heat-holding gases they put into the air?  
*(The more energy they used, the more gases were released.)*
  - ♦ Is the Earth really warmer than it used to be?  
*(According to Environment Canada "an analysis of temperature records shows that the Earth has warmed an average of 0.5°C over the past 100 years. The warming is real and significant though its intensity has varied from decade to decade, from region to region and from season to season"; Source: [www.ec.gc.ca](http://www.ec.gc.ca).)*



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### Teacher instructions (continued)

Definition Answer Key (taken from the 20/20 Glossary of Terms)

	Vocabulary	Definition
1	Fossil fuels	Fuels that are made from decomposed ancient plants and animals. Examples include coal, oil, and natural gas. They are buried deep in the ground and took millions of years to form.
2	Smog	A haze that forms when sunlight reacts with pollutants in the air. Smog makes it difficult for many people to breathe and can cause breathing problems.
3	Pollution	Substance(s) in the environment which result(s) in damage to the water, air, or soil.
4	Greenhouse gases	Any of the gases that contribute to the greenhouse effect. These include carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), ozone (O <sub>3</sub> ), water vapour, and hydrochlorofluorocarbons (HCFCs).
5	Climate change	This is the change in the average weather that a given region experiences. Different areas of the globe will experience different changes, including higher or lower temperatures, increased rainfall, more storm activity or extended drought periods.
6	Energy consumption	The act of using energy.
7 & 8	Student's choice	