

Name: .....

Grade: .....

School: .....

Date: .....

## WithOnePlanet

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Carbon
- > Level:  
Years 3 to 4
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Investigate
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Carbon hides  
in the air
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# Investigate carbon

Lesson 5

Student worksheet

Carbon hides in the air

Years  
3 to 4



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INQuIRY



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Open education  
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# Carbon hides in the air

## Lesson 5a: Student worksheet

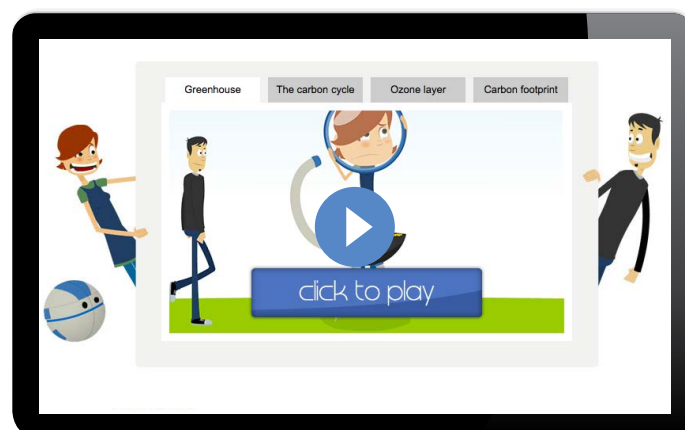


Carbon's greatest disappearing act is when it combines with oxygen to form carbon dioxide. Then BAM! ... it disappears! Being a colourless gas floating high above us, allows carbon to go virtually undetected ... until now! As more and more carbon dioxide goes into our atmosphere – mostly from burning – it starts to heat the Earth. The warmer the Earth gets, the closer we can get to uncovering the culprit ... CARBON!

### Activity:



Watch *Greenhouse Animations* from the Australian Greenhouse Calculator website: <http://www.epa.vic.gov.au/agc/animations.html> and answer the following questions.




Source:

Australian Greenhouse Calculator 2011, *Greenhouse Animations*, viewed 3 January 2014, <http://www.epa.vic.gov.au/agc/animations.html>.

**Q1:** How do the hot car and the greenhouse both heat up?



**Q2:** Where does the Earth get its energy from?



**Q3:** What two things happen to the energy that reaches Earth?



**Q4:** Which 3 gases in the Earth's atmosphere are able to absorb heat? By what name are these gases often referred to?

**Q5:** These 3 gases trap heat being radiated off the Earth's surface. In what two directions do these gases re-radiate this heat?

**Q6:** In general, why is the greenhouse effect a GOOD thing for the Earth?

**Q7:** What would the Earth's average temperature be if there was no greenhouse effect?

**Q8:** Why are human activities like fossil fuel burning, cement production and tropical deforestation causing the Earth to heat up more than it should?

**Q9:** What is the difference between the natural greenhouse effect and man-made climate change?

Source:

Australian Greenhouse Calculator 2011, *Greenhouse Animations*, viewed 3 January 2014, <<http://www.epa.vic.gov.au/agc/animations.html>>.

# Make your own greenhouse

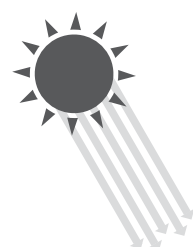
## Lesson 5b: Student worksheet

### How does a greenhouse work?

1. A Greenhouse traps heat.

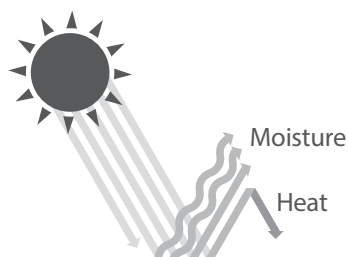


2. Think about a patch of dirt in the open sun.



Dirt

3. As the sun warms the dirt, the temperature increases, and the dirt releases heat and moisture into the atmosphere.



Dirt

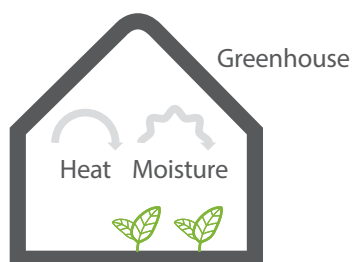
4. If there are plants growing in that dirt, then they may start to wilt owing to lack of water.



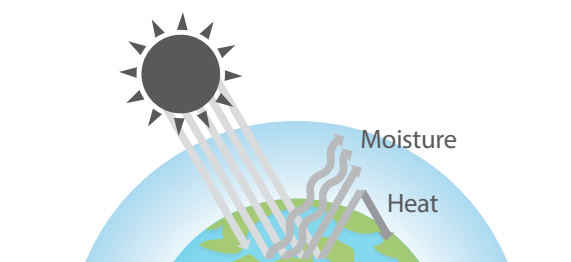
Dirt

5. Gardeners use greenhouses made of glass to trap heat and moisture inside, keeping the temperature higher inside than outside.

This helps the plants inside the greenhouse to grow.



6. Greenhouse effect.



## Activity 1:

In this activity, you and your group will be building and testing your very own greenhouse.

Each group's greenhouse will have walls made of different material of different thickness so that you can compare the temperatures inside them.

## What you will need

Each group will need:

- > a large clear glass jar or plastic bottle
- > small thermometer (must fit inside the jar)
- > damp dirt (enough to cover the bottom of the jar three separate times)
- > large rubber band
- > graph paper
- > a copy of the *Record keeping sheet* (see page 9 of this worksheet)
- > cling wrap
- > bubble wrap

## What to do

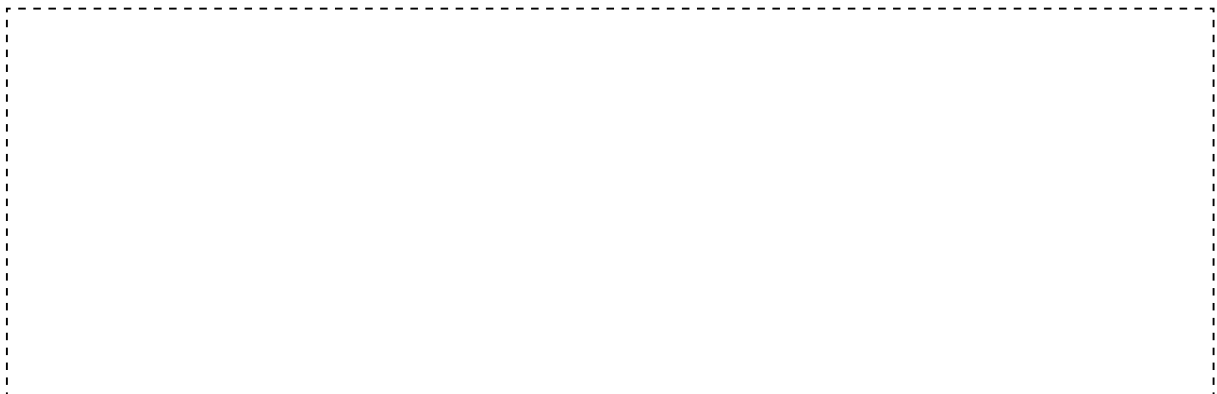
1. Find a sunny position near a window in your classroom to set up your greenhouse.
2. Fill the bottom of the jar or bottle with a layer of damp dirt.
3. Place a thermometer into the dirt.
4. **Record the temperature of the dirt every minute for 10 minutes. Record this temperature in the correct section of the *Record-keeping chart* on page 9.**
5. Tip out the dirt from the jar and replace with a new layer of damp dirt.
6. Place the thermometer back in the dirt.
7. Cover the top of the jar with the cling wrap and secure it with a rubber band.
8. Repeat Step 4 (in **bold**).
9. Remove the cling wrap and replace the dirt with fresh damp dirt again.
10. This time, cover the top of the jar with the bubble wrap and secure it with a rubber band.
11. Repeat Step 4 (in **bold**).

## What did you find out?

**Q1:** Which type of greenhouse – open, cling wrap or bubble wrap – had the **lowest** increase in temperature?



**Q2:** Which type of greenhouse – open, cling wrap or bubble wrap – had the **greatest** increase in temperature?




**Q3:** Why does a covered greenhouse increase in temperature more than an uncovered greenhouse?

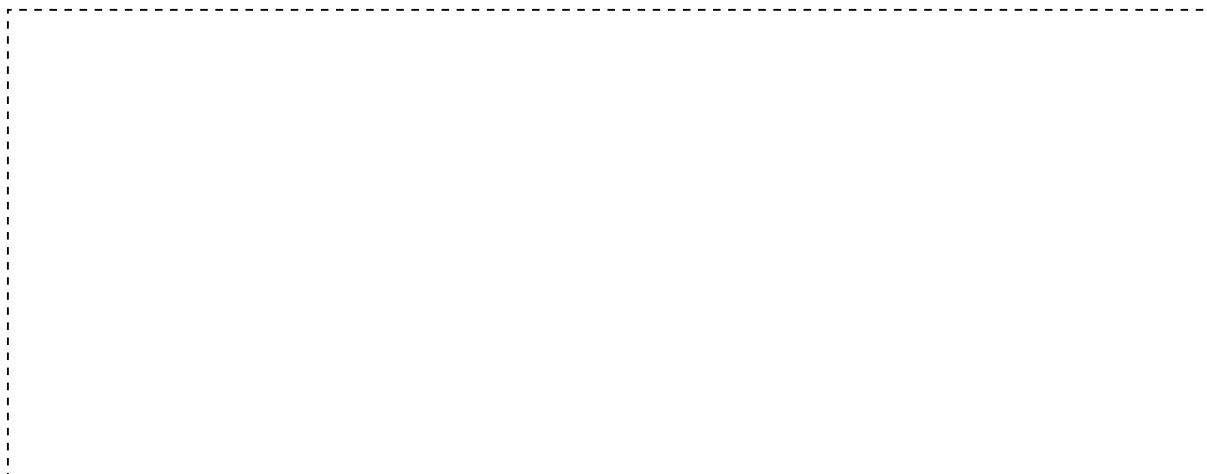




**Q4:** Which greenhouse – open, cling wrap or bubble wrap – is most similar to the greenhouse effect on the Earth?



**Q5:** The Earth is not covered in cling wrap or bubble wrap. What traps the warm air around the earth?



Source:

Museum Victoria: Scienceworks 2013, *Our Living Climate*, viewed 3 January 2014, <<http://museumvictoria.com.au/scienceworks/education/education-kits/planetarium/our-living-climate/>>.

## Record-keeping chart

Greenhouse Type	Time (min)	Temperature (°C)	Greenhouse Type	Time (min)	Temperature (°C)	Greenhouse Type	Time (min)	Temperature (°C)
Open	0		Cling Wrap	0		Bubble Wrap	0	
Open	1		Cling Wrap	1		Bubble Wrap	1	
Open	2		Cling Wrap	2		Bubble Wrap	2	
Open	3		Cling Wrap	3		Bubble Wrap	3	
Open	4		Cling Wrap	4		Bubble Wrap	4	
Open	5		Cling Wrap	5		Bubble Wrap	5	
Open	6		Cling Wrap	6		Bubble Wrap	6	
Open	7		Cling Wrap	7		Bubble Wrap	7	
Open	8		Cling Wrap	8		Bubble Wrap	8	
Open	9		Cling Wrap	9		Bubble Wrap	9	