

Physics: The Greenhouse Effect and Global Warming

Overview	The students will observe Greenhouse Effect and discover how it contributes to the warming of our Earth. They will gain experience in researching using the Internet and comment/ post on Yazzem.
Objective	After visiting and learning about a greenhouse, students will have an understanding of the Greenhouse Effect and be able to hold a discussion online and answer specific questions pertaining to the topic.
Learning Environment	Demonstration, Discussion, E-learning
Types of students	Secondary School
Standards (NETS/ISTE Teachers standards 2008)	Facilitate and Inspire Student Learning and Creativity
Materials	<ul style="list-style-type: none"> - Computers with internet access - Yazzem accounts
Procedure	<ol style="list-style-type: none"> 1. Visit a local greenhouse. Explain students the Greenhouse Effect. 2. Have students visit the Websites in the Internet Resources section and study global warming. For example, visiting the "Index to Climate Change Fact Sheets" Website, students read about possible causes of climate change, impact of climate change, and international response to climate change. 3. As students research global warming discuss the following questions: <ul style="list-style-type: none"> -What impact might CO₂ emissions have on overall global warming? -Is there evidence of a strong connection between CO₂ emissions and global warming? -What impact have chlorofluorocarbons (CFC) emissions had on global warming? -How is the structure of the ozone related to global warming? -Would the earth be warming as quickly if we had not invented and used internal combustion engines for our transportation? -How can we model future changes in the global climate with the scientific models available? -What can global climate models tell us about life on earth for future generations?

	-How much scientific weight should we place on the results of these models?
Application	4. Create a Yazzem account and answer the questions: What evidence is there that the earth is actually warming up? What might be causing any global warming? What effect might global warming have on the earth's inhabitants? 5. Have students comment answering or posting some pictures related to the problem
Evaluation	The teacher will use the class discussions and personal observations to assess learners' understanding of each objective and also evaluate the learners' posts.

Internet Resources for Students

- [An Update on Global Warming](http://www.ncdc.noaa.gov/gblwrmupd/global.html)
[http://www.ncdc.noaa.gov/gblwrmupd/global.html]
At the National Oceanic and Atmospheric Administration (NOAA).
- [Climate Observations Substantiate Global Warming Models](http://pubs.acs.org/hotartcl/cenear/951127/pg1.html)
[http://pubs.acs.org/hotartcl/cenear/951127/pg1.html]
An article in the Chemical and Engineering News, November 27, 1995, on global warming models.
- [FAQs about Global Warming and Climate Change](http://www.greenpeace.org/~climate/climatefaq.html)
[http://www.greenpeace.org/~climate/climatefaq.html]
Frequently asked questions (FAQs) on climate change and global warming at Greenpeace.
- [Global Warming](http://www.pacificrim.net/~wgi/resource/gr_sa/gwarming.html)
[http://www.pacificrim.net/~wgi/resource/gr_sa/gwarming.html]
Information on global warming at the World Game Institute.
- [Global Warming Resources](http://www.covis.nwu.edu/storage/GlobalWarming.html)
[http://www.covis.nwu.edu/storage/GlobalWarming.html]
An extensive list of resources on global warming at the CoVis Website.
- [Global Warming Terminology](gopher://mammat.uspr.umich.edu:70/00/Global_Change/Air_Pollution/global_warming.txt)
[gopher://mammat.uspr.umich.edu:70/00/Global_Change/Air_Pollution/global_warming.txt]
A list of terms and definitions of global warming.
- [Index to Climate Change Fact Sheets](http://www.unep.ch/iucc/fs-index.html)
[http://www.unep.ch/iucc/fs-index.html]
Links to over 90 texts on global climate changes.

- [NASA Facts: Global Warming, Global Change/Climate Change](http://sps0.gsfc.nasa.gov/NASA_FACTS/global/gw.html)
[http://sps0.gsfc.nasa.gov/NASA_FACTS/global/gw.html]
A NASA paper on global warming.
- [Sierra Club Global Warming News](http://www.sierraclub.org/news/global-warming/)
[http://www.sierraclub.org/news/global-warming/]
Resources on global warming at the Sierra Club Website.
- [The sea ice in the Arctic is melting, is this a sign of global warming?](http://www.nrsc.no:8001/Pressreleases/fingerprint.html)
[http://www.nrsc.no:8001/Pressreleases/fingerprint.html]
A press release from the Nansen Environmental and Remote Sensing Center.
- [World Population Clock](http://sunsite.unc.edu/lunarbin/worldpop)
[http://sunsite.unc.edu/lunarbin/worldpop]
The current world population.