

## DRIVING QUESTIONS



University of Cyprus

# Is global warming man-made or natural? What measures should be taken to reduce greenhouse gases?

## LOCAL WORKING GROUP MEMBERS

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## SCENARIO

## Climate change

Your Role

Earth system

Earth &amp; climate

Taking action

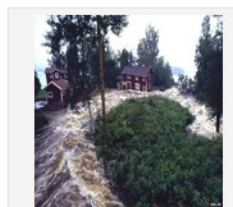
## Climate change

Extreme weather phenomena are reported in the news worldwide on a daily basis. A considerable number of scientists take part in research relating to climate and the processes that cause its change. Scientists have developed contradictory theories accounting for climate change. These theories affect policies adopted on national and international levels. The **Climate Change** learning environment will help you review some of the most important scientific data concerning the issue of climate change.

Over the next few weeks we will study the issue of climate change and we will search for alternative technologies for producing electricity so as to reduce the gas emissions. More specifically:

A. Since we are interested in the temperature increase, it is important to explain the mechanism that helps the earth to attain and maintain its temperature.

B. Construct evidence-based arguments in favor of one of the following



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A. Since we are interested in the temperature increase, it is important to explain the mechanism that helps the earth to attain and maintain its temperature.

B. Construct evidence-based arguments in favor of one of the following two claims: Is global warming a manmade or a natural phenomenon?

C. Develop a procedure for comparatively evaluating competing solutions in decision-making situations and apply this procedure to determine the most appropriate electricity production technology to be used in combination with the currently available coal-fired power station.

## ENACTMENT

Number of sessions: 15

Duration of each session: 90-minute

Grade level: 11<sup>th</sup> grade (16-17 years old)

Subject: Environmental Studies, Biology, Physics

Classroom setup: Groups of three

## WORKSPACE

There are three types of templates:

The first type of templates supports students to appreciate the need of finding evidence to support their position.

The second type of templates supports students to develop their ability to produce evidence-based arguments and counter-arguments.

The third type of templates supports students to appreciate the need and apply the optimization strategy in a decision making situation.

## LEARNING OBJECTIVES

Conceptual understanding:

- The mechanism underlying the greenhouse effect

Epistemological awareness about NOS:

- Contradicting theories can explain the same phenomenon, Science is an ongoing process of interpreting phenomena, Some current scientific debates exist in "science-in-the making"

Reasoning skills:

- Argumentation skills
- Decision making skills

## INQUIRY ACTIVITY OVERVIEW

Students contact experiments in order to develop understanding in relation to the greenhouse effect.

Students, working in pairs, engage in a series of electronic dialogues regarding the causes of climate change (manmade or natural).

Students who share the same view on the topic prepare arguments and counterarguments to use in the Showdown.

Showdown: Class is divided in two groups that hold contradictory positions towards climate change and an e-chat is conducted between the two groups.

Students are introduced to the decision making scenario. They review information regarding the issue and formulate criteria that could be used to guide the decision.

Students appreciate the need for an optimization strategy in decision making.

Students are introduced to the optimization strategy.

They are asked to apply that strategy to the original decision making situation.

## For more information:

[www.coreflect.org](http://www.coreflect.org)

[www.stochasmos.org](http://www.stochasmos.org)

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