

How to heat my house?

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Institute: Vikingaskolan

Country: Sweden

Subject: Science, Biology, Chemistry, Domestic Science, Physics.

Grade level: 9 – 12

Objectives/competencies: Students are expected to be able to:

- Seek and select appropriate information related to the study of different methods of heating from books, computers networks and web pages.
- Explain the advantages and disadvantages of different methods of heating, relating the explanation to the impact these methods have on climate, quality of air in the vicinity and economy.
- Explain the role of combustion of fossil fuels in the greenhouse effect. Explain the part these fuels play in the production of electric power.
- Explain the difference between using fossil fuels for heating and power production and using renewable fuels and renewable sources of electric power.
- Explain the advantages and disadvantages of different methods of different methods of building, the use of different building materials and isolation and relate this to the need of heating the house.
- Propose a way of testing the heat conductance of different building and isolating materials.
- To cooperate with partners in the group in planning and performing the measurements of the heat conductance of different building and isolating materials.

[Alternative for grade 12, physics/ chemistry:

- Propose a way of testing the heat production of different fuels
- Propose a way of testing the efficiency of different methods of power production.]
- Decide, with reasons, what is a good way of building the house, choosing the right building and isolating materials and the right methods of heating.

Curriculum content: Characteristics of different building and isolating materials, fuels and methods to produce electric power.

Kind of activity: Library search, laboratory investigation, group discussion to make a justified socio-scientific decision

Anticipated time: 6 lessons.

Student Guide

Scenario

Ms. Jones lives in an old farmhouse, which she decides to rebuild from scratch. She is concerned about both the global climate and her own comfort. She is a nurse by profession, but her friend happens to be a science teacher, so she wonders if her friend's students could investigate the right methods to build the house and to heat it. Can you help her?

Student Tasks

1. Seek from different sources (as books, computers networks, web pages, etc.) information about different methods to heat houses, to isolate them and different building materials.
2. Analyse the information obtained so as to become familiar with the data on the impact of different methods of heating on global climate as well as their efficiency.
3. Analyse the information obtained so as to become familiar with the data on the efficiency of the different isolating materials and building materials.
4. Plan the experimental procedures of testing the heat conductance of different building and isolating materials.
5. In the laboratory conduct experiments which show the heat conductance of different building and isolating materials.
6. [Alternative for grade 12, physics/ chemistry:
7. Plan the experimental procedures of testing the heat production of different fuels
8. In the laboratory conduct experiments which show the heat production of different fuels
9. Plan the experimental procedures of testing the efficiency of different methods of power production.
10. In the laboratory conduct experiments which show the efficiency of different methods of power production.]
11. Discuss with your group and in classroom
 - the effect of using different isolating materials and building materials;
 - the effect of using different heating methods.
12. Determine how best to communicate the results to Ms. Jones.