

# Introduction to Solar Heat Energy

Re-Energy

Activity

Grade Level 8-12



## Main Objective

Learners will learn about solar heat energy and how it can be harnessed in various technologies.

## Curriculum Connections

### Alberta

Science 7: Heat and Temperature  
 Science 9: Electrical Principles and Technologies  
 Science 10: Energy Flow in Technological Systems  
 Science 14: Understanding Energy Transfer Technologies  
 Science 24: Understanding Common Energy Conversion Systems  
 Science 30: Energy and the Environment (D1.4, D1.5k, D1.3s, D2.3k, D2.4k, D2.1sts, D2.3s, D2.4s)

### Ontario

Science & Technology 6: Electricity and Electrical Devices (1.1)  
 Science & Technology 7: Heat in the environment (1.2)  
 Science 9: The Characteristics of Electricity (Academic) (E1.2)
 

- Electrical Applications (Applied) (1.1)

 Environmental Science 11: Scientific Solutions to Contemporary Environmental Changes (U/C Preparation) (B1.2)  
 Physics 11: Electricity and Magnetism (F1.2)  
 Physics 12: Energy Transformation (E1.1, E1.2)  
 Chemistry 12: Energy Changes and Rates of Reactions (D1.1)

## Learning Outcomes

By the end of this activity, learners will:

- Understand how solar heat can be harnessed for energy
- Identify applications of solar heat energy in daily life

**Length of Activity: 30-40 minutes**

**Step 1+2:** Intro to solar heat and discussion

**Step 3:** Passive house heating video

## Materials Required

- Internet-enabled device
- Introduction to Solar Heat Backgrounder

## Activity

### Step 1: Background Reading

Distribute and review the Solar Heat Backgrounder.

### Step 2: Answer and Discuss the Backgrounder

In groups or individually, discuss the following questions:

1. What are some of the advantages of using sunlight as a source of energy compared to other sources, such as coal or nuclear energy?
2. What two forms of energy are most commonly produced using sunlight?
3. How does a solar home work?
4. List all the ways you and your family use solar energy. Include any solar-powered appliances you may have in your home.

### Step 3: Watch a Video

Continue to watch the video on building a passive house and complete the activity below:

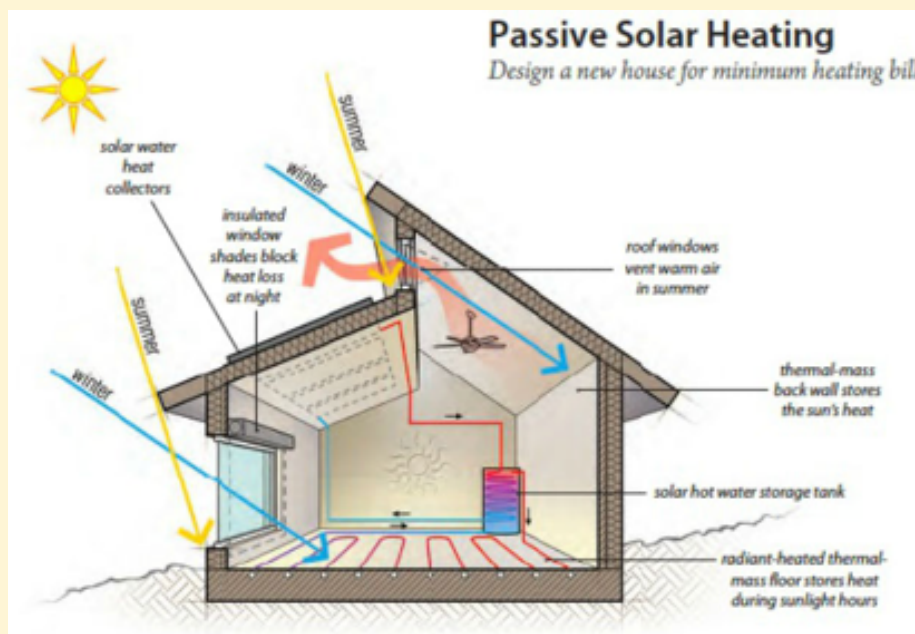


After watching the video, answer the following questions:

1. What are the 5 green building techniques covered in the video?
2. What are the potential energy savings achieved by designing a passive house compared to a traditional home?
3. Can you research any buildings in your vicinity that are built green? What are some of their features that are covered in this video?

## Extension Activity

- Have learners review the “Home Heating” section in the Solar Heat Backgrounder to build a model of a solar home.
- Using the points covered in step 3, write down all possible design components that can be utilized to build a passive home that efficiently captures sun’s energy. List the ideas on a whiteboard/smartboard or on chart paper.
- Give learners some time to research more information on passive solar heating. Using the list, add or revise the original ideas based on their research findings.
- In small groups, have learners build a model of a solar home and test its efficiency by placing it near a window. By comparing the design features of their models, learners can learn how passive solar heating works. Send us a photo of the model by emailing [programs@greenlearning.ca](mailto:programs@greenlearning.ca) using the subject ‘Re-Energy Program’!



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<https://signaturesustainability.com/passivehaus-passive-house/>