

Unit 3: Heat and Temperature *End of Unit Project*

You must choose **1** of these projects and complete it **alone**

Description of Project Goals

1. To design a working model of an **Insulation Chamber**. (Keeping Cold in – Keeping Hot out)
2. To design a scale model of a **Solar Home**.
3. To design and construct a working model (prototype) of a **Solar Cooking Device** that will cook a marshmallow.

Background:

Keep It Cold! (Alone) p. 250-251

To design and build a container which will keep an ice cube from melting for the longest time.



Model Solar Home (Alone)



The purpose of this project is to reinforce the concepts of **active and passive solar heating**.

<http://www.eere.energy.gov/RE/solar.html>

A Solar Cooker (Alone) p. 253



Can you cook a marshmallow just using the power of the Sun?

<http://solarcooking.org/plans.htm#box-style>

Specifications:

Insulation Chamber

Design and build:

... an **Insulation Chamber** that will prevent an ice cube from melting

Testing: You will be given a regular size ice cube to place into your container. Its mass will be recorded. It will then be left for 6 hours, opened and the mass of the remaining ice cube will be measured.

Project **Report** should include:

- Design Blueprint
- Scientific Principles which helped in the design phase
- **Construction Details**
- Troubleshooting

Model Solar Home

Design and build:

... a scale model of a **Solar Home**

Materials: Choice of materials is up to you.

Size Restrictions: Model home must not exceed 50cm² base and 30cm in height.

Solar Home Components:

- Active solar heating **panels** (these don't have to work – just appear to be like the ones that actually do work).
- Passive Solar heating techniques should be labeled on the model that is being presented.

Solar Cooker

Design and build:

... a working model of a **Solar Cooker**

Materials: Choice of materials is up to you.

Size Restrictions: Solar cooker must not exceed 50cm² base and 30cm in height.

Solar Cooker Components:

- Model cooker will be used to cook a marshmallow, which will be given to you on the test day.
- No other heat source can be used to cook your marshmallow.
- Success will be measured by the degree to which the marshmallow is cooked.

Evaluation:

Model 60%

(Testing Your model)

Presentation: 40%

(What you appear to know about what you are presenting)

Self-Evaluation

10%

Peer Evaluation

10%

Teacher Analysis

20%