



Royal Rangers

Merit Requirements: Silver-Bordered Merit

SOLAR SCIENCE MERIT

Requirement #1 - Write a research report of at least five hundred words on the subject "Alternatives for Energy." Include the answers to the following questions in your report:

- a. What energy alternatives are being utilized in other countries?
- b. How much of this development is in the field of solar energy?
- c. Which countries are leaders in the quest for energy alternatives?
- d. Are there any developments in space that could provide energy alternatives?
- e. What other energy alternatives have you found?
- f. Do you have any ideas of your own?

Requirement #2 - Select any TWO of the solar uses listed below and write a five-hundred-word report on each. Include developments that have occurred in the last ten years, expansion potentials, and future developments for the solar uses you have selected. Include an evaluation of the practicality of using solar energy by including advantages and disadvantages, economic value, and concerns of solar energy.

- a. Solar heating for buildings
- b. Solar heating for industry
- c. Solar use in agriculture
- d. Solar collector for heating
- e. Photovoltaic generation of power
- f. Solar wind

Requirement #3 - Build ONE of the following projects (it must be operational):

- a. Solar-powered car from a kit
- b. Solar furnace
- c. Solar water heater
- d. Solar radio
- e. Any other solar science project preapproved by your commander

Requirement #4 - Describe how each part of your completed solar project for Requirement 3 operates. Explain how the different components convert solar energy to electrical and the type of current generated. You may write a report or give a PowerPoint presentation with notes of explanation.

Requirement #5 - Schedule and make a visit to a home or building where solar energy is used. Go with an adult or another Royal Ranger. Interview the owner(s) to answer the following questions. You may write a report or give a PowerPoint presentation with notes summarizing the owner's responses.

- a. What solar energy device (or system) was installed?
- b. What was the cost of the installation?
- c. What short-term savings are projected? Long-term savings?
- d. How long will it take to realize savings from this investment?
- e. Are you pleased with the solar energy device?
- f. Is the device effective and has it met, fallen short of, or exceeded expectations?
- g. Do you have a backup system for periods of overcast weather?
- h. What are the short-term maintenance requirements? Long-term requirements?



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Requirement #6 - Schedule and make a visit to a contracting firm that installs and services solar energy systems. Go with an adult or another Royal Ranger. Obtain brochures or information from the firm, including a business card. If no firms are available locally, then research on the Internet or at a library. Interview the firm's representative to answer the following questions. You may write a report or give a PowerPoint Presentation with notes summarizing the representative's responses.

- a. Is the solar energy business profitable?
- b. Are there many installations in this area?
- c. Are there more installations in homes or in businesses?
- d. What are some of the costs involved if solar energy is used to heat water?
- e. Are there many requests from customers to generate electricity from solar energy?
- f. What training is needed to be a contractor in this field?
- g. What does the contractor believe is the future of solar energy use and demand?
- h. What is the contractor personally accomplishing in this field? What more would he like to accomplish?
- i. Is the solar energy business personally rewarding for him?

Requirement #7 - Draw a solar water-heating system for a home. Label the components used and the lines connecting them. Indicate the direction that the home would face and the direction the solar panel would have to face on the home. Only a simple drawing of the actual home is needed.