

ENGINEERING

1. Visit a construction site, a public works project, or a manufacturing or processing plant. I visited:

Discuss engineering design and construction with the engineer in charge. Ask to see engineering drawings and have them explained. Tell what you learned about engineering and the day-to-day work of an engineer from this visit:

2. Visit another engineer (other than your counselor or the person in requirement 1) in his office. Tell how the work done there relates to the work done in the field.

3. Explain the work of **six** of the following types of engineers:

civil: _____

mechanical: _____

chemical: _____

electrical: _____

industrial: _____

agricultural: _____

3. Continued

aeronautical: _____

mining: _____

astronautical: _____

metallurgical: _____

nuclear: _____

biomedical: _____

ceramic: _____

petroleum: _____

4. With your counselor's advice, select a subject for research in engineering. Do research in publications and interview experts. What subject did you select?

Tell what you learned and how you got the facts. Take notes during the interview:

5. Tell why measurements and calculations are important in an engineer's work:

Explain the difference between accurate and precise measurements and calculations:

Explain the values of the metric system: _____

6. Using an engineering university or college catalog, learn what high school courses you should take to be admitted into an accredited engineering college: _____

Tell what "accredited engineering college" means: _____

7. Do ONE of the following:

- a. Show how the "engineering approach" to problems works by laying out plans, step by step, for your next campout. List alternative ideas on such items as costs, campsites, food, equipment, and transportation. Tell why you decided as you did.

OR

7. Continued,

b. Make an original piece of patrol equipment. Draw or attach plans for it here.

8. Do TWO of the following:

a. **Transforming Motion:** Show how a bicycle transforms motion, or, describe or diagram how a car or truck transmission transforms motion:

b. **Harnessing Electricity** (no kites in T-storms): 1). Make a model of an electrical device. A kit may be used.

OR

2). Make a list of all (10 will do) electrical appliances in your home. Find out how much electricity each uses in a month. (# amps x # hours used in a month)

Tell five ways to conserve electricity: _____

c. **Materials Science.** Do experiments to show the differences in strength and heat conduction among wood, plastic and metal. Describe the results:

d. **Energy Conversion.** Tell how a car battery or flashlight battery converts chemical energy into electrical energy:

Do an experiment to show the value and potential of solar energy. Explain your results: _____

Tell about one way to convert mechanical to electrical energy: _____

e. **Traffic Study.** Study the traffic flow at a busy street or highway in both a heavy and a light traffic period. Count the number of vehicles each minute for 5 minutes:

Heavy 1 _____ Light 1 _____

Gene McClurken, SM, T142 Monticello District, Stonewall Jackson Area Council #763, Virginia