As part of the teacher preparation program, students from Western Michigan University’s College of Education are required to participate in pre-internship. Some elementary education students do their pre-internship at Woodward Elementary School under the guidance of Dr. Carol Crumbaugh.

Students at Woodward Elementary School will be studying electromagnetism in February and March, 2004. The goal of the design project for ENGR 101 is to produce activities, hardware to support the activity, and a manual on how to use the hardware to support instruction on electromagnetism.

Some of the design project specifications are:
- The activities should provoke curiosity among elementary students
- The activities should illustrate a set of concepts or one concept in multiple ways
- The hardware must allow students to collect data or to manipulate variables
- The hardware can be constructed/assembled for less than $50
- The hardware must address safety concerns of the end users and use only non-toxic materials

You will develop additional design specifications as you move forward to complete the design project.

Over the next several weeks you will be provided with some foundational background on electricity and magnetism. You will be guided through a series of assignments to use the engineering design process to complete the design project, culminating in design written report submission, oral presentation, and submission of fully functional hardware on the day of the final examination (Dec. 8).

The first assignment associated with the design project is literature research to learn as much as possible about teaching electromagnetism in elementary school. Specifically, your team needs to research the science benchmarks and examples of lessons and activities that are appropriate to the target grade levels. The results of literature research will guide your team later to write the design project problem statement, generate solution ideas, and select the optimum idea for implementation.

The following are some of the sources for literature research:
1. The American Association for the Advance for Science (AAAS) Benchmarks for Science Literacy.
2. A general web search on lesson plans for magnetism and electricity. The following two sites are particularly useful:
   a) Eisenhower National Clearinghouse for Mathematics & Science has a searchable database of resources that can be searched by topic, type of resource, grade level, and cost. Many web-based resources are indexed. Go to http://www.enc.org/
   b) Ohio Resource Center has a searchable database of resources for mathematics, science, and reading instruction. Searchable by topic, type of resource, and grade level. Go to http://www.ohiorc.org
3. Elementary school science textbooks and/or teachers.

Report the results of literature research as a memorandum to the instructor, Dr. Edmund Tsang. This is a team assignment and it is due on October 29. You should report on your team’s top three choices of activities for the design project and the associated science benchmarks, grouping these activities into two categories of Grades K to 2 and Grades 3 to 6, with at least one activity in each category. Each team will also make a 10-minute oral presentation on the results of their literature research on October 29.