

## Field Projects & Breakout Session Descriptions

### Field Projects

(Friday - Evening & Sunday - Morning/Afternoon)

*These are team-based projects designed to be challenging and fun. Students will be assigned to participate in a field study project based on the preferences they give in their MESA Leadership Retreat application.*

**CHEMISTRY STUDY** >>> You will explore the essence of chemistry in everyday life.

**ENGINEERING DESIGN** >>> You will perform engineering design in solving a problem involving energy, and mechanical properties of materials.

**MYSTERY SPOT** >>> You will tour and evaluate the claims of a local 'wonder' where the laws of gravity are suggested to be violated. In teams, you will use physics to "solve" the mystery.

**STEM-athlon** >>> Come partake in a STEM adventure around the grounds of Happy Valley. Teams of participants will compete in engineering feats, science questions and team exercises. Points are accumulated by completing tasks and answering questions correctly within the allotted time. Winners receive cool stuff and bragging rights for the year.

# Field Projects & Breakout Session Descriptions

## Breakout Sessions

(Saturday - Morning/Afternoon)

*Students will have the opportunity to participate in a total of FOUR breakout sessions and/or workshops. These are interactive, hands-on projects and activities held SATURDAY ONLY.*

**NATURAL HISTORY WALK >>>** Join a guided traverse through the coast Redwood community. Observe and identify key species, consider limiting habitat factors, and investigate the dynamic character of this changing environment. Scientific, ecological, economic, social, and aesthetic values of conservation and protection of the natural environment will be discussed. (Wear rain gear if it is raining and wear footwear to give you good traction.)

**EVOLUTION GAME >>>** “We’re not running around like lunatics! We’re doing science!” Get some fresh air and stretch your muscles on the outdoor playing field as we explore population dynamics, genetic adaptation and selection, and the flow of biological energy through a food chain. The activity will focus on the impact of environmental factors on evolutionary equilibria, both within a species and between species.

**AURDUINO-BASED PROGRAMMING >>>2-SESSION WORKSHOP, YOU MUST Attend both (one in the morning, one in the afternoon)** Arduino is an open-source electronic prototyping platform often used to integrate hardware and software. Arduino boards (and derivatives) are able to send outputs to accomplish all sorts of tasks – illuminating a LED, activating a motor, or transmitting data over the internet or local network. By sending a set of instructions to the microcontroller on the board (programming), you can accomplish all sorts of tasks. This workshop will serve as an introduction to the Arduino programming environment, and hopefully provide a launchpad for you to create your own projects!

**INTENTION-SETTING AND MINDFULNESS PRACTICE >>>** While we will inevitably encounter challenges along our journeys, keeping in mind our intentions and using mindfulness practice to explore issues will support us in persisting on our chosen path. Please join in this practical session to explore how to utilize these practices to support our academic and personal efforts.

**LEADERSHIP NETWORK>>>** Introduce students to Leadership through Networking and building a STEM community.

**RENEWABLE ENERGY LAB>>>** Find, measure, and harness energy. You will explore what a quadratic equation has to do with solar energy, find out just how energetic YOU are, and play with solar cells in series, in parallel and attached to little motors.