H880008 **Virtual Geocache (Scoresheet SF300)**
Keep a log of at least 5 places visited using a virtual geocache platform. At least one site should be from a community other than where you live. For each site, record the latitude, longitude, and elevation. Also include a description of the site, a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional, but highly encouraged.

## STEM ENERGY

This category provides 4-H'ers a way to present their ideas about renewable energy resources. Through participation in this category 4-H'ers will learn more about physics, friction, energy, and elasticity. In addition, participants will make a display to go along with their findings.

**RULES:**

1. The name and county of each exhibitor should appear separately on the back of each board, poster, or article and on the front cover of the notebooks so owner of the exhibit may be identified if the entry tag is separated from the exhibit.
2. Reports should be written using the scientific method whenever possible (Background, the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned.) All reports should be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display.
3. Posters can be any size up to 28 inches by 22 inches when ready for display. Example: tri fold poster boards are not 28 inches by 22 inches when fully open for display.

**Entries per Individual** - One entry per exhibitor per class. Limit of 4 entries per exhibitor per project.

**All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair.**

Premier 4-H Science Award is available in this area. Please see General Information for more details.

Scoresheets and additional resources can be found at https://go.unl.edu/ne4hphysics-powerofwind.

Renewable Energy Resources:

- United States Department of Energy: https://www.energy.gov/clean-energy
- U.S. Energy Information Administration: https://www.eia.gov/energyexplained/renewable-sources
- Natural Resources Defense Council: https://www.nrdc.org/stories/renewable-energy-clean-facts

PREMIUMS: Purple: $4.00; Blue: $3.00; Red: $2.00; White, $1.00

H900001 **Create and Compare Energy Resources Poster (Scoresheet SF307)**
Poster should explore 2 alternative/renewable energy resources. Compare and contrast the 2 resources including two of the following information: amount of energy created, costs of production, usability of the energy, pros/cons of environmental impacts, etc. Posters can be any size up to 28 inches x 22 inches.

H900002 **Experiment Notebook (Scoresheet SF305)**
Notebook will explore the scientific method involving alternative/renewable energy sources. Information required: 1) Hypothesis; 2) Research; 3) Experiment; 4): Measure; 5) Report or Redefine Hypothesis.

H900003 **Solar as Energy Display/Poster (Scoresheet SF308)**
Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6 feet tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of the sun. Examples include solar ovens, solar panels, etc.

H900004 **Water as Energy Display/Poster (Scoresheet SF308)**
Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6 feet tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of water.

H90005 **Wind as Energy Display/Poster (Scoresheet SF308)**
Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6 feet tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of wind.

H900006 **Other Nebraska Alternative Energy (Scoresheet SF305)**
Notebook should explore Nebraska an alternative energy source besides wind, water, and solar power. Include information on type of power chosen, infrastructure for distribution, what resources are needed to create this alternative resource, cost of production, and potential uses of bio-products. Examples include geothermal, biomass, ethanol, bio-diesel, methane reactors, etc.

## STEM ROBOTICS

This category involves the many different aspects of Robotics. Participants will learn more about how robots are designed and developed as well as the mechanical and electronic elements of robots. Involvement in STEM Robotics gives participants a first-hand experience in modern technology.

**RULES:**

1. The name and county of each exhibitor should appear separately on the back of each board, poster, or article and on the front cover of the notebooks so owner of the exhibit may be identified if the entry tag is separated from the exhibit.
2. Reports should be written using the scientific method whenever possible (Background, the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned.) All reports should be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display.
3. Posters can be any size up to 28 inches by 22 inches when ready for display. Example: tri fold poster boards are not 28 inches by 22 inches when fully open for display.
4. **Team Entries**: To qualify for entry at the Nebraska State Fair team materials entered in robotics classes that are clearly the work of a team instead of an individual must have at least 50% of all team members enrolled in 4-H. Additionally, all enrolled 4-H members on the team should complete and attach an entry tag to the materials. A supplemental page documenting the individual contributions to the project should be included. The entry will be judged as a team, with all team members receiving the same ribbon placing.
5. Creating a video of your robot in action would be helpful for the judges but is not mandatory. Videos should be uploaded to a video streaming application and exhibitors should provide a hard copy QR code for viewing. State Fair qualified videos should be submitted to https://go.unl.edu/2024nesfset by August 10. Or videos can be uploaded to a video streaming application and exhibitors MUST provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.

**Entries per Individual** - One entry per exhibitor per class. Limit of 4 entries per exhibitor per project.

**All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair.**

Scoresheets and additional resources can be found at https://go.unl.edu/ne4hrobotics.

**ROBOTICS CLASSES**

PREMIUMS: Purple: $4.00; Blue: $3.00; Red: $2.00; White, $1.00

H861001 **Robotics Poster (Scoresheet SF236)**
Create a poster (28 inches x 22 inches) communicating a robotics theme such as “Robot or Not”, “Pseudocode”, “Real World Robots”, “Careers in Robots”, “Autonomous Robotics”, “Precision Agriculture” or a robotic topic of interest to the 4-Her.

H861002 **Robotics Notebook (Scoresheet SF237)**
Explore a robotics topic in-depth and present your findings in a notebook. Documentation should include any designs, research, notes, pseudocode, data tables or other evidence of the 4-H’ers learning experience. The notebook should contain at least three pages. Topics could include a programming challenge, programming skills, calibration, sensor exploration, or any of the topics suggested in Class 1.

H861004 **Robotics/Careers Interview (Scoresheet SF239)**
Interview someone who is working in the field of robotics and research the career in robotics. Interviews can either be written or in a multimedia format such as a short video uploaded to a cloud sharing service. Include a QR code with your project to allow for judging access. State Fair qualified videos should be submitted to https://go.unl.edu/2024nesfset by August 10. Or videos can be uploaded to a video streaming application and exhibitors MUST provide a hard