



GEARING TOWARDS THE FUTURE

Presented By **Honeywell**



GEARING TOWARDS THE FUTURE

Science, Technology, Engineering and Math! Barrett-Jackson, The World's Greatest Collector Car Auctions, is partnering with Arizona SciTech Institute to bring you Gearing Towards The Future — a community, education and outreach initiative focused on STEM education.

Barrett-Jackson's Gearing Towards The Future aims to encourage and develop future automotive engineers and technicians through age-appropriate STEM challenges focused on teaching students how to solve problems and develop new skills using real-life scenarios related to automobiles.

2024 CHALLENGES

Grades K-5

Create a Mars Rover That Can Navigate the Martian Terrain
Presented by Arizona SciTech.

Grades 6-8

Design and Build an Advanced Air Mobility Vehicle Presented by Honeywell.

Grades 8-12

Life Cycle Analysis, Energy Engineering and STEM Careers in Dairy Production Presented by Arizona Milk Producers.



<https://stem.barrett-jackson.com>

ENERGY ENGINEERING IN THE MILK PRODUCTION LIFE CYCLE

In this challenge, students will delve into the comprehensive world of life cycle analysis, specifically focusing on a dairy product. The goal is to create an informative overview of the product's life cycle, highlighting key stages from materials sourcing to disposal, while incorporating examples of people, places, and products involved at each step.

Life Cycle Stages:

1. Materials:

Identify the raw materials involved in producing the dairy product. Consider the environmental and social aspects of material extraction.

2. Production:

Explore processes turning raw materials into the final product. Discuss energy use and waste during production.

3. Distribution:

Examine getting the product to consumers. Consider transportation, packaging, and environmental impacts.

4. Marketing & Sales:

Analyze strategies to market and sell. Explore advertising, packaging, and consumer choices.

5. Use:

Investigate how consumers use the product. Consider environmental and social impacts.

6. Disposal:

Examine the end-of-life stage and how consumers dispose. Explore recycling, waste management, and environmental consequences.

Presentation Options:

1. Video: Show each life cycle stage
Use Visuals, graphics, and narrations.

2. Flyer: Design a concise flyer
Use visuals for effective communication

3. Blog: Craft a detailed blog post
Incorporate images or infographics

Required Information:

1. Identification of Dairy Product: Clearly state the specific dairy product (e.g., milk, cheese, yogurt).

2. Life Cycle Analysis Examples: Provide concrete examples of people, places, and products at each stage. Consider social, economic, and environmental aspects.



ENERGY ENGINEERING IN THE MILK PRODUCTION LIFE CYCLE

In this challenge, students will explore the intersection of energy engineering and milk production. The focus is on identifying a specific stage in the life cycle of milk where energy is created, transformed, or consumed. Participants will then propose an invention, whether newly conceptualized or already existing, to enhance energy efficiency at this stage. The challenge concludes with the marketing of this energy-efficient product through a video, flyer, or blog.

Challenge Steps:

1. Identify the Stage in the Life Cycle:

Pinpoint where energy is created, transformed, or consumed in milk production.

2. Type of Energy Involved:

Define the energy type involved (e.g., chemical, kinetic, electrical, heat).

3. Invention for Improved Energy Efficiency:

Create or find a solution to boost energy efficiency. Explain how it works and its impact on energy consumption.

4. Marketing the Product:

Develop a strategy to market the energy-efficient invention. Choose video, flyer, or blog for effective communication.

Required Information:

- 1. Timing of the Identified Stage:** Clearly specify when the identified stage occurs in milk production.
- 2. Type of Energy Involved:** Describe the energy being created, transformed, or consumed.
- 3. Invention Details:** Clarify if it's new or existing. Explain how it improves energy efficiency.
- 4. Strengths and Weaknesses:** Highlight two strengths. Identify two potential challenges with the invention.



STEM CAREER HIGHLIGHT

Students will explore and highlight a specific STEM (Science, Technology, Engineering, or Mathematics) career in the dairy industry. The focus is on providing insights into the daily life of professionals in this field, the educational path required, and the STEM skills acquired in high school that are applied in the job. Students have the option to conduct an interview with someone in the chosen career and are tasked with creating a captivating “Day in the Life” commercial, flyer, or blog

Challenge Components:

1. Identify a STEM Career in the dairy industry

2. “Day in the Life” Overview

Describe a typical day for professionals in the chosen career. Highlight key responsibilities, tasks, and challenges.

3. Educational Requirements:

Outline post-high school education needed. Specify if a certificate, degree, apprenticeship, or other is required.

4.STEM Skills from High School:

Identify and discuss STEM skills from high school applicable to the career. Explain how these skills contribute to success.

5. (Optional) Interview:

If possible interview someone in the chosen STEM career. Share insights, advice and experiences from the interviewee.

6. Create a Presentation:

Develop a commercial, flyer, or blog about the STEM career. Clearly communicate the appeal and significance of pursuing it.

Required Information:

- 1. Day in the Life” Details:** Offer a comprehensive overview of the daily routine and tasks.
- 2. Educational Path:** Clearly state post-high school educational requirements
- 3. High School STEM Skills:** Identify specific valuable STEM skills from high school.
- 4. (Optional) Interview Insights:** If interviewed, share relevant insights, anecdotes, and advice.

