DEPARTMENT O-54 – ENGINEERING AND TECHNOLOGY

Superintendent – Tim Krispin (410-504-2204)
Assistant –

Entries must be completed online at www.carrollcountyfair.com. Entry fees need to be paid by credit card only. No late entries will be accepted.
Due to proposed Maryland budgetary constraints that are beyond the control of the Carroll County 4-H/FFA Fair Board, Inc., the Board reserves the right to withhold a portion of premium monies, up to and including all of an exhibitors earned premium payment, for the Carroll County 4-H/ FFA Fair.

RULES AND REGULATIONS – Engineering & Technology Department

1. Photos should be taken during project preparation and presented during judging. Photos should show the major steps of the project and the exhibitor working on the project.
2. Only exhibits completed since August 2025 may be entered. Project shall be completed only by the exhibitor, with assistance from an adult where safety or age-appropriate tasks are an issue. The exhibitor should identify with the judges any help they have received.
3. Engineering Notebook - should contain notes, drawings, material lists, lessons learned and conclusions of technology-related projects the exhibitor has worked on in the past year.
4. Kit - defined as a prepackaged project where the design and parts are provided, and the exhibitor is responsible for assembling the parts to form the completed project. The kit may be purchased or created by an adult leader and assembled by the exhibitor.
5. Non-Kit - defined as a project where the exhibitor performs the design, selects the parts, and assembles the project.
6. LEGO Engineering - projects are designed to introduce youth to engineering design, problem solving, and mechanical motion using LEGO® components. Exhibits in this class must consist of a working LEGO® module compatible with the Great LEGO® Contraption (GBC) system. A GBC module is a mechanically powered LEGO® creation that continuously moves standardized balls through a defined input and output, demonstrating principles of motion, energy transfer, and mechanical reliability. **See Exhibit Requirements at the end.**
7. Robotics - A robotics challenge will be posted on the Carroll County 4-H and FFA Fair website no later than May 30, 2024. This challenge will be held on Saturday, July 27th 9 AM until 3 PM. This is a team event, and teams of 1 to 4 individuals may compete. Please refer to the game rules for all details. This contest will be used to qualify county teams to attend the Maryland State Fair Robotics Contest.
8. Previous winners of the State Fair Robotics contest at the Senior level may not participate in the 2025 County contest or the State Fair contest.
9. In the case of a kit-based project, the exhibitor should present the kit instructions at time of judging and be prepared to explain the theory of operation.
10. In the case of a non-kit-based project, the exhibitor should present their design drawings at the time of judging and be prepared to explain the project theory of operation.
11. All glue and paint must be dry at time of judging. Projects determined to be of an unsafe design or designed for unsafe purposes will be disqualified and sent home.

Section 001 - Engineering & Technology Classes

Clovers (5-7)	Jr. (8-10)	Int. (11-13)	Sr. (14-18)	
101	1001	2001	3001	Project record sheet
102	1002	2002	3002	Engineering notebook
103	1003	2003	3003	Kit electronics/electric circuits
104	1004	2004	3004	Non-kit electronics/electric circuits
105	1005	2005	3005	Robotics
106	1006	2006	3006	Technology in Agriculture (display, poster, or working/non-working model)
107	1007	2007	3007	Kit solar project
108	1008	2008	3008	Rube Goldberg Machine
109	1009	2009	3009	LEGO Engineering
110	1010	2010	3010	Self-Determined Project (identify other technology interest areas for future years)

Section 002 – Engineering & Technology Special Awards

Class 1011 Champ & Res Engineering & Technology Exhibit- Junior-rosette & rosette
Class 2011 Champ & Res Engineering & Technology Exhibit- Intermediate-rosette & rosette
Class 3011 Champ & Res Engineering & Technology Exhibit- Senior-rosette & rosette
Class 4011 Grand Champ & Res Engineering & Technology Exhibit-award & award

LEGO Engineering Exhibit Requirements:

1. The exhibit must be **designed and built primarily by the exhibitor** using LEGO® parts. Adult assistance is permitted only where safety or age-appropriate tasks are involved and must be disclosed to the judge.
2. The module must be **compatible with standard GBC requirements**, including:
    - Use of standard GBC balls (approximately 14–15 mm diameter)
    - A defined **ball input point** and **ball output point**
    - The ability to reliably move balls from input to output in a continuous cycle
    - Complete details can be found in the official GBC specification here: https://www.greatballcontraption.com/wiki/standard
3. Power may be supplied by LEGO® motors, hand-crank mechanisms, or gravity-based systems.
4. The module should demonstrate **engineering concepts** such as gears, linkages, conveyors, lifts, timing mechanisms, or similar mechanical systems.
5. The exhibit must be **stable, safe, and operational at the time of judging**. All components must be securely attached.
6. Exhibitors must provide **photos taken during project preparation**, showing major construction steps and the exhibitor working on the project.
7. An **Engineering Notebook** is strongly encouraged and should include:
    - Design sketches or diagrams
    - Description of the mechanism
    - Challenges encountered and solutions
    - Lessons learned and possible improvements
8. The exhibitor must be prepared to **explain how the module works**, including the mechanical principles involved and how it meets GBC compatibility requirements.

Judging Criteria May Include:

- Functionality and reliability of ball movement.
- Creativity, originality, and documentation of design and design process.
- Application and documentation of engineering principles.
- A quality engineering notebook. A good engineering notebook will contain all of the information a judge would need to understand why the design was chose, how the design was completed, how the construction was completed, what testing was done, any problems encountered, and all solutions that were implemented.
- Quality of construction.
- Understanding of the building process, the module's construction, and the module's operation demonstrated by the exhibitor.