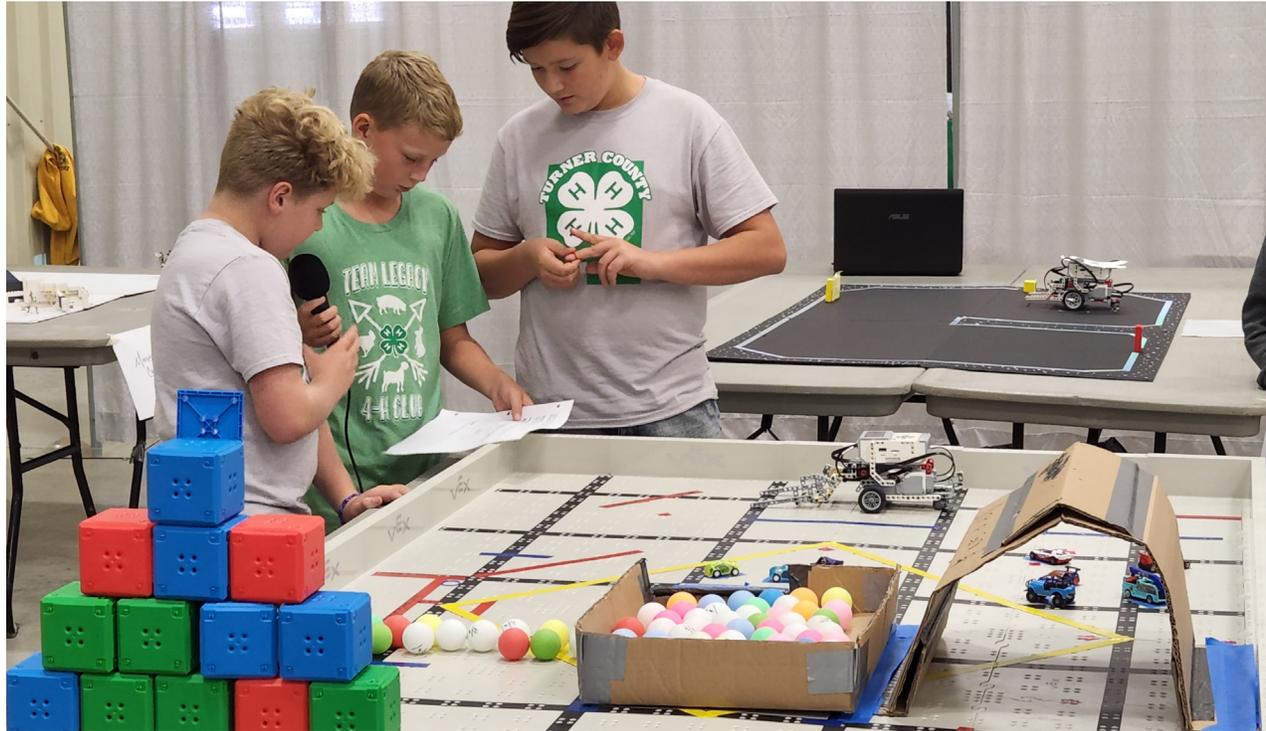




SOUTH DAKOTA STATE
UNIVERSITY EXTENSION



2025 South Dakota 4-H Robotics Showcase



Showcase Overview

The South Dakota 4-H Robotics Challenge Showcase is an opportunity for youth to demonstrate their knowledge and mastery of robotics. During the showcase, youth will share the robot challenge that they designed as well as the robot they built and programmed to complete the challenge.

Event Date and Location

Two showcase opportunities will be provided.

Monday August 4 at the Sioux Empire Fair, Sioux Falls

Schedule*:

- 10:15 am Check-In
- 10:30-11:30 am Team Working Period
- 11:30 am Judging Begins

Friday August 22 at the Central States Fair, Rapid City

Schedule*:

- 5:00 pm Check-In
- 5:15-6:15 Team Working Period
- 6:15 Judging Begins

** These schedules are tentative and subject to change based on facility capacity and number of teams.*

* Judging length will depend on how many teams are registered per session.

Eligibility

1. Registration is taken on a first-come-first-serve basis. This registration deadline will be strictly enforced.
2. Youth may register as individuals or as teams.
3. Teams may consist of youth from different counties.
4. All participants must be currently enrolled in 4-H and at least 8 years of age by January 1, 2025, but not have turned 19 years old prior to January 1, 2025.

Contacts

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Challenge 1 — Mission to Mars!

Story Line

As a spaceship carrying replacement astronauts approaches Mars, the crew on the ground must prepare the landing site for them. Having not been used for several months, the crew sends out their robot to clean up the space. Not only does some debris need to be cleared, but some of the storage needs to be put back in place. Upon completion of the clean up, the robot will need to let the crew know that it's done by making sound.

Objectives (Figure 1)

Your mission objective is to complete as many tasks as possible.

1. Push red fuel pod out of the way (off the board).
2. Travel to the east side of the landing zone.
3. Deliver the green fuel pods to their storage location.
4. Deliver red part crates to their storage location.
5. Deliver yellow food crates to their storage location.
6. Leave the blue sensor crate alone.
7. Return to the robot's charging pad.
8. Communicate with the crew that the tasks are complete.

Robots must start in the "start" location on the board. The mission ends when your robot returns to the start location or your program ends.

Your team will get three attempts to accomplish the mission.

Challenge Board Scoring

Beginner Mission:

Objective	Possible Points
Push red circle off the board	200
Travel towards the East	100
Deliver green balls to the drop zone	100 per ball
Deliver red and yellow crates to the orange square	200 per crate
Return to start	250
Play victory sound	50
Max Possible	1300

Balls and crates must be fully within the drop zones to be scored.
 Every human assist of the robot will deduct 5 points from the final score
 You may restart your robot up to 3 times. Each restart will result in a 100 points deduction

Intermediate Mission:

Objective	Possible Points
Push red circle off the board	200
Travel towards the East	100
Deliver green balls to the drop zone	100 per ball
Deliver red crates to the red rectangle	250 per crate
Deliver yellow crates to the yellow rectangle	250 per crate
Touch blue crate	-200 per touch
Return to start	250
Play victory sound	50
Max Possible	1500

Balls and crates must be fully within the drop zones to be scored.
 Every human assist of the robot will deduct 5 points from the final score
 You may restart your robot up to 3 times. Each restart will result in a 100 points deduction

Advanced Mission:

Objective	Possible Points
Push red circle off the board	200
Travel towards the East	100
Use color sensor to follow blue line	200
Deliver green balls to the drop zone	100 per ball
Deliver red crates to the red rectangle	200 per crate
Deliver yellow crates to the yellow rectangle	200 per crate
Touch blue crate	-200 per touch
Return to start	250
Use color sensor to follow red line	200
Increase speed on East/West stretches	100
Play victory sound	50
Max Possible	1800

Balls and crates must be fully within the drop zones to be scored.
 Every human assist of the robot will deduct 5 points from the final score
 You may restart your robot up to 3 times. Each restart will result in a 100 points deduction

Challenge Board

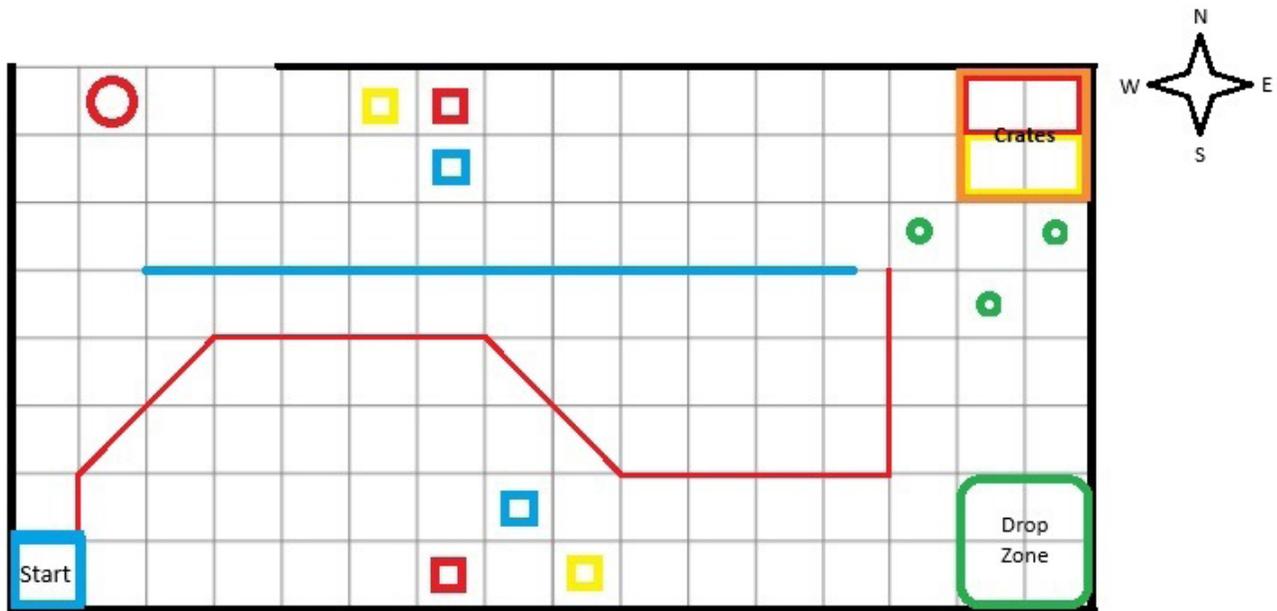


Figure 1. Challenge Board Dimensions 4 ft x 8 ft

Key

-  Ball approximately 2.6 inch diameter (tennis ball - not color specific)
-  2 inch x 2 inch x 2 inch yellow wooden block
-  2 inch x 2 inch x 2 inch red wooden block
-  2 inch x 2 inch x 2 inch blue wooden block
-  Ball approximately 1 inch diameter (table tennis ball - not color specific)
-  Wall approximately 2.5 inches tall

FAQ

- What sound is the “victory sound”?
This is up to the team to determine. They are challenged to use their creativity to determine what a “victory sound” is.
- If part of a crate is touching the line on the board, does that count as the crate being “within” the scoring area?
No, in order to be “within” the scoring area, the crate must not be touching the colored line on the board.
- What is a “human assist”?
A “human assist” is defined as any time any member of the team touches any part of the robot after time has started. If your machine just needs a little nudge or wiggle to continue on its way, but you don’t want to do a restart, this would be considered an assist.

Score Sheet

Skills	Points Possible				Points Assigned
	50	100	150	200	
Participation – All members take an active part in the team effort. It is clear that the team works together as a unit.	Rarely	Some the time	Most the time	All the time	_____
Questions – Teams are able to answer questions from judges	Rarely	Some the time	Most the time	All the time	_____
Notebooks – Teams documented their process in an easily understood manner.	Rarely	Some the time	Most the time	All the time	_____
Robot – Robot design is effective at accomplishing the tasks of the challenge.	Rarely	Some the time	Most the time	All the time	_____
Knowledge – Team understands the components of their robot and their program.	Rarely	Some the time	Most the time	All the time	_____
Game Scoring – Program effectively completes game tasks.	Game Score: Beg: 0-325 Int: 0-375 Adv: 0-450	Game Score: Beg: 326-650 Int: 376-750 Adv: 451-900	Game Score: Beg: 651-975 Int: 751-1125 Adv: 901-1350	Game Score: Beg: 976-1300 Int: 1126-1500 Adv: 1351-1800	_____
Total:					_____

Purple (901-1200) _____ **Blue (601-900)** _____ **Red (301-600)** _____ **White (<300)** _____

Comments:

Appendix B – Registration

Sioux Empire Fair Showcase
Due: July 15, 2025

Email Forms to: Christine Wood – christine.wood@sdstate.edu

County: _____

Team: _____

Coach: _____ Phone Number: _____

Email: _____

Team Member	Age
1.	
2.	
3.	
4.	
5.	

Central States Fair Showcase
Due: August 1, 2024

Email Forms to: Christine Wood – christine.wood@sdstate.edu

County: _____

Team: _____

Coach: _____ Phone Number: _____

Email: _____

Team Member	Age
1.	
2.	
3.	
4.	
5.	