



FIELD TRIP LEARNING GUIDE • 2027 EDITION

FIRST® Chesapeake District Robotics Championship

The Show Place Arena • Upper Marlboro, MD • April 8–11, 2027

School Field Trip Day: Friday, April 9, 2027

About This Experience

The FIRST® Chesapeake District Championship brings together 60 of the top high school robotics teams from Maryland, Virginia, DC, and West Virginia for a real engineering competition. On Field Trip Day, visiting students are guided by a student ambassador from a competing team through the pit area (where robots are built and repaired between matches), the competition floor, and live match rounds. Middle and high school groups can also book a hands-on mission in a mobile STEM lab. This guide connects that experience to Maryland, DC, and Virginia learning standards and gives you ready-to-use prompts for before, during, and after your visit.

Learning Objectives by Grade Level

Elementary (K–5)	Middle School (6–8)	High School (9–12)
• Observe how engineers identify and solve real problems • Connect robotics to everyday tools and technology • Explore how teams work together toward a shared goal • Ask questions about how machines move and are controlled	• Identify examples of force, motion, and energy transfer in action • Recognize the engineering design process in a competitive setting • Explore programming and sensor concepts used by student teams • Connect STEM coursework to real career pathways	• Analyze mechanical systems, control loops, and autonomous programming • Evaluate team design decisions using engineering principles • Connect physics concepts (force, torque, energy) to robot performance • Investigate CTE and STEM career pathways through peer conversation

Field Trip Day at a Glance

Date	Friday, April 9, 2027 (school groups). Saturday and Sunday tours available on request.
Venue	The Show Place Arena at Prince George's Equestrian Center, 14900 Pennsylvania Ave, Upper Marlboro, MD 20772
Admission	Free. Free bus and car parking with a dedicated bus drop-off.
Tour format	Student-ambassador led, about 45 minutes across the pits, competition floor, and team conversations, sized to your group. Groups rotate so no area is overcrowded. Grades 6–12 can add a 15–20 minute Mobile STEM Lab session (12 students per session).
Safety	Safety glasses are required in the pit area and provided on site at no cost. The venue is fully accessible.
Food	Concessions on site; a designated space is available for groups bringing bag lunches.
Chaperones	Schools follow their own district chaperone ratios. Ambassadors guide; your staff supervise.
Reservations	Reserve a tour window at firstchesapeake.org/frc/championship-2027 (Field Trip Day section) or by writing events@firstchesapeake.org . Windows and lab sessions fill in order of request, so tell us how many students would like a lab session when you book.

Before Your Visit

Ten minutes of setup turns a fun day into a learning day. Pick one or two of these for the class period before you go.

- **Watch the game animation.** Each season has a new game. The official animation (about 3 minutes) is posted on the FIRST Robotics Competition YouTube channel in January: youtube.com/@FIRSTRoboticsCompetition. Watch it together and students will understand what the robots are trying to do the moment they walk in.
- **Assign a lens.** Give each student one thing to track all day: a mechanism, a team role, a safety practice, a strategy. They report back on the bus.
- **Set the sound expectation.** The arena is loud during matches (music, cheering, buzzers). Students who are sensitive to noise should bring ear protection; quieter spaces are marked on site.
- **Prep one question.** Every student arrives with one question written down to ask a team member. Ambassadors will make sure they get to ask it.

Field Trip Experience: What to Look For

Your student ambassador will guide your group through the pits, the competition floor, and conversations with teams. Middle and high school groups can add a Mobile STEM Lab session, booked when you reserve your tour window. Use these prompts to keep students engaged and looking closely.

1 Pit Area — Engineering in Action

Teams build, repair, and refine their robots between matches. This is where the engineering design process is most visible.

Look for: How teams are organized and the roles students are playing: programmer, builder, driver, scout, strategist, safety captain.

Ask a team member: What problem did you have to solve this season, and how did your design change over time?

Notice: The materials, tools, and electronics in use. Can students identify motors, sensors, wiring, pneumatics, and structural parts?

2 Competition Floor — Physics in Motion

Watch 2–3 matches and observe how robots interact with the game field and with each other.

Look for: Force and motion. How robots accelerate, push against objects, climb, and handle contact.

Look for: Autonomous mode (the first 15 seconds), when robots operate without a driver, running entirely on code the students wrote.

Notice: How alliances of three teams cooperate to score. What strategy do you see? Who is defending and who is scoring?

3 Mobile STEM Lab — Environmental Mission (Grades 6–12)

Our partner **Learning Undeclared** brings its Drop Anywhere mobile lab on site for Field Trip Day. Inside, students work as a team of interns at a busy port. Using touchscreen walls, augmented reality, and a project file left by their supervisor, they solve a series of puzzles to plan a new construction site that protects wildlife, reduces disruption for nearby residents, and cuts emissions, all while staying on budget. They test their strategies against real tradeoffs, run a planning simulation, and read emissions and migration data to make their final call. The clock starts the moment they walk in.

Each session runs 15 to 20 minutes for up to 12 students and is open to grades 6–12. Sessions fill in order of request, so book yours when you reserve your tour window.

Look for: How the lab uses the same habits as the robotics teams: gather data, test a solution, weigh tradeoffs, and adjust.

Ask: Engineers, environmental scientists, IT specialists, and communications staff all work at ports like this one. Which of those jobs would you want, and what would you need to learn to get there?

4 Team Conversations — People Behind the Robots

Your ambassador will connect you with student team members and coaches. Many of them were in your students' seats a few years ago.

Ask: What subject in school has been most useful on your robotics team?

Ask: What do you want to study or do after high school? How did the team change that answer?

For CTE and administrators: Ask coaches about program structure, costs, meeting schedules, and how the team connects with community partners and employers.

Standards Alignment

Maryland and the District of Columbia both use the Next Generation Science Standards (NGSS), CSTA-aligned computer science standards, and the Common Core math standards, so one alignment table serves both. A Virginia Standards of Learning crosswalk follows for Virginia schools. Codes are listed so you can drop them straight into a field trip request form.

Maryland & District of Columbia (NGSS • CSTA • Common Core)

Grade band	Subject area	Standards connections
Elementary K–5	Science: Engineering Design	K-2-ETS1-1 to 3 and 3-5-ETS1-1 to 3. Define a problem, compare solutions, test and improve a design. Visible in every pit as teams repair and refine robots between matches.
	Science: Forces & Energy	K-PS2-1, K-PS2-2 (pushes and pulls), 3-PS2-1, 3-PS2-2 (balanced and unbalanced forces), 4-PS3-1, 4-PS3-2, 4-PS3-4 (energy, speed, and energy transfer). Watch robots accelerate, collide, lift, and climb.
	Computer Science (CSTA 1A/1B)	1A-AP-08 to 1A-AP-11 and 1B-AP-08 to 1B-AP-15. Algorithms as step-by-step instructions, sequences and loops, testing and debugging. Autonomous mode is a program running in front of them.
	Math (CCSS)	K-5 Measurement & Data and Geometry (e.g., 2.MD, 3.MD, 5.MD). Robot size limits, match time, and live scores give real numbers to compare and graph.
Middle 6–8	Science: Physical Science	MS-PS2-1, MS-PS2-2 (Newton's laws, force and mass), MS-PS3-1, MS-PS3-2, MS-PS3-5 (kinetic and potential energy, energy transfer). Drive trains, arms, and climbs are the demonstrations.
	Science: Engineering Design	MS-ETS1-1 to MS-ETS1-4. Define criteria and constraints, evaluate competing designs, analyze test data, iterate. Compare two teams' solutions to the same game challenge.
	Science: Earth & Human Activity	MS-ESS3-3 (design a method for monitoring and minimizing human impact on the environment) and MS-ETS1-2 (evaluate competing solutions against criteria and constraints). Both are the core of the Mobile STEM Lab mission.
	Computer Science (CSTA 2)	2-AP-10 (flowcharts and pseudocode), 2-AP-13 (decomposition), 2-AP-17 (testing and refining programs), 2-CS-02 (hardware and software working together through sensors and controllers).
	Math (CCSS)	6.RP, 7.RP (ratios and proportional reasoning: gear ratios, drive speed), 6.SP, 7.SP (statistics: scouting data and match scores), 7.G (geometry of mechanisms and the field).

Maryland & District of Columbia, continued

Grade band	Subject area	Standards connections
High School 9–12	Science: Physics	HS-PS2-1, HS-PS2-2, HS-PS2-3 (forces, momentum, and minimizing force in collisions), HS-PS3-1, HS-PS3-3 (energy conservation and conversion in motors, batteries, and mechanisms).
	Science: Earth & Human Activity	HS-ESS3-6 (how human activity changes Earth systems) and HS-ETS1-3 (evaluating solutions against cost, safety, and environmental impact). Students apply both directly in the Mobile STEM Lab mission.
	Science: Engineering Design	HS-ETS1-1 to HS-ETS1-4. Break a complex problem into solvable parts, weigh trade-offs (weight vs. strength, speed vs. control), and evaluate solutions against constraints.
	Computer Science (CSTA 3A/3B)	3A-AP-13 (decomposition and modularity), 3A-AP-17 (abstraction and procedures), 3A-AP-21 (testing and debugging strategies), 3A-CS-02 (hardware/software interaction). Ask programmers how they tune autonomous routines.
	Math (CCSS)	N-Q.1 to N-Q.3 (units and quantitative reasoning), S-ID (interpreting data from scouting and match results), the Modeling practice standard throughout.
	Career & Technical Education	Maryland CTE Engineering, IT/Computer Science, and Manufacturing pathways; DC CTE STEM and IT clusters. Teams model real roles in engineering, software, fabrication, business, marketing, and project management.

Virginia (Standards of Learning)

Grade band	Subject area	Standards connections
Elementary K–5	Science & Computer Science	K.1–5.1 scientific investigation and reasoning; 4.2 force, motion, and energy; C/CT K.1–5.2 algorithms, sequencing, and computational thinking; K.9–5.14 measurement, geometry, and data.
Middle 6–8	Physical Science, CS, T&E, Math	PS.1 investigation; PS.10 force, motion, Newton's laws; PS.11 energy; C/CT 6.1–8.5 programming and debugging; T/E 6–8 engineering design process; 6.1–8.17 ratios, proportions, and data; 6.9 and LS.9 human impact on ecosystems and natural resources (Mobile STEM Lab mission).
High School 9–12	Physics, CS, CTE	PH.1, PH.5, PH.6, PH.7 investigation, forces and torque, work and energy, rotational motion; C/CT 9.1–12.5 algorithms and control structures; TED.1–TED.6 engineering design and career readiness; all CTE pathways; BIO.8.D and ES.10.E human impact on ecosystems and resources (Mobile STEM Lab mission).

Post-Visit Discussion & Reflection

Use these on the bus, in the next class session, or as a short writing prompt.

Elementary (K–5)	Middle School (6–8)	High School (9–12)
- What was the most surprising thing you saw a robot do? - What problem were the students trying to solve? - What job would you want on a robotics team, and why? - If you could build a robot to solve one problem at your school, what would it do?	- Where did you see Newton's laws of motion during the matches? - How did teams use sensors or programming to improve performance? - What did the engineering design process look like in the pit area? - Which STEM skills seemed most important on a robotics team? - If your group did the mobile lab mission, how did your team decide between saving money, protecting wildlife, and cutting emissions?	- Pick one mechanism you observed. What physics principles governed it? - How did autonomous programming shape team strategy in the first 15 seconds? - What design trade-offs did you notice between different teams' robots? - How does this experience connect to a career pathway you are considering? - If your group did the mobile lab mission, which data point changed your team's final decision, and why?

Bring FIRST to Your School

Elementary & Middle (K–8)	Middle & High School (7–12)	We're Here to Help
FIRST® LEGO® League Explore (grades PreK–4) and Challenge (grades 4–8): teams research a real-world problem, build and program a LEGO robot, and present at a tournament. Ask us about what is next for K–8 in the 2027–28 season.	FIRST® Tech Challenge: teams design, build, and program a robot to compete in a game challenge. The ideal entry point for new schools, with a clear pathway to the championship level and startup support through our Geared Up cohort.	FIRST® Chesapeake supports your school with program setup, local team connections, near-peer mentors, funding guidance, and follow-up materials. No experience required. To talk through next steps, write to ftc-teams@firstchesapeake.org (FIRST Tech Challenge) or frc-teams@firstchesapeake.org (FIRST Robotics Competition).

Contact FIRST® Chesapeake • events@firstchesapeake.org • firstchesapeake.org • Serving 10,000+ students across DC, Maryland & Virginia

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