



AIM FOR FUTURE

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VEX AIM Competition – AIM FOR FUTURE

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1. About the VEX AIM Challenge

VEX AIM is an AI-powered robot designed for learners from elementary through university levels, delivering an intuitive, hands-on STEM experience. It supports programming in VEXcode Blocks, Python, and even integration with large language models, enabling deep exploration of artificial intelligence. True to our theme **AIM FOR FUTURE**, this platform empowers the next generation of innovators to build, code, and compete with purpose.

Per our current vision for the VEX AIM robotics competition, we plan to structure the event into four age divisions: Elementary Lower Division, Elementary Upper Division, Middle School Division, and High School Division. This version of the rules does not yet include specific regulations for the Middle and High School Divisions. We invite feedback from the community through the Elementary Division events to help refine the **AIM FOR FUTURE** rule set for all ages.

Feedback Collection Form for VEX AIM Rule Revisions (Tencent Docs):

<https://docs.qq.com/form/page/DSkloaXFiUk1mUWFm>

2. Match Overview

VEX AIM matches take place on a field measuring 27" (685.8 mm) × 36" (914.4 mm). Two Alliances—Red and Blue—compete to outscore each other, embodying the AIM FOR FUTURE spirit of collaboration and innovation. Each Alliance consists of two pre-assigned teams.

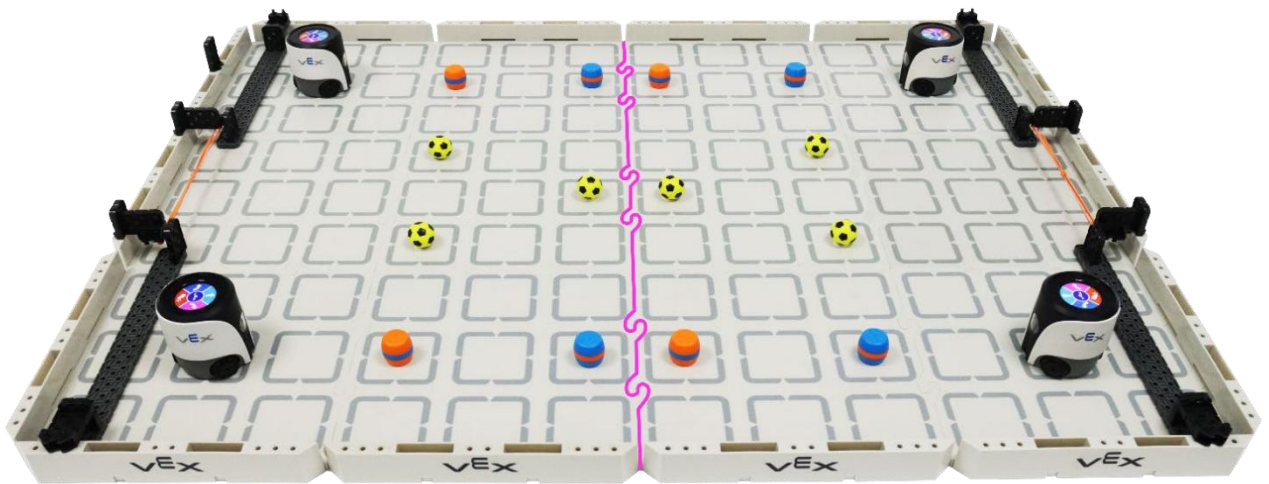


Figure 1: VEX AIM Starting Configuration

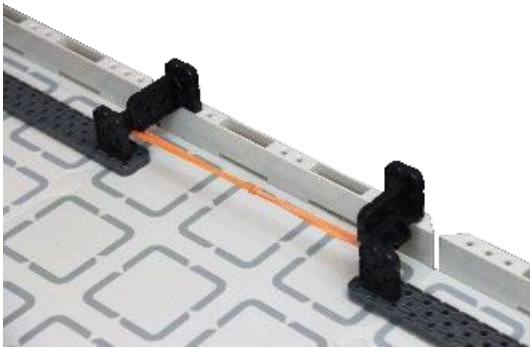
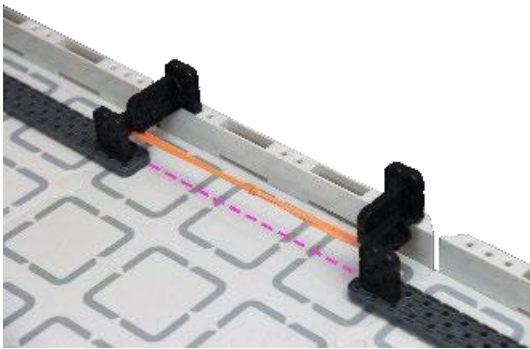
Each VEX AIM Match features two Alliances (Red Alliance and Blue Alliance). Each Alliance consists of two pre-assigned Teams.

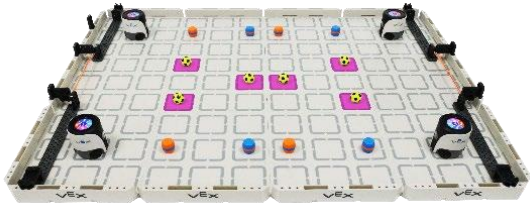
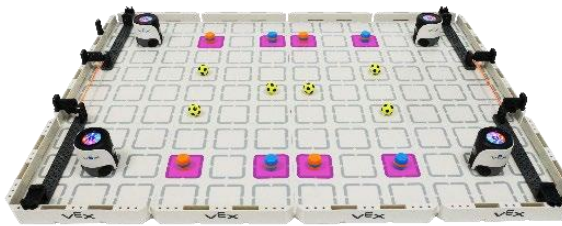
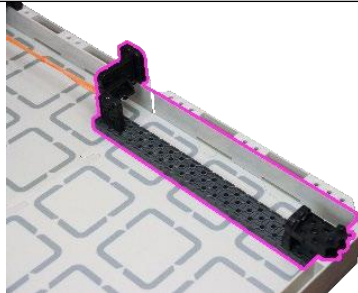
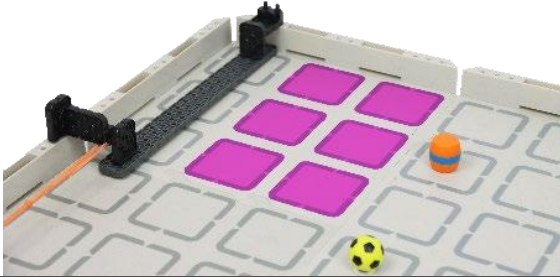
All VEX AIM Match fields contain the following components:

1. Two Goals (one per Alliance)
2. Two Goal Lines (one in front of each Goal)
3. Six neutral Sports Balls
4. Six Sports Ball starting positions
5. Eight Barrels (four per Alliance)
6. Four Barrel Scoring Zones (two per Alliance)
7. AprilTag fiducials (required for higher-age divisions)
8. Four Starting Zones (two per Alliance)

3. Definitions

3.1 Props & Field Elements

Name	Definition	Illustration
Goal	A structure built from VEX IQ components. One per Alliance. The Goal area does not include the structural parts used to build the Goal.	
Goal Line	A boundary line in front of the Goal, used to determine whether a Sports Ball meets scoring conditions inside the Goal.	
Midfield Line	The edge of the field tile that bisects the field lengthwise into Red and Blue halves.	See Figure 1
Sports Ball	6 total per match.	

Name	Definition	Illustration
Sports Ball Starting Position	The position of each Sports Ball at match start (marked by stickers on the field).	
Red Barrels	4 total per match.	
Blue Barrels	4 total per match.	
Barrel Starting Position	The pre-set starting location of each Barrel.	
Barrel Scoring Zone	The pre-set starting location of each Barrel.	
Starting Zone	A gray rectangular area within each Barrel Scoring Zone tile. Each tile contains 6 Starting Zones; robots are assigned via random draw pre-match. Zones are numbered as shown.	

3.2 Additional Definitions

Scoring Objects: Sports Balls, Barrels.

Field Elements: Goals, Goal Lines, Sports Ball positioning points, Barrel placement areas, AprilTag fiducials, Starting Zones.

Possession: When a robot carries, grasps, or controls a Scoring Object such that the object moves with the robot when the robot changes direction. There is no possession limit for AIM robots.

Team: A group of one or more student members. **A team** is considered an Elementary Division team if all members are in grades 1–6. **A team** is considered an Upper Division team if any member is in a higher grade, or if the team consists of elementary students but registers to compete as an Upper Division team (“playing up”). **Once declared** as an Upper Division team, a team may not revert to the Elementary Division for the remainder of the season.

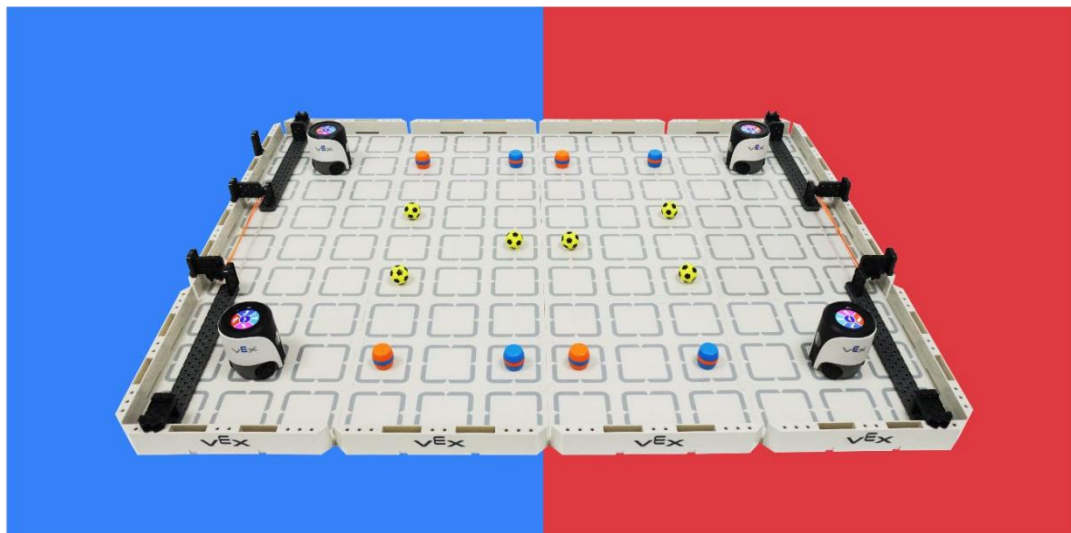
Elementary Lower Division Student: All team members are in grade 4 or below.

Elementary Upper Division Student: Meets the definition of an Elementary Student but does not qualify as an Elementary Lower Division Student.

Driver: The student responsible for controlling the robot during the match.

On-Field Student: Team members standing within the Alliance Station Area during a Match.

Alliance Station: The designated area where Drivers stand during the match (Red and Blue areas correspond to the respective Alliance stations).



Match: A timed period during which teams compete in Autonomous and Driver Controlled Periods to earn points.

- **Autonomous Coding Period:** The period before the Autonomous Period during which students may write and adjust code based on their assigned Starting Zone.
- **Autonomous Period:** A period during which the robot operates solely based on pre-programmed instructions uploaded to the AIM robot; no manual input is permitted.
- **Driver Controlled Period:** A period during which the robot is controlled by the Driver via the handheld controller.

Match Format by Division

Match Type	Participating Teams	Autonomous Coding Period	Autonomous Period	Autonomous Requirements	Driver Controlled Period
Elementary Lower Division	4 teams form 2 Alliances	3:00	0:30	Touch-based coding only	1:00
Elementary Upper Division	4 teams form 2 Alliances	3:00	0:15	Pre-programmed operation	1:15

Teamwork Challenge: Part of the VEX AIM Teamwork Head-to-Head Competition, consisting of Qualification Matches, Finals Matches, and optional Practice Matches.

Robot Skills Challenge: Details to be announced.

4. Match Rules

1. Each team competes with 1 VEX AIM robot.
2. At match start, 4 Starting Zones are randomly selected via electronic draw (one per robot). Once positions are confirmed, the Autonomous Coding Period timer begins.
3. In Teamwork Challenge matches, teams may only control their robots via the handheld controller during the Driver Controlled Period. During the Autonomous Period, robots must operate solely on pre-loaded code.
4. At match start, robots must:
 - a. Be in contact with the field surface;
 - b. Be fully contained within the gray rectangular area of their assigned Starting Zone;
 - c. Be completely stationary;
 - d. Have no orientation restrictions.
5. No modifications to the VEX AIM robot are permitted, except for non-functional decorative elements. Each team must have at least 1 Driver, who may not represent more than one team in any single match.
6. Each team may have up to 2 Drive Team Members per match, who must remain in their Alliance Station throughout both periods.
7. During both the Autonomous and Driver Controlled Periods, Drive Team Members may not touch any Field Elements, Scoring Objects, or robots.
8. If a prop leaves the field, it will not be returned to play for the remainder of the match.
9. The competition field may have a tolerance of ± 1 " (25.4 mm). Teams must design their robots accordingly.
10. Replays are at the sole discretion of the Event Partner and Head Referee, and will only be granted under exceptional circumstances.



11. Robots may only be handled in specific situations (fully exiting the field, becoming stuck, tipping over, or requiring technical assistance). Drivers must:

- a. Place the controller on the ground and notify the Head Referee;
- b. Return the robot to its Starting Zone;
- c. Return any possessed Scoring Objects to the nearest positioning point.

Note: *This rule is intended for recovery only, not as a strategic advantage. Repeated or intentional use will result in match disqualification at the Head Referee's discretion.*

12. No robot may be pinned for more than 3 consecutive counts. Pinning occurs when an opposing robot's movement is restricted to an area no larger than one field tile with no clear escape path. A robot that makes no attempt to escape is not considered pinned.

5. Scoring Rules

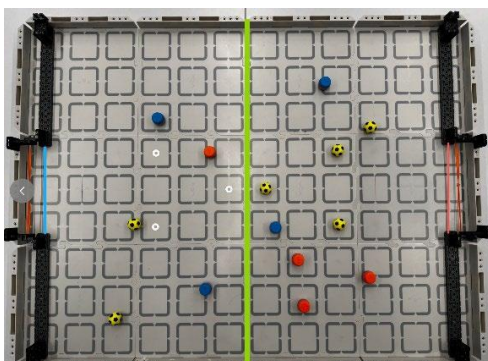
5.1 Autonomous Period Scoring

Scores are calculated immediately after the Autonomous Period ends and all field objects have come to a complete stop. Points scored due to robot movement after the period ends are not counted. Referees may not review match video or photos prior to scoring.

Scoring Type	Points
Each Sports Ball in the opponent's half	2
Each Barrel in the opponent's half (color irrelevant)	3

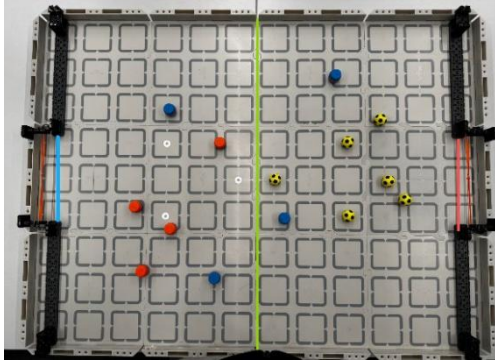
- Barrel color is ignored for all Autonomous Period scoring calculations.
- Autonomous Period match outcomes are determined by the combined total of Sports Ball and Barrel points, which determine Autonomous Period Bonus Points for the winning Alliance.
- Any game piece resting exactly on the Midfield Divider Line awards zero points to either Alliance.
- The Alliance with the higher combined Autonomous score receives 10 Autonomous Bonus Points; the opposing Alliance receives 0.
- If the Autonomous Period ends in a tie (including a 0–0 scoreline), both Alliances receive 5 Autonomous Bonus Points each.

Sample 1: Blue wins (Blue = +10 Autonomous Bonus Points, Red = 0)



	Blue	Red
Scoring Sports Balls	4 (8 pts)	2 (4 pts)
Scoring Barrels	5 (15 pts)	3 (9 pts)
Total Autonomous Score	23	13

Sample 2: Tie, both Alliances earn 5 Autonomous Bonus points



	Blue	Red
Scoring Sports Balls	6 (12 pts)	0 (0 pts)
Scoring Barrels	2 (6 pts)	6 (18 pts)
Total Autonomous Score	18	18

5.2 Driver Controlled Period Scoring

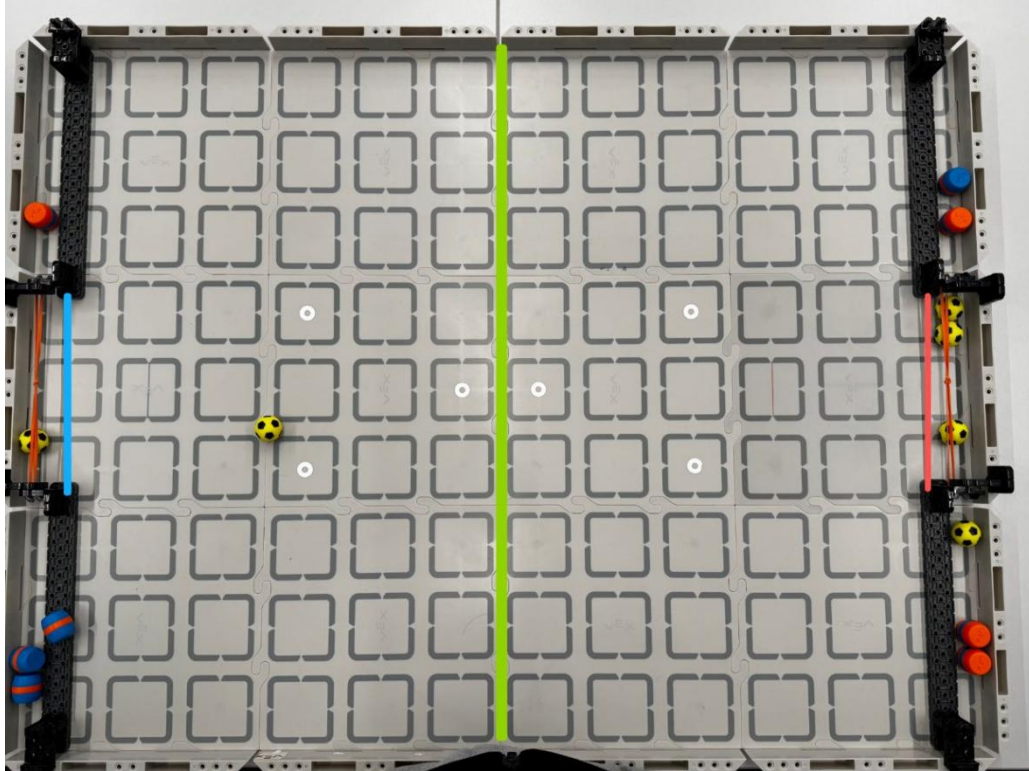
Scores are calculated immediately after the match ends and all field objects have stopped moving. Points scored due to robot movement after the period ends are not counted.

Scoring Type	Points
Each Sports Ball scored in the opponent's Goal	5
Each own-color Barrel in own Barrel Scoring Zone	4
Each own-color Barrel in opponent's Barrel Scoring Zone	1
Same-Color Fill Bonus (per zone)	10

- **Sports Ball Scoring:** A Sports Ball is scored when it fully crosses the Goal Line into the opponent's Goal area.
- **Barrel Scoring:**
 - i. Barrels must be located within the space bounded by the structural beams and field perimeter (the beams themselves count as part of this space); only Barrels of the Alliance's own color may score for that Alliance.
 - ii. There is no limit to the number of Barrels that may occupy a single Barrel Scoring Zone.
- **Same-Color Fill Bonus:** Awarded when an Alliance's Barrel Scoring Zone contains 3 or more of that Alliance's Barrels and zero opponent Barrels.



Sample 2 (Autonomous points excluded)



	Blue	Red
Scored Sports Balls	3 (15 pts)	1 (5 pts)
Own Barrels in own Zone	3 (12 pts)	3 (12 pts)
Own Barrels in opponent's Zone	1 (1 pt)	1 (1 pt)
Same-Color Barrel Zone Fill Bonus	10	0
Total Match Score	38	18

6. Tournament Rules

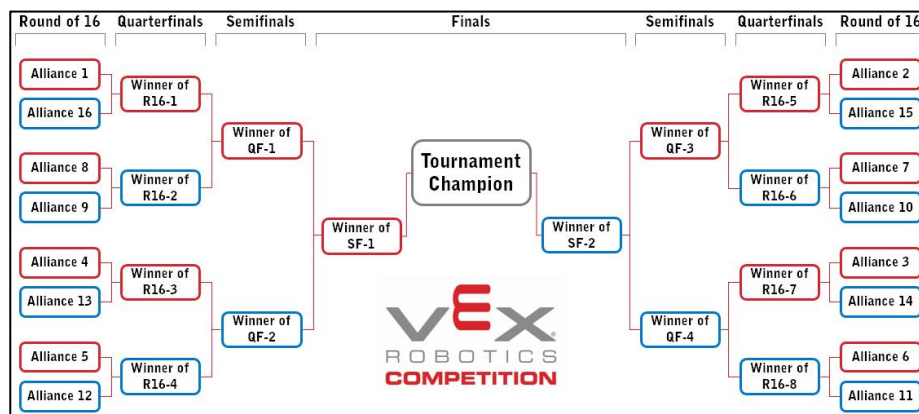
- Each team will participate in an equal number of Qualification Matches, as determined by the Event Partner.
- The official match schedule lists Alliance partners, match times, and field assignments (for multi-field events). The Event Partner may modify the schedule as needed.

- **Head-to-Head Competition:**

- Teams are ranked based on their performance across all Qualification Matches. Additional unranked matches may be scheduled (marked with an asterisk on the schedule) and do not affect team rankings.
- Disqualification:** If a team is disqualified from a Qualification Match, they receive 0 points for that match. Their Alliance partner still receives their earned points. In Finals Matches, disqualification applies to the entire Alliance, and the Alliance receives 0 points for the match.
- The number of teams advancing to the Finals is determined by the Event Organizer.

- **Finals Alliance Formation:**

- Finals Alliances are formed based on team rankings after all Qualification Matches conclude:
 - The #1 and #2 ranked teams automatically form Alliance 1;
 - The #3 and #4 ranked teams automatically form Alliance 2;
 - This process continues until all Finals-qualified teams are placed into Alliances.
- Finals matches follow a standard tournament bracket format.



- Tournament Manager software (VEX V5 Basic Game module) will be used to generate match schedules and record scores.

7. Robot Rules

Non-functional decorations are permitted, provided they meet the following requirements:

1. Each team may use only 1 VEX AIM robot. A team ID sticker (50×30 mm, thickness ≤2 mm) must be affixed to the robot body. This robot is the team's sole competition robot for the event; teams may not lend or use another team's robot.
2. Non-functional decorations are allowed, provided they do not affect robot performance or match outcomes. Decorations must align with the spirit of the AIM FOR FUTURE competition. Inspectors and the Head Referee have final authority on decoration compliance.
3. Electronic components may not be used as non-functional decorations.
4. Materials that interfere with opposing robots' sensors are prohibited.
5. Aside from the permitted decorations above, no modifications to the VEX AIM robot are allowed.

8. Field Build Guide

Teams may use components from the following kits to assemble all field props for the VEX AIM competition, per the reference diagrams:

Part Number	Product Name	Quantity
248-7350	VEX 123/AIM Field	3
228-5653	VEX IQ 2x Extended Straight Beam Combo	1
228-5657	VEX IQ Corner Connector Advanced Add-On Combo	1
228-6633	VEX IQ Silicone Rubber Bands #32 (10-pack)	1
—	Positioning Stickers	—

Field Assembly Diagram: [Refer to AIM Competition Field.pdf](#).