ISTE Standards			KIPR Curriculum
Empowered Learner	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences	a. Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	Students progress through the inquiry-based curriculum at their own speed, the curricular activities are open-ended allowing for differentiated learning and personalized strategies to reach a solution. This includes leveraging software and robot hardware designs that are used in an iterative design process to come to a personalized solution.
		b. Students build networks and customize their learning environments in ways that support the learning process.	Students collaborate to develop multiple solutions for the open-ended tasks. The software development environment can be customized using a device of their choosing such as a laptop, cell phone, tablet or whatever Wi-Fi capable device they are comfortable with.
		c. Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.	Tasks performed by the robot demonstrate students' learning and improves their understanding through an iterative process. These open-ended tasks allow students and student groups to generate multiple successful solutions for the same task.
		d. Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.	Students have to continually interface with and troubleshoot the technology. Interaction requires that students can successfully navigate Wi-Fi connections, use programming software, use a file management system, and generate programming solutions using a text-based programming language.
Digital Citizen	Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.	a. Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.	Students learn that their code if published may be used as a digital resource by others and take on the responsibility of making it easily readable and accessible to others.
		b. Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.	Participants will be accessing online curriculum and challenge examples as they progress through the program. In addition, participants will identify, develop, and design creative effectors to solve a problem. Participants will practice digital citizenship while accessing and researching information online.
		c. Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.	The curriculum promotes collaborative programming while teaching proper attribution for using code or other resources generated by others.
		d. Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.	In the "Managing Your Data" unit students understand how to log in using passwords and user groups and proper nomenclature for their programs. They understand that when accessing online curriculum and other resources they can be tracked by websites and those proper protocols and procedures must be used with personal data.

ISTE Standards			KIPR Curriculum
owledge Construc	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:	a. plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.	Participants will research previous designs and options as they apply the engineering design process to engineering effectors for their robots to solve the tasks. Participants will use and apply the engineering process to refine and improve their designs. Participants will evaluate and research different types of autonomous robots and how they relate to everyday applications. Students will evaluate practicality and suitability of autonomous robotic solutions.
		b. evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.	Students are allowed to use any materials or resources they have available while engineering components and developing software solutions to complete the tasks. Students research, evaluate, and discuss options to determine the best material for the solution. Collaborating with teammates provides students the opportunity to ask questions, evaluate and clarify information.
		c. curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.	Students must utilize the online curriculum and other provided resources such as printable and videos, to help navigate the Botball code API and otherwise learn new programming techniques which are required to develop solutions to the progressively more difficult challenges.
		d. build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.	The tasks are open ended, with no set solution so the students are constantly brainstorming different approaches to the same problems. Because it is not a competition (fastest, etc.) all student ideas can be tested and implemented. This leads to students seeing other solutions to the same tasks that they would not have previously thought of. The classroom teacher can use the curriculum to have the students optimize and refine their solutions once they have demonstrated completion.
		a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	Students are given a set of challenges that require them to create their own software and hardware solutions for the robot and follow a design process until they achieve their goal. Throughout the curriculum students are taught methods of brainstorming, flowcharting, and writing pseudocode following the engineering design process.

ISTE Standards			KIPR Curriculum
Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.	b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	Students use a process of creating flow charts, pseudocode and note booking prior to writing the code and because they are allowed to use any materials they wish while engineering mechanical components they must discuss options to determine the best material for the solution.
		c. Students develop, test and refine prototypes as part of a cyclical design process.	This is accomplished through the step analysis that teams must do as they look at a problem and break it into subtasks. They can then complete each subtask with a software or hardware solution. Students will utilize digital note booking skills to document their iteration and testing of the design
		d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	In the curriculum assessments students are given challenges with an end goal and a limited amount of guidelines. Students must then develop their own interpretation of the task, brainstorm solutions, and develop their solutions out. The robots are autonomous so the software solution with a text based programming language requires an attention to detail and perseverance on task to be successful.
Computational Thinker	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.	a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	Autonomous robots require the use of data analysis on sensor feedback to help develop models and algorithms to solve the task.
		b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem solving and decision-making.	Students utilize both digital and analog sensors on their robots to gather data from the surrounding environment and have to utilize the curriculum to learn how to analyze and manipulate the resulting data. Students must then take the information this data provided to develop a code solution such that the robot may appropriately and autonomously make decisions in response to the environment.
		c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.	Students are given tasks that the robot needs to complete and determine which parts of the process can be done through engineering or software. Students are then encouraged to break the problem apart using a flowchart and solve individual components of the problem.
		d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	The students are programming autonomous robots through the algorithms and accompanying computer code they create for their solution
		a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	Students use Google Classroom tools to store programs and to collaborate with peers while collaboratively solving challenges. Any type of material can be added to the robot allowing for unique and personalized solutions.

ISTE Standards			KIPR Curriculum
Creative Communicator	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.	b. Students create original works or responsibly repurpose or remix digital resources into new creations.	All challenges are open-ended and can have unique and original solutions. Participants use Github and Google Classroom to share coding solutions and add to other collaborative projects.
		c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.	Students use note booking to create algorithms and scaled drawings to show brainstorming and pre-thinking when working on solutions. Previous participants have created webpages, videos, PowerPoint presentations and static displays for science nights, PTA meetings, STEM conferences, science fair projects and for general promotion of their program or solution to a problem. Participants will have the opportunity to create cultural expression through music and art challenges.
		d. Students publish or present content that customizes the message and medium for their intended audiences.	Students have to work as a team as they work through the multiple ways to solve the challenges. The students must decompose the tasks and effectively explain their strategy and the steps involved for solving the task. Students present their mechanical and software solutions to other class members. Students share ideas, designs and solutions with other students on a daily basis. Teachers can use provided rubrics to assess student cooperation, teamwork, communication and effectiveness of collaborative problem solving. Students communicate their participation in the program and creative solutions at school events, parent nights, STEM events, PTA and school board presentations.
		a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.	Participants in the United States have made classroom pals in China and other countries where they share cultures and background knowledge as well as solutions and ideas over social media and with apps such as We Chat. Some participants attend out Global Conference on Educational Robotics and interact with other teachers and students who are participating in the program from around the U.S., China, Austria, Canada, and Qatar.

ISTE Standards			KIPR Curriculum
Global Collaborator	Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.	b. Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.	Participating students and classrooms have participated in virtual field trips with other classrooms around the country and worked on community problem solving. Guest speakers and KIPR staff often provide virtual classroom lessons and information about robotics.
		c. Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.	The program encourages teams to brainstorm multiple solutions to problems and then have each team member work on the coding for one of the solutions. As a collaborative team they are successful when all team members solve the problem. Students can assume various roles from programming, mechanical design, testing and documentation.
		d. Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.	Participants have completed community outreach including teaching the elderly at local nursing homes how to program robots and hosting public coding nights at local libraries. Challenges and Mystery Challenges have a local or global theme such as recycling, disaster relief, environmental issues, human robot interaction and autonomous vehicles. Educators and students often create their own challenges to fit their local culture and issues.