

6 REASONS YOUR DISTRICT NEEDS EARLY LEARNING STEAM ROBOTICS AND CODING





Early childhood is a wonderful time to spark kids' interest in coding, robotics, and engineering. Young children are curious about the world around them, and today that world includes technology. But how best to promote positive, creative, and educational engagement with technology? By introducing and integrating developmentally appropriate robotics and coding into early childhood education. KinderLab Robotics' KIBO[™], the hands-on coding robot, teaches computer science, engineering, and computational thinking to young children ages 4 – 10. The curriculum is standards-aligned in computer science and engineering, and supports deep cross-curricular connections to science, ELA, math, and social studies.

Find out how KIBO can:



COMBAT LEARNING LOSS AND PROVIDE SOCIA-EMOTIONAL LEARNING OPPORTUNITIES – FROM PRESCHOOL TO EARLY ELEMENTARY SCHOOL



SOLUTIONS YOU CAN RUN IN YOUR OWN SCHOOL, AFTERSCHOOL OR SUMMER PROGRAM





LEARNING MADE FUN

KIBO is entirely screen-free, as children program their robots with "tangible code" made of wooden blocks. This approach takes advantage of years of research into providing physical manipulatives to allow young children to engage with abstract concepts like coding.

With KIBO, children build, program, decorate, and bring their own robot to life. KIBO is designed to be extended with craft and other building materials, providing a platform for imaginative play, sturdy building, and the engineering design process. KIBO lets children make almost anything – a character from a story, a carousel, a dancer, a race car, a helicopter – anything that they can think of. Since 2013, <u>KIBO</u> has provided a platform for young students to engage and learn STEAM concepts through play and creative selfexpression. KIBO brings robotics and coding to young learners and sparks their interest in STEAM. When children code with KIBO they are learning invaluable skills that will lead them on the path for success in science, technology, engineering, art, and mathematics (STEAM) skills and future careers. While children are developing computational thinking skills, simultaneously they are working on their social-emotional development.

> Not only are students learning about computer programming, but they're also learning social skills—like sharing and working with others—that will serve them just as importantly in the future.

- Brian Flaig, Educational Consultant, CA



MEET KIBO

Based on 20 years of early child development research, KIBO is used in 60+ countries and tested and approved by thousands of children, their caregivers, and educators. KIBO has proven efficacy in helping kids learn STEAM and getting them excited about it!

KIBO OFFERS

- A coding platform that can be EASILY INTEGRATED INTO EXISTING CURRICULUM OR CLASSROOM PROJECTS, such as literacy, social studies, science, math, and art curricula.
- STEAM learning to meet early learning COMPUTER SCIENCE STANDARDS.
- Over 160 hours of STANDARDS-ALIGNED STEM CURRICULUM and teaching materials to ensure success when implementing KIBO in classrooms.
- Easy-to-implement lesson plans and FUN PLAY-BASED ACTIVITIES.
- Training and support in integrating robotics into classrooms with a WIDE RANGE OF CROSS-CURRICULAR CONNECTIONS to literacy, community, dance, science, and more.





#1 - SERVING YOUR STUDENTS WHERE THEY ARE TODAY

After this difficult year, age-appropriate, cross-curricular tools and resources have never been more important to re-engage with in-person learning, practice SEL skills like collaboration and teamwork, and recover lost ground in math, literacy, and more with cross-curricular STEAM lessons. KIBO supports playful learning, computational thinking, STEAM skills, cooperation, and collaboration. And because KIBO is an open-ended coding and robotic platform, it can be integrated easily into existing curriculum or classroom projects, such as literacy, social studies, science, math, and art.

With KIBO, educators can <u>combat learning loss and provide</u> <u>social emotional learning opportunities</u> – from preschool to early elementary school, in any environment – in class, afterschool or in summer programs.



The class was visibly proud of their collaboration, creativity, design thinking, and programming skills. Our young coders researched, artistically designed, communicated with each other, and critically thought about their mistakes on their learning

journey. - Andy Hanes, Technology Integrator, Friends School of Baltimore, MD



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We want computer programming to reach everyone, starting with young kids. We think of coding as a literacy – to understand how the world works. - Dr. Marina

Bers, DevTech Research Group and Chair, Tufts University, MA



#2 - RELYING ON RESEARCH AND LEARNING OUTCOMES

Research shows starting computer science and STEM education with young learners has the greatest impact. Even the youngest students can learn sequencing and coding in a fun and engaging way, regardless of curriculum. Specific, powerful, and positive learning outcomes for young learners when working with robotics include:

IMPROVED SEQUENCING ABILITY IN EARLY CHILDHOOD

MASTERY OF FOUNDATIONAL CODING AND ROBOTICS SKILLS

STEAM SUCCESS: INTEGRATION OF ROBOTICS ACROSS CURRICULA

POSITIVE IMPACT ON UNDERREPRESENTED GROUPS IN STEM FIELDS KinderLab Robotics emerged from a need to bring Dr. Marina Umaschi Bers', professor of Child Development and Computer Science, and director of the <u>DevTech Research</u> Group at Tufts University's Eliot Pearson Department of Child Development, <u>research on new technologies</u> for young children to a wider audience.

KIBO was developed through Dr. Bers' research into improving STEM education for young children with innovative and age-appropriate technology. Evidence of KIBOs effect exists in the form of numerous published research articles by Marina and her team.

When applying for a Maryland State Department of Education Grant specifically for robotics instruction, I drew heavily on research regarding the benefits of play and creativity with KIBO. The work Kinderlab has done to map their Curriculum to CSTA standards provided a framework for aligning my proposal with

MSDE standards. - Jane de Winter, Executive Director, Big Learning Science & Engineering, MD

#3 - MEETING YOUR DISTRICT'S STEAM INITIATIVES AND COMPUTER SCIENCE STANDARDS WITH PROGRESSIVE CURRICULUM



More and more states are challenged to meet computer science standards starting in early childhood. KIBO can be a part of a district-wide technology strategy for student success by building a comprehensive computer science pathway from PreK – 5th grade.

One important way to meet these CS standards and district goals for young children is incorporating curriculum and Professional Development into technology decisions.

The <u>KIBO robotics program curriculum</u> is built upon the work of Dr. Bers and her DevTech Research Group. Using a "spiral" scope and sequence model, each level of the standards-aligned curriculum engages children in the full range of powerful ideas in creative coding and robotics. After working through the curriculum, young children will be able to engage in both computational thinking and engineering design as well as use robotics and coding to express themselves, explore their interests, and connect and collaborate with their peers.

Our curriculum is designed for classroom use in school environments for teachers who are not experts in technology integration, and offers clear lesson plans for teaching computational thinking, engineering design, and digital fluency through cross-curricular integrated STEAM lessons with KIBO. The curriculum offers a clear sequence from grade to grade to assist in fitting KIBO into a comprehensive computer science pathway. The curriculum is aligned with both ISTE and CSTA standards.



#4 - PROVIDING A PLAYFUL SOLUTION TO ADDRESS THE "WHOLE CHILD"

Using interactive, age-appropriate tools such as KIBO welcomes socio-emotional development, collaboration and creativity and can be a powerful tool for all young students within the district. Coding offers an opportunity for children to learn in a holistic way, supporting both a range of STEAM learning and soft skills.

Based on Dr. Bers' <u>Positive Technological Development (PTD) Framework</u> – the six Cs: communication, collaboration, community building, content creation, creativity and choice of conduct – KIBO becomes a powerful tool for supporting the whole child, not just with STEAM learning skills, such as problem solving and computational thinking, but soft skills, such as collaboration, mindfulness and teamwork.





#5 - ENSURING YOUR TEACHER'S SUCCESS WITH TECHNOLOGY

Not all educators have a computer science or coding background. Many teachers have minimal experience in computing and are being asked to support new computer science curricula and mandates. They need tools that engage their students as their learning progresses, can be easily incorporated into their instruction, will stimulate creativity, collaboration, and computational thinking. That is the beauty of KIBO. It is an easy-to-use, hands-on, and interactive tool to implement and support young learners and their educators. KINDERLAB OFFERS <u>SUPPORT TO</u> ENSURE YOUR EDUCATORS WILL BE SUCCESSFUL, INCLUDING:

CLASSROOM PACKAGES

KinderLab works to provide the best package for your unique situation. We offer classroom packages with 2, 5, or 10 KIBO Robot Kits. Each robot supports small group work by 2-4 children working with a robot, encouraging collaboration. For example, a Full Classroom Package (10 robots) can support simultaneous engagement by a class of 25-30 children.

With our classroom packages you'll get the right number of KIBOs, valuable training, hours of curriculum, teacher workbooks, and more! The classroom packages are priced at a 5% discount compared to buying a la carte.

PROFESSIONAL DEVELOPMENT AND TRAINING

PD and teacher training are vital aspects of STEM practices. It is imperative that teachers receive training so that they can "make KIBO their own," customize it to their school's needs, and understand how to pace the curriculum to allow students time to explore and experiment. Developing the skills of teachers is a critical part of our mission to develop the STEM skills of students. Start on the right foot with KIBO PD, lesson plan development and curriculum integration.

CURRICULUM

Our <u>KIBO STEAM curriculum</u> is backed by 20 years of research and has been designed to support early elementary educators and students. When you make the commitment to purchase KIBO for your young learners, we want to ensure you're successful bringing robotics into your classroom.

Our 160+ hours of STEM curriculum materials supports you in every way. You'll get easy to implement lesson plans and fun play-based activities to introduce KIBO and build students' basic engineering, coding and programming skills; but you'll also get support in integrating robotics into your classroom with a wide range of crosscurricular connections in every subject.

KIBO grows with students from Pre-K to 5th Grade



#6 - INVESTING IN CODING ROBOTS THAT "GROW" WITH YOUR STUDENTS

All educational institutions need to stretch their dollars with solutions that provide their students every opportunity to be successful. That's why, now, more than ever, it's important for early educators to implement technology strategies that "grow" with your student body. From the moment students as young as 4 years old engage with KIBO, they are acquiring skillsets that will be used throughout their lifetime. Because KIBO can be shared among students and classrooms across grade levels, KIBO can be used for years.

When considering <u>applying for grants</u> don't underestimate the value KIBO brings. KIBO is a worthwhile investment that not only extends from PreK – 5th grade but helps educators with teaching innovative STEAM learning that spans every elementary school subject. Using these learned concepts year after year, KIBO can become an anticipated part of elementary school projects and activities.

And with the new American Rescue Plan federal stimulus program, which provides \$122 billion in aid to K-12 schools, purchasing EdTech like KIBO is easier than ever. Provisions in the law guarantee that at least 20% of this funding must be spent on programs to help students recover from learning loss during this challenging past year. These funds will support interventions like extended school hours and summer enrichment programs.





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Given some time, encouragement and a little direction, students can make an engineering plan for KIBO and see it through to fruition. Interacting with KIBO in a real-world environment makes the learning immediate and real. **THE RESULT IS THAT COMPUTER PROGRAMMING DOESN'T SEEM LIKE MAGIC IN A SMARTPHONE, BUT MORE LIKE A CRAFT TO BE MASTERED.** As we start a new school year and prepare students for the future, we believe KIBO can be a bright spot on the horizon. Teachers and parents will embrace the chance to keep the scientific thinking going, but also give their children a break from the screens.

D TO FIND OUT MORE

SEE HOW KINDERLAB IS BRINGING TECHNOLOGY TO YOUNG LEARNERS, INCLUDING POPULATIONS WITH LIMITED ECONOMIC ACCESS. SUPPORT THE MOVEMENT TO BRING GIRLS INTO STEAM, AND WIN GRANTS FOR YOUR SCHOOL. LEARN MORE ABOUT KIBO TODAY. KINDERLABROBOTICS.COM