# CodeXcursion & Iowa State Standards

CodeXcursion is thoughtfully designed to align with several key Iowa standards, focusing on **21st Century Skills** like technology literacy, as well as math and science standards that emphasize computational thinking and engineering design. The program is also aligned with **ISTE Standards for Educators** and **CSTA K-12 Computer Science Standards**, ensuring comprehensive coverage of essential skills for students.

🌟**Check out:** [Firia Labs Iowa Computer Science Standards Alignments](#) 🌟

## Grades 4-5 | Technology Literacy Standards

21.3-5.TL.1 | ***Use technology resources to create original products, identify patterns and problems, make predictions, and propose solutions.*** Firia Labs' CodeX curriculum encourages students to use Python programming to create original projects like interactive games or simulations. Through hands-on activities, students identify patterns in data, debug code, make predictions about program outcomes, and develop coding solutions to achieve desired results.

21.3-5.TL.2 | ***Use interactive technologies in a collaborative group to produce digital presentations or products in a curricular area.*** The CodeX curriculum integrates collaborative coding projects where students work in groups to develop digital solutions or presentations, such as an animated story or a program simulating science concepts. Interactive technologies like CodeSpace allow seamless collaboration, enabling students to share and refine their ideas.

21.3-5.TL.3 | ***Utilize digital tools and resources to investigate real-world issues, answer questions, or solve problems.*** CodeX projects incorporate real-world problem-solving, such as using sensors to collect environmental data or creating programs to demonstrate scientific principles. Students use CodeSpace and Python to gather, analyze, and interpret information, fostering critical thinking and inquiry.

21.3-5.TL.4 | ***Use technological resources to develop and refine questions for investigation.*** Students are guided to develop investigative questions, such as how variables in their code affect outcomes or how sensors interact with their programs. Through iteration and testing, they refine their understanding using Python and physical computing resources.

21.3-5.TL.6 | ***Understand technology hardware and software system operations and their application.*** The CodeX curriculum introduces students to how hardware and software work together, from writing Python code to controlling sensors and LEDs. Students gain a foundational understanding of how these systems operate and how to apply their knowledge to create functioning projects.

## Grades 6-8 | Technology Literacy Standards

21.6-8.TL.1 | ***Demonstrate creative thinking in the design and development of innovative technology products and problem solving.*** Firia Labs' CodeX curriculum empowers students to design and develop their own technology projects, from coding interactive games to building physical computing prototypes. Through hands-on activities, students solve real-world challenges creatively, applying Python programming and hardware integrations to bring their ideas to life.

21.6-8.TL.2 | ***Collaborate with peers, experts, and others using interactive technology.*** The CodeX curriculum encourages collaboration through project-based learning activities where students work in teams to debug code, design solutions, and share their insights. CodeSpace, the online learning platform, allows students to collaborate and interact with others by remixing projects.

21.6-8.TL.3 | ***Plan strategies utilizing digital tools to gather, evaluate, and use information.*** CodeX projects integrate research and strategic planning, guiding students to use digital tools and resources to learn coding techniques, evaluate programming outcomes, and refine their solutions. Students practice gathering data from sensors and analyzing it using Python code to draw conclusions and improve their designs.

21.6-8.TL.4 | ***Use critical thinking skills to conduct research, solve problems, and make informed decisions using appropriate technological tools and resources.*** Students engage in debugging, algorithm creation, and iterative testing, using Python as a technological tool to solve programming challenges. By analyzing issues and testing different approaches, they develop critical thinking and decision-making skills in a structured coding environment.

21.6-8.TL.6 | ***Understand the underlying structure and application of technology systems.*** The CodeX curriculum demystifies the inner workings of technology by teaching students how hardware and software interact. Students learn key concepts like input/output systems, data processing, and control flow, helping them understand and apply the principles that drive modern technology systems.

## Grades 9-12 | Technology Literacy Standards

**21.9-12.TL.1 | *Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.*** Firia Labs' CodeX curriculum encourages high school students to demonstrate creative thinking by applying Python coding to develop original projects, from games to simulations and hardware integrations. By using technology to solve real-world problems, students construct knowledge through hands-on learning, developing innovative processes that connect coding skills to practical applications.

**21.9-12.TL.2 | *Use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.*** CodeX provides a platform for students to engage with digital media and collaborate both in person

and remotely. Through projects in CodeSpace, students can share their work, get feedback, and collaborate on coding challenges. This fosters teamwork, communication, and peer learning, both in the classroom and beyond.

21.9-12.TL.3 | ***Apply digital tools to gather, evaluate, and use information.*** Using Python and sensors, students gather and evaluate real-world data, such as environmental variables or user inputs. They apply digital tools to manipulate this information, solve problems, and make decisions. This prepares students to use technology to support critical research and data-driven decision-making.

21.9-12.TL.4 | ***Demonstrate critical thinking skills using appropriate tools and resources to plan and conduct research, manage projects, solve problems and make informed decisions.*** CodeX encourages students to use Python programming as a tool for critical thinking, allowing them to analyze problems, test hypotheses, and evaluate solutions through iterative coding projects. By managing their projects from concept to completion, students develop essential problem-solving skills and learn to make informed decisions using available resources.

21.9-12.TL.6 | ***Demonstrate a sound understanding of technology concepts, systems and operations.*** CodeX students gain a thorough understanding of how technology systems operate by working with both software (Python code) and hardware (sensors, displays, and physical devices). They explore system architecture, input/output operations, and how data flows through coding applications, developing a strong grasp of underlying technology concepts.

## Sample STEM Standards with Specific Examples

---

**Science HS-PS2-1** | ***Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.*** For example: Students will use the CodeX accelerometer to apply Newton's laws of motion. By measuring the acceleration of an object under different forces, students can analyze how the net force on the object affects its acceleration in relation to its mass.

**Technology 3A-AP-13** | ***Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.*** For example: Students will use CodeX with external sensors, like a temperature or humidity sensor, to create a weather station. They will write algorithms to collect and process data, such as triggering a notification when a temperature threshold is reached. This project allows students to apply computational thinking to real-world data while exploring their interests in weather and technology.

**Engineering HS-ETS1-2** | ***Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.*** Every Mission in the curriculum is based on a real-world problem solved with coding. For example: Students use the built-in light sensor to detect the amount of ambient light. They use the data to make the CodeX into a night light, turning itself on when the environment is dark.

**Math 8.G.A.3** | ***Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.*** For example: In a remix project, students will create and manipulate tessellations.

---