Kid Spark Education Early Childhood STEM & Literacy Program:

Standards Alignment & Frameworks Overview

This document illustrates how Kid Spark Education's Early Childhood STEM & Literacy Program aligns with national learning standards and is informed by evidence-based frameworks to promote equitable, developmentally appropriate STEM experiences.

Introduction

> **Kid Spark Education's Early Childhood STEM & Literacy Program equips young learners to think like engineers, inventors, and creative problem solvers through hands-on, literacy-integrated learning experiences.**

Developed in collaboration with educators and early learning specialists, this program builds foundational skills in STEM and literacy that lay the groundwork for future learning and success.

Kid Spark's early childhood curriculum aligns with leading national and developmental frameworks to ensure that all lessons are **standards-based, inclusive, and developmentally appropriate**.

This guide highlights the frameworks that guided the creation of the program:

- **Head Start Early Learning Outcomes Framework (ELOF) –** developmental goals for preschool learners across domains including mathematics, scientific reasoning, and language.
- **Next Generation Science Standards (NGSS) –** inquiry-based engineering and design practices emphasizing observation, problem-solving, and evidence-driven reasoning.
- **International Society for Technology in Education (ISTE) –** digital fluency, innovation, and creative communication skills.
- **Common Core State Standards (CCSS) –** mathematical reasoning and language development through purposeful discussion and hands-on exploration.
- **CASEL Framework for Social and Emotional Learning (SEL) –** fostering self-awareness, self-management, social awareness, relationship skills, and responsible decision-making.
- **Universal Design for Learning (UDL) –** ensuring equitable access and engagement for all learners.
- **Science of Reading (SoR) –** informing the design of literacy components and Storytime Inventing lessons through evidence-based reading practices.
- **World-Class Instructional Design and Assessment (WIDA) –** a framework for English Language Development that supports multilingual learners' language growth across academic content.

Universal Design for Learning (UDL): Access for All Learners

The Kid Spark Early Childhood STEM & Literacy Program was developed through the lens of **Universal Design for Learning (UDL)** to make STEM accessible for all students. Guided by **CAST (Center for Applied Special Technology)** and its UDL Guidelines v3.0 (2023),

- **Multiple Means of Engagement –** nurturing curiosity and motivation through student choice, playful learning, and real-world relevance.
- **Multiple Means of Representation –** using visual, verbal, and tactile methods to ensure that concepts are understood by diverse learners.
- **Multiple Means of Action & Expression –** offering flexible ways for students to demonstrate understanding through building, communication, and reflection.

Collaboration with **CAST** directly influenced the development of both **engineering materials** and **teaching tools**. Feedback from CAST led to enhancements such as:

- Redesigned engineering materials that are easier to handle, more intuitive, and accessible for a wider range of young learners.
- Slide companions that provide visual scaffolds and flexible pacing.
- Lesson modifications promoting inclusion, peer interaction, and equitable participation.

Through UDL, Kid Spark Education nurtures learner agency—empowering children to become purposeful, resourceful, and strategic problem-solvers.

CASEL Framework for Social & Emotional Learning

The Collaborative for Academic, Social, and Emotional Learning (CASEL) identifies five core competencies of SEL, all of which are fostered in Kid Spark's adaptive sports–themed Storytime Inventing lessons through collaboration, invention, and reflection:

1. **Self-Awareness:** Recognizing one's emotions, thoughts, and values and understanding how they influence behavior.
2. **Self-Management:** Regulating one's emotions, thoughts, and behaviors effectively in different situations.
3. **Social Awareness:** Taking the perspective of and empathizing with others from diverse backgrounds.
4. **Relationship Skills:** Establishing and maintaining healthy, rewarding relationships with diverse individuals.
5. **Responsible Decision-Making:** Making constructive, ethical choices about personal behavior and social interactions.

Integration by Grade Band

- **Pre-K Storytime Inventing:** CASEL 2–5 – Self-Management, Social Awareness, Relationship Skills, Responsible Decision-Making
- **Kindergarten Storytime Inventing:** CASEL 2–5 – Self-Management, Social Awareness, Relationship Skills, Responsible Decision-Making
- **1st Grade Storytime Inventing:** CASEL 1–5 – Self-Awareness, Self-Management, Social Awareness, Relationship Skills, Responsible Decision-Making

Science of Reading: Evidence-Informed Literacy Foundations

While the Kid Spark Early Childhood STEM & Literacy Program is not a comprehensive reading curriculum, the literacy experiences embedded in the **Storytime Inventing** strand were intentionally designed using principles drawn from the body of research commonly referred to as the *Science of Reading*.

Research from the **National Reading Panel (2000)** and subsequent studies demonstrates that early reading success is strengthened when children are systematically exposed to and supported in developing **phonological and phonemic awareness, phonics, fluency, vocabulary, and comprehension** *(National Reading Panel, 2000; Reading Rockets)*.

Each Storytime Inventing lesson includes a brief literacy component designed to **expose, emphasize, or review** one or more of these domains in meaningful, integrated ways—not to deliver direct, sequential instruction. Examples include:

- **Phonological and Phonemic Awareness –** identifying, segmenting, and playing with sounds and syllables in focus words from the story.
- **Vocabulary Development –** introducing and using new words in authentic design and discussion contexts.
- **Comprehension and Oral Expression –** explaining and reflecting on story events and design ideas with peers.

Through this embedded approach, students encounter research-based literacy components in playful, purposeful ways that connect **language to design, communication, and creative problem-solving**.

By coupling these early literacy exposures with hands-on STEM exploration, Kid Spark reinforces foundational skills that support reading development—while keeping the central focus on **curiosity, invention, and engineering fluency**.

World-Class Instructional Design and Assessment: English Language Development through Multimodal STEM Learning

The Kid Spark Early Childhood STEM & Literacy Program is designed to support multilingual learners by reflecting the principles of the World-Class Instructional Design and Assessment (WIDA) **English Language Development (ELD) Standards Framework**. Grounded in WIDA's asset-based **Can Do Philosophy**, the program embeds language supports within content instruction—positioning language development as something that occurs through meaningful participation in STEM learning rather than as a prerequisite for engagement, and as a complement to, not a replacement for, dedicated English Language Development services. Across both STEM Foundations and Storytime Inventing lessons, students develop language through hands-on exploration, observation, collaboration, and reflection.

> Lessons follow a consistent, predictable structure and include intentional teacher modeling of both language and actions, helping reduce cognitive load and clarify expectations for multilingual learners. Through activity guides, students engage with concrete materials, repeated instructional language, and purposeful talk tied directly to actions and objects, allowing them to demonstrate understanding through building, modeling, pointing, and brief verbal responses.

Slide companions and teacher lesson plans further scaffold learning by breaking tasks into focused steps, visually reinforcing vocabulary and example builds, and providing sentence stems, shared discussion expectations, and structured opportunities for peer interaction. Together, these embedded supports align with WIDA's emphasis on multimodal communication and collaborative learning, creating environments in which multilingual learners can actively participate in engineering practices while developing academic language in authentic, developmentally appropriate ways.

Grade-Level Alignment to National and Early Learning Standards

This section is divided into three grade-level groups: Pre-K, Kindergarten, and 1st Grade.
Each is organized into two complementary learning strands:

- **STEM Foundations –** Core engineering and inquiry-based lessons emphasizing STEM foundational fluencies, basic engineering concepts, mathematics, and problem-solving.
- **Storytime Inventing –** Literacy-integrated STEM experiences that connect reading comprehension with creative engineering design challenges.

The following charts show how national and early learning standards apply across the program strands. Educators can use them to:

- Understand the academic and developmental expectations addressed in each program strand.
- Connect classroom experiences to national and early learning standards.
- Support intentional planning, assessment, and documentation of student progress in STEM learning.

Pre-K

Program Strand	Framework	Standard Code	Full Text of Standard
STEM Foundations	Head Start (ELOF)	P-MATH 1	Child knows number names and the count sequence.
		P-MATH 2	Child recognizes the number of objects in a small set.
		P-MATH 3	Child understands the relationship between numbers and quantities.
		P-MATH 7	Child understands simple patterns.
		P-MATH 8	Child measures objects by their various attributes using standard and non-standard measurement. Uses differences in attributes to make comparisons.
		P-MATH 9	Child identifies, describes, compares, and composes shapes.
		P-MATH 10	Child explores the positions of objects in space.
		P-SCI 1	Child observes and describes observable phenomena (objects, materials, organisms, and events).
		P-SCI 4	Child asks a question, gathers information, and makes predictions.
		P-SCI 5	Child plans and conducts investigations and experiments.
		P-SCI 6	Child analyzes results, draws conclusions, and communicates results.
		P-LC 1	Child attends to communication and language from others.
		P-LC 4	Child understands, follows, and uses appropriate social and conversational rules.
		P-LC 6	Child understands and uses a wide variety of words for a variety of purposes.
Storytime Inventing	Head Start (ELOF)	P-LIT 1	Child demonstrates awareness that spoken language is composed of smaller segments of sound.
		P-LIT 3	Child identifies letters of the alphabet and produces correct sounds associated with letters.
		P-LIT 5	Child asks and answers questions about a book that was read aloud.
		P-LIT 6	Child understands and uses a wide variety of words for a variety of purposes.
		P-SCI 2	Child engages in scientific talk.
		P-SCI 4	Child asks a question, gathers information, and makes predictions.
		P-SCI 5	Child plans and conducts investigations and experiments.
		P-SCI 6	Child analyzes results, draws conclusions, and communicates results.

Kindergarten

Program Strand	Framework	Standard Code	Full Text of Standard
STEM Foundations	NGSS	K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
		K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
		K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
		K-PS2-1	Plan and conduct an investigation to compare the effects of different strengths or directions of pushes and pulls on the motion of an object.
		K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
	ISTE	1.4 Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.
		1.6 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.
	CCSS	SL.K. 1	Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
		SL.K. 3	Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
		SL.K. 4	Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
		SL.K. 6	Speak audibly and express thoughts, feelings, and ideas clearly.
		OA.A.K.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.
		OA.A.K.2	Plan and conduct an investigation to compare the effects of different strengths or directions of pushes and pulls on the motion of an object.
		CC.B.K.4	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
		CC.B.K.5	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
Storytime Inventing	NGSS	K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
		K-PS3-2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight in an area.

Kindergarten (Continued)

Program Strand	Framework	Standard Code	Full Text of Standard
Storytime Inventing	ISTE	1.4 Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.
	CCSS	SL.K.1	Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
		RF.K.2	Demonstrate understanding of spoken words, syllables, and sounds (phonemes).
		RF.K.3	Know and apply grade-level phonics and word analysis skills in decoding words.
		L.K.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on kindergarten reading and content.

1st Grade

Program Strand	Framework	Standard Code	Full Text of Standard
STEM Foundations	NGSS	K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
		K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
		K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
		K-PS2-1	Plan and conduct an investigation to compare the effects of different strengths or directions of pushes and pulls on the motion of an object.
		K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
	ISTE	1.4 Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.
	CCSS	SL.1.1	Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
		1.MD.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
		1.MD.A.2	Express the length of an object as a whole number of length units by laying multiple copies of a shorter object end to end.
		1.G.A.2	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

1st Grade (Continued)

Program Strand	Framework	Standard Code	Full Text of Standard
Storytime Inventing	NGSS	K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
		1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
		1-LS1-1	Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
	ISTE	1.4 Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.
	CCSS	RF.1.2	Demonstrate understanding of spoken words, syllables, and sounds (phonemes).
		RF.1.3	Know and apply grade-level phonics and word analysis skills in decoding words.
		L.1.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content.
		SL.1.1	Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

Appendix: Framework Reference Key

- **Head Start ELOF (2015, updated 2022) –** U.S. Department of Health and Human Services, Office of Head Start
- **NGSS (2013) –** Next Generation Science Standards, Lead States
- **ISTE (2016) –** International Society for Technology in Education, Standards for Students
- **CCSS (2010) –** Common Core State Standards for English Language Arts and Mathematics (NGA/CCSSO)
- **CASEL (2020) –** Collaborative for Academic, Social, and Emotional Learning, CASEL Framework for SEL
- **UDL Guidelines v3.0 (2023) –** CAST: Center for Applied Special Technology
- **National Reading Panel Report (2000) –** National Institute of Child Health and Human Development