Sioux City Community Schools

believe... achieve... succeed






Blueprint for the State

Loess Hills Computer Programming Specialty School

The Blueprint for the State serves as guide for schools as they embark upon a journey that transforms the delivery of instruction. *The Blueprint* chronicles the Sioux City's Loess Hills Elementary School's journey resulting in one of the country's first computer programming elementary schools.

Computer Science is a broad field. At Loess Hills, a computer programming focus provided a foundation. Over time, student learning expanded into other facets of computer science, beyond computer programming.

The Blueprint for the State contains:

- **Loess Hill's Computer Programming Specialty School Plan**

  The essential components for implementation contained in the specialty school plan provide a guide as schools begin planning for a school transformation.

- **Scope and Sequence**

  Teachers developed a scope and sequence for computer programming concepts and skills for grades kindergarten through 5th grade. The scope and sequence covers one school year. Computer programming skills and concepts weave throughout instruction and enhance Iowa Core standards.

- **Implementation Rubric**

  After converting into a computer programming school, the implementation rubric provides logical next steps for development to reach exemplary status.

- **Timeline**

  The timeline provides the steps taken in chronological order at Loess Hills.

Steps included in *The Blueprint for the State* cause Loess Hills Elementary School students to be equipped with 21st century skills. Classrooms center teaching around the Iowa Core standards and incorporate collaboration, creativity, critical thinking, and problem solving into instruction with a concentrated focus on computer programming. This forward thinking model has helped us raise proficiency rates on the Iowa Assessments showing increases in math this year of 4.8% and reading .77%. Fall Curriculum-Based Measurements for Reading (CBM-R) show an increase from 2015-2017 of 12%. In 2017-18, Loess Hills Elementary students in grades Kindergarten through 5 increased scores on the CBM-R from fall to spring by 9%.

Not only have instruction and student achievement been impacted, but enrollment has been impacted also. Comparing the initial year, 2014, to the 2018 enrollment shows an increase of 93 students. While the students identified as white remain at 42% and Asian at 11%, there has been an increase in populations of students identified as American Indian, Black or African American, and two or more races. Attendance at parental involvement activities involving computer programming shows an increase each year.

Finally, as our students advance to middle school, they are better skilled at computer programming and can advance to higher levels as they enroll in computer programming classes offered at the middle school, high school and career academy program.

Loess Hills Elementary School

Computer Programming Specialty School Plan

For the Sioux City Community School District

John Beeck, Principal

April 2018

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Introduction

Loess Hills Elementary Computer Programming School views technology proficiency as a gateway to the future. By teaching students core subject material infused with technology tools and concepts, we believe we are preparing our students to be productive citizens in an ever-increasing technological world. The faculty incorporates interdisciplinary teaching and daily technology instruction emphasizing programming (the process of writing and maintaining the source code of a computer), offering children opportunities to develop creativity, analytical thinking, and problem-solving. Students master the Iowa Core standards in a collaborative, multi-disciplined approach, with technology continuously woven into every aspect of a child's learning.

The purposes of Sioux City Community School District's Specialty Schools are to enhance student learning, narrow the achievement gap, and give parents more choices in their child's educational experience. Specialty schools strategically placed within the District reduce, eliminate, or prevent the racial, ethnic, or economic isolation of public school students while offering a high-quality curriculum that supports educational improvement. Loess Hills Elementary Computer Programming School provides an exceptional learning opportunity for students of the Sioux City Community School District.

Educational Goals

Students attending Loess Hills Elementary Computer Programming School receive rigorous core instruction and experience education in three ways:

- Programming integration: Bring together programming with traditional classroom objectives to create hands-on, experiential, connected and meaningful learning experiences to enhance the mastery of math and language arts Iowa Core standards.
- Production: Produce products that demonstrate foundational skills to be used in future education and employment.
- Dedicated programming and coding education: Develop an understanding and comfort in logic, reasoning, problem-solving, and programming tools.

Learning Objectives & Strategies

1. Create an exceptional educational environment that inspires students.
    a. Students will have an opportunity to understand how video games, applications and computer software are produced.

2. Improve reading and math by augmenting traditional instruction with computer programming's best practices.
    a. Students will master Iowa Core standards through the careful and intentional integration of innovative coding tools and practices.
    b. Curriculum lessons will incorporate hands-on learning experiences.
    c. Computer programming and coding will be included in curriculum planning and design.
    d. Students will master computer programming skills, such as understanding instructions (the programs control structure and how it works), the data (data types and objects involving attributes) and syntax (rules that decide how a program is constructed) that are part of programming.
3. Inspire and develop students' interest in pursuing computer programming career fields, especially those related to computer science.
    a. Expose students to career opportunities of the future involving elements of computer programming and coding.
    b. Demonstrate how basic knowledge of programming applies in real-world situations.
4. Incorporate computer programming into math and English language arts Iowa Core standards.
    a. Each grade level will have an end of year project to demonstrate computer programming/coding skills.

Implementation Steps

To become a specialty school, critical implementation steps taken include creation of vision & design, curriculum, marketing & recruitment plan, budget plan, timeline, policies, professional development plan, monitoring and evaluation plan.

School Vision and Design

1. Mission and Vision

    Mission:
    Loess Hills Elementary Computer Programming School incorporates computer programming to support students' belief in their capabilities, achievement in academics, and success in preparing for college and career.

    Vision:
    Every student at Loess Hills Elementary Computer Programming School learns foundational computer programming skills as they master Iowa

Core standards to prepare them for future career and college opportunities linked to computer programming.

2. Goals

a) Utilize computer programming fundamentals in an organized scope and sequence across all subject matters.
b) Support students in practicing critical thinking, communication, collaboration, and creativity.
c) Increase student and faculty transfers into Loess Hills Elementary Computer Programming School.
d) Develop interests and talents of students using technology tools and software.

3. Alignment to Priority Areas Contained in the District's Strategic Plan

a) Student Achievement

Student achievement is the top priority of the Loess Hills Elementary Computer Programming School. English language arts and math achievement will improve through the layering of interdisciplinary instruction connected with computer programming. Interventions will continue to be implemented and monitored to ensure optimal student achievement. The work of professional learning communities will focus on student achievement with an emphasis on enriching our students' learning through computer programming.

b) Educational Facilities

Loess Hills Elementary Computer Programming School is a new facility opened in 2014 and updated with the latest technological tools and software programs to build student computer programming skills. We utilize our current building and through creative scheduling and collaboration with staff, use all available resources to fulfill the mission and goals of the school.

c) Human Resources

District staff from Emerson and Roosevelt Elementary Schools are the staff of Loess Hills Elementary School. When we have an open position, we recruit, hire, develop, support, and retain the most qualified, diverse, and culturally competent staff to support the academic achievement and

advancement of all students. We support staff as they embrace the new culture and strengthen relationships. As Loess Hills has openings, we attract highly qualified teachers with a passion for technology.

d) Community Engagement

Establishing partnerships with internal and external audiences, engaging the community in the opportunities available, and serving as ambassadors for the diverse experiences provided for our students occur. We contribute to the retention of District students and attract additional families from within our neighborhood, District, and the greater community by promoting the unique opportunity at Loess Hills Elementary Computer Programming School.

e) Fiscal Accountability

Loess Hills Elementary Computer Programming School follows the District's budget process that ensures effective and efficient utilization of financial resources to enable staff to focus on academic success. We apply for available grant dollars and utilize community resources including Title I in order to protect District funding.

Programming Curriculum

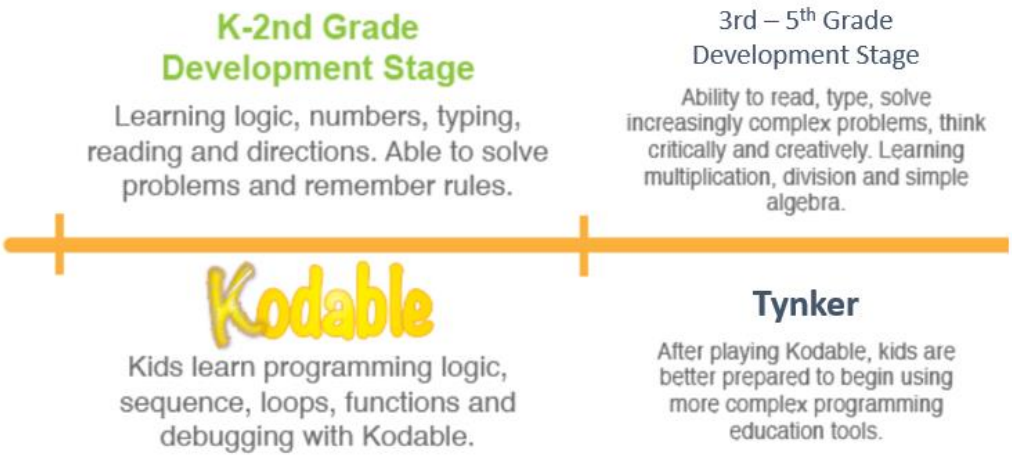
The Sioux City Community School District engages teachers in curriculum development. One common curriculum is adopted by the School Board and used by all buildings, grade levels and teachers. Loess Hills Elementary Computer Programming School uses the Sioux City Community School District's elementary scope and sequence. Enough flexibility in the curriculum allows Loess Hills Elementary Computer Programming School to infuse computer programming into core instruction. Currently, there is not one single "off the shelf" curriculum that supports computer programming integrated across the curriculum.

In order to realize the bold vision for the Loess Hills Elementary Computer Programming School and District, staff members created their own vision for the curriculum. The approach used to develop the cutting-edge curriculum for Loess Hills Elementary Computer Programming School created a genuinely unique curriculum in the area and perhaps first of its kind across the nation.

The initial curriculum revision effort to incorporate computer programming into District curriculum to fit the vision of Loess Hills Elementary Computer Programming School began in the summer of 2014. During that time, a small group of building leaders and technology

coaches worked to develop the scope and sequence of computer programming integration within the existing scope and sequence of the core content. Team members worked on defining and selecting the best-in-class tools that would allow for integration into core content areas and the ability to facilitate projects.

The graphic below highlights an overview of what was developed.



Kindergarten through 2nd-grade students use Kodable. Students in grades 2nd – 5th use Tynker.

During the summer of 2014, the Loess Hills Coding Leadership Team, a core group of classroom teachers from each K-5 grade level, explored tools and curriculum integration approaches. Curriculum maps and pacing guides developed included touch points and activities. The 2014-2015 school year was a year that the core group of teachers experimented, learned and refined the curriculum guide, instructional plans, and scope and sequence. By working closely throughout the year, the core group of teachers determined the most effective approaches and refined the curriculum.

The core group of classroom teachers focused instructional plans on the following configuration:

- Level 1: Kindergarten and 1st grade
- Level 2: 2nd and 3rd grade
- Level 3: 4th and 5th grade

Each level has a blend of online, self-guided and self-paced tutorials with "unplugged" activities which are lessons that teach computing concepts without a computer. Each level consists of about 20 lessons that may be implemented as one contiguous unit or one lesson a week for a semester. Each lesson can be implemented in about 45-50 minutes.

During the 2014-2015 school year, the core group of classroom teachers planned building-wide professional development for all teachers for the summer of 2015.

Another resource, “code.org,” was leveraged through this process as an elementary specific curriculum created and released over that summer which included lessons for all K-5 grade levels.

During the summers of 2016 and 2017, the Loess Hills Elementary Computer Programming School teachers met to continue refining and developing a vertical alignment of programming projects and activities within the curriculum for each grade level based upon quarterly expectations.

During the summers, the Loess Hills Computer Programming Leadership Team meets to evaluate, refine, enhance and update expectations for each grade level’s programming curriculum and vertical alignment projects and activities.

Student Composition, Services and Policies

A. School Demographics

1. Enrollment

Loess Hills Elementary Computer Programming School serves students in grades K-5. We project annually serving 575-650 students. This number is flexible due to the mobility of Loess Hills’s student population, which is 14%, and the District’s transfer policy. Grade distribution structure:

- Kindergarten – 5 sections of 20 students
- First Grade – 5 sections of 20 students
- Second Grade – 5 sections of 20 students
- Third Grade – 4 sections of 25 students
- Fourth Grade – 4 sections of 25 students
- Fifth Grade – 4 sections of 25 students

2. Diversity

Loess Hills Elementary Computer Programming School attracts some affluent families from the neighborhood and community. The 2016-2017 student demographics consisted of:

- Black/African American 7%
- Native American 5%
- Asian American 2%
- White 42%

- Hawaiian/Pacific Islander NA
- Multi-racial 8%
- Hispanic 35%
- Male 52%
- Female 48%
- Free/Reduced Lunch 72%
- Special Education Program 10%
- ELL 18%

B. Policies

1. Transfers

Parents, guardians and/or legal custodians of District students may request a transfer for their child(ren) to a different attendance center for one of the reasons listed in Board policy 501.8. Transfers may be granted only if classroom space is available at the attendance center for which the transfer is requested. If space is available, within-District transfers may be granted only as outlined in the Administrative Regulation (AR) 501.8 of the Sioux City Community School District. Loess Hills Elementary Computer Programming School allows and welcomes transfers. In 2013-14, the combined transfers into the elementary schools that in 2014-15 created Loess Hills was 27. Upon opening, Loess Hills had 57 transfers into the new building. Each year since the initial opening of the building, there has been a greater number of student transfers into Loess Hills with the highest number of transfers being 111.

2. Mid-Year Entries

Loess Hills Elementary Computer Programming School continues to serve the neighborhood in which it is located. The population is highly mobile, and we accept mid-year entries into our school.

3. Student Discipline

Loess Hills Elementary Computer Programming School commits to develop students of character through the PBIS program. Our PBIS acronym is PAWS: Personal Best, Act Responsibly and Respectfully, Work and Play Safely, and Show Integrity. Loess Hills staff strive to consistently employ the following strategies: teach desired behavior, model desired behavior, practice and reinforce positive behavior. PBIS focuses on

rewarding positive/appropriate behavior throughout the year. We track inappropriate behavior and analyze data to determine problem areas or times in the environment that may need particular attention.

Student discipline is addressed by following the established Sioux City Community School District Code of Conduct, Board policy and Loess Hills Elementary Computer Programming School rules and behavior expectations.

Special Needs Populations

A. English Language Learners

Loess Hills Elementary Computer Programming School believes that second language learners benefit from immersion in an English-speaking classroom. The teaching staff employs English language instruction strategies wherever possible into the regular classroom program. Peers model classroom practices and support students in their assignments while teachers include English language mini-lessons as appropriate. Highly qualified and certified ESL teachers provide small group ESL instruction. An ESL paraeducator is also available to support students. As much as possible, ESL instruction and support will occur in the regular classroom to prevent pullouts from the regular classroom program. A computer programming focus benefits students learning English as it provides a way in which second language learners make connections through coding, which is a universal language.

B. Special Education Students

Loess Hills Elementary Computer Programming School follows all federal mandates regarding special education. The State of Iowa Multi-Tiered System of Support is used, as well as supports provided to students receiving special education services as indicated in their Individualized Education Plan. In circumstances where there is a referral for a special education evaluation, the support assigned to Loess Hills Elementary Computer Programming School by Northwest Area Education Agency provides evaluation services to determine if the child has any special education needs. Appropriate services are available to the student if the team determines that special education services are needed. Loess Hills

Elementary Computer Programming School serves students receiving resource and behavioral level support through three full-time special education teachers.

C. Students With Physical Disabilities

Students with physical disabilities restricting them to a handicapped accessible school will be able to attend our facility, as our school is handicapped accessible.

D. Non-Proficient Students

Loess Hills Elementary Computer Programming School implements the State of Iowa Multi-Tiered System of Support for students who are not proficient. We utilize small group, skills-based instruction during a 90-minute literacy block, an intervention model supporting student literacy needs, tutoring before and after school, and summer school.

Budget Plan

The budget for Loess Hills Elementary Computer Programming School includes professional development costs, curriculum costs, and advertising costs.

Specialty School Budget	Year 1	Year 2	Year 3
	Expenses	Expenses	Expenses
Vision and Mission Statement	$0	$0	$0
Professional Development	$10,000- 7 teachers	$40,000-all teachers	$5,000
Curriculum	$10,000	$2,000	$2,000
Advertising	$0	$0	$0
Totals	$20,000	$42,000	$7,000

Teaching Staff Commitment Survey

Loess Hills' Building Leadership Team built consensus and commitment among our staff for the integration of computer programming into instruction. Support for the change was built through conversations and training during professional learning community meetings and professional development sessions. A school-wide vote of Loess Hills Elementary School faculty administered during the 2014-15 school year showed 85% support for the specialty school concept.

Professional Development Plan

A. Ongoing, high-quality professional development and the development of strong community partnerships are necessary for the Loess Hills Elementary Computer Programming School to maintain its unique identity while continuing to grow and change as shifts in the educational landscape take place. Staff participates in District-wide professional development activities. Building leadership team (BLT) members and District technology support personnel are responsible for the planning and implementation of building-based professional development. The BLT and District technology experts design and implement programs that help staff members gain specific knowledge and skills needed to implement a computer programming curriculum. Loess Hills utilizes already available Title I allocations and professional development time to conduct our own professional development.

B. Eight staff members attended the state "One to One" Conference in Des Moines in April 2014 to gain insight of new technology projects which could be replicated at Loess Hills as part of our programming curriculum.

C. During summer 2014, the District technology department trained one teacher from each grade level on computer programming basics and web page development. These teachers began developing a plan to infuse computer programming into the existing math and reading curriculum maps and pilot these initial ideas during the 2014 – 2015 school year.

D. During the summers of 2015, 2016 and 2017, the Loess Hills Elementary Computer Programming School teachers met and continued refining the curriculum and developed a vertical alignment of programming projects and activities for each grade level based upon quarterly expectations.

E. During the summer of 2018, Loess Hills Elementary Computer Programming School teachers reviewed current curriculum plans and vertical alignment of computer programming projects integrated within the Iowa Core subject areas, and learned how to use new hardware and software programs.

Monitoring and Evaluation Plan

Loess Hills Elementary Computer Programming School continues to follow the professional development planning process established by the Sioux City Community School District. We report all student data required and administer assessments required by the State of Iowa and the Sioux City Community School District. Student achievement is monitored through the careful analysis of formative and summative data.

A. Data
   1. Student Achievement
      a) Iowa Assessment
      b) District Quarterly Assessments

c) FAST
d) ELPA 21
e) Common Formative Assessments
f) Daily Formative Assessments

2. Parent Involvement
   a) Back to School Night
   b) Family Literacy and Math Events
   c) Parent-Teacher Conferences
   d) Field Trips
   e) Parent Group
   f) Volunteering in the Classrooms
   g) Parent Surveys

3. Student Attendance
   a) Monthly Student Recognition
   b) Family Recognition
   c) Attendance Hearings
   d) Family Support

4. Teacher
   a) Walkthroughs
   b) Implementation of Strategies
   c) Staff Surveys
   d) Observation

Evaluation of this plan will occur through our regular process of reviewing data as a BLT and staff. Additional data may be necessary in order to evaluate the effectiveness of our program.

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Computer Programming** Grade: **Kindergarten**

Coding Concept/Skill: **Sequence**

CSTA Computer Science Standards: 1A-AP-11: Decompse (break down) the steps needed to solve a problem into a precise sequence of instructions. 1A-AP-12: Develop plans that describe a program's sequence of events, goals, and expected outcomes. 1A-AP-14: Debug (identify and fix) errors in an algorithm or program that includes sequences and single loops. 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Weeks 1-9	Programming language: forward, spin, jump. Background knowledge	steps, choices, iterative process. (1A-AP-15)	describe, choices (1A-AP-15)	Unplugged activity: using programming language, move teacher from point A to point B. Independent practice: lesson 1,2,3 roll.	Kodable curriculum
Weeks 1-9	Write code using commands	steps, sequence and problem (1A-AP-11)	deompose, solve (1A-AP-11)	Students will show a written code for their partner to navigate the obstacle course. Independent practice: lesson Alien Algorithms	Kodable curriculum
weeks 1-9	Test and debug code	algorithm (1A-AP-14)	fix, identify, debug(1A-AP-14)	Students will use worksheet to draw commands. Show how to debug. Whole group Kodable lesson on projector. Independent practice: Off and Rolling	Fuzz Family Fever worksheet
weeks 9-18	Identify bugs in code	errors, algorithm, sequences (1A-AP-14)	fix, identify, debug(1A-AP-14)	Given worksheet, students will analyze and select the fuzz with correct line of code. Independent practice: Fuzzy Fun	Fuzz Family Face Off
weeks 9-18	Create, solve programming problem	sequence, plan, program, events, goals, outcomes (1A-AP-12)	develop, describe (1A-AP-12)	Design own maze using skills learned.	Fuzz Family Maze maker

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject**: Math** Grade: **1**

Unit: **Quarter 1**

Coding Concept/Skill: **Conditions**

CSTA Computer Science Standards: 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1B-AP-10: Create programs that include sequences, events, loops, conditionals.

Iowa Core Standard(s): 1.NBT.B.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Weeks Planned for Unit:	**"Learning Progressions" Instructional Sequence**	**"Unwrapped" Concepts Specific to Each Learning Activity**	**"Unwrapped" Skills Specific to Each Learning Activity**	**Computer Programming**	**Resources**
Week 1-2	Sequence, directional words	programs, sequences, loops, condition of events, (1A-AP-10) terminology, steps, choices, program development, iterative process (1A-AP-15)	create programs, (1A-AP-10) describe (1A-AP-15)	Introduce conditions through a discussion about rules and when it is okay to break the rules. Introduce "if-then" statements. Explain/model that color tiles represent conditions in Kodable. Use conditions to get the Fuzz through the maze	Kodable Conditions 1: Introduction
Week 3-4				Practice "if-then" statements by playing Rock-Paper-Scissors. Use conditions to get the Fuzz through the maze	Kodable Conditions 2: Conditional Statements

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Week 5-6	sequence, directional words	programs, sequences, loops, condition of events, (1A-AP-10) terminology, steps, choices, program development, iterative process (1A-AP-15)	create programs, (1A-AP-10) describe (1A-AP-15)	Match conditions and rules that correspond. Students will identify conditions and strategize next steps. Use conditions to program Fuzz through the maze	Kodable Conditions 3: Rules Apply
Week 7-8				Play Simon Says using "if-then" statements. Use conditions to program the Fuzz through the maze	Kodable Conditions 4: Exception to the Rule
Week 9-10	follow two-step directions, identifying numbers			Unplugged activity: Students use conditional statements to play a game using deck of cards	code.org course 2: unplugged lesson 12
Week 11	coding blocks			use conditions to complete the puzzles	code.org puzzles Lesson 13
Week 12	tens and ones, identify numbers to 100, if-then statements	two-digit numbers, tens and ones digits, symbols (1.NBT.B.3)	compare, record (1.NBT.B.3)	Students will use "if-then" statements to determine if they should look at tens or ones place when comparing numbers. (IF number in tens place is same, THEN look at the digit in the ones place.)	

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Foundational Reading** Grade**: 1**

Unit: **Quarter 2**

Coding Concept/Skill: **Looping**

CSTA Computer Science Standard(s): 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1B-AP-10: Create programs that include sequences, events, loops, conditionals.

Iowa Core Standard(s): 1.RF.3g: Read with sufficient accuracy and fluency to support comprehension. 1.RF.4: Recognize and read grade-appropriate irregularly spelled words.

Weeks Planned for Unit:	**"Learning Progressions" Instructional Sequence**	**"Unwrapped" Concepts Specific to Each Learning Activity**	**"Unwrapped" Skills Specific to Each Learning Activity**	**Computer Programming**	**Resources**
Weeks 1-2	Patterns, sequence, conditions	programs, sequences, events, loops, conditionals, (1B-AP-10) terminology, steps, choices, program development, iterative process (1A-AP-15)	create programs (1B-AP-10) describe (1A-AP-15)	Create a dance with repetitive moves to learn about loops. Use loops to get the Fuzz through the maze	Kodable Loops 1: Introduction
Weeks 3-4	Patterns, sequence, conditions			Use loops to simplify moves through a hopscotch course. Use loops to get the Fuzz through the mazes	Kodable Loops 2: Algorithm on Repeat
Weeks 5-6	Patterns, sequence, conditions			Students create and loop a real-life algorithm to make "sandwiches." Use loops to get the Fuzz through the maze	Kodable Loops 3: Lunch for 4

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Weeks 7-8	Block coding, sequence, patterns			Students use repeat blocks to program the robots to create loops	Dot and Dash 3.1-3.2 Loops
Weeks 9-10	Sight words	irregularly-spelled words (1.RF.3g) accuracy, fluency, comprehension (1.RF.4)	recognize, read (1.RF.3g)(1.RF.4)	Students program robot using loops to drive along sentence strip of sight words and return to start position. Students "race" the robot and try to read the words faster than the robot	Dot and Dash, sight words on sentence strips
Week 11	Patterns, block coding	programs, sequences, events, loops, conditional, (1B-AP-10) terminology, steps, choices, program development, iterative process (1A-AP-15)	create programs (1B-AP-10) describe (1A-AP-15)	Students use loops to complete the puzzles	Code.org course 1: Stage 13
Week 12					Code.org Course 1: Stage 14

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Math & Foundational Reading** Grade: **1**

Unit: **Quarter 3 & 4**

Coding Concept/Skill: **Sequence**

CSTA Computer Science Standards: 1A-AP-10: Develop programs with sequences and simple loop, to express ideas or address a problem. IA-AP-14: Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. 1A-AP-14: Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

Iowa Core Standard(s): 1.OA.A: Represent and solve problems involving addition and subtraction. 1.OA.C: Add and subtract within 20. RF1.3: Know and apply grade level phonics and word analysis skills in decoding words. RF 1.2b: Orally produce single-syllable words by blending sounds (phonemes).

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programing	Resources
Week 1	Directional words	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Use arrows to program the Fuzz to get through the maze	Kodable: Sequence 1:Introduction. Ipads
Week 2	Programmer, sequence	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Use arrows to program the Fuzz to get through the maze	Kodable: Sequence 2:Introduction. Ipads

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Week 3	Sequence, algorithm	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Debug the written code to get the Fuzz through the maze	Kodable: Sequence 3:Introduction. Ipads
Week 4	Sequence, algorithm	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Debug the written code to get the Fuzz through the maze	Kodable: Sequence 4:Introduction. Ipads
Week 5	Sequence, algorithm, bug, debug	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Debug the written code to get the Fuzz through the maze	Kodable: Sequence 5:Introduction. Ipads
Week 6	Coding arrows, directional words,	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Introduce and explore Bee bots	Bee bots, arrow cards

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Week 7	Identify letters and sounds	Grade-level phonics, word analysis skills, (RF1.3) single syllable words, sounds (RF1.2b) programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	know, apply, decoding (RF1.3) Orally produce, blending (RF1.2b) develop programs, express ideas, address a problem (1A-AP-10)debug (1A-AP-14) decompose (1A-AP-11)	Choose a picture card, identify beginning sound.Use arrow cards to create the code. Use code program Bee bots to corresponding letter	Bee bots, arrow cards, abc mats
	Blend sounds to read words			Choose CVC card. Blend sounds to read word. Use arrow cards to create the code. Use code program Bee bots to correct picture	Bee bots, arrow cards, CVC picture mat
Week 8	Numbers to 20	Addition, subtraction (1.OA.C) programs, sequences, loops ideas, problem (1A-AP-10) errors, algorithm, program, sequences, (1A-AP-14)steps, problem, sequence of instructions (1A-AP-11)	represent, solve (1.OA.C) add, subtract(1.OA.C) develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Using an addition/subtraction card. Solve equation. Use arrow cards to create code. Use code, program Bee bots to correct number	bee bots, arrow cards, number mat
Week 10	Sequence, algorithm	Programs, sequences, loops, ideas, problem (1A-AP-10) errors, algorithm, program, sequences (1A-AP-14) steps, problem, sequence of instructions (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) debug (1A-AP-14) decompose (1A-AP-11)	Students will work independently or with a partner using coding blocks to code Awbie on an adventure	Osmo coding with Awbie

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ACCOMPANYING DETAILS

Subject: **Computer Programming/Writing** Grade: **2**

Unit: **Quarter 1**

Coding Concept/Skill: **Sequencing**

CSTA Computer Science Standard(s): 1A-AP-10: Develop programs with sequences and simple loops, to express ideas or address a problem.
1A-AP-11: Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
1A-AP-14: Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

Iowa Core Standard(s): W.2.3: Write narratives in which they recount a well elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order and provide a sense of closure.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Week 1	Directional/sequential terms, coding vocabulary: walk, turn right, turn left, etc., carpet square equals one block	sequences, simple loops, ideas, problem (1A-AP-10) steps, sequence of instruction (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) decompose the steps (1A-AP-11)	Unplugged lesson (coding lesson without the use of technology)- students will use the terms walk, turn right, turn left, and sit to program the teacher to walk a path around the classroom and sit in a chair	Code.org, Course B, unplugged lesson 1
Week 2				Unplugged lesson- students will use the terms walk, turn right, turn left, and sit to program a peer partner to walk a (different) path around the classroom and sit in a chair	

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Week 3	Log in, user name, password, reading simple directions, Tynker vocabulary (block coding, my lessons, program, programmers, command, rotate, sequence)	sequences, simple loops, ideas, problem (1A-AP-10) steps, sequence of instruction (1A-AP-11)	develop programs, express ideas, address a problem (1A-AP-10) decompose the steps (1A-AP-11)	Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lessons "Connect Code Blocks", activities 1-4, on their computers with teacher assistance	Tynker Programming 1a, Teacher Guide in Tynker
Week 4				Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lesson "Follow the Path", activities 1-4 on their computers with teacher assistance if needed	
Week 5				Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lesson "Sequencing", activities 1-4 on their computers with peer assistance if needed	
Week 6	Sequential words (first, next, then, etc.), knowledge of simple everyday tasks	narratives, event, sequence, details, actions, thoughts, feelings, temporal words, event order, sense of closure (10.2.3)	write, recount, describe, use (W.2.3)	Pre-writing actviity- brainstorm simple every day tasks (brushing teeth, putting on shoes, etc.), create list on board, have students tell sequence of washing hands, emphasize the importance of step by step details just like when coding-- choose topic to write about and write topic on graphic organizer	graphic organizer, Journeys

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					Journeys materials
Week 7	Sequential words (first, next, then, etc.), correct sentence structure and grammar	narratives, event, sequence, details, actions, thoughts, feelings, temporal words, event order, sense of closure (10.2.3)	write, recount, describe, use (W.2.3)	Pre-writing- list sequential words, use graphic organizer to plan and write step by step instructions	
Week 8	Correct paragraph writing expectations, knowledge of writing process (revise, edit, publish)	narratives, event, sequence, details, actions, thoughts, feelings, temporal words, event order, sense of closure (W.2.3)	write, recount, describe, use (W.2.3)	Write paragraph using information from graphic organizer, revise and edit for correct paragraph expectations	graphic organizer, Journeys materials
Week 9	Debugging, sequential order	errors, algorithm, program, sequences, simple loops (IA-AP-14)	debug (identify and fix) (IA-AP-14)	Students complete a sequencing activity/game	Code.org, Course C, lesson 3

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ACCOMPANYING DETAILS

Subject: **Computer Programming/ Math** Grade: **2**

Unit: **Quarter 2**

Coding Concept/Skill: **Looping**

CSTA Computer Science Standard(s): 1A-AP-10: Develop programs with sequences and simple loops, to express ideas or address a problem. 1A-AP-14: Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

Iowa Core Standard(s): 2.NBT.5: Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Week 1	Vocabulary words: sequence, character, map, repeats	sequences, simple loops (IA-AP-10) algorithm, program (IA-AP-14)	develop programs, express ideas, address a problem (IA-AP-10) debug (identify and fix) errors (IA-AP-14)	Unplugged lesson- students will draw code to get one character across a map to the other side using arrows; students will then use the same code to identify where repeats can be used	Code.org, Course A, unplugged lesson 9
Week 2	Vocabulary words: pattern, loop, counting loops			Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lessons "Recognize the Pattern", activities 1-5, on their computers with teacher assistance	Tynker Programming 1a, Teacher Guide from Tynker

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Week 3	Vocabulary words: pattern, loop, counting loops	sequences, simple loops (IA-AP-10) algorithm, program (IA-AP-14)	develop programs, express ideas, address a problem (IA-AP-10) debug (identify and fix) errors (IA-AP-14)	Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lessons "Connect Code Blocks", activities 5-6, on their computers with teacher assistance if needed	Tynker Programming 1a, Teacher Guide from Tynker
Week 4				Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lessons "Sequencing", activities 5-6, on their computers with peer assistance if needed	
Week 5				Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Students will complete Tynker lessons "Follow the Path", activities 5-6, on their computers with peer assistance if needed	
Week 6	Prior knowledge of reviewed computer programming topics			Students will complete a loop review activity/game	Code.org, Course C, lesson 8
Week 7				Students will complete a loop review activity/game	Code.org, Course C, lesson 10

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Week 8	2 digit addition process, place value, number sense	strategies, place value, properties of operation, addition, relationship	add within 100, use place value strategies	Students will connect coding to addition process. They will make a connection from looping to adding in the ones place and then the tens place until the task is complete	Math Worksheet

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Subject: **Computer Programming/Reading/Math** Grade: **2**

Unit**: Quarter 3**

Coding Concept/Skill: **Conditionals**

CSTA Computer Science Standard(s): 1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes.

Iowa Core Standard(s): 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 2.RI.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (3.RI.3 ...that pertains to time, sequence, and cause/effect).

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Comuter Programming	Resources
Week 1	Review of repeat and loops; new coding vocabulary: repeat until, condition, conditional statement, if/then, true/false	sequence of events, goals, expected outcomes (1A-AP-12)	develop plans, describe a program (IA-AP-12)	Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Classs will create and complete an "if/then" graphic organizer	Tynker programming 1b, Teacher Guide from Tynker
Week 2				Teacher will introduce "repeat until" code block. Students will complete Tynker lessons "Use Conditional Logics", activities 1-5, on their computers with teacher assistance	

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Week 3	New coding vocabulary: conditional loops	sequence of events, goals, expected outcomes (1A-AP-12)	develop plans, describe a program (IA-AP-12)	Teacher will use "Teacher Guide" in Tynker to warm up with an unplugged activity. Class will create and complete an if/then/else graphic organizer	Tynker Programming 1a, Teacher Guide from Tynker
Week 4				Students will complete Tynker lessons "Conditional Logics", activities 1-6, on their computers with teacher assistance	
Week 5				Teacher will review vocabulary words repeat, repeat until, conditions, if/then/else. Students will complete Tynker lessons "Conditional Loops", activities 1-6, on their computers with teacher assistance	
Week 6	Conditionals, Minecraft			Students will do a review activity/game for conditionals with peer assistance if needed	Code.org, Course C, lesson 15

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Week 7	2 and 3 digit subtraction process, place value, number sense	strategies, place value, properties, subraction, relationship (2.NBT.5)	subtract within 100, use place value strategies (2.NBT.5)	Students will connect coding to the subtraction math process, making a conditional block code for the math process, Example: Start in 1s place, if more on floor, then go next door (regroup), else, subtract, etc. They will create a loop (repeat until) by repeating the process until problem is finished	Whiteboard, math worksheet, block code graphic organizer
Week 8	Cause/effect comprehension strategy	series, historical events, scientific ideas or concepts, steps, technical procedures (cause and effect) (2.RI.3)	describe connections (2.RI.3)	Students will connect coding to the cause and effect comprehension strategy. They will place the cause and effect in "if/then" code blocks	Cause and Effect Graphic Organizer

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ACCOMPANYING DETAILS

Subject: **Computer Programming/Writing** Grade: **2**

Unit: **Quarter 4**

Coding Concept/Skill: **Sequences, loops, coniditionals**

CSTA Computer Science Standard(s): 1A-AP-08: Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.

Iowa Core Standard(s): W.2.2: Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Completed during writing block	Informative writing requirements and research skills	informative/explanatory texts	write, introduce a topic, use facts and definitions, develop, provide a concluding section	Students will complete their fourth quarter informative writing project. This will be researching and writing about an animal	kid friendly animal search websites, informational books, writing materials
Week 1-4	All computer programming terminology and skills	algorithms, tasks (IA-AP-08)	model, create and follow algorithms, complete tasks (1A-AP-08)	Teacher will lead students in creating an example project in Tynker. This will include how to create a "blank project", add characters, change the background, and use the talk blocks. Each student will create the same project on their individual	Tynker "create new project"

				device	
Week 5-6	Dialogue and presentation of information	informative/explanatory texts	write, introduce a topic, use facts and definitions, develop, provide a concluding section	Students will use their informational writing project to complete a graphic organizer that lays out the dialogue of their Tynker presentation	graphic organizer
Week 7-9	All computer programming terminology and skills	algorithms, tasks (IA-AP-08)	model, create and follow algorithms, complete tasks (1A-AP-08)	Students will follow the same steps as in the example project in weeks 1-4. They will use the same requirements such as adding background, character, and talk blocks. They will use their informational writing to create a dialogue based on the information they researched	Tynker "create new project", informational writing project

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Computer and coding basics** Grade: **3**

Unit: **Quarter 1**

Coding Concept/Skill**: Looping, sequencing, variables, conditionals, debugging, blocks, backpacks, characters, backgrounds, save, edit**

CSTA Computer Science Standard(s): 1B-CS-02: Model how computer hardware and software work together as a system to accomplish tasks. 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended. 1B-AP-16: Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. 1A-DA-05: Store, copy, search, retrieve, modify, and delete information using a computing device and define information stored as data. 1B-AP-12: Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
1	Prior instruction on basic of computer parts (mouse, click, select, and drag, saving files, turn on/off)	hardware, software, system, tasks (1B-CS-02)	model, work, accomplish (1B-CS-02)	Identify and describe functions of a computer program	
2	What to do when you are stuck and how to work with a partner	program, algorithm (IB-AP-15) roles, design, implementation, stages, program development (IB-AP-16)	test and debug (1B-AP-15) collaborate, review (1B-AP-16)	Teach what to do when you become stuck as well as how to work with a partner (hands-off helping)	Tynker/Scratch
3	How to research a topic safely (downloading images, folder creation, file organization)		research information, collect data	Teach how to search the internet safely using appropriate search engines	kidzsearch.com Kiddle.co

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4	Review opening and saving a projects in Tynker	information, data (IA-DA-05)	store, copy, search, retrieve, modify files (IA-DA-05)	Teach how to save projects to quickly retreive	Tynker/Scratch
5	Backpack (Tynker)			Teach how to copy and paste sections of code to retrieve at a later date	Tynker/Scratch

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Subject: **Math (Muliplication Game)** Grade: **3**

Unit: **Quarter 2 & 3**

Coding Concept/Skill: **Looping, sequencing, variables, conditionals, debugging, import background, import character, glide, go to, touch, score**

CSTA Computer Science Standard(s): 1A-AP-08: Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks. 1B-AP-10: Create programs that includes sequences, events, loops, and conditionals. 1B-AP-15: Test and debug (identify and fix errors) a program or algrithom to ensure it runs as intended. 1B-AP-11: Decompose (break down) problems into smaller manageable subproblems to facilitate the program development process. IB-AP-16: Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development IB-AP-17: Describe choices made during program development using code comments, presentations, and demonstrations.

Iowa Core Standard(s): 3.OA.C.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one–digit numbers.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Weeks 1-4	Concept of multiplication, multiplication facts	strategies, relationships, multiplication, division, properties of operations (3.OA.C.7)	multiply, divide (3.OA.C.7)		brainpop, GoMath,
Week 5	Prior knowledge of background, characters, dialouge, wait time, sequencing, looping	processes, algorithms (IB-AP-08)	model, creating,following (IB-AP-08)	Review, creation of background and characters	Tynker/ Scratch
Weeks 6					

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Weeks 7-9	Variable of score	algorithm, loops, sequence, conditionals, events, stages, program development, choices, code, comments, presentations, demonstrations (IB-AP-10) (1B-AP-11) (1B-AP-15) (IB-AP-16) (IB-AP-17)	create and follow algorithms, decompose problems, test and debug, collaborate with peers and teachers, describe choices (IB-AP-10) (1B-AP-11) (1B-AP-15) (IB-AP-16) (IB-AP-17)	Create a multiplication game using backgrounds, characters, and scores	Tynker/ Scratch

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ACCOMPANYING DETAILS

Subject: **Social Studies (Pioneers)** Grade: **3**

Unit: **Quarter 4**

Coding Concept/Skill: **Looping, sequencing, variables, conditionals, debugging, import background, import character, glide, go to, touch, voice over**

CSTA Computer Science Standard(s): 1A-AP-08: Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks. 1B-AP-10: Create programs that includes sequences, events, loops, and conditionals. 1B-AP-15: Test and debug (identify and fix errors) a program or algrithom to ensure it runs as intended. IB-AP-11: Decompose (break down) problems into smaller manageable subproblems to facilitate the program development process. IB-AP-16: Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.
IB-AP-17: Describe choices made during program development using code comments, presentations, and demonstrations.

Iowa Core Standard(s): SS.3-5.G.3 and SS.3-5.H.1: Examine the circumstances that affect the development of societies. (Pioneers) RF.3.4: Read with sufficient accuracy and fluency to support comprehension. SL.3.4: Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. W.3.5: With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 3.) W.3.6 With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Weeks 1-9	Prior instruction on Pioneer Life	circumstances (SS.3-5.G.3 & SS.3-5.5.H.1) development, societies	examine, affect (SS.3-5.G.3 & SS.3-5.H.1)		VR goggles, brainpop, nonfiction books
Weeks 1-9	Prior instruction on informative writing	planning, revising, editing, technology (W.3.5 & W.3.6)	write, revise, edit, produce, publish, interact, colloborate (W.3.5 &W.3.6)		youtube, rubrics, brainpop

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Week 10	Prior knowledge of background, characters, dialouge, wait time, sequencing, looping, keyboarding	processes, algorithms (IA-AP-08)	model, creating, following (IA-AP-08)	Review selecting a background and characters. Review talking bubbles and wait time	Tynker/ Scratch/ Edutyping
Week 11		programs, sequence, events, loops, conditionals (IB-AP-10)	create (IB-AP-10)	Teach changing backgrounds and importing backgrounds	Tynker/ Scratch
Week 12		programs, sequence, events, loops, conditionals (IB-AP-10)	create (IB-AP-10)	Teach characters and importing characters	Tynker/ Scratch
Week 13		programs, sequence, events, loops, conditionals (IB-AP-10)	create (IB-AP-10)	Teach how to animate characters	Tynker/ Scratch
Week 14-18		programs, sequence, events, loops, stages, problems, program delopment, code comments, presentations, demonstrations, conditionals (IB-AP-10) (IB-AP-11) (IB-AP-15) (IB-AP-16) (IB-AP-17)	create, decompose problems, test and debug, colloborate with peers and teachers, decsribe choices, decompose	Create a slideshow about Pioneers using informational writing which incorporates speech bubbles and voice over	Student informational writing over Pioneers/ Tynker/ Scratch

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Subject: **Reading** Grade: **4**

Unit: **Quarters 1 & 2**

Coding Concept/Skill: **Variables, looping, sequencing,create characters, create backgrounds, sound and voice over, events, debugging**

CSTA Computer Science Standard(s): 1B-AB-09 Create programs that use variables to store and modify data.
1B-Ab-10 Create programs that include sequences, events, loops, and conditionals.
1B-AB-14 Observe Intellectual property rights and give appropriate attribution when creating or remixing programs.
1B-AB-15 Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

Iowa Core Standard(s): RL.4.2/RI.4.2 Identify main idea or theme using details; summarize text. RL4.3/RI.4.3mDescribe characters, settings and events.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Week 1-9	Knowledge of creating backgrounds and block coding.	programs, variables, data, sequences, events, loops, conditionals, main idea, theme, details, text (1B-AB-09, 1B-AB-10, RL.4.3/RI.4.3)	create, identify, summarize (1B-AB-09, 1B-AB-10, RL.4.3/RI.4.3)	Students will create a background from a scene in their book, they will then import that background into a final project	Tynker, Scratch
Week 1-9	Knowledge of character development/loops/conditionals	programs, sequences, events, loops, conditionals, main idea, theme, details, text (IB-AP-10), RL.4.3)	create, identify, summarize (1B-AP-10, RL.4.3)	Students will create a character using character traits from their book and import into final project	Tynker, Scratch

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Week 9-18	Knowledge of dialogue/setting	programs, sequences, events, loops, conditionals, main idea, theme, details, text, characters, settings, events (IB-AP-10), RL.4.3)	create, identify, summarize, desribe (1B-AB-10, RL.4.3/RI.4.3, RL.4.2/RI.4.2)	Students will create speech bubbles for the characters they created and import into their setting	Tynker, Scratch
Week 9-18	Knowledge of sequencing and debugging	programs, sequences, events, loops, conditionals, main idea, theme, details, text, characters, settings, events (IB-AP-10), RL.4.3)	create, identify, summarize, desribe (1B-AB-10, RL.4.3/RI.4.3, RL.4.2/RI.4.2)	Students will create a project that uses setting, character, and speech bubbles from their book to summarize an event	Tynker, Scratch

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Subject**: Social Studies** Grade: **4**

Unit: **Quarters 3 & 4**

Coding Concept/Skill: **Variables, looping, sequencing, modifying characters, modifying backgrounds, sound and voice over, events, debugging**

CSTA Computer Science Standard(s): 1B-AB-12: Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features. 1B-AB-14: Observe Intellectual property rights and give appropriate attribution when creating or remixing programs. 1B-AB-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.1B-AB-09: Create programs that use variables to store and modify data. 1B-AB-10: Create programs that include sequences, events, loops, and conditionals.

Iowa Core Standard(s): RL.4.2/RI4.2: Identify main idea or theme using details; summarize text. W4.2 a, b, d: Using facts, definitions, concrete details, quotations, or other information and examples related to the topic. SS.4.H.4: Describe significant people, events, and ideas in local history.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Week 18-24	Knowledge of importing images, character development, loops, conditionals	programs, sequences, events, loops, conditionals, features, main idea, theme, details, test (IB-AB-10) (IB-AB-12)	create, modify, remix, incorporate, develop (IB-AB-12, RL.4.2/RI.4.2, W4.2 a, b, d, SS.4.H.4) summarize, identify	Students will use digital cameras to take photos of local historical sites, people, and upload photos to the computer, modify scenery, and import into project	Tynker Scratch Digital Cam.
Week 18-24					

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Week 24-36	Knowledge of dialogue	programs, variables, data, program, features (IB-AB-09, IB-AB-12)	create, store, modify, remix, incorporate (1B-AB-09, 1-AB-12)	Students will create voice overs of themselves describing their projects and their historical backgrounds	Tynker Scratch
Week 24-36	Knowledge of sequencing and debugging	programs, sequences, events, loops, conditionals, algorithm (IB-AB-10, IB-AB-15)	Create, test, debug (1B-AP-10, 1B-AB-15)	Students will create a project that uses information gathered about local history and their research	Tynker Scratch

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Subject: **Computer Programming** Grade: **5**

Unit: **Quarter 1**

Coding Concept/Skill: **Operators, forever (Hide/Show), characters disappear and appear, repeat until, define, go to: (mouse-pointer & random positioning), play sound until, touching/sensing, animation, parallelism, nested loops, debugging**

CSTA Computer Science Standard(s): 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1A-AP-08: Model daily processes by creating and following algorithms (sets of step by step instructions to complete tasks). 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

Iowa Core Standard(s): W.5.3:-Write narratives to develop real or imagined experiences or events using effective, technique, descriptive details, and clear event sequences

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Weeks 1-9	Basic Knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, algorithms, program (IA-AP-15, IB-AP-15)	use, describe, test and debug (IA-AP-15, IB-AP-15)	Students will import and modify a background Students will import and modify pictures by changing size, color, and erasing	Scratch, Code.org
				Students will use x-y coordinates to place characters	

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Weeks 1-9	Basic Knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, algorithms, program (IA-AP-15, IB-AP-15)	use, describe, test and debug (IA-AP-15, IB-AP-15)	Students will move a character by using go to and glide	Scratch, Code.org
				Students will animate their character by using loops (repeat, forever), turns	
				Students will use simple conditionals to change backgrounds and characters	
				Students will import sound and incorporate the wait block	
				Students will create a program to complete a task including a series of simple sequential instructions	
				Students will demonstrate debugging steps to solve flawed programming	
				Students will list a variety of strategies they can use to become “unstuck!”	

Weeks 1-9	Basic knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, algorithms, program, processes (IA-AP-15, IB-AP-15) (IA-AP-08)	use, describe, model, creating, following, test and debug (IA-AP-15, IB-AP-15) (IA-AP-08)	Students will explore/create a block coding project with only 10 blocks	Scratch, Code.org
				Students will test and debug in order to meet the required task	
				Students will embed loops in order to simplify their coding	
				Students will create programs using loops in mazes	
				Students will incorporate the random block	
				Students will include nested loops to create more complex programs	
				Students will embed parallelism in their code to have their character move and speak at the same time	
		narratives, experiences, events, details, sequences (W.5.3)	write, develop (W.5.3)	Students will present their narrative using code	Scratch

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Computer Programming, Math, Science** Grade**: 5**

Unit: **Quarter 2**

Coding Concept/Skill:

Basic Syntax Commands with Python, arguments with Python, strings with Python, solving puzzles with a given number of lines of code or strings with Python, while Loops with Python, solving puzzles with while loops with Python, variablles with Python, solving puzzles with Variables with Python, algorithms with Python, sovling puzzles with algorithms

CSTA Computer Science Standard(s): 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1A-AP-08: Model daily processes by creating and following algorithms (sets of step by step instructions to complete tasks) 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

Iowa Core Standard(s): 5-ESS1-2: Represent data graphical displays to reveal patterns of shadows day & night and seasons

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Coding Integration	Resources
Weeks 1-9	Basic knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, algorithms, program (IA-AP-15, IB-AP-15, IA-AP-08)	use, test and debug, model, creating, following (IA-AP-15, IB-AP-15, IA-AP-08)	Students will solve puzzles by using basic syntax	Python Lessons from codecombat.com
				Students will solve puzzles by using arguments	
				Students will solve puzzles by using strings	
				Students will solve puzzles by using while loops	

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Weeks 1-9	Basic knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, algorithms, program (IA-AP-15, IB-AP-15, IA-AP-08)	use, test and debug, model, creating, following (IA-AP-15, IB-AP-15, IA-AP-08)	Students will solve puzzles by using variables	Python Lessons from codecombat.com
				Students will solve puzzles by using alogorithms	
				Students will compare block coding versus python	
		data, displays, patterns, shadows, day, night, seasons (5-ESS1-2)	represent, reveal (5-ESS1-2)	Students will create a coding program to represent the seasons	Scratch

LOESS HILLS UNIT PLANNING ORGANIZER
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Subject: **Computer Programming, Science** Grade: **5**

Unit: **Quarter 3**

Coding Concept/Skill:

Compound conditionals, operators, comparing operators (expressions), forever (hide/show), characters disappear and appear, repeat until, define, nested loops, go to: (mouse-pointer & randomn positioningg), variable/data: change score, set time, velocity, play sound until, touching/sensing, animation, debugging, collaboration

CSTA Computer Science Standard(s): 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1A-AP-08: Model daily processes by creating and following algorithms (sets of step by step instructions to complete tasks). 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

Iowa Core Standard(s): 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Weeks Planned for Unit:	"Learning Progressions" Instructional Sequence	"Unwrapped" Concepts Specific to Each Learning Activity	"Unwrapped" Skills Specific to Each Learning Activity	Computer Programming	Resources
Weeks 1-9	Basic knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, processes, algorithms (IA-AP-15, IA - AP-08, IB-AP-15)	use, describe, create, follow, model, test and debug (IA-AP-15, IA-AP-08, IB-AP-15)	Students will identify code programming necessary to build different components of a game	Scratch, Code.org

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Weeks 1-9 of Quarter 3	Basic knowledge of Block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, processes, algorithms (IA-AP-15, IA - AP-08, IB-AP-15)	use, describe, create, follow, model, test and debug (IA-AP-15, IA-AP-08, IB-AP-15)	Students will experience remixing and reusing a project or part of a project	Scratch, Code.org
				Students will identify a variable as a way to label and reference a value in a program in order to keep score	
				Students will use computational concepts of conditionals, operators, and data (variables and lists)	
				Students will organize objects based on simple and compound boolean statements	
				Students will use conditionals to react to changes in variables and characters	
				Students will use conditionals to react to keyboard input to change character/object movement	

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Weeks 1-9 of Quarter 3	Basic knowledge of block coding; working with a team using productive criticism	terminology, steps, choices, iterative process, program development, processes, algorithms (IA-AP-15, IA - AP-08, IB-AP-15)	use, describe, create, follow, model, test and debug (IA-AP-15, IA-AP-08, IB-AP-15)	Students will use an "else" statement in place of an "if" statement	Scratch, Code.org
				Students will use velocity and rotation blocks to create and change character/object movements	
				Students will use the "touching/sensing" block to determine when two objects are touching	
				Students will code a variety of movement blocks(collide, bounce, bounce off, displace) to enhance movement of objects in game	
				Students will use functions for blocks of code that perform a single high-level task within a program	
				Students will gain more fluency in the concepts of conditionals, operators, and data and the practice of testing and debugging	

LOESS HILLS UNIT PLANNING ORGANIZER
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		model, movement, matter, plants, animals, decomposers, environment (5-LS2-1)	develop, describe (5-LS2-1)	Students will create a game demonstrating the movement of matter among plants, animals, decomposers, and the environment	Scratch

LOESS HILLS UNIT PLANNING ORGANIZER
ACCOMPANYING DETAILS

Subject: **Computer Programming** Grade**: 5**

Unit: **Quarter 4**

Coding Concept/Skill: **Velocity, operators, repeat, repeat until**

CSTA Computer Science Standard(s): 1A-AP-15: Using correct terminology, describe steps taken and choices made during the iterative process of program development. 1A-AP-08: Model daily processes by creating and following algorithms (sets of step by step instructions to complete tasks). 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

Iowa Core Standard(s): 3-5-ETS1-2: Generate, compare and evaluate multiple possible solutions to a problem. W.5.8. Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Weeks 1-9	Basic knowledge of block coding (repeats/loops)	terminology, steps, choices, iterative process, processes, program development, program, algorithms (IA-AP-15, IA-AP-08, IB-AP-15)	use, describe, test and debug, model, create, follow (IA-AP-15, IA-AP-08, IB-AP-15)	Students use loops to better navigate through mazes.	spheros, ipads, EDU spero app
				Students conduct test runs and modify code in order to complete a maze in shortest time.	
		solutions, problem (3-5-ETSI-2)	generate, compare, evaluate (3-5-ETSI-2)	Students will use the engineering process to solve a real world problem.	https://www.eie.org/engineering-adventures/curriculum-units/rescue
		information, experiences, print, digital sources, notes, sources (W.5.8)	Recall, paraphrase, summarize, gather, provide (W.5.8)	Students will compose a written summary of a real world problem presented with the final project	

Computer Programming Specialty School Implementation Rubric

*Computer Programming is referenced as CP in this rubric.

***Curriculum*: Computer Programming Integration Across All Subject Areas**				
Key Element	**Early** →	**Developing** →	**Prepared** •	**Model** ●
1.1 Frequency of Computer Programming Projects	A single coding project is only completed in each semester	1-2 coding projects are completed in each qtr.	A coding project is completed monthly as part of several content areas instruction	Coding is seen regularly throughout all subject areas. Projects are completed with multiple connections to several content areas.
1.2 Frequency of Computer Programming Integration	Cohort group (teacher from each grade level) making intentional effort to integrate coding into 1 curriculum area.	25-50% of core teachers making intentional effort to integrate coding into 1 curriculum area.	50-75% of core teachers making intentional effort to integrate coding into 2 or more curriculum areas.	75-100% of core teachers making intentional effort to integrate coding into 2 or more curriculum areas.
1.3 Collaborative PLC's	Semiannually, Core teachers share Coding activities or ideas and plan learning outcomes through professional learning community time	Quarterly, Core teachers share Coding activities or ideas and plan learning outcomes through professional learning community time	Monthly, Core teachers share Coding activities or ideas and plan learning outcomes through professional learning community time	Weekly, Core teachers share Coding activities or ideas and plan learning outcomes through professional learning community time
1.4 Physical Space	Students have a workspace/device available for creating with code and collaboration among students.	Students have devices in classrooms to share that are available for creating with code and collaboration among students.	Students have devices in classrooms to share 2:1 ratio that are available for creating with code and collaboration among students.	All classrooms are equipped with devices for coding and space for collaboration among students.

(2) Curriculum: Connections to effective in – and out-of-school programs				
Key Element	**Early** →	**Developing** →	**Prepared** •	**Model** ●
2.1 Computer Programming Network	School/program is seeking to establish partnerships with other schools, communities, postsecondary institutions, and businesses to identify solutions for building a quality CP school/program	School/program engages with other schools, communities, postsecondary institutions, and businesses to identify solutions for executing a quality CP school/program	School/program has documented partnerships with other schools, communities, postsecondary institutions, and businesses to identify solutions for executing a quality CP school/program	School/program has partnerships with other schools, communities, postsecondary institutions, and businesses to identify solutions for executing a quality CP school/ program; partnerships are purposeful, mutually beneficial, monitored, and evaluated
2.2 Students and Computer Programming Professionals	Leaders are creating plans to provide opportunities for students to meet CP professionals and/or to experience professional CP work environments during and/or outside school[2]	Direct experiences with CP professionals, professional CP work environments, and/or practical applications of CP content during and/or outside school[2] are available to students at each semester	Direct experiences with CP professionals, professional CP work environments, and/or practical applications of CP content during and/or outside school[2] are available to students at least quarterly	Direct experiences with CP professionals, professional CP work environments, and/or practical applications of CP content during and/or outside school[2] are available to students approximately monthly

[2] For example, presentations, guest speakers, field trips, summer/weekend/afterschool programs taught by CP teachers and/or industry professionals. Experiences are can be both face to face or virtual.

(3) Curriculum: Integration of Technology and Digital Learning				
Key Element	**Early** →	**Developing** →	**Prepared** •	**Model** ●
3.1 Instructional Tech for	Technology tools[3] relevant to the CP program have been identified	Technology tools[3] relevant to the CP program are available to teachers and students. Up	Technology tools[3] relevant to the CP program are being used by most teachers and	Technology tools[3]relevant to the CP program are being used by almost all teachers

Computer Programming		to 50% of students and teachers are proficient in these technology tools	students. 50-75% of students and teachers are proficient in common technology tools	and students more than 75% of students and teachers are proficient in common technology tools
3.2 Instructional Tech Resources for Computer Programming	Teachers rarely receive information regarding computer-based and/or online instructional resources for CP aligned to the CSTA K-12 Computer Science Standards (e.g. links to instructional technology tools, articles about effective use of instructional technology, meetings with peers focused on instructional technology, etc.)	Teachers annually receive information regarding computer-based and/or online instructional resources for CP aligned to the CSTA K-12 Computer Science Standards (e.g. links to instructional technology tools, articles about effective use of instructional technology, meetings with peers focused on instructional technology, etc.)	Teachers semiannually receive information regarding computer-based and/or online instructional resources for CP aligned to the CSTA K-12 Computer Science Standards (e.g. links to instructional technology tools, articles about effective use of instructional technology, meetings with peers focused on instructional technology, etc.)	STEM teachers monthly receive information regarding computer-based and/or online instructional resources for CP aligned to the CSTA K-12 Computer Science Standards (e.g. links to instructional technology tools, articles about effective use of instructional technology, meetings with peers focused on instructional technology, etc.) 3.3
3.3 Computer and Web-based Technology	Teachers occasionally use a few computer-based, online, mobile, virtual, and/or other technology tools to support instruction	Teachers weekly use computer-based, online, mobile, virtual, and/or other technology tools to support instruction	Teachers weekly use computer-based, online, mobile, virtual, and/or other technology tools to support instruction	Teachers seamlessly integrate computer-based, online, mobile, virtual, and/or other technology tools are into instruction; the technology is consistently in the hands of students
3.4 Tech Support	Teachers have limited access to maintenance support for instructional technology; IT equipment is regularly inoperable for extended periods of time	Teachers occasionally have access to maintenance support for instructional technology; IT equipment is occasionally inoperable for extended periods of time	Teachers have regular access to maintenance support for instructional technology; IT equipment is rarely inoperable for extended periods of time	Teachers and students have on-demand access to maintenance support instructional technology; IT equipment is rarely inoperable for extended periods of time

[3] For example app-enabled toys (Spheros, Dash and Dot, Parrott Drones), software (Tynker, Kodable, Scratch)

(4) Curriculum: Authentic Assessments and Exhibition of Computer Programming Skills				
Key Element	**Early** →	**Developing** →	**Prepared** •	**Model** ●
4.1 Authentic Assessments	Selected core and specials teachers are encouraged and supported to use multiple indicators of student success, including knowledge- and performance-based assessments (projects, portfolios, etc.)	As many as 50% of core C teachers use multiple indicators of student success, including knowledge and performance-based assessments (projects, portfolios, etc.)	50-75% of core and specials teachers use multiple indicators of student success, including knowledge and performance-based assessments (projects, portfolios, etc.) multiple times during the school year	Over 75% of core and specials teachers regularly use multiple indicators of success, including knowledge- and performance-based assessments (projects, portfolios, etc.)
4.2 Teachers Collaboratively Develop Assessments	Twice a year core and specials teachers share assessment strategies.	Quarterly core and specials teachers share assessment strategies; they occasionally co-create measures of student success and examine and reflect on student work	Core and specials teachers collaborate at least monthly to reflect on student work, to discuss strategies for using the results to inform instruction, and to co-create various measures of student success	Core and specials teachers collaborate at least biweekly to reflect on student work, to discuss strategies for using the results to inform instruction, and to co-create various measures of student success
4.3 Celebrate Computer Programming Work	Students, teachers and administrators annually celebrate high-quality student work in CP	Students, teachers and administrators celebrate high-quality student work in CP with semiannual on-site and online exhibits	Students, teachers and administrators celebrate high-quality student work in CP with quarterly on-site and online exhibits	Students, teachers and administrators celebrate high-quality student work in CP through on-going student exhibits on-site, online and/or in state and national forums
4.4 Culture of Innovation	Program leadership annually honors and encourages innovation in CP among students	Program leadership semiannually honors and encourages innovation in CP among students	Program leadership and program participants quarterly honor and encourage innovation in CP among students	Program culture consistently honors, encourages and incentivizes innovation in CP among students
4.5 Community Computer	Classrooms occasionally invite school community (parents, CP professional, community leaders, etc.) to	Classrooms frequently invite school community (parents, CP professional, community leaders, etc.) to partake in	Annual special event for community (parents, CP professional, community leaders, etc.) to partake in	Each semester there is a special event for community (parents, CP professional, community leaders, etc.) to

Programming Events	partake in coding lessons and student projects in CP	coding lessons and student projects in CP	the CP activities of the school and classrooms. (i.e Hour of Code Week)	partake in the CP activities of the school and classrooms.

(5) Curriculum: Professional development on computer programming curriculum, community/industry, partnerships and connections with postsecondary education				
Key Element	**Early** →	**Developing** →	**Prepared** •	**Model** ●
5.1 Individualized PD	Teachers participate in large group professional development sessions that introduce novice CP teaching skills	Teachers participate in large group professional development sessions focusing on critical CP teaching skills	Teachers have identified unique professional development goals and tailor as much as 25% of their CP professional development activities to meet their individual, professional needs	Teachers have identified unique professional development goals and tailor at least 50% of their CP professional development activities to meet their individual needs
5.2 Job-embedded PD	A job-embedded or practice-based approach to professional development is used twice during the school year for teachers	A job-embedded or practice-based approach to professional development is used quarterly during the school year for teachers	A job-embedded or practice-based approach to professional development is used monthly during the school year for teachers	A job embedded or practice-based approach to professional development is used multiple times a month for teachers
5.3 Specific to Teachers and Students	Professional development activities for teachers focus on standardized, scripted teaching strategies	On an annual basis professional development activities for teachers focus on strategies for teaching specific content to specific types of learners	On a quarterly basis professional development activities for teachers focus on strategies for teaching specific content to specific types of learners	Professional development activities for teachers that focus on strategies for teaching specific content to specific types of learners are frequently available
5.4 Frequency of PD	Teachers participate in 10-20 hours per year of CP-related professional development which addresses integrated content,	Teachers participate in 20-25 hours per year of CP-related professional development which addresses integrated content,	Teachers participate in 25-30 hours per year of CP-related professional development which addresses integrated content,	Teachers participate in 30 or more hours per year of CP-related professional development which addresses integrated

	community/industry partnerships, connections with postsecondary education, pedagogy, and/or digital learning	community/industry partnerships, connections with postsecondary education, pedagogy, and/or digital learning	community/industry partnerships, connections with postsecondary education, pedagogy, and/or digital learning	content, community/industry partnerships, connections with postsecondary education, pedagogy, and/or digital learning
5.5 CP Leadership Team	CP Leadership team[5] is formed and functioning to plan large group professional development and future planning.	CP leadership team[5] is leading large group professional development. Team members are taking a leading in professional learning community among grade level peers.	Leadership team[5] meets monthly to plan individual PD focused on CP skills and pedagogy. Provides occasional job-embedded PD for teachers, lead PLC's and planning events.	Leadership team[5] meets monthly to plan individual PD focused on CP skills and pedagogy. Provide frequent job-embedded PD for teachers, serves a model classroom, lead PLC's and planning events.

[5] Computer programming leadership team includes a representative from each grade level and at least one member representing specials.

Implementation Rubric adapted from *North Carolina STEM Attribute Implementation Rubric*.

Implementation Timeline

The initial development effort for Loess Hills Computer Programming Specialty School began in 2014. After receiving school board approval for the specialty school plan, a small group of building leaders and technology coaches worked to develop an outline of a scope and sequence of computer programming integration within the existing scope and sequence of the core content. Team members worked on defining and selecting the best-in-class tools that would allow for computer programming integration into core content areas and the ability to facilitate projects.

During the summer of 2014, the Loess Hills Computer Programming Leadership Team, a core group of classroom teachers from each K-5 grade level, explored tools and curriculum integration approaches. Curriculum maps and pacing guides developed included touch points and activities. The 2014-2015 school year was a year that the core group of teachers experimented, learned and refined the curriculum guide, instructional plans, and scope and sequence. By working closely throughout the year, the core group of teachers determined the most effective approaches and refined the curriculum.

The Computer Programming Leadership Team focused instructional plans for the following configuration:

- Level 1: Kindergarten and 1st grades
- Level 2: 2nd and 3rd grades
- Level 3: 4th and 5th grades

Each level blends online, self-guided and self-paced tutorials with "unplugged" activities, which are lessons that teach computing concepts without a computer. Each level consists of about 20 lessons that may be implemented as one contiguous unit or one lesson a week for a semester. Each lesson can be implemented in about 45-50 minutes.

During the 2014-2015 school year, the core group of classroom teachers planned building-wide professional development for all teachers for the summer of 2015. Not only was training provided during the summer of 2015, but core classroom teachers supported grade-alike teachers with computer programming implementation during professional learning community (PLC) meetings. Teachers were paid for their attendance at professional development training during the summer. The PLC meetings were held during the teachers' contract day.

During the summers of 2016 and 2017, the Loess Hills Elementary Computer Programming School teachers met to continue refining and developing a vertical alignment of programming projects and activities within the curriculum for each grade level based upon quarterly expectations.

During the summers, the Loess Hills Computer Programming Leadership Team meets to evaluate, refine, enhance and update expectations for each grade level's programming curriculum and vertical alignment projects and activities.

Next Steps for Loess Hills Computer Programming Specialty School

As the computer programming lessons were planned and implemented, all students in the building were at the same level; they had very little knowledge of computer programming. Teachers at all grade levels started at the introductory level of instruction. Four years later, the introductory lessons have been infused into the lower grade levels, causing the upper elementary grade levels to increase the depth and rigor of computer programming instruction. The upper grade level teachers have had to learn more advanced computer programming concepts and skills. We are at a point that the 5th grade computer programming curriculum needs to be recreated. The next step may be the development of culminating student projects that demonstrate student mastery of computer programming skills and concepts.

Many teachers remain at Loess Hills Computer Programming Elementary School with little teacher turnover. When new teachers are hired or transfer to Loess Hills, they are expected to learn computer programming skills and concepts and implement the computer programming lessons. The next step for Loess Hills is to develop training modules for teachers new to the building to access for training and support. Online training modules would be an efficient use of time for training purposes because not all teachers need the same level of training. The training modules would show lessons effectively delivered in classrooms.

Similar to the training modules, Loess Hills will capture exemplar instruction to be used for professional learning for all teachers, not just teachers new to Loess Hills. A repository of exemplar videos showcasing computer programming instruction will move all teachers forward in their implementation of computer programming instruction.