CODING
To Support Literacy
LAMP 2019
**VISION**

To create a world-class educational system that gives students the knowledge and skills to be successful in college and the workforce, and to flourish as parents and citizens.

**MISSION**

To provide leadership through the development of policy and accountability systems so that all students are prepared to compete in the global community.

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**State Board of Education Goals**

**FIVE-YEAR STRATEGIC PLAN FOR 2016-2020**

1. **All Students Proficient and Showing Growth in All Assessed Areas**
2. **Every Student Graduates from High School and is Ready for College and Career**
3. **Every Child Has Access to a High-Quality Early Childhood Program**
4. **Every School Has Effective Teachers and Leaders**
5. **Every Community Effectively Uses a World-Class Data System to Improve Student Outcomes**
6. **Every School and District is Rated “C” or Higher**
DA.1A.2 [COLLECTION, VISUALIZATION, & TRANSFORMATION]

Collect and present the same data in various visual formats.

The collection and use of data about the world around them is a routine part of life and influences how people live.

DA.1A.2a Students should be able to collect data.

For example, students could collect data on the weather, such as sunny days versus rainy days, the temperature at the beginning of the school day and end of the school day, or the inches of rain over the course of a storm…

DA.1A.2b Students should be able to present data in various visual formats.

For example, the data collected could be organized into two or more visualizations, such as a bar graph, pie chart, or pictograph.
DA.1A.3 [INFORMATION & MODELS]

Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.

All data can be used to make inferences or predictions about the world. The collection and use of data about the world around them is a routine part of life and influences how people live.

DA.1A.3a Students should be able to analyze data in visual formats. For example, students could analyze a graph or pie chart of the colors in a bag of candy or the averages for colors in multiple bags of candy...

DA.1A.3b Students should be able to identify patterns and make predictions based on the patterns. For example, students could identify the patterns for which colors are most and least represented in bags of candy, and then make a prediction as to which colors will have most and least in a new bag of candy...
Conceptual understanding: **An algorithm is a sequence of steps designed to accomplish a specific task.** Algorithms are translated into programs, or code, to provide instructions for computing devices. Algorithms and programming control all computing systems, empowering people to communicate with the world in new ways and solve compelling problems. The development process to create meaningful and efficient programs involves choosing which information to use and how to process and store it, breaking apart large problems into smaller ones, recombining existing solutions, and analyzing different solutions.

**ALGORITHMS & PROGRAMMING**

AP.1A.1 [ALGORITHMS]
Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.

Composition is the combination of smaller tasks into more complex tasks.

AP.1A.1a **Students should be able to create and follow algorithms.**
For example, students could create and follow algorithms for making simple foods, brushing their teeth, getting ready for school, participating in cleanup time. Students may demonstrate understanding visually, orally, or in writing.
AP.1A.2 [VARIABLES]
Model the way programs store and manipulate data by using numbers or other symbols to represent information.

Information in the real world can be represented in computer programs.

AP.1A.2a Students should be able to model data storage and manipulation by using representative symbols.
For example, students could use thumbs up/down as representations of yes/no, use arrows when writing algorithms to represent direction, or encode and decode words using numbers, pictographs, or other symbols to represent letters or words.

AP.1A.3 [CONTROL]
Develop programs with sequences and simple loops to express ideas or address a problem.

Information in the real world can be represented in computer programs.

Programming is used as a tool to create products that reflect a wide range of interests. Control structures specify the order in which instructions are executed within a program. Sequences are the order of instructions in a program. For example, if dialogue is not sequenced correctly when programming a simple animated story, the story will not make sense. If the commands to program a robot are not in the correct order, the robot will not complete the task desired. Loops allow for the repetition of a sequence of code multiple times. For example, in a program to show the life cycle of a butterfly, a loop could be combined with move commands to allow continual but controlled movement of the character.
LEARNING GOALS

- to work together
- to problem solve
- to talk through your learning
- to listen to each other
- to learn something new
- to have fun

Source: “Learning with Spheros” - Mark W. Carbone
Ozobot

- Starts students coding
- Screen-free or block coding options
- Programmable LED lights, sensors, and motor
- Lesson plans and webinars
Dot and Dash  (Grades K-6)

Features
- Apps
- Curriculum
- Professional Development
Scratch Jr (FREE)

Scratch Foundation

- Activity Cards
- Screen-free Activities
- Drag-and-Drop Block Coding
**Kodable (FREE)**
*SurfScore*
- Curriculum
- Guided iPad access
- Critical thinking skills

**APP**

**age 6+**

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**Daisy the Dinosaur (FREE)**
*Hopscotch Technologies*
- Drag-and-Drop moves
- Free-play mode
- Math and science skills

**APP**

**age 7+**
**APP & WEBSITE**

- **Tynker** (FREE, Paid)
  - Story-based puzzles
  - Drag-and-Drop moves
  - Game creation guides
  - Stand alone or code robots

**WEBSITE**

- **Code.org** (FREE)
  - Screen-free and online activities
  - Hour of Code
  - Lesson plans and student handouts
RHYMING

CODING AND LITERACY

CURRICULUM STANDARDS

RF.K.2a: Recognize and produce rhyming words

RL.2.4: Describe how words and phrases (e.g., regular beats, alliteration, rhymes, repeated lines) supply rhythm and meaning in a story, poem, or song
RHYME TIME WITH -AT WORDS

LITERACY CONNECTION

● READ The Cat in the Hat by Dr. Seuss
● Find the -AT words

OZOBOTS can be used to complete activity
EASY TO REPLICATE

- READ Brown Bear, Brown Bear by Eric Carle
- Find the COLORS that rhyme (RED - Bed, Head, Led)

SPELLING

CODING AND LITERACY
CURRICULUM STANDARDS

RF.K.3: Know and apply grade-level phonics and word analysis skills in decoding words

L.1.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing

ALPHABET SOUP

- READ various books and build a vocabulary list
- Print letters
- Code the robots to spell the vocabulary words

Any robot can be used to complete activity

Source: "Ozobot Alphabet Soup" - StemsofOneTree
**SIGHT WORDS**

- Print out large letters for students to practice writing
- Code from the letter to the corresponding picture

**OZOBOTS can be used to complete activity**

Source: “Ozobot Alphabet Coding” - Kate in Kinder

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**RETELLING**

**CODING AND LITERACY**
**CURRICULUM STANDARDS**

**RL.K.3:** With prompting and support, identify characters, settings, and major events in a story

**RL.1.3:** Describe characters, settings, and major events in a story, using key details

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**UPDATED FAIRY TALES**

Source: “Ozobot Little Red Riding Hood Video” - Edtechs
UPDated Fairy Tales

- READ Little Red Riding Hood
- Create story map to retell the story

Source: "Introduction to Ozobot Robots" - Steven Payne

Easy to Replicate

- READ Give a Mouse a Cookie
- Cut and paste the items in order of the story
- Code robot to follow the sequence

Any robot can be used to complete activity

Source: "If You Give a Mouse a Cookie Sequencing" - Kelsey Christophel
EASY TO REPLICATE

- **READ** Goldilocks and the Three Bears
- Work within a group to create story map and code to retell the story

CREATING CODING AND LITERACY
CURRICULUM STANDARDS

W.1.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers

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

Coding Stories with ScratchJR
**ALTERNATE ENDING**

- READ *The Bear Ate Your Sandwich*
- Create an alternate ending to the story digitally

**Screen-Free Activities**

Start with screen-free storyboard to organize alternate ending
Screen-Free Activities

Write your script.

Source: "How to Use Scratch for Digital Storytelling" - Common Sense Education

Screen-Free Activities

Use printable blocks to help design code.

 scratchjr.org/pdfs/blocks.pdf
Create ozobot labels to help design code.


Helpful Resources

- **Mixing Reading with Coding in Early Childhood** *(Knowledge Quest, December 2017)*
- **40+ Coding Classes, Websites, Games, and Apps for Kids**
- **Why Kids Should Code** *(Tufts Now, September 2017)*
- **Coding as Literacy for the 21st Century** *(Education Week, January 2018)*
- **Teaching Kids to Code**

LET’S PLAY
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