



# HANDS-ON LEARNING LAB ACTIVITIES

## TEACHER RESOURCE GUIDE

**School of Computing, University of South Alabama**



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# CRYPTOGRAPHY

DR. TODD ANDEL

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students learn fundamentals of basic cryptography. They will be able to encrypt and decrypt messages, as well as perform basic cryptanalysis.

## OBJECTIVES

- Explain how a shift cipher works
- Encrypt a message
- Decrypt a message
- Perform cryptanalysis on a secret message

## INSTRUCTOR NOTES

This activity should be done in a computer lab or classroom with laptop computers. The instructor should have a computer connected to an overhead projector for lecture & demonstration. Java runtime environment must be present as well as connection to the internet to reach the referenced Java applets. It may also be helpful to have pre-encrypted messages with various plaintexts encrypted via different keys so students can use input to cryptanalyze exercises. Lecture slides are also provided.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #29:** Summarize the role of compression and encryption in modifying the structure of digital artifacts and the varieties of information carried in the metadata of these artifacts.

#### Language Arts

- **9<sup>th</sup> Grade L.9-10.5:** Acquire and use accurately, general academic & domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college

and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

- **10<sup>th</sup> Grade L.9-10.5:** Acquire and use accurately, general academic & domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately, general academic & domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **12<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately, general academic & domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-PC.1.4:** Explain the principles of cryptography by examining encryption, digital signatures, and authentication methods.

### Language Arts

- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.L.3.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> – 12<sup>th</sup> LAFS.1112.L.3.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## MISSISSIPPI

### Computer Science

- **11<sup>th</sup> – 12<sup>th</sup> Grade NI.3B.2:** Compare ways software developers protect devices and information from unauthorized access.

### Language Arts

- **9<sup>th</sup> Grade L.9.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

- **10<sup>th</sup> Grade L.10.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> Grade L.11.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **12<sup>th</sup> Grade L.12.6:** Acquire and use accurately, general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

# BLENDER3D

DR. TODD ANDEL & ROBERT FORNOF

## GRADES

1<sup>st</sup> – 6<sup>th</sup>

## DESCRIPTION

Students will learn the basics of 3D coordinates and variables through art. This lesson will use the free, open-source Blender3d (<http://www.blender.org>) graphics and animation package to teach students how to create digital pictures and animations. Students will modify pre-made examples to learn about keyframing variables; the x, y, z coordinate system; and digital art.

## OBJECTIVES

- Describe the x, y, z coordinate system using their own words
- Understand the concept of a variable
- Understand how animation works through frames and how to animate a variable through keyframing

## INSTRUCTOR NOTES

The projects are designed as starting points for students to explore the Blender3d software and documentation. Blender3d can do just about anything in regard to digital art (video editing, video games, sculpting, 2D drawing, compositing, Photoshop for animation, and many more features). If you have extra time left, give the students some free time to explore the features of Blender3d – perhaps challenge them to make a monkey or a smiley face from primitive shapes, or a light saber using a light saber tutorial.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **1<sup>st</sup> Grade #19:** Identify and revise problem-solving strategies to solve a simple problem.
- **2<sup>nd</sup> Grade #18:** Investigate the design process and use digital tools to illustrate potential solutions to a problem, given guidance and support.
- **3<sup>rd</sup> Grade #23:** Implement the design process to solve a simple problem.



- **4<sup>th</sup> Grade #17:** Demonstrate an appropriate level of proficiency in performing tasks using a range of digital devices.
- **5<sup>th</sup> Grade #7:** Identify variables.
- **6<sup>th</sup> Grade #8:** Create a program that initializes a variable.

### Visual Art

- **1<sup>st</sup> Grade #11:** Compare and/or contrast similar images, subjects, or themes.
- **2<sup>nd</sup> Grade #6:** Integrate art vocabulary while planning and creating art. A.) Elements of art: line, shape, neutral colors, value, texture; B.) Picture compositions: overlapping, background, horizontal, vertical orientation; C.) Colors in the color wheel: primary, secondary, warm and cool.
- **3<sup>rd</sup> Grade #2:** Demonstrate skills using available resources, tools, and technologies to investigate personal ideas through the art-making process.
- **4<sup>th</sup> Grade #1:** Individually brainstorm multiple approaches to an art problem.
- **5<sup>th</sup> Grade #1:** Combine ideas to develop an innovative approach to creating art.
- **6<sup>th</sup> Grade #1:** Work collaboratively to develop new and innovative ideas for creating art.

### Mathematics

- **1<sup>st</sup> Grade 1.NBT.5:** Given a two-digit number, mentally find 10 more or 10 less than the number without having to count; explain reasoning.
- **2<sup>nd</sup> Grade 2.NBT.8:** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
- **3<sup>rd</sup> Grade 3.NBT.1:** Use place value understanding to round whole numbers to the nearest 10 or 100.
- **4<sup>th</sup> Grade 4.NBT.3:** Use place value understanding to round multi-digit whole numbers to any place.
- **5<sup>th</sup> Grade 5.NB.4:** Use place value understanding to round decimals to any place.
- **6<sup>th</sup> Grade 6.NS.8:** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

## FLORIDA

### Computer Science

- **K – 2<sup>nd</sup> Grade SC.K2.CS-CP.2.3:** Explain that computers only follow the program's instructions.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CP.2.4:** Explain that programs need known initial conditions.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.11:** Predict outputs while showing an understanding of inputs.

### Visual Art

- **1<sup>st</sup> Grade VA.1.C.2.2:** Use various media or techniques to learn how changes affect the completed artwork.
- **2<sup>nd</sup> Grade VA.2.S.1.1:** Experiment with tools and techniques as part of the art-making process.
- **3<sup>rd</sup> Grade VA.3.S.1.4:** Choose accurate art vocabulary to describe works of art and art processes.

- **4<sup>th</sup> Grade VA.4.S.1.2:** Explore and used media, technology, and other art resources to express ideas visually.
- **5<sup>th</sup> Grade VA.5.S.1.2:** Use media, technology, and other resources to inspire personal art-making decisions.
- **6<sup>th</sup> – 8<sup>th</sup> Grade VA.68.F.1.4:** Use technology skills to create an imaginative and unique work of art.

## Mathematics

- **1<sup>st</sup> Grade MAFS.1.OA.3.6:** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making a ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier known sums.
- **2<sup>nd</sup> Grade MAFS.2.OA.2.2:** Fluently add and subtract within 20 using mental strategies. By the end of grade 2, know from memory all sums of two one-digit numbers.
- **3<sup>rd</sup> Grade MAFS.3.NBT.1.1:** Use place value understanding to round whole numbers to the nearest 10 or 100.
- **4<sup>th</sup> Grade MAFS.4.NBT.1.3:** Use place value understanding to round multi-digit whole numbers to any place.
- **5<sup>th</sup> Grade MAFS.5.NBT.1.4:** Use place value understanding to round decimals to any place.
- **6<sup>th</sup> Grade MAFS.6.NS.3.8:** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

## MISSISSIPPI

### Computer Science

- **K – 2<sup>nd</sup> Grade AP.1A.2:** Model the way programs store and manipulate data by using numbers or other symbols to represent information.
- **K – 2<sup>nd</sup> Grade CS.1A.2:** Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).
- **K – 2<sup>nd</sup> Grade DA.1A.1:** Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade AP.1B.2:** Create programs that use variables to store and modify data.
- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.2:** Create clearly named variables that represent different data types and perform operations on their values.

### Visual Art

- **1<sup>st</sup> Grade VA: Re7.2.1:** Compare images that represent the same subject.
- **2<sup>nd</sup> Grade VA: Re9.1.2:** Use learned art vocabulary to express preferences about artwork.
- **3<sup>rd</sup> Grade VA: Re9.1.3:** Evaluate an artwork based on given criteria.
- **4<sup>th</sup> Grade VA: Re9.1.4:** Apply one set of criteria to evaluate more than one work of art.
- **5<sup>th</sup> Grade VA: Re7.1.5:** Compare one's own interpretation of a work of art with the interpretation of others.

- **6<sup>th</sup> Grade VA Re9.1.6:** Develop and apply relevant criteria to evaluate a work of art.

## Mathematics

- **1<sup>st</sup> Grade 1.OA.6:** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten; decomposing a number leading to a 10; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.
- **2<sup>nd</sup> Grade 2.OA.2:** Fluently add and subtract within 20 using mental strategies.
- **3<sup>rd</sup> Grade 3.NBT.1:** Use place value understanding to round whole numbers to the nearest 10 or 100.
- **4<sup>th</sup> Grade 4.NBT.3:** Use place value understanding to round multi-digit whole numbers to any place.
- **5<sup>th</sup> Grade 5.NBT.4:** Use place value understanding to round decimals to any place.
- **6<sup>th</sup> Grade 6.NS.8:** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points within the same first coordinate or the same second coordinate.

**Blender 3D Window**

Node Editor - Dots

Connect yellow dots together to output a picture

Start here

Changers and Effects

Color+How Bright

Lens Distortion

Outputs

Viewer Node

Render Result

Input -> Changers --> outputs

Computer Programs use

- Inputs
- Changers
- Outputs

# CREATING A WEB PAGE

DR. DEBRA CHAPMAN & PAMELA WISNIEWSKI

## GRADES

3<sup>rd</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn how to write the basic structure of an XHTML web page, including embedding, images, and adding textual content.

## OBJECTIVES

- Properly structure a basic web page using <html>, <head>, <title>, and <body>
- Use basic XHTML for Dr. Matting tags to add text
- Embed an image
- Save and view the web page

## INSTRUCTOR NOTES

This activity should be done in a computer lab or classroom with laptop computers. Lesson can be taught using a basic Notepad editor. An internet connection is necessary to download pictures.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **3<sup>rd</sup> Grade #1:** Use numbers or letters to represent information in another form.
- **4<sup>th</sup> Grade #17:** Demonstrate an appropriate level of proficiency in performing tasks using a range of digital devices.
- **5<sup>th</sup> Grade #10:** Identify appropriate and inappropriate uses of communication technology and discuss the permanence of actions in the digital world.
- **5<sup>th</sup> Grade #16:** Use advanced features of digital tools and media-rich resources to communicate key ideas and details in a way that informs, persuades, and/or entertains.
- **5<sup>th</sup> Grade #17:** Publish organized information in different ways to make it more useful or relevant.

- **6<sup>th</sup> Grade #9:** Differentiate between a secure and a non-secure website including how they affect personal data.
- **7<sup>th</sup> Grade #11:** Demonstrate positive, safe, legal, and ethical habits when creating and sharing digital content and identify the consequences of failing to act responsibly.
- **7<sup>th</sup> Grade #21:** Compare common transfer protocols.
- **8<sup>th</sup> Grade #17:** Communicate and publish individually or collaboratively to persuade peers, experts, or community about issues and problems.

## Language Arts

- **3<sup>rd</sup> Grade W.3.6:** With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- **3<sup>rd</sup> Grade L.3.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **4<sup>th</sup> Grade W.4.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- **4<sup>th</sup> Grade L.4.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **4<sup>th</sup> Grade L.4.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **4<sup>th</sup> Grade L.4.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **5<sup>th</sup> Grade W.5.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
- **5<sup>th</sup> Grade L.5.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **5<sup>th</sup> Grade L.5.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **5<sup>th</sup> Grade L.5.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **6<sup>th</sup> Grade W.6.6:** Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.
- **6<sup>th</sup> Grade L.6.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **6<sup>th</sup> Grade L.6.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **6<sup>th</sup> Grade L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- **7<sup>th</sup> Grade W.7.8:** Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- **7<sup>th</sup> Grade L.7.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **7<sup>th</sup> Grade L.7.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **7<sup>th</sup> Grade L.7.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **8<sup>th</sup> Grade W.8.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade L.8.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade L.8.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade L.8.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

## FLORIDA

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CC.1.1:** Identify technology tools for individual and collaborative data collection, writing, communications, and publishing activities.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CC.1.2:** Describe key ideas and details while working individually or collaboratively using digital tools and media-rich resources in a way that informs, persuades, and/or entertains.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CS.4.1:** Identify the basic components of a computer.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-PC.1.1:** Identify appropriate and inappropriate uses of technology when posting to social media, sending e-mail, and browsing the internet.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-PC.1.2:** Describe responsible uses of modern communication media and devices.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CP.3.1:** Write, communicate, and publish activities using technology tools.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.3.2:** Create online content using advanced design tools.

### Language Arts

- **3<sup>rd</sup> Grade LAFS.3.W.2.6:** With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- **3<sup>rd</sup> Grade LAFS.3.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **3<sup>rd</sup> Grade LAFS.3.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- **3<sup>rd</sup> Grade LAFS.3.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **4<sup>th</sup> Grade LAFS.4.W.2.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- **4<sup>th</sup> Grade LAFS.4.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **4<sup>th</sup> Grade LAFS.4.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **4<sup>th</sup> Grade LAFS.4.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **5<sup>th</sup> Grade LAFS.5.W.2.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
- **5<sup>th</sup> Grade LAFS.5.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **5<sup>th</sup> Grade LAFS.5.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **5<sup>th</sup> Grade LAFS.5.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **6<sup>th</sup> Grade LAFS.6.W.2.6:** Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.
- **6<sup>th</sup> Grade LAFS.6.L.2.5:** Include multimedia components and visual displays in presentations to clarify information.
- **6<sup>th</sup> Grade LAFS.6.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **6<sup>th</sup> Grade LAFS.6.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **6<sup>th</sup> Grade LAFS.6.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **7<sup>th</sup> Grade LAFS.7.W.2.6:** Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- **7<sup>th</sup> Grade LAFS.7.L.2.5:** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- **7<sup>th</sup> Grade LAFS.7.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **7<sup>th</sup> Grade LAFS.7.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **7<sup>th</sup> Grade LAFS.7.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- **8<sup>th</sup> Grade LAFS.8.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade LAFS.8.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade LAFS.8.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade LAFS.8.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade AP.1B.10:** Describe choices made during program development using code comments, presentations, and demonstrations.
- **6<sup>th</sup> – 8<sup>th</sup> Grade IC.2.4:** Describe tradeoffs between allowing information to be public and keeping information private and secure.

### Language Arts

- **3<sup>rd</sup> Grade W.3.6:** With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- **4<sup>th</sup> Grade W.4.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- **4<sup>th</sup> Grade L.4.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **4<sup>th</sup> Grade L.4.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **4<sup>th</sup> Grade L.4.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **5<sup>th</sup> Grade W.5.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
- **5<sup>th</sup> Grade L.5.1:** Demonstrate command of standard English grammar and usage when writing or speaking.
- **5<sup>th</sup> Grade L.5.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **5<sup>th</sup> Grade L.5.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.



- **6<sup>th</sup> Grade W.6.6:** Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.
- **6<sup>th</sup> Grade L.6.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **6<sup>th</sup> Grade L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **6<sup>th</sup> Grade L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **7<sup>th</sup> Grade W.7.6:** Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- **7<sup>th</sup> Grade L.7.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **7<sup>th</sup> Grade L.7.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **7<sup>th</sup> Grade L.7.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **8<sup>th</sup> Grade W.8.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade L.8.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade L.8.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade L.8.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

# CREATING A WEB PAGE

DR. DEBRA CHAPMAN & PAMELA WISNIEWSKI

## GRADES

8<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to write the basic structure of an XHTML web page, including embedding images and adding textual content.

## OBJECTIVES

- Properly structure a basic web page using sections
- Identify Doc types
- Use basic XHTML formatting tags to add and format text
- Embed an image, including alt tags
- Use an image as a hyperlink
- Save and view the web page
- Validate the web page to comply with W3C requirements

## INSTRUCTOR NOTES

This activity should be done in a computer lab or classroom with laptop computers. Lesson can be taught using a basic Notepad editor. An internet connection is necessary to download pictures.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **8<sup>th</sup> Grade #17:** Communicate and publish individually or collaboratively to persuade peers, experts, or community about issues and problems.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #25:** Use a variety of digital tools to create digital artifacts across content areas.

## Language Arts

- **8<sup>th</sup> Grade W.8.4:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade L.8.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade L.8.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade L.8.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **9<sup>th</sup> Grade W.9-10.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
- **9<sup>th</sup> Grade L.9-10.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **9<sup>th</sup> Grade L.9-10.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **10<sup>th</sup> Grade W.9-10.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
- **10<sup>th</sup> Grade L.9-10.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **10<sup>th</sup> Grade L.9-10.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **11<sup>th</sup> Grade W.11-12.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **11<sup>th</sup> Grade L.11-12.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **11<sup>th</sup> Grade L.11-12.2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.
- **12<sup>th</sup> Grade W.11-12.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **12<sup>th</sup> Grade L.11-12.1:** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
- **12<sup>th</sup> Grade L.11.12-2:** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.3.2:** Create online content using advanced design tools.

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.2:** Create mobile computing applications and/or dynamic web pages through the use of a variety of design and development tools, programming languages, and mobile devices/emulators.

## Language Arts

- **8<sup>th</sup> Grade LAFS.8.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade LAFS.8.SL.2.5:** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
- **8<sup>th</sup> Grade LAFS.8.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade LAFS.8.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade LAFS.8.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.W.2.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.SL.2.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.L.2.3:** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.W.2.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.SL.2.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence to add interest.
- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.L.2.3:** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade IC.2.4:** Describe tradeoffs between allowing information to be public and keeping information private and secure.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.9:** Evaluate and refine computational artifacts to make them more usable and accessible.
- **11<sup>th</sup> – 12<sup>th</sup> Grade IC.3B.1:** Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.

### Language Arts

- **8<sup>th</sup> Grade W.8.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade L.8.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade L.8.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade L.8.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English I W.9.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically.
- **English I L.9.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English I L.9.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English I L.9.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English II W.10.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically.
- **English II L.10.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English II L.10.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English II L.10.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- **English III W.11.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **English III L.11.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English III L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English III L.11.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English IV W.12.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **English IV L.12.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English IV L.12.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English IV L.12.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

## View HTML Code of Web Pages

```

1 |
2 |<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
3 |<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en-gb" lang="en-gb" >
4 |<head>
5 |
6 |<base href="http://www.cis.usouthal.edu/" />
7 |<meta http-equiv="content-type" content="text/html; charset=utf-8" />
8 |<meta name="robots" content="index, follow" />
9 |<meta name="keywords" content="University of South Alabama School of Computing, CyberSecurity, Forensics, Robotics, Information Technology, Security,
  Scholarships, Embedded Systems, Health Information, Malware Detection, Computing, Alabama, Research, Masters, Graduate, Undergraduate, Bachelors, Internship,
  CyberSecurity" />
10 |<meta name="description" content="University of South Alabama School of Computing" />
11 |<meta name="generator" content="Joomla! 1.5 - Open Source Content Management" />
12 |<title>USA School of Computing</title>
13 |<link href="/index.php?format=feed&type=rss" rel="alternate" type="application/rss+xml" title="RSS 2.0" />
14 |<link href="/index.php?format=feed&type=atom" rel="alternate" type="application/atom+xml" title="Atom 1.0" />
15 |<link href="/favicon.ico" rel="shortcut icon" type="image/x-icon" />
16 |<style type="text/css">
17 |<!--
18 |.gn_header_1 { background-color:#E0E0E0; border:1px solid #FFFFFF; border-bottom:none; padding:5px; }
19 |.gn_slider_1 { border:1px solid #FFFFFF; padding:5px; height:103px; background-color:#FFFFFF; overflow:hidden; border-bottom:none; }
20 |.gn_slider_1 .gn_opacitylayer { height:100%; filter:progid:DXImageTransform.Microsoft.alpha(opacity=100); -moz-opacity:1; opacity:1; }
21 |.gn_pagination_1 { border:1px solid #FFFFFF; border-top:none; padding:2px 5px; text-align:right; background-color:#FFFFFF; }
22 |.gn_pagination_1 a:link { font-weight:bold; padding:0 2px; }
23 |.gn_pagination_1 a:hover, .gn_pagination_1 a.selected { color:#000; }
24 |-->
25 |</style>
26 |<script type="text/javascript" src="/media/system/js/mootools.js"></script>
27 |<script type="text/javascript" src="/media/system/js/caption.js"></script>
28 |<script type="text/javascript" src="/modules/mod_globalnews/scripts/slider.js"></script>
29 |<script type="text/javascript">
30 |function addLoadEvent(func) { if (typeof window.onload != 'function') { window.onload = func; } else { var oldonload = window.onload; window.onload = function()
  { if (oldonload) { oldonload(); } func(); } } }
31 |addLoadEvent(function(){GJ_ContentSlider('gn_slider_1_1',4000,'Next','');});
32 |</script>
33 |<script type="text/javascript" src="http://www.cis.usouthal.edu/modules/mod_swmenufree/transmenu_Packed.js"></script>
34 |<script type="text/javascript" src="http://www.cis.usouthal.edu/modules/mod_swmenufree/jquery-1.2.6.pack.js"></script>
35 |</style type="text/css">
  
```

# BRAIN-COMPUTER INTERFACE

DR. MATT CAMPBELL

## GRADES

4<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to use brainwaves to interact with a computer, specifically, students will use single-channel, non-invasive electroencephalography (EEG) headsets to interact with and manipulate a number of computer games and other activities. Students are encouraged to think creatively about other applications of this technology, especially in relation to helping people with disabilities.

## OBJECTIVES

- Explain how brainwaves can be used to control a computer or other electrical device
- Propose creative uses of EEG technology
- Interact with a computer through the use of brain waves

## INSTRUCTOR NOTES

Students are each assigned an EEG headset to use during the activity. Students will progress through a number of games and tasks that require them to either maintain a high level of concentration or relaxation. Scoring mechanisms within the applications allow the students to compete on each of the activities. It is recommended that the instructor have at least one assistant in the lab to assist learners who need help with the headsets. Activity should be done in a computer lab or a classroom with laptop computers. The instructor should demonstrate with a computer connected to a projector.

**HOW DOES BCI WORK?**

- **Invasive BCIs**
  - Example: Electronic eye
  - Pros: Highest quality signals
  - Cons: Prone to rejection and scar tissue build up
- **Partially invasive BCIs**
  - Technology: Electrocorticography (ECoG)
  - Pros: Lower risk of scar tissue
  - Cons: Lesser quality signals compared to invasive
- **Non-invasive BCIs**
  - Technology: Electroencephalography (EEG)
  - Pros: easy to use
  - Cons: poor signal quality






Photo credit: wikipedia.com

University of South Alabama

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **4<sup>th</sup> Grade #20:** Explain how hardware and applications can enable everyone, including people with disabilities, to do things they could not do otherwise.
- **5<sup>th</sup> Grade #15:** Explore and predict how advances in computing technologies affect job opportunities and/or processes now and in the future.
- **6<sup>th</sup> Grade #28:** Define assistive technologies and state reasons they may be needed.
- **7<sup>th</sup> Grade # 28:** Classify types of assistive technologies.
- **8<sup>th</sup> Grade #27:** Analyze assistive technologies and how they improve the quality of life for users.
- **9<sup>th</sup> -12<sup>th</sup> Grade #22:** Research the impact of computing technology on possible career pathways.

#### Science

- **4<sup>th</sup> Grade #2:** Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents.
- **4<sup>th</sup> Grade #6:** Develop a model of waves to describe patterns in terms of amplitude and wavelength and including that waves can cause objects to move.
- **8<sup>th</sup> Grade #17:** Create and manipulate a model of a simple wave to predict and describe the relationship between wave properties and energy.
- **Physical Science #15:** Obtain and communicate information from published materials to explain how transmitting and receiving devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
- **Physics #1:** Investigate and analyze, based on evidence obtained through observation or experimental design, the motion of an object using both graphical and mathematical models that may include descriptors such as position, distance traveled, displacement, speed, velocity, and acceleration.

### FLORIDA

#### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-PC.2.5:** Identify ways in which people with special needs access and use adaptive technology.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.4.8:** Identify software used to support specialized forms of human-computer interaction.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.6.3:** Identify novel ways humans interact with computers, including software, probes, sensors, and handheld devices.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-PC.2.5:** Describe ways in which adaptive technologies can assist users with special needs to function in their daily lives.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-PC.2.8:** Evaluate ways in which adaptive technologies may assist users with special needs.



## Science

- **4<sup>th</sup> Grade SC.4.N.1.6:** Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.
- **5<sup>th</sup> Grade SC.5.N.1.3:** Recognize and explain the need for repeated experimental trials.
- **6<sup>th</sup> Grade SC.6.N.1.4:** Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.
- **7<sup>th</sup> Grade SC.7.N.1.4:** Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.
- **8<sup>th</sup> Grade SC.8.N.1.4:** Explain how hypotheses are valuable if they lead to further investigations, even if they turn out to not be supported by the data.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.L.14.26:** Identify the major parts of the brain on diagrams or models.

## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade IC.1B.2:** Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade CS.1B.1:** Describe how internal and external parts of computing devices function to form a system.
- **3<sup>rd</sup> – 5<sup>th</sup> Grades CS.1B.2:** Model how computer hardware and software work together as a system to accomplish tasks.
- **6<sup>th</sup> – 8<sup>th</sup> Grade IC.2.2:** Discuss issues of bias and accessibility in the design of existing technologies.
- **9<sup>th</sup> – 10<sup>th</sup> Grade IC.3A.2:** Test and refine computational artifacts to reduce bias and equity deficits.
- **11<sup>th</sup> – 12<sup>th</sup> Grade IC.3B.3:** Predict how computational innovations that have revolutionized aspects of our culture might evolve.

### Science

- **8<sup>th</sup> Grade P.8.6:** Students will demonstrate an understanding of the properties, behaviors, and applications of waves.
- **Human Anatomy & Physiology HAP.6:** Students will investigate the structure and functions of the nervous system, including the cause and effect of diseases and disorders.
- **Physical Science PHS.6:** Students will explore the characteristics of waves.
- **Physics PHY.4:** Students will investigate and explore wave properties.

# CRITICAL PATH METHOD

DR. JEFF LANDRY & ROSALIND MCCULLOUGH

## GRADES

6<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will be introduced to basic project management concepts such as the project triple constraints of scope, cost, and time. Students will learn about the critical path method, used by project managers to plan a project's schedule. Students will start with a project's activity network diagram and then learn how to calculate the expected time to complete a project and identify the critical paths for a project. This HOLLA will allow the students to experience the Team-Based Learning approach that is used in several courses throughout our university. This will allow students to work as a group to perform an activity applying the concepts being taught within the HOLLA.

## OBJECTIVES

- Given a list of project activities, arrange them in logical order
- Create a project network diagram by deciding which activities can be performed in parallel
- Identify and calculate the project's critical path

## INSTRUCTOR NOTES

The workshop is broken down into three parts. The ideal room is one where teams can gather, and that also has a chalk/white board and a projector. The exercises can be completed with pencil and paper, although they can also be adapted to use a software tool such as MS-Project or a Smart board for drawing. A pocket folder is needed for each team, containing the list of activities and durations, the index cards of activities, the Readiness Assurance Test, and an IF-AT form.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #6:** Identify steps in developing solutions to complex problems using computational thinking.

- **7<sup>th</sup> Grade #6:** Create and organize algorithms in order to automate a process efficiently.
- **8<sup>th</sup> Grade #6:** Discuss how algorithmic processes and automation increase efficiency.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #1:** Decompose problems into component parts, extract key information, and develop descriptive models to understand the levels of abstractions in complex systems.

### Language Arts

- **6<sup>th</sup> Grade W.6.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **7<sup>th</sup> Grade W.7.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **8<sup>th</sup> Grade W.8.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **9<sup>th</sup> Grade W.9-10.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **10<sup>th</sup> Grade W.9-10.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **11<sup>th</sup> Grade W.11-12.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **12<sup>th</sup> Grade W.11-12.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.12:** Select the “best” algorithm based on a given criteria to solve a problem, individually and collaboratively.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CS.2.9:** Evaluate ways to characterize how well algorithms perform and that two algorithms can perform differently for the same task.

### Language Arts

- **6<sup>th</sup> Grade LAFS.6.W.1.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **7<sup>th</sup> Grade LAFS.7.W.1.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **8<sup>th</sup> Grade LAFS.8.W.1.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

- **9<sup>th</sup> – 10<sup>th</sup> Grade LAFS.910.W.1.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **11<sup>th</sup> – 12<sup>th</sup> Grade LAFS.1112.W.1.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

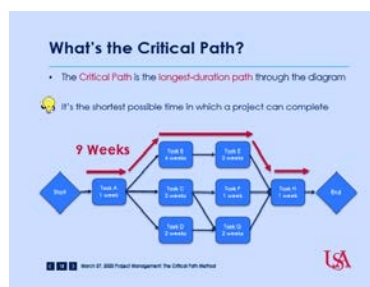
## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.1:** Use flowcharts and/or pseudocode to address complex problems as algorithms.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.11:** Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.4:** Evaluate algorithms in terms of their efficiency, correctness, and clarity.

### Language Arts

- **6<sup>th</sup> Grade W.6.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **7<sup>th</sup> Grade W.7.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **8<sup>th</sup> Grade W.8.2:** Write informative or explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **English I W.9.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **English II W.10.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **English III W.11.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- **English IV W.12.2:** Write informative or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.



# SCRATCH THE CAT: ELEMENTARY PROGRAMMING

DR. DEBRA CHAPMAN

## GRADES

K – 1<sup>st</sup>

## DESCRIPTION

Students will use a computer assisted learning tool to write programs to describe simple geometric shapes. Learners will use a graphical user interface, using visual representations to program the actions of Scratch the Cat.

## OBJECTIVES

- Explain the purpose of a program
- Write a program to create several simple shapes, including triangles & squares
- Explain how angles affect shapes

## INSTRUCTOR NOTES

Scratch the Cat is designed to build incrementally from simple to more complex. It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration. Scratch the Cat is free, so the instructors can provide it to the students/parents for home use.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **Kindergarten #2:** Demonstrate use of input devices.
- **Kindergarten #7:** Locate letters and numbers on the keyboard.
- **1<sup>st</sup> Grade #3:** Construct elements of a simple computer program in collaboration with others.

## Mathematics

- **Kindergarten K.G.1:** Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as *above*, *below*, *besides*, *in front of*, *behind*, and *next to*.
- **Kindergarten K.G.2:** Correctly name shapes regardless of their orientations or overall size.
- **1<sup>st</sup> Grade 1.G.1:** Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.

## FLORIDA

### Computer Science

- **K – 2<sup>nd</sup> Grade SC.K2.CS-CS.2.4:** Define an algorithm as a sequence of defined steps.
- **K – 2<sup>nd</sup> Grade SC.K2.CS-CS.4.2:** Recognize and operate different types of computers, applications, and peripherals.
- **K – 2<sup>nd</sup> Grade SC.K2.CS-CP.2.4:** Construct a simple program using tools that do not require a textual programming language.

## Mathematics

- **Kindergarten MAFS.K.G.1.2:** Correctly name shapes, regardless of their orientations or overall size.
- **1<sup>st</sup> Grade MAFS.1.G.1.1:** Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.

## MISSISSIPPI

### Computer Science

- **K – 2<sup>nd</sup> Grade AP.1A.5:** Develop plans that describe a program's sequence of events, goals, and expected outcomes.
- **K – 2<sup>nd</sup> Grade CS.1A.2:** Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).
- **K – 2<sup>nd</sup> Grade DA.1A.1:** Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.

## Mathematics

- **Kindergarten K.G.2:** Correctly name shapes regardless of their orientations or overall size.
- **1<sup>st</sup> Grade 1.G.1:** Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.

# SCRATCH THE CAT: OBJECT ORIENTED PROGRAMMING

DR. DEBRA CHAPMAN

## GRADES

3<sup>rd</sup> – 5<sup>th</sup>

## DESCRIPTION

Students will use a computer assisted learning tool to write programs to describe simple geometric shapes. Learners will write algorithms that use a graphical user interface, using visual representations, mathematical functions & conditional statements to program the actions of Scratch the Cat.

## OBJECTIVES

- Explain the purpose of an algorithm
- Write an algorithm to create several simple shapes, including triangles & squares
- Explain how angles affect shapes
- Explain a conditional statement

## INSTRUCTOR NOTES

Scratch the Cat is designed to build incrementally from simple to more complex. It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration. Scratch the Cat is free, so the instructors can provide it to the students/parents for home use.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **3<sup>rd</sup> Grade #7:** Test and debug a given program in a block-based visual programming environment using arithmetic operations, conditionals, and repetition in programs, in collaboration with others.

- **4<sup>th</sup> Grade #7:** Create a working program in a block-based visual programming environment using arithmetic operators, conditionals, and repetition in programs, in collaboration with others.
- **5<sup>th</sup> Grade #6:** Create a working program in a block-based visual programming environment using arithmetic operators, conditionals, and repetition in programs.
- **5<sup>th</sup> Grade #7:** Identify variables.

## Mathematics

- **3<sup>rd</sup> Grade 3.G.1:** Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- **4<sup>th</sup> Grade 4.G.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles in a category and identify right triangles.
- **5<sup>th</sup> Grade 5.G.3:** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

## FLORIDA

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CP.2.3:** Create a program using arithmetic operators, conditionals, and repetition in programs.

### Mathematics

- **3<sup>rd</sup> Grade MAFS.3.G.1.1:** Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- **4<sup>th</sup> Grade MAFS.4.G.1.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles in a category and identify right triangles.
- **5<sup>th</sup> Grade MAFS.5.G.2.3:** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade AP.1B.3:** Create programs that include sequences, events, loops, and conditionals.

### Mathematics

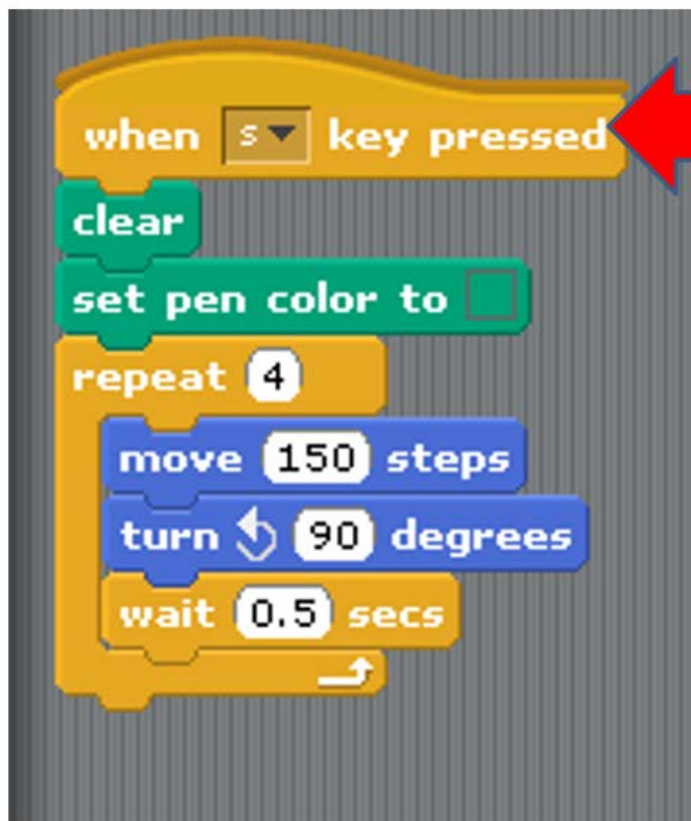
- **3<sup>rd</sup> Grade 3.G.1:** Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and



squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

- **4<sup>th</sup> Grade 4.G.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles in a category and identify right triangles.
- **5<sup>th</sup> Grade 5.G.3:** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

## Drawing a Square- Instructions



The image shows a Scratch script for drawing a square. The script starts with a yellow 'when s key pressed' block, which is pointed to by a red arrow labeled 'Key to Press'. This is followed by a green 'clear' block, a green 'set pen color to' block with a red color swatch, and a yellow 'repeat' block with the number '4'. Inside the repeat loop are three blue blocks: 'move 150 steps', 'turn 90 degrees' (with a left-turn arrow), and 'wait 0.5 secs'. To the right of the code is a cartoon drawing of the Scratch cat.

# ALICE: BEGINNING OBJECT ORIENTED PROGRAMMING

DR. DEBRA CHAPMAN

## GRADES

6<sup>th</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn about introductory Object Oriented programming concepts, including objects, properties, and methods using the ALICE programming software.

## OBJECTIVES

- Add objects to the Alice World
- Modify objects' properties and methods
- Add new object methods
- Create decision structures (if statements)
- Create repetition structures (loops)
- Use events to fire methods

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits and allow students to create their own ALICE projects. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #3:** Create pseudocode that uses conditionals.
- **7<sup>th</sup> Grade #3:** Create algorithms that demonstrate sequencing, selection, or iteration.
- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.2.4:** Develop problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.3:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

# Starting Off

- Our first step is to choose a background.
- When you open Alice, a box will pop up that has six different choices of background. It looks like the box to the right.
- Select the **space** background, because our world will be in space.
- Click on **space** and then click **Open**.



# ALICE: ADVANCED OBJECT ORIENTED PROGRAMMING

DR. DEBRA CHAPMAN

## GRADES

6<sup>th</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn about advanced Object Oriented programming concepts, including method scope and interactivity through events using the ALICE programming software. Students should have completed the Beginning Object Oriented Programming: ALICE HOLLA.

## OBJECTIVES

- Create an interactive object oriented Alice environment using events
- Differentiate between local and global scope (methods & events)
- Use camera cuts
- Add 3D text for additional effects.

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits and allow students to create their own ALICE projects. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration. A started file (similar to what is created Beginning Object Oriented Programming: ALICE HOLLA) containing objects, methods, and events is needed to save time.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #3:** Create pseudocode that uses conditionals.
- **7<sup>th</sup> Grade #3:** Create algorithms that demonstrate sequencing, selection, or iteration.
- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.2.4:** Develop problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.3:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

# THE PARTS OF THE ALICE SCREEN

- When you create an Alice world, there are three important parts of the Screen
  - The world
    - You get to see a miniature version of your world
  - The code area
    - This is where you place the instructions to the computer
  - Procedures and functions
    - Tasks that you can have the currently selected object do



# ANIMATION MANIA

DR. DEBRA CHAPMAN

## GRADES

6<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will create their own animated movies using Muvizu animation software and learn about objects, animating in passes, and using timelines.

## OBJECTIVES

- Modify the properties of objects
- Use objects to set up a movie scene
- Prepare object animation
- Direct object movement and animation in passes
- Edit or delete timeline components
- Create a .avi file of a movie

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #2:** Define a process as a function.
- **7<sup>th</sup> Grade #1:** Create a function to simplify a task.
- **8<sup>th</sup> Grade #16:** Present content designed for specific audiences through an appropriate medium.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #6:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects, with parameters, and which return a result.

## Media Arts

- **6<sup>th</sup> Grade #8:** Demonstrate adaptability, using tools and techniques in standard and experimental ways in constructing media arts productions
- **7<sup>th</sup> Grade #4:** Independently improve and refine media artworks by intentionally emphasizing particular expressive elements to reflect an understanding of purpose, audience, or place.
- **8<sup>th</sup> Grade #4:** Modify and refine media artworks, improving technical quality and intentionally accentuating selected expressive and stylistic elements, to reflect an understanding of purpose, audience, and setting.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Proficient #4:** Modify and refine media artworks, honing aesthetic quality and intentionally accentuating stylistic elements, to reflect an understanding of personal goals and preferences.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Accomplished #4:** Refine and elaborate aesthetic elements and technical components to intentionally form relevant expressions in media artworks for specific contexts, intentions, and audiences.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Advanced #4:** Intentionally and consistently refine and elaborate elements and components to form relevant expressions in media artworks, directed at specific contexts, purposes, and audiences.

## Visual Art

- **6<sup>th</sup> Grade #6:** Make observations and reflect on whether personal artwork conveys the intended meaning and revise accordingly.
- **7<sup>th</sup> Grade #2:** Develop and implement criteria to guide making a work of art or design to meet an identified goal.
- **7<sup>th</sup> Grade #5:** Apply graphic design strategies to produce a work of art, design, or media that clearly communicates information or ideas.
- **7<sup>th</sup> Grade #7:** Analyze how various technologies have changed the way artwork is preserved, presented, and experienced.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Novice #1:** Explore multiple approaches to begin the creative process.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #1:** Apply multiple approaches to formulate artwork using the creative process.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #2:** Implement multiple solutions with the use of available digital tools and/or innovative technology in an artistic investigation of traditional and/or contemporary practices.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CC.1.3:** Design, develop, and publish a collaborative digital product using a variety of digital tools and media-rich resources that demonstrate and communicate concepts to inform, persuade, and/or entertain.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

## Visual Arts

- **6<sup>th</sup> – 8<sup>th</sup> Grade VA.68.C.2.1:** Assess personal artwork during production to determine areas of success and needed change for achieving self-directed or specified goals.
- **6<sup>th</sup> – 8<sup>th</sup> Grade VA.68.S.1.2:** Use media, technology, and other resources to derive ideas for personal art-making.
- **9<sup>th</sup> – 12<sup>th</sup> Grade V.912.F.1.4:** Use technological tools to create art with varying effects and outcomes.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.4:** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.7:** Construct solutions to problems using student-created components, such as procedures, modules, and/or objects.

### Media Arts

- **6<sup>th</sup> Grade MA: Pr5.1.6.c:** Demonstrate adaptability using tools and techniques in standard and experimental ways in constructing media artworks.
- **7<sup>th</sup> Grade MA: Pr5.1.7.c:** Demonstrate adaptability using tools and techniques in standard and experimental ways to achieve an assigned purpose in constructing media artworks.
- **8<sup>th</sup> Grade MA: Pr5.1.8.c:** Demonstrate adaptability using tools, techniques, and content in standard and experimental ways to communicate intent in the production of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Proficient MA: Pr5.1.I.c:** Demonstrate adaptation and innovation through the combination of tools, techniques, and content, in standard and innovative ways, to communicate intent in the production of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Accomplished MA: Pr5.1.II.c:** Demonstrate the skillful adaptation and combination of tools, styles, techniques, and interactivity to achieve specific expressive goals in the production of a variety of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Advanced MA: Pr5.1.III.c:** Independently utilize and adapt tools, styles, and systems in standard, innovative, and experimental ways in the production of complex media artworks.





# VIDEO PODCASTING

DR. DEBRA CHAPMAN

## GRADES

6<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create a video podcast, including separate audio and video files, using Audacity and Windows Movie Maker.

## OBJECTIVES

- Create an audio file using Audacity
- Import a video file into Movie Maker
- Use the timeline to adjust podcast elements
- Add effects to the podcast – including video effects, transitions, titles, and credits
- Convert files to MPEG-4 format for posting as a podcast

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits and can allow students to create their own podcasts. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration. Headset microphones are recommended – audio files can be distributed if the files cannot be recorded.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #2:** Define a process as a function.
- **7<sup>th</sup> Grade #1:** Create a function to simplify a task.
- **8<sup>th</sup> Grade #16:** Present content designed for specific audiences through an appropriate medium.

- **9<sup>th</sup> – 12<sup>th</sup> Grade #6:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects, with parameters, and which return a result.

### Language Arts

- **6<sup>th</sup> Grade SL.6.5:** Include multimedia components and visual displays in presentations to clarify information.
- **7<sup>th</sup> Grade SL.7.4:** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- **8<sup>th</sup> Grade SL.8.5:** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
- **9<sup>th</sup> Grade SL.9-10.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence, and to add interest.
- **10<sup>th</sup> Grade SL.9-10.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **11<sup>th</sup> Grade SL.11-12.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **12<sup>th</sup> Grade SL.11-12.5:** Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

### Media Arts

- **6<sup>th</sup> Grade #2:** Collaboratively organize, propose, and evaluate artistic ideas, plans, prototypes, and production processes for media arts productions, considering purposeful intent.
- **6<sup>th</sup> Grade #8:** Demonstrate adaptability, using tools and techniques in standard and experimental ways in constructing media arts productions.
- **6<sup>th</sup> Grade #11:** Identify, describe, and analyze how message and meaning are created by components in media arts productions.
- **6<sup>th</sup> Grade #18:** Analyze and interact appropriately with media art tools and environments, considering fair use and copyright, ethics, and media literacy.
- **7<sup>th</sup> Grade #4:** Independently improve and refine media artworks by intentionally emphasizing particular expressive elements to reflect an understanding of purpose, audience, or place.
- **7<sup>th</sup> Grade #5:** Apply concepts of diverse content and varied forms into unified media arts productions that convey consistent narratives.
- **7<sup>th</sup> Grade #6:** Display an increasing set of artistic, design, technical, and career skills through creative problem-solving, organizing, and collaboration to produce media artworks.
- **7<sup>th</sup> Grade #8:** Demonstrate adaptability using tools and techniques in standard and experimental ways to achieve an assigned purpose in constructing media arts productions.
- **8<sup>th</sup> Grade #4:** Modify and refine media artworks, improving technical quality and intentionally accentuating selected expressive and stylistic elements, to reflect an understanding of purpose, audience, and setting.
- **8<sup>th</sup> Grade #5:** Apply concepts from across content areas and varied arts forms to create a single media arts production.

- **9<sup>th</sup> – 12<sup>th</sup> Grade Proficient #4:** Modify and refine media artworks, honing aesthetic quality and intentionally accentuating stylistic elements, to reflect an understanding of personal goals and preferences.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Accomplished #4:** Refine and elaborate aesthetic elements and technical components to intentionally form relevant expressions in media artworks for specific contexts, intentions, and audiences.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Advanced #4:** Intentionally and consistently refine and elaborate elements and components to form relevant expressions in media artworks, directed at specific contexts, purposes, and audiences.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CC.1.3:** Design, develop, and publish a collaborative digital product using a variety of digital tools and media-rich resources that demonstrate and communicate concepts to inform, persuade, and/or entertain.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

### Language Arts

- **6<sup>th</sup> Grade LAFS.6.W.2.6:** Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.
- **6<sup>th</sup> Grade LAFS.6.SL.2.5:** Include multimedia components and visual displays in presentations to clarify information.
- **6<sup>th</sup> Grade LAFS.6.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **6<sup>th</sup> Grade LAFS.6.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **6<sup>th</sup> Grade LAFS.6.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **7<sup>th</sup> Grade LAFS.7.W.2.6:** Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- **7<sup>th</sup> Grade LAFS.7.SL.2.5:** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- **7<sup>th</sup> Grade LAFS.7.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **7<sup>th</sup> Grade LAFS.7.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **7<sup>th</sup> Grade LAFS.7.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- **8<sup>th</sup> Grade LAFS.8.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade LAFS.8.W.2.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade LAFS.8.L.1.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade LAFS.8.L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade LAFS.8.L.2.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.4:** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.7:** Construct solutions to problems using student-created components, such as procedures, modules, and/or objects.

### Media Arts

- **6<sup>th</sup> Grade MA: Pr5.1.6.c:** Demonstrate adaptability using tools and techniques in standard and experimental ways in constructing media artworks.
- **7<sup>th</sup> Grade MA: Pr5.1.7.c:** Demonstrate adaptability using tools and techniques in standard and experimental ways to achieve an assigned purpose in constructing media artworks.
- **8<sup>th</sup> Grade MA: Pr5.1.8.c:** Demonstrate adaptability using tools, techniques, and content in standard and experimental ways to communicate intent in the production of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Proficient MA: Pr5.1.I.c:** Demonstrate adaptation and innovation through the combination of tools, techniques, and content, in standard and innovative ways, to communicate intent in the production of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Accomplished MA: Pr5.1.II.c:** Demonstrate the skillful adaptation and combination of tools, styles, techniques, and interactivity to achieve specific expressive goals in the production of a variety of media artworks.
- **9<sup>th</sup> – 12<sup>th</sup> Grade Advanced MA: Pr5.1.III.c:** Independently utilize and adapt tools, styles, and systems in standard, innovative, and experimental ways in the production of complex media artworks.

## Language Arts

- **6<sup>th</sup> Grade W.6.6:** Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.
- **6<sup>th</sup> Grade L.6.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **6<sup>th</sup> Grade L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **6<sup>th</sup> Grade L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **7<sup>th</sup> Grade W.7.6:** Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- **7<sup>th</sup> Grade L.7.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **7<sup>th</sup> Grade L.7.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **7<sup>th</sup> Grade L.7.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **8<sup>th</sup> Grade W.8.6:** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
- **8<sup>th</sup> Grade L.8.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **8<sup>th</sup> Grade L.8.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **8<sup>th</sup> Grade L.8.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English I W.9.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
- **English I L.9.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English I L.9.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English I L.9.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English II W.10.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
- **English II L.10.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- **English II L.10.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English II L.10.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English III W.11.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **English III L.11.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English III L.1.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English III L.11.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **English IV W.12.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **English IV L.12.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **English IV L.12.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **English IV L.12.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.

# GAMEMAKER: BEGINNING GAMING

DR. DEBRA CHAPMAN

## GRADES

6<sup>th</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn how to create basic computer games. An introduction to designing games and the different gaming genres will be discussed. A simple game will be created in GameMaker.

## OBJECTIVES

- Discuss many of the significant components of a computer game
- Identify different genres of computer games

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **6<sup>th</sup> Grade #8:** Create a program that initializes a variable.
- **7<sup>th</sup> Grade #8:** Formulate a narrative for each step of a process and its intended result, given pseudocode or code.
- **8<sup>th</sup> Grade #7:** Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.5:** Decompose a problem and create a function for one of its parts at a time, individually and collaboratively.

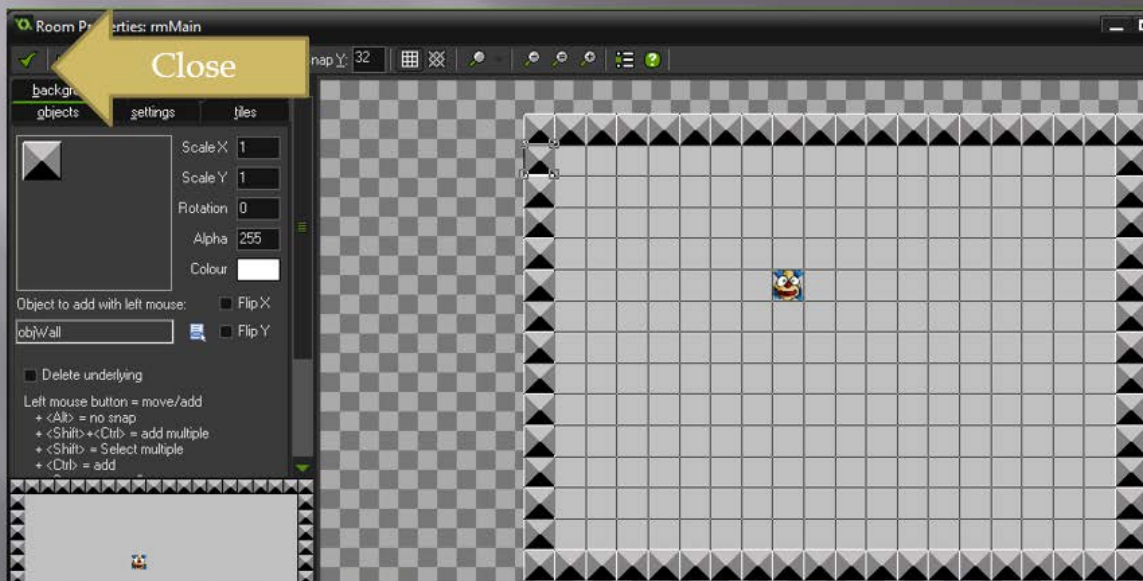
## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.2:** Create clearly named variables that represent different data types and perform operations on their values.

# Create the Room

- ❑ Room is Created
- ❑ Click Green Check to Close Room





# GAMEMAKER: INTERMEDIATE GAMING

DR. DEBRA CHAPMAN

## GRADES

7<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create a more advanced maze computer game. An introduction to designing games and interactive gaming features will be discussed. A simple maze game will be created in GameMaker

## OBJECTIVES

- Discuss many of the components needed in computer games
- Discuss the importance of a design document
- Create a basic maze game with user controllable player, actions, collectible objects, challenges, obstacles, multiple lives, and scorekeeping

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits and allow students to create their own games. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **7<sup>th</sup> Grade #8:** Formulate a narrative for each step of a process and its intended result, given pseudocode or code.
- **8<sup>th</sup> Grade #7:** Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.

- **9<sup>th</sup> – 12<sup>th</sup> Grade #38:** Systematically design and develop programs for broad audiences by incorporating feedback from users.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.5:** Decompose a problem and create a function for one of its parts at a time, individually and collaboratively.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CS.2.8:** Decompose a problem by defining new functions and classes.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.2:** Create clearly named variables that represent different data types and perform operations on their values.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.7:** Systematically design and develop programs for broad audiences by incorporating feedback from users.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process.

## ADVANCING TO THE NEXT ROOM

- In order to advance to the next room, we have to collect the ring
- We will create a Collision event on the Ring object that will destroy the ring and go to the next room
- You will find the Destroy Instance Icon in the main1 group on the right
- You will also find the Next Room icon

The screenshot shows the 'Events' and 'Actions' panels for an object named 'objRing'. The 'Events' panel has a blue highlight on the event 'objRing' triggered by '<no key>'. The 'Actions' panel contains two actions: '1 Destroy the instance' and '2 Go to next room'. Above the panels, a 'Rooms' panel is visible with three room icons. To the right, a 'main1' group contains three icons: a return arrow, a trash can (Destroy Instance), and a grid (Next Room). Red arrows point from the text in the list to these specific icons and the 'Rooms' panel.

# ANDROD APP

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn the basics of creating an Android app, including creation of views and handling of events.

## OBJECTIVES

- Create a basic Android app using the Android Virtual Device Manager
- Create a simple button and write a handler for the button click
- Use images and sounds
- Handle touch events

## INSTRUCTOR NOTES

Activity should be done in a laboratory where each machine has the Android Development Environment installed; includes the Android Virtual Device Manager; allows the student to test an Android app without having an Android device. Recommended idea: simple game. Some code could be pre-written, and the students could complete it.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #8:** Demonstrate code reuse by creating programming solutions using libraries and Application Programming Interfaces.

### FLORIDA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.2.4:** Facilitate programming solutions using application programming interfaces and libraries.

**Computer Science**

- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.9:** Demonstrate code reuse by creating programming solutions using libraries and APIs.

## Creating the Board

- We will create the board by using a special view called a `RelativeLayout`
- The `RelativeLayout` allows us to place components on the App and then specify where those components should be placed relative to other components
- We can define the size of our components by creating an instance of `RelativeLayout.LayoutParams` and specifying width and height

# JAVA: ANIMATIONS

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to draw shapes using Java and produce a simple animation.

## OBJECTIVES

- Draw triangles, circles, and general polygons
- Create a simple thread
- Be able to use the thread to animate a figure

## INSTRUCTOR NOTES

Java provides a nice mechanism for drawing shapes like circles and rectangles. In this activity, the student will learn how to draw shapes and figures and then use a simple technique to make it appear that the figure is moving.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

#### Visual Art

- **9<sup>th</sup> – 12<sup>th</sup> Grades: Novice #1:** Explore multiple approaches to begin the creative process.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #1:** Apply multiple approaches to formulate artwork using the creative process.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #2:** Implement multiple solutions with the use of available digital tools and/or innovative technology in an artistic investigation of traditional and./or contemporary practices.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process

## Drawing a Stick Figure and Making it Move

- In order to make the stick figure appear to move, we draw several stick figures
- We then display each of those figures in order
- When we repeat this, the figure moves

# JAVA: CREATING SIMPLE MUSIC

KEITH LYNN

## GRADES

7<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create simple midi sounds using the javax.sound.midi package.

## OBJECTIVES

- Create a sequencer object to be able to play sounds
- Create a sequence object
- Create a track containing a list of MidiEvents
- Create MidiEvents to play a note

## INSTRUCTOR NOTES

Students will use the javax.sound.midi package to create simple midi sounds that can be used to simulate music. It is recommended that Eclipse with Java EE be installed on the machines because it will have the correct package installed. Sample programs can be found in Head First Java.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **7<sup>th</sup> Grade #3:** Create algorithms that demonstrate sequencing, selection, or iteration.
- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## Music

- **7<sup>th</sup> Grade #1:** Generate rhythmic, melodic, and harmonic phrases and variations over harmonic accompaniments within AB, ABA, or theme and variation forms that convey expressive intent.
- **8<sup>th</sup> Grade #1:** Generate rhythmic, melodic, and harmonic phrases and harmonic accompaniments within expanded forms, including introductions, transitions, and codas, that convey expressive intent.
- **8<sup>th</sup> Grade #4:** Evaluate their own work by selecting and applying criteria, including appropriate application of compositional techniques, style, form, and use of sound sources.
- **Technology: Proficient #1:** Generate melodic, rhythmic, and harmonic ideas for compositions or improvisations using digital tools.
- **Technology: Proficient #2:** Select melodic, rhythmic, and harmonic ideas, using digital tools and resources.
- **Technology: Proficient #3:** Share compositions or improvisations that demonstrate a proficient level of musical and technological craftsmanship as well as the use of digital tools and resources in the development and organization of musical ideas in developing and organizing musical ideas.
- **Technology: Accomplished #1:** Generate melodic, rhythmic, and harmonic ideas for compositions and improvisations using digital tools and resources.
- **Technology: Accomplished #4:** Share compositions and improvisations that demonstrate an accomplished level of musical and technological craftsmanship as well as the use of digital and analog tools and resources in developing and organizing musical ideas.
- **Technology: Advanced #1:** Generate melodic, rhythmic, and harmonic ideas for compositions and improvisations that incorporate digital tools, resources, and systems.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.5:** Decompose a problem and create a function for one of its parts at a time.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

### Music

- **6<sup>th</sup> – 8<sup>th</sup> Grade MU.68.S.1.2:** Compose a short musical piece.
- **6<sup>th</sup> – 8<sup>th</sup> Grade MU.68.S.1.6:** Explain and employ basic functions of MIDI for sequencing and/or editing, including interface options and types of controllers.
- **6<sup>th</sup> – 8<sup>th</sup> Grade MU.68.S.1.8:** Demonstrate specific mixing and editing techniques using selected software and hardware.
- **6<sup>th</sup> – 8<sup>th</sup> Grade MU.68.H.2.2:** Analyze how technology has changed the way music is created, performed, acquired, and experienced.
- **9<sup>th</sup> – 12<sup>th</sup> Grade MU.912.S.1.2:** Compose music for voices and/or acoustic, digital, or electronic instruments.



- **9<sup>th</sup> – 12<sup>th</sup> Grade MU.912.S.1.6:** Synthesize music, MIDI, podcasting, webpage development, and/or similar technology-based skills to share knowledge.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.4:** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process

### Music

- **6<sup>th</sup> Grade MU:Cr1.1.6:** Generate simple rhythmic, melodic, and harmonic phrases within AB and ABA forms that convey expressive intent.
- **7<sup>th</sup> Grade MU:Cr1.1.7:** Generate rhythmic, melodic, and harmonic phrases and variations over harmonic accompaniments within AB, ABA, or theme and variation forms that convey expressive intent.
- **8<sup>th</sup> Grade MU:Cr1.1.8:** Generate rhythmic, melodic, and harmonic phrases and harmonic accompaniments within expanded forms (including introductions, transitions, and codas) that convey expressive intent.
- **Technology: Proficient MU:Cr1.1.T.I:** Generate melodic, rhythmic, and harmonic ideas for compositions or improvisations using digital tools.
- **Technology: Accomplished MU:Cr1.1.T.II:** Generate melodic, rhythmic, and harmonic ideas for compositions and improvisations using digital tools and resources.
- **Technology: Advanced MU:Cr1.1.T.III:** Generate melodic, rhythmic, and harmonic ideas for compositions and improvisations that incorporate digital tools, resources, and systems.

## Playing Notes

- The third parameter to create the ShortMessage is a note
- Middle C is 60
- The fourth parameter is the velocity
- Typically we can use 100

# JAVA: CREATING PDFS

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to use the third-party application iText to create their own PDF files using Java.

## OBJECTIVES

- Create a basic PDF document
- Use methods available in the iText package to draw text and graphics on the document
- Learn to create documents using Chunks, Phrases, and Paragraphs

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners who fall behind. The instructor can cover as much material as time permits. This activity should be done in a computer lab or a classroom with laptop computers. The instructor should have a computer connected to an overhead projector for demonstration.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

### FLORIDA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

**Computer Science**

- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process

## Things we can do with a PDF Document

- Drawing a graph
- Drawing an image
- Drawing a Table
- Drawing Graphics
- Drawing Chart
- There are other things that can be done with a PdfContentByte, but these are the ones we will consider

# READING & WRITING

## EXCEL

KEITH LYNN

### GRADES

9<sup>th</sup> – 12<sup>th</sup>

### DESCRIPTION

Students will learn how to use the third-party application POI in order to read and write Microsoft Excel spreadsheets.

### OBJECTIVES

- Open an existing Microsoft Excel spreadsheet
- Create a new Microsoft Excel spreadsheet
- Create large amounts of data in Java which can be stored in a Microsoft Excel spreadsheet

### INSTRUCTOR NOTES

The POI package needs to be installed on the laptops. The documentation for POI can provide some ideas that the instructor can use. It is recommended that the instructor have a particular document in mind that they want to create and show the student how to create the document. Also, the instructor should create a Microsoft Excel spreadsheet and have the students read it.

### COURSES OF STUDY

ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process

## Creating a Chart

- To create a new chart, we create a new instance of an `XSSFWorkbook`
- We then create a new `XSSFSheet`
- When then create rows and place data in cells
- We can create a new cell and set its value with `setCellValue`

# HANGMAN

KEITH LYNN

## GRADES

7<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create a simple hangman game.

## OBJECTIVES

- Place buttons on a screen that represent letters to guess
- Learn how to handle the clicking of a button
- Learn how to handle keyboard events
- Draw a simple hangman

## INSTRUCTOR NOTES

This simple game can be written in basic Java. It is recommended that the instructor write the solution ahead of time and at the beginning of the field trip, demonstrate it. Then the instructor should lead the students through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **7<sup>th</sup> Grade #7:** Create a program that updates the value of a variable in the program.
- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.
- **8<sup>th</sup> Grade #7:** Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #6:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects, with parameters, and which return a result.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.2.4:** Develop problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CP.2.4:** Facilitate programming solutions using application programming interfaces (APIs) and libraries.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade AP.2.3:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
- **9<sup>th</sup> – 10<sup>th</sup> Grade AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **11<sup>th</sup> – 12<sup>th</sup> Grade AP.3B.10:** Plan and develop programs for broad audiences using a software life cycle process.

# Hangman

- The plan for creating Hangman is to create three panels
- The first panel will contain buttons that represent the characters in the word
- The second panel will contain buttons indicating the characters in the alphabet that haven't been chosen
- The third panel will be used to draw the hangman

# SETTING UP A WEB SERVER

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to set up the Apache web server and Tomcat servlet container locally.

## OBJECTIVES

- Set up the Apache web server to server pages
- Install php and create php pages
- Set up the Tomcat servlet container
- Configure Apache to forward requests for the servlets to Tomcat

## INSTRUCTOR NOTES

The Apache web server, php, and Tomcat are free downloads. It is recommended to have them installed ahead of time or create a virtual machine with the software ready. It is recommended that the instructor have some pages ready that involve html, php, and servlets to demonstrate.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #33:** Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, packets, or addressing, as well as the issues that impact network functionality.



## FLORIDA

### Computer Science

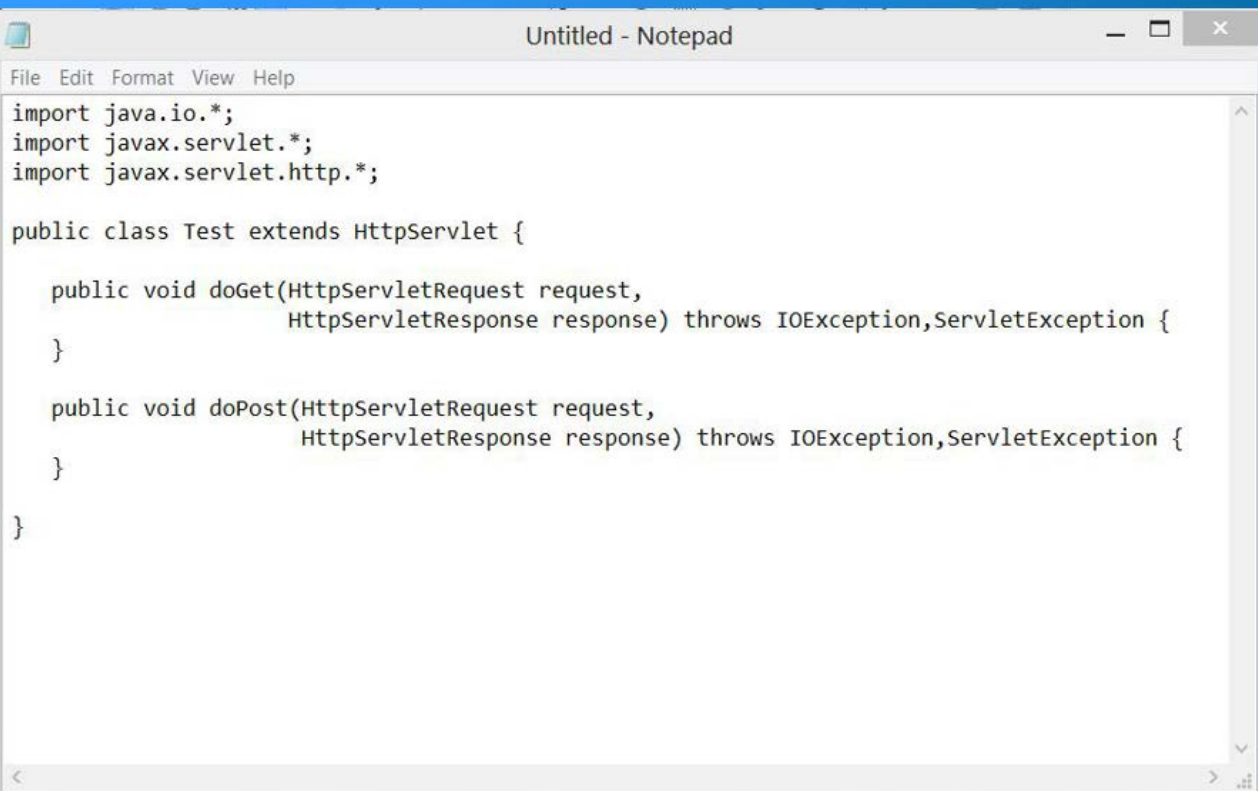
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CS.5.3:** Describe common network protocols, such as IP, TCP, SMTP, HTTP, and FTP, and how these are applied by client-server and peer-to-peer networks.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grade NI.3A.1:** Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, and addressing.
- **11<sup>th</sup> – 12<sup>th</sup> Grade NI.3B.1:** Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).

# A Simple Servlet



```
Untitled - Notepad
File Edit Format View Help
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class Test extends HttpServlet {

    public void doGet(HttpServletRequest request,
        HttpServletResponse response) throws IOException,ServletException {
    }

    public void doPost(HttpServletRequest request,
        HttpServletResponse response) throws IOException,ServletException {
    }

}
```

# CREATING A SIMPLE CLIENT/SERVER

KEITH LYNN

## GRADES

6<sup>th</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn how to create a simple client/server application in Java so that requests can be sent from the client to the server and the server can respond.

## OBJECTIVES

- Create a server application
- Create a client application
- Send messages from the client to the server
- Send messages from the server to the client

## INSTRUCTOR NOTES

The instructor can use the Java libraries to create the server and client. It is recommended that some activity, like a chat program or tic-tac-toe game, be created to demonstrate a use for the client and server.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **6<sup>th</sup> Grade #24:** Compare and contrast types of networks.
- **7<sup>th</sup> Grade #22:** Compare data storage structures.
- **7<sup>th</sup> Grade #24:** Diagram a network given a specific setup or need.
- **8<sup>th</sup> Grade #23:** Design a digital artifact to propose a solution for a content-related problem.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.5.1:** Describe how information, both text and non-text, is translated and communicated between digital computers over a computer network.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.5.3:** Identify the major components of a network.

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades NI.2.1:** Model the role of protocols in transmitting data across networks and the Internet.

## Creating a Simple Chat Server

- To create a simple chat server, we first create a `ServerSocket` and pick a port for it to listen to
- We wait for an incoming request from a client
- When we receive one, we create a thread that will constantly read from and write to the socket
- On the client side, once the connection has been established, we create a thread that constantly reads from and writes to the `Socket`

# JAVA: CREATING A WORD SEARCH

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create a simple puzzle in which words are hidden and the user locates them.

## OBJECTIVES

- Create an array of words
- Randomly place words in a puzzle
- Using MouseMotionListener events to allow the user to select puzzle words
- Indicate that a word has been found by using a strikethrough

## INSTRUCTOR NOTES

This is an exercise containing several components. The students will be shown how to hide a word in the puzzle. This will involve detecting where to place the word. It is recommended that the instructor write the code ahead of time and demonstrate it at the beginning of the HOLLA, then lead the students through development.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## Language Arts

- **9<sup>th</sup> Grade L.9-10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **10<sup>th</sup> Grade L.9-10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **12<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

### Language Arts

- **9<sup>th</sup> – 10<sup>th</sup> Grades LAFS.910.L.3.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> – 12<sup>th</sup> Grades LAFS.1112.L.3.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.

### Language Arts

- **9<sup>th</sup> Grade L.9.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **10<sup>th</sup> Grade L.10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> Grade L.11.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **12<sup>th</sup> Grade L.12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## The game

- The idea behind the game to choose randomly words from a list
- We create a grid of 400 letters and randomly choose locations to place those words in the grid
- After we have placed those words, we fill the other buttons in with random letters
- The words hidden are displayed in a list

# JAVA: DOWNLOAD IMAGES & SOUNDS

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to make network connections in Java in order to read images and sounds from web sites.

## OBJECTIVES

- Use a URL object to contact a web site
- Use regular expression to look for links to images and audio
- Use a BufferedInputStream to read the bytes of a file

## INSTRUCTOR NOTES

This can be done using the `java.util.regex` and `java.net` packages. It is recommended that beforehand, the instructor research websites that offer lots of video or audio and then use regular expressions to find the links to audio and video. Then the user can demonstrate how to make the network connection and download the files.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.

## Downloading an image or sound

- In order to download an image or sound, locate one on the web
- Then place the URL in the JTextField
- When you click the download button, the file will be downloaded
- Since we are downloading the bytes of the file, we will get an exact copy



# JAVA: SECURE A VNC CONNECTION

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to make a secure connection to a server and tunnel a port through the connection that carries VNC.

## OBJECTIVES

- Create a connection to a remote server running SSH
- Tunnel a VNC connection
- Use the ProcessBuilder class to start the VNC viewer

## INSTRUCTOR NOTES

This field trip will make use of the Java program found in the jcraft package. It is recommended that this and VNC Viewer be installed locally. For demonstration, it is recommended that a remote server be set up so that it runs VNC locally.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade #33:** Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, packets, or addressing, as well as the issues that impact network functionality.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CS.5.3:** Describe common network protocols, such as IP, TCP, SMTP, HTTP, and FTP, and how these are applied by client-server and peer-to-peer networks.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grade NI.3A.1:** Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, and addressing.
- **11<sup>th</sup> – 12<sup>th</sup> Grade NI.3B.1:** Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).

## VncViewer

- Vncviewer is a free utility that will allow us to connect to a VNC server
- We specify the port that'd we've tunneled through SSH and use 127.0.0.1 as the hostname
- If everything is connected correctly, you should see the desktop

# JAVA: CREATING AN EVENT CALENDAR

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will use the iText libraries to create a PDF document displaying a particular month and listing events that are occurring during that month.

## OBJECTIVES

- Create a basic PDF document
- Display a calendar for any month and year
- Draw text on the calendar

## INSTRUCTOR NOTES

This will require iText to be installed on the laptops. It is recommended that this be written ahead of time and demonstrated at the start of the field trip, then the students can be led through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.

# The Calendar

*August 2014*

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Test	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

# A MEMORY GAME

KEITH LYNN

## GRADES

7<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to place buttons or other shapes on the screen in pairs. Users will attempt to choose buttons that contain the same text or image.

## OBJECTIVES

- Create buttons that contain text or images
- Detect two button clicks and display the text or images
- Create a simple thread that will allow a pause

## INSTRUCTOR NOTES

This is a simple game using event handling. It is recommended that this be written ahead of time and demonstrated to the students at the beginning of the field trip. Students can be led through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **7<sup>th</sup> Grade #7:** Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.
- **8<sup>th</sup> Grade #29:** Create an artifact to solve a problem using ideation and iteration in the problem-solving process.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #38:** Systematically design and develop programs for broad audiences by incorporating feedback from users.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.5:** Decompose a problem and create a function for one of its parts at a time, individually and collaboratively.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades AP.2.9:** Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.

## The Game

- In order to play the game, we create two arrays
- The first array contains 16 ids of images, and the second array contains 16 ids of corresponding sounds
- For each button, we use its tag
- A tag is a String associated with a View
- In the tag we put the id of the image or sound followed by a semicolon followed by the index in the array

# JAVA: CREATE A CROSSWORD PUZZLE

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to create a simple crossword puzzle

## OBJECTIVES

- Create buttons and place them on the screen
- Determine where a word can fit on the screen
- Allow the user to use the keyboard or mouse to input letters

## INSTRUCTOR NOTES

This will be a simple game where words are placed onto a puzzle and their corresponding clues are displayed. It is recommended that this be written ahead of time and demonstrated at the beginning of class. Then the students can be led through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

#### Language Arts

- **9<sup>th</sup> Grade L.9-10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college

and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

- **10<sup>th</sup> Grade L.9-10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **12<sup>th</sup> Grade L.11-12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

### Language Arts

- **9<sup>th</sup> – 10<sup>th</sup> Grades LAFS.910.L.3.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **11<sup>th</sup> – 12<sup>th</sup> Grades LAFS.1112.L.3.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.



## Language Arts

- **English I L.9.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **English II L.10.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **English III L.11.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **English IV L.12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## The Game

- After the list of words and clues are loaded and we have chosen the words, we will display the clue for the word in a JComboBox
- The JComboBoxes corresponding to the word that goes with the clue will be highlighted in red
- If the user correctly chooses the letters, then the JComboBoxes are highlighted in green
- If the user gives up, then all of the words are displayed and all JComboBoxes that contains letters of words are highlighted in green

# JAVA: CREATE A DIGITAL ALARM CLOCK

KEITH LYNN

## GRADES

7<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to access the system time in a thread so they can display the current time and set a timer so that something happens when a time is reached.

## OBJECTIVES

- Create a simple thread
- Get the system time
- Cause something to happen at a chosen time

## INSTRUCTOR NOTES

This is a simple task involving a thread. You can use images of numbers in order to display the clock. It is recommended that this be written ahead of time and demonstrated at the beginning of the field trip, then students can be led through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **7<sup>th</sup> Grade #7:** Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.
- **8<sup>th</sup> Grade #29:** Create an artifact to solve a problem using ideation and iteration in the problem-solving process.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #38:** Systematically design and develop programs for broad audiences by incorporating feedback from users.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CS.2.5:** Decompose a problem and create a function for one of its parts at a time, individually and collaboratively.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.3.1:** Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).

## MISSISSIPPI

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades AP.2.9:** Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.1:** Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.4:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.3:** Use and adapt classic algorithms to solve computational problems.

## Creating an Alarm

- In order to create the alarm, we will place EditTexts and a Spinner on the app to allow the user to specify what time the alarm is for
- We then create a Thread which will obtain the system time and display it
- After we set the alarm and we reach that time, an alarm goes off

# CREATING & SAVING FRACTALS

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to draw fractal images such as Julia Sets and the Mandelbrot Set and use the netpbm package to store the images.

## OBJECTIVES

- Understand what a Julia Set is
- Draw the Julia Set for a quadratic or trigonometric function
- Understand what the Mandelbrot Set is
- Store .jpg or .gif images of Julia Sets or the Mandelbrot Set

## INSTRUCTOR NOTES

It is recommended that the netpbm packages be installed on the laptops. The instructor can lead the student through the drawing of the Julia Set or Mandelbrot Set so that students will see how to change the colors associated with a particular orbit of the function.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #25:** Utilize a variety of digital tools to create digital artifacts across content areas.

#### Visual Arts

- **9<sup>th</sup> – 12<sup>th</sup> Grades: Novice #1:** Explore multiple approaches to begin the creative process.

- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #1:** Apply multiple approaches to formulate artwork using the creative process.
- **9<sup>th</sup> – 12<sup>th</sup> Grades: Intermediate #2:** Implement multiple solutions with the use of available digital tools and/or innovative technology in an artistic investigation of traditional and/or contemporary practices.

## Mathematics

- **Algebra I F-IF.3:** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by  $f(0)=f(1)=1$ ,  $f(n+1)=f(n)+f(n-1)$  for  $n > \text{or} = 1$ .

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.1.1:** Analyze data and identify real-world patterns through modeling and simulation.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CS.2.10:** Design and implement a simple simulation algorithm to analyze, represent, and understand natural phenomena.

### Visual Art

- **9<sup>th</sup> – 12<sup>th</sup> Grade VA.912.S.1.2:** Investigate the use of technology and other resources to inspire art-making decisions.
- **9<sup>th</sup> – 12<sup>th</sup> Grade VA.912.S.1.8:** Use technology to simulate art-making processes and techniques.

## Mathematics

- **9<sup>th</sup> – 12<sup>th</sup> Grade MAFS.912.F-IF.1.3:** Determine characteristics of sequences, including the Fibonacci sequence, the triangular numbers, and pentagonal numbers.

## MISSISSIPPI

### Computer Science

- **9<sup>th</sup> – 10<sup>th</sup> Grades DA.3A.1:** Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.
- **11<sup>th</sup> – 12<sup>th</sup> Grades DA.3B.1:** Use data analysis tools and techniques to identify patterns in data representing complex systems.

## Mathematics

- **Algebra II F-IF.3:** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by  $f(0)=f(1)=1$ ,  $f(n+1)=f(n)+f(n-1)$  for  $n > \text{or} = 1$ .

# JAVA: CREATING AND READING ZIP FILES

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn to use the `java.util.zip` package to read and create `.zip` files.

## OBJECTIVES

- Reading a `.zip` file
- Create a `.zip` file
- Create a `.zip` file of a directory

## INSTRUCTOR NOTES

This is a straightforward exercise using the `java.util.zip` package. It is recommended that this be written ahead of time and demonstrated at the start of the field trip, then students can be led through development.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #25:** Utilize a variety of digital tools to create digital artifacts across content areas.

### FLORIDA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.3.2:** Evaluate different file types for different purposes.

# RASPBERRY PI: BUILDING A MEDIA SERVER

DR. MATT CAMPBELL

## GRADES

4<sup>th</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn how to build their own media server using a Raspberry Pi and open-source software. It allows users to play and view most videos, music, podcasts, and other digital media files from local and network storage media and the internet.

## OBJECTIVES

- Format and install Raspbmc software to a memory card
- Create and/or locate multimedia content and convert it for playback on the Raspberry Pi
- Set up and boot a Raspberry Pi

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners with the project. This activity should be done in a computer lab or classroom with one laptop and one Raspberry Pi, monitor, mouse, and keyboard for each group of 2-3 students. The instructor should have a Raspberry Pi connected to an overhead projector for demonstration.

<http://www.raspbmc.com/>

<http://www.howtogeek.com/119924/build-a-35-media-center-with-raspbmc-and-raspberry-pi/>

## COURSES OF STUDY

ALABAMA

### Computer Science

- **8<sup>th</sup> Grade #21:** Differentiate types of data storage and apply most efficient structure.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.4.5:** Evaluate various forms of input and output (e.g., IO and storage devices and digital media).

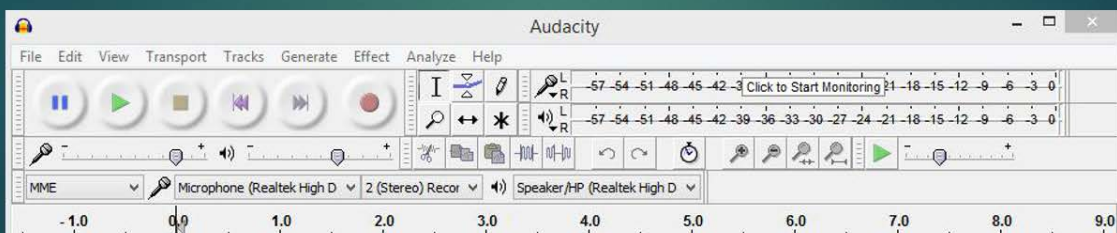
## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grades CS.1B.2:** Model how computer hardware and software work together as a system to accomplish tasks.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade CS.1B.1:** Describe how internal and external parts of computing devices function to form a system.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade DA.1B.3:** Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
- **6<sup>th</sup> – 8<sup>th</sup> Grades CS.2.2:** Design projects that combine hardware and software components to collect and exchange data.

## Creating an Audio file

- ▶ Start the program called Audacity
- ▶ You will see the control panel





# RASPBERRY PI: BUILDING A LOW-POWER FM RADIO TRANSMITTER

DR. MATT CAMPBELL

## GRADES

6<sup>th</sup> – 10<sup>th</sup>

## DESCRIPTION

Students will learn how to build their own low-power FM radio transmitter using a Raspberry Pi and open-source software.

## OBJECTIVES

- Explain how a radio transmitter works
- Set up and boot a Raspberry Pi
- Modify source code
- Compile the source code
- Modify hardware for FM broadcast
- Evaluate transmission strength

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners with the project. This activity should be done in a computer lab or classroom with one laptop and one Raspberry Pi, monitor, mouse, and keyboard for each group of 2-3 students. The instructor should have a Raspberry Pi connected to an overhead projector for demonstration. This lesson uses a custom research software called the Program Encryption Toolkit (PET) to help students visualize and create digital logic circuits and components. PET is also used to illustrate basic digital logic principles and security techniques such as obfuscation.

[http://www.icrobotics.co.uk/wiki/index.php/Turning\\_the\\_Raspberry\\_Pi\\_Into\\_an\\_FM\\_Transmitter](http://www.icrobotics.co.uk/wiki/index.php/Turning_the_Raspberry_Pi_Into_an_FM_Transmitter)

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.
- **9<sup>th</sup> – 12<sup>th</sup> Grades #8:** Demonstrate code reuse by creating programming solutions using libraries and application programming interfaces.

### FLORIDA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CP.2.7:** Classify programming languages by paradigm and application domain (e.g. imperative, functional, and logic languages) and evaluate their application to domains such as web programming, symbolic processing, and data/numerical processing.

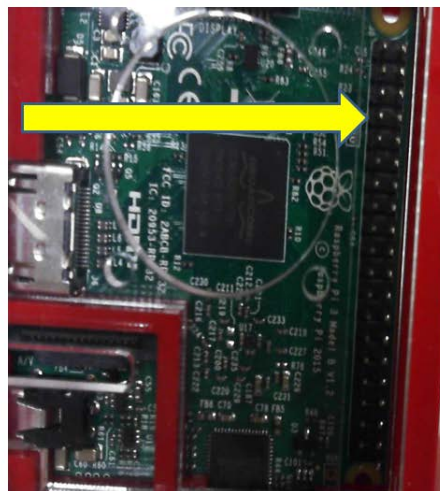
### MISSISSIPPI

#### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades AP.2.7:** Incorporate existing code, media, and libraries into original programs and give attribution.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.10:** Design and develop computational artifacts working in team roles using collaborative tools.



- In order for sound to be broadcast, we need to connect a cable to the Pi
- If you hold the Pi so that the network interface is at the bottom, you will see two rows of pins
- The pin you want to connect a cable to is the 4<sup>th</sup> pin in the column on the left



# RASPBERRY PI: BUILDING A RETRO GAMING CONSOLE

DR. MATT CAMPBELL

## GRADES

4<sup>th</sup> – 10<sup>th</sup>

## DESCRIPTION

Students will learn how to build their own retro gaming console (e.g. Atari 2600, Nintendo, Sega) using a Raspberry Pi and open-source software.

## OBJECTIVES

- Create a bootable RetroPie disk from an image file
- Set up and boot a Raspberry Pi
- Configure EmulationStation for gameplay

## INSTRUCTOR NOTES

It is recommended that the instructor have at least one assistant in the lab to assist learners with the project. This activity should be done in a computer lab or classroom with one laptop and one Raspberry Pi, monitor, mouse, and keyboard for each group of 2-3 students. The instructor should have a Raspberry Pi connected to an overhead projector for demonstration. This lesson uses a custom research software called the Program Encryption Toolkit (PET) to help students visualize and create digital logic circuits and components. PET is also used to illustrate basic digital logic principles and security techniques such as obfuscation.

<http://lifehacker.com/how-to-turn-your-raspberry-pi-into-a-retro-game-console-498561192>

## COURSES OF STUDY

ALABAMA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #34:** Categorize the roles of operating system software.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.4.2:** Describe the main functions of an operating system and explain how an operating system provides user and system services.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.4.3:** Describe the relationships between hardware and software.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.4.8:** Identify software used to support specialized forms of human-computer interaction.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.6.3:** Identify novel ways humans interact with computers, including software, probes, sensors, and handheld devices.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.4.3:** Differentiate between multiple levels of hardware and software that support program execution.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.6.3:** Describe the process of designing software to support specialized forms of human-computer interaction.

## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grades CS.1B.2:** Model how computer hardware and software work together as a system to accomplish tasks.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade CS.1B.1:** Describe how internal and external parts of computing devices function to form a system.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade DA.1B.3:** Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
- **9<sup>th</sup> – 10<sup>th</sup> Grades CS.3A.2:** Compare levels of abstraction and interactions between application software, system software, and hardware layers.

# Retro Pi

The old school way to game...



# ETHICAL HACKING

DR. TODD MCDONALD

## GRADES

11<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will gain deeper insight into software security.

## OBJECTIVES

- Understand the consequences of illegal hacking
- Differentiate between ethical and unethical hacking
- Compute and understand binary and hexadecimal numbers
- Explain the goals of a reverse engineer
- Define a man-at-the-end (MATE) attack
- Use a dynamic analysis tool to understand and reverse engineer a program

## INSTRUCTOR NOTES

This topic focuses on both illegal and ethical uses of hacking and will highlight the negative and illegal consequences of malicious hacking. Students will learn how software can be analyzed to change its intended behavior and learn concepts related to penetration testing and securing software from attack.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #11:** Model and demonstrate behaviors that are safe, legal, and ethical while living, learning, and working in an interconnected digital world.
- **9<sup>th</sup> – 12<sup>th</sup> Grades #12:** Describe how sensitive data can be affected by malware and other attacks.
- **9<sup>th</sup> – 12<sup>th</sup> Grades #13:** Compare various security measures of a computer system.
- **9<sup>th</sup> – 12<sup>th</sup> Grades # 14:** Compare ways to protect devices, software, and data.
- **9<sup>th</sup> – 12<sup>th</sup> Grades #17:** Discuss the ethical ramifications of malicious hacking and its impact on society.

## FLORIDA

### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.1.6:** Describe computer security vulnerabilities and methods of attack and evaluate their social and economic impact on computer systems and people.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.4.4:** Describe security and privacy issues that relate to computer networks.

## MISSISSIPPI

### Computer Science

- **11<sup>th</sup> – 12<sup>th</sup> Grades NI.3B.2:** Compare ways software developers protect devices and information from unauthorized access.



### Hacking



- Most people associate hacking with the negative meaning rather than a positive one
- Hacking = the art of exploiting computers, particularly for illegal purposes
  - Very serious consequences
  - Laws have been passed or refined that make it a crime to hack into systems



# STEGANOGRAPHY

DR. TODD MCDONALD

## GRADES

11<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will gain deeper insight into software security and privacy.

## OBJECTIVES

- Explain how secret writing came about
- Differentiate between steganography and cryptography
- Understand the advantages and disadvantages of using or detecting stego
- Create or read a text-based stego message
- Understand how information can be embedded in digital media
- Hide a message in an image using a stego tool

## INSTRUCTOR NOTES

This topic focuses on basic types of steganography or secret writing.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #29:** Summarize the role of compression and encryption in modifying the structure of digital artifacts and the varieties of information carried in the metadata of these artifacts.

### FLORIDA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.5.1:** Identify and select the most appropriate file format based on trade-offs.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.1.4:** Explain the principles of cryptography by examining encryption, digital signatures, and authentication methods.

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.1.5:** Implement an encryption, digital signature, or authentication method.

## MISSISSIPPI

### Computer Science

- **11<sup>th</sup> – 12<sup>th</sup> Grades NI.3B.2:** Compare ways software developers protect devices and information from unauthorized access.



## What is Steganography?



- The word Steganography comes from Greek:  
Steganos – Covered or Protected  
Grapheī – Writing
- It is a technique of embedding information into something else for the sole purpose of hiding that information from the casual observer.
- For true secrecy, you don't want anyone to know you are sending a message at all.





# DIGITAL LOGIC WITH THE PROGRAM ENCRYPTION TOOLKIT

DR. TODD MCDONALD

## GRADES

11<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn about basic digital logic and circuits and how security impacts their design.

## OBJECTIVES

- Understand basic types of logic gates like AND, OR, XOR
- Interpret or create a truth table for a logic gate
- Understand the logic equation of a logic gate using canonical sum of products and product of sums
- Create basic components from logic gates
- Create polymorphic variants of a logic circuit
- Understand how to analyze circuits to see if they are equivalent
- Understand the security issues associated with digital logic and circuit designs.

## INSTRUCTOR NOTES

This lesson uses a custom research software called the Program Encryption Toolkit (PET) to help students visualize and create digital logic circuits and components. PET is also used to illustrate basic digital logic principles and security techniques such as obfuscation.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades #29:** Summarize the role of compression and encryption in modifying the structure of digital artifacts and the varieties of information carried in the metadata of these artifacts.

## FLORIDA



### Computer Science

- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.5.1:** Identify and select the most appropriate file format based on trade-offs.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.1.4:** Explain the principles of cryptography by examining encryption, digital signatures, and authentication methods.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-PC.1.5:** Implement an encryption, digital signature, or authentication method.



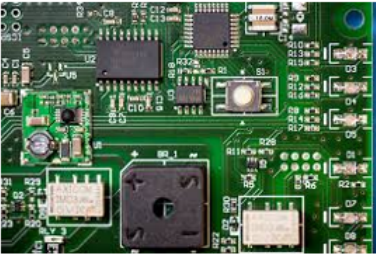
## MISSISSIPPI

### Computer Science

- **11<sup>th</sup> – 12<sup>th</sup> Grades NI.3B.2:** Compare ways software developers protect devices and information from unauthorized access.

 **What is Digital Logic?** 5 

- **Digital logic:** electronic circuits that handle information encoded in binary form (deal with signals that have only two values, 0 and 1 or **false** and **true**)
- **Computers** are built from digital logic components



- The number system that has two values is the **binary number system**

University of South Alabama      CFITS (Center for Forensics, Information Technology, and Security)      School of Computing

# RASPBERRY PI: LIGHTING AN LED

KEITH LYNN

## GRADES

9<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn how to assemble items such as LEDs and resistors on a breadboard and to use the Raspberry Pi and Python to control the LEDs.

## OBJECTIVES

- Understand how to place items on a breadboard
- Connect to a Raspberry Pi and start IDLE to create a Python program
- Write and execute a Python program
- Turn an LED on and off with a Python program
- Make an LED blink using a Python program

## INSTRUCTOR NOTES

Each student uses a laptop with a special program installed that allows them to view the desktop of a Raspberry Pi. They are shown how to create and write a Python program that will control the pins of a Raspberry Pi.

## COURSES OF STUDY

ALABAMA

### Computer Science

- 9<sup>th</sup> – 12<sup>th</sup> **Grades #34:** Categorize the roles of operating system software.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.4.2:** Describe the main functions of an operating system and explain how an operating system provides user and system services.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.4.3:** Describe the relationships between hardware and software.
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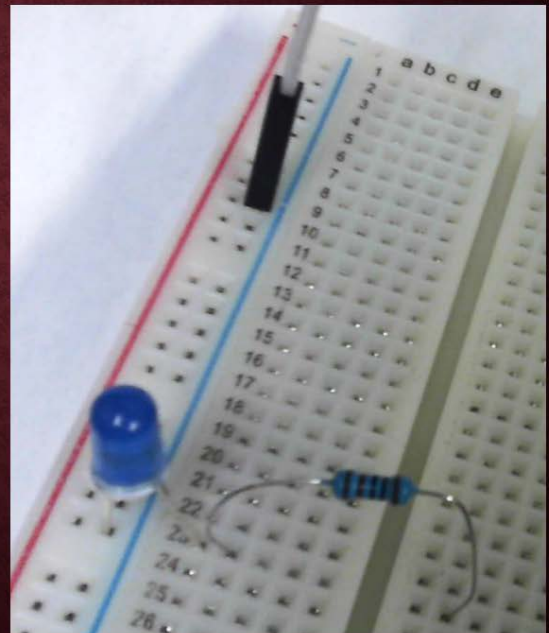
## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grades CS.1B.2:** Model how computer hardware and software work together as a system to accomplish tasks.
- **9<sup>th</sup> – 10<sup>th</sup> Grades CS.3A.2:** Compare levels of abstraction and interactions between application software, system software, and hardware layers.

### CONNECT A WIRE FOR LOW VOLTAGE

- Take a M – F wire and connect it to the same column where you connected the cathode (short wire) of the LED.
- Make sure it is firmly connected.



# LEARNING TO PROGRAM WITH LOGO

KEITH LYNN

## GRADES

2<sup>nd</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn to create simple programs using the Logo programming language.

## OBJECTIVES

- Understand how to start a logo program
- Use logo to control the “turtle”
- Make the “turtle” move in a path

## INSTRUCTOR NOTES

Each student uses a laptop with the MSWLogo program installed. They will be shown how to create a simple program.

## COURSES OF STUDY

### ALABAMA

#### Computer Science

- **2<sup>nd</sup> Grade #2:** Create an algorithm for other learners to follow.
- **2<sup>nd</sup> Grade #3:** Construct elements of a simple computer program using basic commands.
- **3<sup>rd</sup> Grade #5:** Create an algorithm to solve a problem as a collaborative team.
- **4<sup>th</sup> Grade #3:** Show that different solutions exist for the same problem or sub-problem.
- **5<sup>th</sup> Grade #7:** Identify variables.
- **6<sup>th</sup> Grade #5:** Identify algorithms that make use of sequencing, selection, or iteration.
- **7<sup>th</sup> Grade #3:** Create algorithms that demonstrate sequencing, selection, or iteration.

- **8<sup>th</sup> Grade #3:** Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.
- **9<sup>th</sup> – 12<sup>th</sup> Grades #3:** Differentiate between a generalized expression of an algorithm in pseudocode and its concrete implementation in a programming language.

## Mathematics

- **2<sup>nd</sup> Grade 2.G.1:** Recognize and draw shapes having specified attributes such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- **3<sup>rd</sup> Grade 3.G.1:** Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- **4<sup>th</sup> Grade 4.MD.5:** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint and understand concepts of angle measurement.
- **4<sup>th</sup> Grade 4.G.1:** Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines. Identify these in two-dimensional figures.
- **7<sup>th</sup> Grade 7.G.1:** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing, and reproducing a scale drawing at a different scale.
- **Geometry G.CO.5:** Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

## FLORIDA

### Computer Science

- **K – 2<sup>nd</sup> Grades SC.K2.CS-CS.2.4:** Define an algorithm as a sequence of defined steps.
- **3<sup>rd</sup> – 5<sup>th</sup> Grades SC.35.CS-CS.2.5:** Write an algorithm to solve a grade-level appropriate problem, individually or collaboratively.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.2.10:** Recognize that more than one algorithm can solve a given problem.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.2.11:** Predict outputs while showing an understanding of inputs.
- **6<sup>th</sup> – 8<sup>th</sup> Grades SC.68.CS-CS.2.12:** Select the "best" algorithm based on a given criteria to solve a problem, individually and collaboratively.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.2.11:** Evaluate algorithms by their efficiency, correctness, and clarity.
- **9<sup>th</sup> – 12<sup>th</sup> Grades SC.912.CS-CS.2.7:** Explain how sequence, selection, iteration, and recursion are building blocks of algorithms.

### Mathematics

- **Kindergarten MAFS.K.G.1.2:** Correctly name shapes regardless of their orientations or overall size.

- **1<sup>st</sup> Grade MAFS.1.G.1.1:** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
- **2<sup>nd</sup> Grade MAFS.2.G.1.1:** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- **3<sup>rd</sup> Grade MAFS.3.G.1.1:** Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- **4<sup>th</sup> Grade MAFS.4.G.1.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specialized size. Recognize right triangles as a category and identify right triangles.

## MISSISSIPPI

### Computer Science

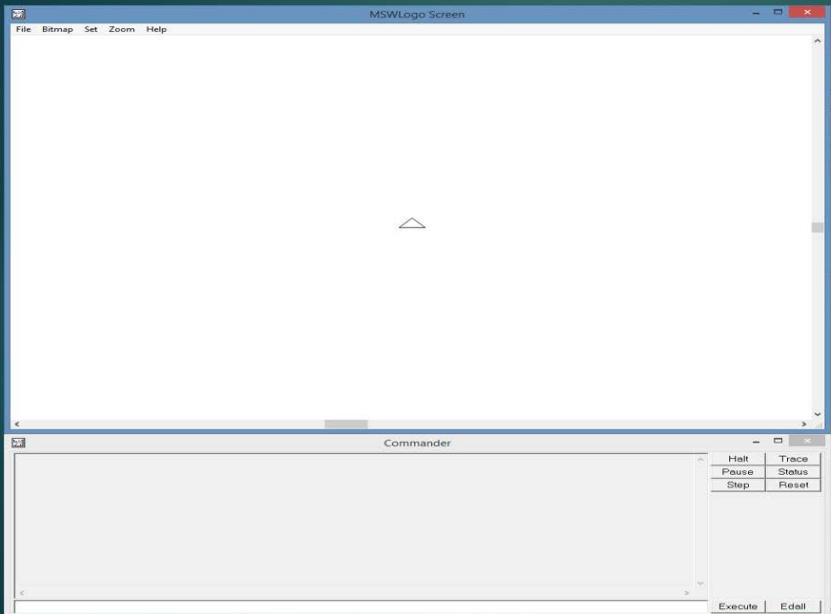
- **K – 2<sup>nd</sup> Grades AP.1A.4:** Decompose the steps needed to solve a problem into a precise sequence of instructions.
- **K – 2<sup>nd</sup> Grades AP.1A.5:** Develop plans that describe a program's sequence of events, goals, and expected outcomes.
- **3<sup>rd</sup> – 5<sup>th</sup> Grades AP.1B.1:** Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- **3<sup>rd</sup> – 5<sup>th</sup> Grades AP.1B.3:** Create programs that include sequences, events, loops, and conditionals.
- **3<sup>rd</sup> – 5<sup>th</sup> Grades AP.1B.4:** Decompose problems into smaller, manageable subproblems to facilitate the program development process.
- **6<sup>th</sup> – 8<sup>th</sup> Grades AP.2.1:** Use flowcharts and/or pseudocode to address complex problems as algorithms.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.2:** Use lists and functions to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
- **9<sup>th</sup> – 10<sup>th</sup> Grades AP.3A.5:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
- **11<sup>th</sup> – 12<sup>th</sup> Grades AP.3B.4:** Evaluate algorithms in terms of their efficiency, correctness, and clarity.

### Mathematics

- **Kindergarten K.G.4:** Correctly name shapes regardless of their orientations or overall size.
- **1<sup>st</sup> Grade 1.G.1:** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non—defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

- **2<sup>nd</sup> Grade 2.G.1:** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- **3<sup>rd</sup> Grade 3.G.1:** Understand that shapes in different categories (e.g., rhombuses, rectangles, circles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- **4<sup>th</sup> Grade 4.G.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.

## You should see this



The screenshot displays the MSWLogo environment. At the top is a menu bar with 'File', 'Bitmap', 'Set', 'Zoom', and 'Help'. Below it is a large white canvas titled 'MSWLogo Screen' containing a small triangle representing the Logo turtle. At the bottom is a 'Commander' window with a text input area and a control panel on the right. The control panel includes buttons for 'Halt', 'Trace', 'Pause', 'Status', 'Step', and 'Reset'. At the very bottom of the Commander window are 'Execute' and 'Edall' buttons.

This part of the screen is where we see the Logo turtle. When you give commands to the turtle, you will see the turtle respond

In this part of the screen, you will type in instructions



# DIGITAL STORYTELLING (2<sup>ND</sup> – 5<sup>TH</sup>)

JESSICA FREELAND

## GRADES

2<sup>nd</sup> – 5<sup>th</sup>

## DESCRIPTION

Students will learn to create a digital story using the Photo Story 3 software.

## OBJECTIVES

- Understand what a digital story is.
- Learn how to use digital storytelling software.
- Create a digital story.

## INSTRUCTOR NOTES

Images for each grade-level appropriate story should be pre-loaded into a folder on each laptop. Each student should have a copy of the narration script that goes along with the grade-level appropriate story. Photo Story 3 should be pre-installed on each laptop. Completed digital stories could be uploaded to a flash drive or to Google Drive to be shared with the classroom teacher.

## COURSES OF STUDY

### ALABAMA

#### Media Arts

- **2<sup>nd</sup> Grade #18:** Interact appropriately with media arts tools and environments, practicing safety, rules, and fairness.
- **3<sup>rd</sup> Grade #18:** Examine and interact appropriately with media arts tools and environments, applying safety, rules, and fairness.
- **4<sup>th</sup> Grade #18:** Examine and interact appropriately with media arts tools and environments, considering ethics, rules, and fairness.

- **5<sup>th</sup> Grade #18:** Examine, discuss, and interact appropriately with media arts tools and environments, considering ethics, rules, and media literacy.

### Computer Science

- **2<sup>nd</sup> Grade #9:** Use a variety of digital tools to connect with other learners.
- **3<sup>rd</sup> Grade #13:** Communicate key ideas and details collaboratively in a way that informs, persuades, and/or entertains, using digital tools.
- **4<sup>th</sup> Grade #12:** Use basic features of digital tools to communicate key ideas and details in a way that informs and/or persuades.
- **5<sup>th</sup> Grade #16:** Use advanced features of digital tools and media-rich resources to communicate key ideas and details in a way that informs, persuades, and/or entertains.

## FLORIDA

### Computer Science

- **K – 2<sup>nd</sup> Grade SC.K2.CS-CS.3.2:** Create, review, and revise artifacts that include text, images, and audio using digital tools.
- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CS.3.1:** Manipulate and publish multimedia artifacts using digital tools (local and online).

## MISSISSIPPI

### Media Arts

- **2<sup>nd</sup> Grade Pr4.1.2a:** Practice combining varied academic, arts, and media content into unified media artworks such as a narrated science animation.
- **3<sup>rd</sup> Grade Cr1.1.3:** Develop multiple ideas for media artworks using a variety of tools, methods and/or materials.
- **4<sup>th</sup> Grade Pr4.1.4:** Demonstrate how a variety of academic, arts, and media forms and content may be mixed and coordinated into media artworks, such as narrative, dance, and media.
- **5<sup>th</sup> Grade Pr4.1.5:** Create media artworks through the integration of multiple contents and forms, such as a media broadcast.

# DIGITAL STORYTELLING (6<sup>TH</sup> – 12<sup>TH</sup>)

JESSICA FREELAND

## GRADES

6<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn to create a digital story using the Photo Story 3 software.

## OBJECTIVES

- Understand what a digital story is.
- Learn how to use digital storytelling software.
- Create a digital story.

## INSTRUCTOR NOTES

Students will first be directed to look up information and write 1-2 paragraphs about a particular topic (if one is not chosen by the classroom teacher, then use "Favorite Video Game" as a starter topic). Students will then be directed to search for and save images to go with their paragraph. Then, as a class, students will be walked through how to upload their saved images and to record their paragraph as a digital story.

## COURSES OF STUDY

### ALABAMA

#### Media Arts

- **6<sup>th</sup> Grade #18:** Analyze and interact appropriately with media arts tools and environments, considering fair use and copyright, ethics, and media literacy.
- **7<sup>th</sup> Grade #18:** Analyze and responsibly interact with media arts tools and environments, considering copyright, ethics, media literacy, and social media.
- **8<sup>th</sup> Grade #18:** Analyze and responsibly interact with media arts tools, environments, and legal and technological contexts, considering ethics, media literacy, social media, and virtual worlds.

- **Proficient #4:** Modify and refine media artworks, honing aesthetic quality and intentionally accentuating stylistic elements, to reflect an understanding of personal goals and preferences.
- **Accomplished #4:** Refine elaborate aesthetic elements and technical components to intentionally form relevant expressions in media artworks for specific contexts, intentions, and audiences.
- **Advanced #4:** Intentionally and consistently refine and elaborate elements and components to form relevant expressions in media artworks, directed at specific contexts, purposes, and audiences.

## Computer Science

- **6<sup>th</sup> Grade #16:** Communicate and/or publish collaboratively to inform others from a variety of backgrounds and cultures about issues and problems.
- **7<sup>th</sup> Grade #16:** Construct content designed for specific audiences through an appropriate medium.
- **8<sup>th</sup> Grade #16:** Present content designed for specific audiences through an appropriate medium.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CC.1.3:** Design, develop, and publish a collaborative digital product using a variety of digital tools and media-rich resources that demonstrate and communicate concepts to inform, persuade, and/or entertain.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CC.1.6:** Communicate and publish key ideas and details to a variety of audiences using digital tools and media-rich resources.

## MISSISSIPPI

### Media Arts

- **6<sup>th</sup> Grade Pr4.1.6:** Validate how integrating multiple contents and forms can support a central idea in a media artwork, such as media, narratives, and performances.
- **7<sup>th</sup> Grade Pr4.1.7:** Integrate multiple contents and forms into unified media arts productions that convey consistent perspectives and narratives, such as an interactive video game.
- **8<sup>th</sup> Grade Pr4.1.8:** Integrate multiple contents and forms into unified media arts productions that convey specific themes or ideas, such as interdisciplinary projects, or multimedia theatre.
- **Proficient Pr4.1.I:** Integrate various arts, media arts forms, and content into unified media arts productions, considering the reaction and interaction of the audience, such as experiential design.
- **Accomplished Pr4.1.II:** Integrate various arts, media forms, and academic content into unified media arts productions that retain thematic integrity and stylistic continuity, such as transmedia productions.

# CANVA: CLASS BROCHURE

JESSICA FREELAND

## GRADES

6<sup>th</sup> – 12<sup>th</sup>

## DESCRIPTION

Students will learn to create a digital brochure using the free graphic design software, Canva.

## OBJECTIVES

- Understand what a brochure is.
- Understand what graphic design is.
- Create a digital brochure.

## INSTRUCTOR NOTES

Student laptops should be logged into individual google accounts (i.e. [hollastudent1@gmail.com](mailto:hollastudent1@gmail.com)) for easier access to Canva. Students should use this google account to log in to Canva to create a brochure.

## COURSES OF STUDY

### ALABAMA

#### Media Arts

- **6<sup>th</sup> Grade #3:** Experiment with multiple approaches to produce content and components for specific purpose and meaning in media arts productions, utilizing a range of associated principles.
- **7<sup>th</sup> Grade #4:** Independently improve and refine media artworks by intentionally emphasizing particular expressive elements to reflect an understanding of purpose, audience, or place.
- **8<sup>th</sup> Grade #4:** Modify and refine media artworks, improving technical quality and intentionally accentuating selected expressive and stylistic elements, to reflect an understanding of purpose, audience, and setting.

- **Proficient #4:** Modify and refine media artworks, honing aesthetic quality and intentionally accentuating stylistic elements, to reflect an understanding of personal goals and preferences.
- **Accomplished #4:** Refine and elaborate aesthetic elements and technical components to intentionally form relevant expressions in media artworks for specific contexts, intentions, and audiences.
- **Advanced #4:** Intentionally and consistently refine and elaborate elements and components to form relevant expressions in media artworks, directed at specific contexts, purposes, and audiences.

### Computer Science

- **6<sup>th</sup> Grade #16:** Communicate and/or publish collaboratively to inform others from a variety of backgrounds and cultures about issues and problems.
- **7<sup>th</sup> Grade #16:** Construct content designed for specific audiences through an appropriate medium.
- **8<sup>th</sup> Grade #16:** Present content designed for specific audiences through an appropriate medium.
- **9<sup>th</sup> – 12<sup>th</sup> Grade #5:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.

## FLORIDA

### Computer Science

- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CC.1.3:** Design, develop, and publish a collaborative digital product using a variety of digital tools and media-rich resources that demonstrate and communicate concepts to inform, persuade, and/or entertain.
- **9<sup>th</sup> – 12<sup>th</sup> Grade SC.912.CS-CC.1.6:** Communicate and publish key ideas and details to a variety of audiences using digital tools and media-rich resources.

## MISSISSIPPI

### Media Arts

- **6<sup>th</sup> Grade Pr4.1.6:** Validate how integrating multiple contents and forms can support a central idea in a media artwork, such as media, narratives, and performances.
- **7<sup>th</sup> Grade Pr4.1.7:** Integrate multiple contents and forms into unified media arts productions that convey consistent perspectives and narratives, such as an interactive video game.
- **8<sup>th</sup> Grade Pr4.1.8:** Integrate multiple contents and forms into unified media arts productions that convey specific themes or ideas, such as interdisciplinary projects, or multimedia theatre.
- **Proficient Pr4.1.I:** Integrate various arts, media arts forms, and content into unified media arts productions, considering the reaction and interaction of the audience, such as experiential design.
- **Accomplished Pr4.1.II:** Integrate various arts, media forms, and academic content into unified media arts productions that retain thematic integrity and stylistic continuity, such as transmedia productions.

# DATA WITH GOOGLE FORMS & SHEETS

JESSICA FREELAND

## GRADES

3<sup>rd</sup> – 8<sup>th</sup>

## DESCRIPTION

Students will learn to create a Google Form, export the data to Google Sheets, and customize a graph to display the data.

## OBJECTIVES

- Create a Google Form survey.
- Export Google Form results to Google Sheets.
- Create a customized graph in Google Sheets.

## INSTRUCTOR NOTES

Student laptops should be logged into individual google accounts (i.e. [hollastudent1@gmail.com](mailto:hollastudent1@gmail.com)) for easier access to G-Suite. There should be a link on the desktop or shared to all of the student accounts in Google Drive where students can post their survey links. Students should save their completed graph to a shared folder or flash drive to be shared with the classroom teacher.

## COURSES OF STUDY

ALABAMA

### Computer Science

- **3<sup>rd</sup> Grade #17:** Describe examples of data sets or databases from everyday life.
- **4<sup>th</sup> Grade #16:** Gather and organize data to answer a question using a variety of computing and data visualization methods.
- **5<sup>th</sup> Grade #21:** Manipulate data to answer a question using a variety of computing methods and tools to collect, organize, graph, analyze, and publish the resulting information.

- **6<sup>th</sup> Grade #19:** Track data change from a variety of sources.
- **7<sup>th</sup> Grade #22:** Compare data storage structures.
- **8<sup>th</sup> Grade #21:** Differentiate types of data storage and apply most efficient structure.

## Mathematics

- **3<sup>rd</sup> Grade 3.MD.3:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
- **6<sup>th</sup> Grade 6.SP.2:** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- **7<sup>th</sup> Grade 7.SP.2:** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

## FLORIDA

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade SC.35.CS-CP.1.2:** Identify and describe examples of databases from everyday life.
- **6<sup>th</sup> – 8<sup>th</sup> Grade SC.68.CS-CP.1.2:** Select and use data-collection technology to gather, view, organize, analyze, and report results for content-related problems, individually and collaboratively.

## Mathematics

- **3<sup>rd</sup> Grade MAFS.3.MD.2.3:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
- **6<sup>th</sup> Grade MAFS.6.SP.1.2:** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- **7<sup>th</sup> Grade MAFS.7.SP.1.2:** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

## MISSISSIPPI

### Computer Science

- **3<sup>rd</sup> – 5<sup>th</sup> Grade DA.1B.1:** Organize and present collected data visually to highlight relationships and support a claim.
- **6<sup>th</sup> – 8<sup>th</sup> Grade DA.2.2:** Collect data using computational tools and transform the data to make it more useful and reliable.



# APPENDIX A

## RESOURCES

Alice: [www.alice.org](http://www.alice.org)

Android Studio: <https://developer.android.com/studio>

Apache HTTP Server: <https://httpd.apache.org/download.cgi>

Apache Tomcat: <https://tomcat.apache.org/download-80.cgi>

Audacity: [www.audacityteam.org](http://www.audacityteam.org)

Blender 3-D: [www.blender.org](http://www.blender.org)

Canva: [www.canva.com](http://www.canva.com)

GameMaker: [www.yoyogames.com/gamemaker](http://www.yoyogames.com/gamemaker)

Jsch Package: [www.jcraft.org](http://www.jcraft.org)

Logo: <http://www.softronix.com/logo.html>

Movie Maker 10: [www.microsoft.com/en-us/p/movie-maker-10-free/9mvfq4lmz6c9?activetab=pivot:overviewtab](http://www.microsoft.com/en-us/p/movie-maker-10-free/9mvfq4lmz6c9?activetab=pivot:overviewtab)

Muvizu: [www.muvizu.com](http://www.muvizu.com)

Netpbm: <http://netpbm.sourceforge.net/>

Open Source Media Center: <https://osmc.tv>

Photo Story 3: <https://www.microsoft.com/en-us/download/details.aspx?id=11132>

Raspberry Pi: [www.raspbmc.com/](http://www.raspbmc.com/)

Raspberry Pi Operating Systems: [www.raspberrypi.org/downloads](http://www.raspberrypi.org/downloads)

Scratch the Cat: [www.scratch.mit.edu/studios/1284020/](http://www.scratch.mit.edu/studios/1284020/)

# APPENDIX B

AT-A-GLANCE ALIGNMENT CHART – ALABAMA



Overview HOLLA Integration Alignment to Alabama State Standards	Computer Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)									•	•	•	•	•
#5 Brain-Computer Interface					•	•	•	•	•	•	•	•	•
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming	•	•											
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming							•	•	•				
#10: ALICE: Advanced Object Oriented Programming							•	•	•				
#11: Animation Mania							•	•	•	•	•	•	•
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming							•	•	•				
#14 GameMaker: Intermediate Gaming								•	•	•	•	•	•
#15 Android App										•	•	•	•
#16 Java: Animations										•	•	•	•
#17 Java: Creating Simple Music								•	•	•	•	•	•
#18 Java: Creating PDFs										•	•	•	•
#19 Reading & Writing Excel										•	•	•	•
#20 Hangman								•	•	•	•	•	•
#21 Setting Up a Web Server										•	•	•	•
#22 Creating a Simple Client/Server								•	•	•			
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds										•	•	•	•
#25 Java: Secure a VNC Connection										•	•	•	•
#26 Java: Creating an Event Calendar										•	•	•	•
#27: A Memory Game								•	•	•	•	•	•
#28 Java: Create a Crossword Puzzle										•	•	•	•
#29 Java: Create Digital Alarm Clock								•	•	•	•	•	•
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files										•	•	•	•
#32 Raspberry Pi: Building a Media Server									•				
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter									•	•	•	•	•
#34 Raspberry Pi: Building a Retro Gaming Console										•	•	•	•
#35 Ethical Hacking										•	•	•	•
#36 Steganography										•	•	•	•
#37 Digital Logic with the Program Encryption Toolkit										•	•	•	•
#38 Raspberry Pi: Lighting an LED										•	•	•	•
#39 Learning to Program with LOGO			•	•	•	•	•	•	•	•	•	•	•
#40 Digital Storytelling			•	•	•	•							
#41 Digital Storytelling (6th - 12th)							•	•	•	•	•	•	•
#42 Canva: Class Brochure							•	•	•	•	•	•	•
#43 Data with Google Forms & Sheets			•	•	•	•	•	•					

Overview HOLLA Integration Alignment to Alabama State Standards	Arts Education												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania							•	•	•	•	•	•	•
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations										•	•	•	•
#17 Java: Creating Simple Music								•	•	•	•	•	•
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling			•	•	•	•							
#41 Digital Storytelling (6th - 12th)							•	•	•	•	•	•	•
#42 Canva: Class Brochure							•	•	•	•	•	•	•
#43 Data with Google Forms & Sheets													

Overview HOLLA Integration Alignment to Alabama State Standards	Language Arts												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d													
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)									•	•	•	•	•
#5 Brain-Computer Interface													
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming													
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#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
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#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

Overview HOLLA Integration Alignment to Alabama State Standards	Mathematics												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming	•	•											
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
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#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO			•	•	•			•		•	•	•	•
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets			•				•	•					

Overview HOLLA Integration Alignment to Alabama State Standards	Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d													
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface					•				•	•	•	•	•
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#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

# APPENDIX C

AT-A-GLANCE ALIGNMENT CHART – FLORIDA





Overview HOLLA Integration Alignment to Florida State Standards	Computer Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d	•	•	•	•	•	•	•	•	•	•	•	•	•
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)							•	•	•	•	•	•	•
#5 Brain-Computer Interface				•	•	•	•	•	•	•	•	•	•
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming	•	•	•										
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming							•	•	•	•	•	•	•
#10: ALICE: Advanced Object Oriented Programming							•	•	•	•	•	•	•
#11: Animation Mania							•	•	•	•	•	•	•
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming							•	•	•				
#14 GameMaker: Intermediate Gaming							•	•	•	•	•	•	•
#15 Android App										•	•	•	•
#16 Java: Animations										•	•	•	•
#17 Java: Creating Simple Music							•	•	•	•	•	•	•
#18 Java: Creating PDFs										•	•	•	•
#19 Reading & Writing Excel										•	•	•	•
#20 Hangman							•	•	•	•	•	•	•
#21 Setting Up a Web Server										•	•	•	•
#22 Creating a Simple Client/Server							•	•	•				
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds										•	•	•	•
#25 Java: Secure a VNC Connection										•	•	•	•
#26 Java: Creating an Event Calendar										•	•	•	•
#27: A Memory Game							•	•	•	•	•	•	•
#28 Java: Create a Crossword Puzzle										•	•	•	•
#29 Java: Create Digital Alarm Clock							•	•	•	•	•	•	•
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files										•	•	•	•
#32 Raspberry Pi: Building a Media Server										•	•	•	•
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter										•	•	•	•
#34 Raspberry Pi: Building a Retro Gaming Console							•	•	•	•	•	•	•
#35 Ethical Hacking										•	•	•	•
#36 Steganography										•	•	•	•
#37 Digital Logic with the Program Encryption Toolkit										•	•	•	•
#38 Raspberry Pi: Lighting an LED							•	•	•	•	•	•	•
#39 Learning to Program with LOGO	•	•	•	•	•	•	•	•	•	•	•	•	•
#40 Digital Storytelling			•	•	•	•							
#41 Digital Storytelling (6th - 12th)							•	•	•	•	•	•	•
#42 Canva: Class Brochure							•	•	•	•	•	•	•
#43 Data with Google Forms & Sheets			•	•	•	•	•	•	•				

Overview HOLLA Integration Alignment to Florida State Standards	Arts Education												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d	•	•	•	•	•	•	•	•					
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
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#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music							•	•	•	•	•	•	•
#18 Java: Creating PDFs													
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#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

Overview HOLLA Integration Alignment to Florida State Standards	Language Arts												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d													
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)									•	•	•	•	•
#5 Brain-Computer Interface													
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting							•	•	•				
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle										•	•	•	•
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

Overview HOLLA Integration Alignment to Florida State Standards	Mathematics												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming	•	•											
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting													
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO	•	•	•	•	•								
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets				•			•	•					

Overview HOLLA Integration Alignment to Florida State Standards	Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d													
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface					•	•	•	•	•	•	•	•	•
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting													
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

# APPENDIX D

## AT-A-GLANCE ALIGNMENT CHART – MISSISSIPPI



Overview HOLLA Integration Alignment to Mississippi State Standards	Computer Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography												•	•
#2 Blender3d	•	•	•	•	•	•	•	•	•				
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)							•	•	•	•	•	•	•
#5 Brain-Computer Interface				•	•	•	•	•	•	•	•	•	•
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming	•	•	•										
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming							•	•	•	•	•	•	•
#10: ALICE: Advanced Object Oriented Programming							•	•	•				
#11: Animation Mania							•	•	•	•	•	•	•
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming							•	•	•				
#14 GameMaker: Intermediate Gaming							•	•	•	•	•	•	•
#15 Android App										•	•	•	•
#16 Java: Animations										•	•	•	•
#17 Java: Creating Simple Music							•	•	•	•	•	•	•
#18 Java: Creating PDFs										•	•	•	•
#19 Reading & Writing Excel										•	•	•	•
#20 Hangman							•	•	•	•	•	•	•
#21 Setting Up a Web Server										•	•	•	•
#22 Creating a Simple Client/Server							•	•	•				
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds										•	•	•	•
#25 Java: Secure a VNC Connection										•	•	•	•
#26 Java: Creating an Event Calendar										•	•	•	•
#27: A Memory Game							•	•	•	•	•	•	•
#28 Java: Create a Crossword Puzzle										•	•	•	•
#29 Java: Create Digital Alarm Clock							•	•	•	•	•	•	•
#30 Creating and Saving Fractals										•	•	•	•
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server				•	•	•	•	•	•				
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter							•	•	•	•	•		
#34 Raspberry Pi: Building a Retro Gaming Console				•	•	•	•	•	•	•	•		
#35 Ethical Hacking												•	•
#36 Steganography												•	•
#37 Digital Logic with the Program Encryption Toolkit												•	•
#38 Raspberry Pi: Lighting an LED				•	•	•				•	•		
#39 Learning to Program with LOGO	•	•	•	•	•	•	•	•	•	•	•	•	•
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets				•	•	•	•	•	•				

Overview HOLLA Integration Alignment to Mississippi State Standards	Arts Education												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania							•	•	•	•	•	•	•
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music							•	•	•	•	•	•	•
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling			•	•	•	•							
#41 Digital Storytelling (6th - 12th)							•	•	•	•	•		
#42 Canva: Class Brochure							•	•	•	•	•		
#43 Data with Google Forms & Sheets													



Overview HOLLA Integration Alignment to Mississippi State Standards	Language Arts												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography										•	•	•	•
#2 Blender3d													
#3 Creating a Web Page (3-8)				•	•	•	•	•	•				
#4 Creating a Web Page (8-12)									•	•	•	•	•
#5 Brain-Computer Interface													
#6 Critical Path Method							•	•	•	•	•	•	•
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting							•	•	•	•	•	•	•
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search										•	•	•	•
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle										•	•	•	•
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

Overview HOLLA Integration Alignment to Mississippi State Standards	Mathematics												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d		•	•	•	•	•	•						
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface													
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming	•	•											
#8 Scratch the Cat: Object Oriented Programming				•	•	•							
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting													
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO	•	•	•	•	•								
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets				•			•	•					

Overview HOLLA Integration Alignment to Mississippi State Standards	Science												
	K	1	2	3	4	5	6	7	8	9	10	11	12
#1 Cryptography													
#2 Blender3d													
#3 Creating a Web Page (3-8)													
#4 Creating a Web Page (8-12)													
#5 Brain-Computer Interface									•	•	•	•	•
#6 Critical Path Method													
#7 Scratch the Cat: Elementary Programming													
#8 Scratch the Cat: Object Oriented Programming													
#9 ALICE: Beginning Object Oriented Programming													
#10: ALICE: Advanced Object Oriented Programming													
#11: Animation Mania													
#12 Video Podcasting													
#13 GameMaker: Beginning Gaming													
#14 GameMaker: Intermediate Gaming													
#15 Android App													
#16 Java: Animations													
#17 Java: Creating Simple Music													
#18 Java: Creating PDFs													
#19 Reading & Writing Excel													
#20 Hangman													
#21 Setting Up a Web Server													
#22 Creating a Simple Client/Server													
#23 Java: Creating a Word Search													
#24 Java: Download Images & Sounds													
#25 Java: Secure a VNC Connection													
#26 Java: Creating an Event Calendar													
#27: A Memory Game													
#28 Java: Create a Crossword Puzzle													
#29 Java: Create Digital Alarm Clock													
#30 Creating and Saving Fractals													
#31 Java: Creating & Reading Zip Files													
#32 Raspberry Pi: Building a Media Server													
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter													
#34 Raspberry Pi: Building a Retro Gaming Console													
#35 Ethical Hacking													
#36 Steganography													
#37 Digital Logic with the Program Encryption Toolkit													
#38 Raspberry Pi: Lighting an LED													
#39 Learning to Program with LOGO													
#40 Digital Storytelling													
#41 Digital Storytelling (6th - 12th)													
#42 Canva: Class Brochure													
#43 Data with Google Forms & Sheets													

# APPENDIX E

DETAILED ALIGNMENT CHART – ALABAMA



Detailed HOLLA Integration Alignment to Alabama State Standards	Computer Science	
#1 Cryptography	9th - 12th	29
#2 Blender3d	1st	19
	2nd	18
	3rd	23
	4th	17
	5th	7
	6th	8
#3 Creating a Web Page (3-8)	3rd	1
	4th	17
	5th	10, 16, 17
	6th	9
	7th	11, 21
	8th	17
#4 Creating a Web Page (8-12)	8th	17
	9th - 12th	25
#5 Brain-Computer Interface	4th	20
	5th	15
	6th	28
	7th	28
	8th	27
	9th - 12th	22
#6 Critical Path Method	6th	6
	7th	6
	8th	6
	9th - 12th	1
#7 Scratch the Cat: Elementary Programming	Kindergarten	2, 7
	1st	3
#8 Scratch the Cat: Object Oriented Programming	3rd	7
	4th	7
	5th	6, 7
#9 ALICE: Beginning Object Oriented Programming	6th	3
	7th	3
	8th	3
#10: ALICE: Advanced Object Oriented Programming	6th	3
	7th	3
	8th	3

Detailed HOLLA Integration Alignment to Alabama State Standards	Computer Science (Continued)	
#11: Animation Mania	6th	2
	7th	1
	8th	16
	9th - 12th	6
#12 Video Podcasting	6th	2
	7th	1
	8th	16
	9th - 12th	6
#13 GameMaker: Beginning Gaming	6th	8
	7th	8
	8th	7
#14 GameMaker: Intermediate Gaming	7th	8
	8th	7
	9th - 12th	38
#15 Android App	9th - 12th	8
#16 Java: Animations	9th - 12th	5
#17 Java: Creating Simple Music	7th	3
	8th	3
	9th - 12th	5
#18 Java: Creating PDFs	9th - 12th	5
#19 Reading & Writing Excel	9th - 12th	5
#20 Hangman	7th	7
	8th	3, 7
	9th - 12th	6
#21 Setting Up a Web Server	9th - 12th	33
#22 Creating a Simple Client/Server	6th	24
	7th	22, 24
	8th	23
#23 Java: Creating a Word Search	9th - 12th	5
#24 Java: Download Images & Sounds	9th - 12th	5
#25 Java: Secure a VNC Connection	9th - 12th	33
#26 Java: Creating an Event Calendar	9th - 12th	5
#27: A Memory Game	7th	7
	8th	29
	9th - 12th	38
#28 Java: Create a Crossword Puzzle	9th - 12th	5

Detailed HOLLA Integration Alignment to Alabama State Standards	Computer Science (Continued)	
#29 Java: Create a Digital Alarm Clock	7th	7
	8th	29
	9th - 12th	38
#30 Creating and Saving Fractals	9th - 12th	25
#31 Java: Creating & Reading Zip Files	9th - 12th	25
#32 Raspberry Pi: Building a Media Server	8th	21
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter	8th	3
	9th - 12th	8
#34 Raspberry Pi: Building a Retro Gaming Console	9th - 12th	34
#35 Ethical Hacking	9th - 12th	11, 12, 13, 14, 17
#36 Steganography	9th - 12th	29
#37 Digital Logic with the Program Encryption Toolkit	9th - 12th	29
#38 Raspberry Pi: Lighting an LED	9th - 12th	34
#39 Learning to Program with LOGO	2nd	2, 3
	3rd	5
#39 Learning to Program with LOGO (Continued)	4th	3
	5th	7
	6th	5
	7th	3
	8th	3
	9th - 12th	3
#40 Digital Storytelling (2nd - 5th)	2nd	9
	3rd	13
	4th	12
	5th	16
#40 Digital Storytelling (6th - 12th)	6th	16
	7th	16
	8th	16
	9th - 12th	5
#41 Canva: Class Brochure	6th	16
	7th	16
	8th	16
	9th - 12th	5
	8th	21

Detailed HOLLA Integration Alignment to Alabama State Standards	Computer Science (Continued)	
#43 Data with Google Forms & Sheets	3rd	17
	4th	16
	5th	21
	6th	19
	7th	22
	8th	21

Detailed HOLLA Integration Alignment to Alabama State Standards	Arts Education	
#2 Blender3d	1st	Visual Arts 11
	2nd	Visual Arts 6
	3rd	Visual Arts 2
	4th	Visual Arts 1
	5th	Visual Arts 1
	6th	Visual Arts 1
#11: Animation Mania	6th	Media Arts 8
	7th	Media Arts 4
	8th	Media Arts 4
	9th - 12th	Media Arts Proficient 4, Accomplished 4, Advanced 4
#12 Video Podcasting	6th	Media Arts 2, 8, 11, 18
	7th	Media Arts 4, 5, 6, 8
	8th	Media Arts 4, 5
	9th - 12th	Media Arts Proficient 4, Accomplished 4, Advanced 4
#16 Java: Animations	9th - 12th	Visual Arts Novice 1, Intermediate 1, 2
#17 Java: Creating Simple Music	7th	1
	8th	1, 4
	Music Technology	Proficient 1, 2, 3, Accomplished 1, 4, Advanced 1
#30 Creating and Saving Fractals	9th - 12th	Visual Arts Novice 1, Intermediate 1, 2



Detailed HOLLA Integration Alignment to Alabama State Standards	Arts Education (Continued)	
#40 Digital Storytelling (2nd - 5th)	2nd	Media Arts 18
	3rd	Media Arts 18
	4th	Media Arts 18
	5th	Media Arts 18
#40 Digital Storytelling (6th - 12th)	6th	Media Arts 18
	7th	Media Arts 18
	8th	Media Arts 18
	Proficient	Media Arts 4
	Accomplished	Media Arts 4
	Advanced	Media Arts 4
#41 Canva: Class Brochure	6th	Media Arts 3
	7th	Media Arts 4
	8th	Media Arts 4
	Proficient	Media Arts 4
	Accomplished	Media Arts 4
	Advanced	Media Arts 4

Detailed HOLLA Integration Alignment to Alabama State Standards	Language Arts	
#1 Cryptography	9th	L.9-10.5
	10th	L.9-10.5
	11th	L.11-12.6
	12th	L.11-12.6
#3 Creating a Web Page (3-8)	3rd	W.3.6, L.3.2
	4th	W.4.6, L.4.1, L.4.2, L.4.3
	5th	W.5.6, L.5.1, L.5.2, L.5.3
	6th	W.6.6, L.6.1, L.6.2, L.6.3
	7th	W.7.8, L.7.1, L.7.2, L.7.3
	8th	8.W.6, L.8.1, L.8.2, L.8.3

Detailed HOLLA Integration Alignment to Alabama State Standards	Language Arts (Continued)	
#4 Creating a Web Page (8-12)	8th	W.8.4, L.8.1, L.8.2, L.8.3
	9th	W.9-10.6, L.9-10.1, L.9-10.2
	10th	W.9-10.6, L.9-10.1, L.9-10.2
	11th	W.11-12.6, L.11-12.1, L.11-12.2
	12th	W.11-12.6, L.11-12.1, L.11-12.2
#6 Critical Path Method	6th	W.6.2
	7th	W.7.2
	8th	W.8.2
	9th	W.9-10.2
	10th	W.9-10.2
	11th	W.11-12.2
	12th	W.11-12.2
#12 Video Podcasting	6th	SL.6.5
	7th	SL.7.4
	8th	SL.8.5
	9th	SL.9-10.5
	10th	SL.9-10.5
	11th	SL.11-12.5
	12th	SL.11-12.5
#23 Java: Creating a Word Search	9th	L.9-10.6
	10th	L.9-10.6
	11th	L.11-12.6
	12th	L.11-12.6

Detailed HOLLA Integration Alignment to Alabama State Standards	Mathematics	
#2 Blender3d	1st	1.NBT.5
	2nd	2.NBT.8
	3rd	3.NBT.1
	4th	4.NBT.3
	5th	4.NBT.4
	6th	6.NS.8

Detailed HOLLA Integration Alignment to Alabama State Standards	Mathematics (Continued)	
#7 Scratch the Cat: Elementary Programming	Kindergarten	K.G.1, K.G.2
	1st	1.G.1
#8 Scratch the Cat: Object Oriented Programming	3rd	3.G.1
	4th	4.G.2
#8 Scratch the Cat: Object Oriented Programming	5th	5.G.3
#30 Creating and Saving Fractals	Algebra I	F.IF.3
#39 Learning to Program with LOGO	2nd	2.G.1
	3rd	3.G.1
	4th	4.MD.5, 4.G.1
	7th	7.G.1
	Geometry	G.CO.5
#43 Data with Google Forms & Sheets	3rd	3.MD.3
	6th	6.SP.2
	7th	7.SP.2

Detailed HOLLA Integration Alignment to Alabama State Standards	Science	
#5 Brain-Computer Interface	4th	2, 6
	8th	17
	Physical Sc.	15
	Physics	1

# APPENDIX F

DETAILED ALIGNMENT CHART – FLORIDA



Detailed HOLLA Integration Alignment to Florida State Standards	Computer Science	
#1 Cryptography	9th - 12th	SC.912.CS-PC.1.4
#2 Blender3d	K - 2nd	SC.K2.CS-CP.2.3
	2rd - 5th	SC.35.CS-CP.2.4
	6th - 8th	SC.68.CS-CS.2.11
#3 Creating a Web Page (3-8)	3rd - 5th	SC.35.CS-CC.1.1, SC.35.CS-CC.1.2, SC.35.CS-CS.4.1, SC.35.CS-PC.1.1, SC.35.CS-PC.1.2, SC.35.CS-CP.3.1
	6th - 8th	SC.68.CS-CP.3.2
#4 Creating a Web Page (8-12)	6th - 8th	SC.68.CS-CP.3.2
	9th - 12th	SC.912.CS-CP.3.2
#5 Brain-Computer Interface	3rd - 5th	SC.35.CS-PC.2.5
	6th - 8th	SC.68.CS-CS.4.8, SC.68.CS-CS.6.3, SC.68.CS-PC.2.5
	9th - 12th	SC.912.CS-PC.2.8
#6 Critical Path Method	6th - 8th	SC.68.CS-CS.2.12
	9th - 12th	SC.912.CS-CS.2.9
#7 Scratch the Cat: Elementary Programming	K - 2nd	SC.K2.CS-CS.2.4, SC.K2.CS-CS.4.2, SC.K2.CS-CP.2.4
#8 Scratch the Cat: Object Oriented Programming	3rd - 5th	SC.35.CS-CP.2.3
#9 ALICE: Beginning Object Oriented Programming	6th - 8th	SC.68.CS-CP.2.4
#10: ALICE: Advanced Object Oriented Programming	6th - 8th	SC.68.CS-CP.2.4
#11: Animation Mania	6th - 8th	SC.68.CS-CC.1.3
	9th - 12th	SC.912.CS-CP.3.1
#12 Video Podcasting	6th - 8th	SC.68.CS-CC.1.3
	9th - 12th	SC.912.CS-CP.3.1
#13 GameMaker: Beginning Gaming	6th - 8th	SC.68.CS-CS.2.5
#14 GameMaker: Intermediate Gaming	6th - 8th	SC.68.CS-CS.2.5
	9th - 12th	SC.912.CS-CS.2.8
#15 Android App	9th - 12th	SC.912.CS-CP.2.4
#16 Java: Animations	9th - 12th	SC.912.CS-CP.3.1
#17 Java: Creating Simple Music	6th - 8th	SC.68.CS-CS.2.5
	9th - 12th	SC.912.CS-CP.3.1
#18 Java: Creating PDFs	9th - 12th	SC.912.CS-CP.3.1
#19 Reading & Writing Excel	9th - 12th	SC.912.CS-CP.3.1

Detailed HOLLA Integration Alignment to Florida State Standards	Computer Science (Continued)	
#20 Hangman	6th - 8th	SC.68.CS-CP.2.4
	9th - 12th	SC.912.CS-CP.2.4
#21 Setting Up a Web Server	9th - 12th	SC.912.CS-CS.5.3
#22 Creating a Simple Client/Server	6th - 8th	SC.68.CS-CS.5.1, SC.68.CS-CS.5.3
#23 Java: Creating a Word Search	9th - 12th	SC.912.CS-CP.3.1
#24 Java: Download Images & Sounds	9th - 12th	SC.912.CS-CP.3.1
#25 Java: Secure a VNC Connection	9th - 12th	SC.912.CS-CS.5.3
#26 Java: Creating an Event Calendar	9th - 12th	SC.912.CS-CP.3.1
#27: A Memory Game	6th - 8th	SC.68.CS-CS.2.5
	9th - 12th	SC.912.CS-CP.3.1
#28 Java: Create a Crossword Puzzle	9th - 12th	SC.912.CS-CP.3.1
#29 Java: Create Digital Alarm Clock	6th - 8th	SC.68.CS-CS.2.5
	9th - 12th	SC.912.CS-CP.3.1
#30 Creating and Saving Fractals	9th - 12th	SC.912.CS-CS.1.1, SC.912.CS-CS.2.10
#31 Java: Creating & Reading Zip Files	9th - 12th	SC.912.CS-CS.3.2
#32 Raspberry Pi: Building a Media Server	8th	SC.912.CS-CS.4.5
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter	9th - 12th	SC.912.CS-CP.2.7
#34 Raspberry Pi: Building a Retro Gaming Console	6th - 8th	SC.68.CS-CS.4.2, SC.68.CS-CS.4.3, SC.68.CS-CS.4.8, SC.68.CS-CS.6.3
	9th - 12th	SC.912.CS-CS.4.3, SC.912.CS-CS.6.3
#35 Ethical Hacking	9th - 12th	SC.912.CS-PC.1.6, SC.912.CS-PC.4.4
#36 Steganography	9th - 12th	SC.912.CS-CS.5.1, SC.912.CS-PC.1.4, SC.912.CS-PC.1.5
#37 Digital Logic with the Program Encryption Toolkit	9th - 12th	SC.912.CS-CS.5.1, SC.912.CS-PC.1.4, SC.912.CS-PC.1.5
#38 Raspberry Pi: Lighting an LED	6th - 8th	SC.68.CS-CS.4.2, SC.68.CS-CS.4.3, SC.68.CS-CS.4.8, SC.68.CS-CS.6.3
	9th - 12th	SC.912.CS-CS.4.3, SC.912.CS-CS.6.3

Detailed HOLLA Integration Alignment to Florida State Standards	Computer Science (Continued)	
#39 Learning to Program with LOGO	K - 2nd	SC.K2.CS-CS.2.4
	3rd - 5th	SC.35.CS-CS.2.5
	6th - 8th	SC.68.CS-CS.2.10, SC.68.CS-CS.2.11, SC.68.CS-CS.2.12
	9th - 12th	SC.912.CS-CS.2.11, SC.912.CS-CS.2.7
#40 Digital Storytelling (2nd - 5th)	K - 2nd	SC.K2.CS-CS.3.2
	3rd - 5th	SC.35.CS-CS.3.1
#40 Digital Storytelling (6th - 12th)	6th - 8th	SC.68.CS-CC.1.3
	9th - 12th	SC.912.CS-CC.1.6
#41 Canva: Class Brochure	6th - 8th	SC.68.CS-CC.1.3
	9th - 12th	SC.912.CS-CC.1.6
#43 Data with Google Forms & Sheets	3rd - 5th	SC.35.CS-CP.1.2
	6th - 8th	SC.68.CS-CP.1.2

Detailed HOLLA Integration Alignment to Florida State Standards	Arts Education	
#2 Blender3d	1st	VA.1.C.2.2
	2nd	VA.2.S.1.1
	3rd	VA.3.S.1.4
	4th	VA.4.S.1.2
	5th	VA.5.S.1.2
	6th - 8th	VA.68.F.1.4
#11: Animation Mania	6th - 8th	VA.68.C.2.1, VA.68.S.1.2
	9th - 12th	VA.912.F.1.4
#17 Java: Creating Simple Music	6th - 8th	MU.68.S.1.2, MU.68.S.1.6, MU.68.S.1.8, MU.68.H.2.2
	9th - 12th	MU.912.S.1.2
#30 Creating and Saving Fractals	9th - 12th	VA.912.S.1.2, VA.912.S.1.8

Detailed HOLLA Integration Alignment to Florida State Standards	Language Arts	
#1 Cryptography	9th - 10th	LAFS.910.L.3.6
	11th - 12th	LAFS.1112.L.3.6
#3 Creating a Web Page (3-8)	3rd	LAFS.3.W.2.6, LAFS.3.L.1.1, LAFS.3.L.1.2, LAFS.3.L.2.3
	4th	LAFS.4.W.2.6, LAFS.4.L.1.1, LAFS.4.L.1.2, LAFS.4.L.2.3
#3 Creating a Web Page (3-8)	5th	LAFS.5.W.2.6, LAFS.5.L.1.1, LAFS.5.L.1.2, LAFS.5.L.2.3
	6th	LAFS.6.W.2.6, LAFS.6.L.2.5, LAFS.6.L.1.1, LAFS.6.L.1.2, LAFS.6.L.2.3
	7th	LAFS.7.W.2.6, LAFS.7.L.2.5, LAFS.7.L.1.1, LAFS.7.L.1.2, LAFS.7.L.2.3
	8th	LAFS.8.W.2.6, LAFS.8.L.1.1, LAFS.8.L.1.2, LAFS.8.L.2.3



Detailed HOLLA Integration Alignment to Florida State Standards	Language Arts (Continued)	
#4 Creating a Web Page (8-12)	8th	LAFS.8.W.2.6, LAFS.8.SL.2.5, LAFS.8.L.1.1, LAFS.8.L.1.2, LAFS.8.L.2.3
	9th - 10th	LAFS.910.W.2.6, LAFS.910.SL.2.5, LAFS.910.W.2.6, LAFS.910.L.1.1, LAFS.910.L.1.2, LAFS.910.L.2.3
	11th - 12th	LAFS.1112.W.2.6, LAFS.1112.SL.2.5, LAFS.1112.L.1.1, LAFS.1112.L.1.2, LAFS.1112.L.2.3
#6 Critical Path Method	6th	LAFS.6.W.1.2
	7th	LAFS.7.W.1.2
	8th	LAFS.8.W.1.2
	9th - 10th	LAFS.910.W.1.2
	11th - 12th	LAFS.1112.W.1.2
#12 Video Podcasting	6th	LAFS.6.W.2.6, LAFS.6.L.2.5, LAFS.6.L.1.1, LAFS.6.L.1.2, LAFS.6.L.2.3
	7th	LAFS.7.W.2.6, LAFS.7.L.2.5, LAFS.7.L.1.1, LAFS.7.L.1.2, LAFS.7.L.2.3
	8th	LAFS.8.W.2.6, LAFS.8.W.2.6, LAFS.8.L.1.1, LAFS.8.L.1.2, LAFS.8.L.2.3
#23 Java: Creating a Word Search	9th - 10th	LAFS.910.L.2.6
	11th - 12th	LAFS.1112.L.3.6
#28 Java: Create a Crossword Puzzle	9th - 10th	LAFS.910.L.3.6
	11th - 12th	LAFS.1112.L.3.6

Detailed HOLLA Integration Alignment to Florida State Standards	Mathematics	
#2 Blender3d	1st	MAFS.1.OA.3.6
	2nd	MAFS.2.OA.2.2
	3rd	MAFS.3.NBT.1.1
	4th	MAFS.4.NBT.1.3
	5th	MAFS.5.NBT.1.4
	6th	MAFS.6.NS.3.8
#7 Scratch the Cat: Elementary Programming	Kindergarten	MAFS.K.G.1.2
	1st	MAFS.1.G.1.1
#8 Scratch the Cat: Object Oriented Programming	3rd	MAFS.3.G.1.1
	4th	MAFS.4.G.1.2
	5th	MAFS.5.G.2.3
#30 Creating and Saving Fractals	9th - 12th	MAFS.912.F-IF.1.3
#39 Learning to Program with LOGO	Kindergarten	MAFS.K.G.1.2
	1st	MAFS.1.G.1.1
	2nd	MAFS.2.G.1.1
	3rd	MAFS.3.G.1.1
	4th	MAFS.4.G.1.2
#43 Data with Google Forms & Sheets	3rd	MAFS.3.MD.2.3
	6th	MAFS.6.SP.1.2
	7th	MAFS.7.SP.1.2

Detailed HOLLA Integration Alignment to Florida State Standards	Science	
#5 Brain-Computer Interface	4th	SC.4.N.1.6
	5th	SC.5.N.1.3
	6th	SC.6.N.1.4
	7th	SC.7.N.1.4
	8th	SC.8.N.1.4
	9th - 12th	SC.912.L.14.26

# APPENDIX F

DETAILED ALIGNMENT CHART - MISSISSIPPI



Detailed HOLLA Integration Alignment to Mississippi State Standards	Computer Science	
#1 Cryptography	11th - 12th	NI.3B.2
#2 Blender3d	K - 2nd	AP.1A.2, CS.1A.2, DA.1A.1
	3rd - 5th	AP.1B.2
	6th - 8th	AP.2.2
#3 Creating a Web Page (3-8)	3rd - 5th	AP.1B.10
	6th - 8th	IC.2.4
#4 Creating a Web Page (8-12)	6th - 8th	IC.2.4
	9th - 10th	AP.23A.9
	11th - 12th	IC.3B.1
#5 Brain-Computer Interface	3rd - 5th	IC.1B.2, CS.1B.1, CS.1B.2
	6th - 8th	IC.2.2
	9th - 10th	IC.3A.2
	11th - 12th	IC.3B.3
#6 Critical Path Method	6th - 8th	AP.2.1
	9th - 10th	AP.3A.11
	11th - 12th	AP.3B.4
#7 Scratch the Cat: Elementary Programming	K - 2nd	AP.1A.5, CS.1A.2, DA.1A.1
#8 Scratch the Cat: Object Oriented Programming	3rd - 5th	AP.1B.3
#9 ALICE: Beginning Object Oriented Programming	6th - 8th	AP.2.3
#10: ALICE: Advanced Object Oriented Programming	6th - 8th	AP.2.3
#11: Animation Mania	6th - 8th	AP.2.4
	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.7
#12 Video Podcasting	6th - 8th	AP.2.4
	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.7
#13 GameMaker: Beginning Gaming	6th - 8th	AP.2.2
#14 GameMaker: Intermediate Gaming	6th - 8th	AP.2.2
	9th - 10th	AP.3A.7
	11th - 12th	AP.3B.10
#15 Android App	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.9
#16 Java: Animations	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.10

Detailed HOLLA Integration Alignment to Mississippi State Standards	Computer Science (Continued)	
#17 Java: Creating Simple Music	6th - 8th	AP.2.4
	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.10
#18 Java: Creating PDFs	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.10
#19 Reading & Writing Excel	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.10
#20 Hangman	6th - 8th	AP.2.3
	9th - 10th	AP.3A.1
	11th - 12th	AP.3B.10
#21 Setting Up a Web Server	9th - 10th	NI.3A.1
	11th - 12th	NI.3B.1
#22 Creating a Simple Client/Server	6th - 8th	NI.2.1
#23 Java: Creating a Word Search	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#24 Java: Download Images & Sounds	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#25 Java: Secure a VNC Connection	9th - 10th	NI.3A.1
	11th - 12th	NI.3B.1
#26 Java: Creating an Event Calendar	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#27: A Memory Game	6th - 8th	AP.2.9
	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#28 Java: Create a Crossword Puzzle	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#29 Java: Create Digital Alarm Clock	6th - 8th	AP.2.9
	9th - 10th	AP.3A.1, AP.3A.4
	11th - 12th	AP.3B.3
#30 Creating and Saving Fractals	9th - 10th	DA.3A.1
	11th - 12th	DA.3B.1
#32 Raspberry Pi: Building a Media Server	3rd - 5th	CS.1B.2, CS.1B.1, DA.1B.3
	6th - 8th	CS.2.2
#33 Raspberry Pi: Building a Low-Power FM Radio Transmitter	6th - 8th	AP.2.7
	9th - 10th	AP.3A.10
#34 Raspberry Pi: Building a Retro Gaming Console	3rd - 5th	CS.1B.2, CS.1B.1, DA.1B.3
	9th - 10th	CS.3A.2

Detailed HOLLA Integration Alignment to Mississippi State Standards	Computer Science (Continued)	
#35 Ethical Hacking	9th - 12th	NI.3B.2
#36 Steganography	11th - 12th	NI.3B.2
#37 Digital Logic with the Program Encryption Toolkit	11th - 12th	NI.3B.2
#38 Raspberry Pi: Lighting an LED	3rd - 5th	CS.1B.2
	9th - 10th	CS.3A.2
#39 Learning to Program with LOGO	K - 2nd	AP.1A.4, AP.1A.5
	3rd - 5th	AP.1B.1, AP.1B.3, AP.1B.4
	6th - 8th	AP.2.1
	9th - 10th	AP.3A.2, AP.3A.5
	11th - 12th	AP.3B.4
#43 Data with Google Forms & Sheets	3rd - 5th	DA.1B.1
	6th - 8th	DA.2.2

Detailed HOLLA Integration Alignment to Mississippi State Standards	Arts Education	
#2 Blender3d	1st	VA.Re7.2.1
	2nd	VA.Re9.1.2
	3rd	VA.Re9.1.3
	4th	VA.Re9.1.4
	5th	VA.Re7.1.5
	6th	VA.Re9.1.6
#11: Animation Mania	6th	MA.Pr5.1.6.c
	7th	MA.Pr5.1.7.c
	8th	MA.Pr5.1.8.c
	9th - 12th	Proficient MA.Pr5.1.I.c, Accomplished MA.Pr5.1.II.c, Advanced MA.Pr5.1.III.c

Detailed HOLLA Integration Alignment to Mississippi State Standards	Arts Education (Continued)	
#12 Video Podcasting	6th	MA.Pr5.1.6.c
	7th	MA.Pr5.1.7.c
	8th	MA.Pr5.1.8.c
	9th - 12th	Proficient MA.Pr5.1.I.c, Accomplished MA.Pr5.1.II.c, Advanced MA.Pr5.1.III.c
#16 Java: Animations	9th - 10th	AP.3A.4
	11th - 12th	AP.3B.10
#17 Java: Creating Simple Music	6th	MU.Cr1.1.6
	7th	MU.Cr1.1.7
	8th	MU.Cr1.1.8
	Music Technology	Proficient MU.Cr1.1.T.I, Accomplished MU.Cr1.1.T.II, Advanced MU.Cr1.1.T.III
#40 Digital Storytelling (2nd - 5th)	2nd	MA.Pr4.1.2a
	3rd	MA.Cr1.1.3
	4th	MA.Pr4.1.4
	5th	MA.Pr4.1.5
#40 Digital Storytelling (2nd - 5th)	6th	MA.Pr4.1.6
	7th	MA.Pr4.1.7
	8th	MA.Pr4.1.8
	Proficient	MA.Pr4.1.I
	Accomplished	MA.Pr4.1.II
#41 Canva: Class Brochure	6th	MA.Pr4.1.6
	7th	MA.Pr4.1.7
	8th	MA.Pr4.1.8
	Proficient	MA.Pr4.1.I
	Accomplished	MA.Pr4.1.II

Detailed HOLLA Integration Alignment to Mississippi State Standards	Language Arts	
#1 Cryptography	9th	L.9.6
	10th	L.10.6
	11th	L.11.6
	12th	L.12.6
#3 Creating a Web Page (3-8)	3rd	W.3.6
	4th	W.4.6, L.4.2, L.4.1, L.4.3
	5th	W.5.6, L.5.1, L.5.2, L.5.3
	6th	W.6.6, L.6.1, L.6.2, L.6.3
	7th	W.7.6, L.7.1, L.7.2, L.7.3
	8th	W.8.6, L.8.1, L.8.2, L.8.3
#4 Creating a Web Page (8-12)	8th	W.8.6, L.8.1, L.8.2, L.8.3
	English I	W.9.6, L.9.1, L.9.2, L.9.3
	English II	W.10.6, L.10.1, L.10.2, L.10.3
	English III	W.11.6, L.11.1, L.11.2, L.11.3
	English IV	W.12.6, L.12.1, L.12.2, L.12.3
#6 Critical Path Method	6th	W.6.2
	7th	W.7.2
	8th	W.8.2
	English I	W.9.2
	English II	W.10.2
	English III	W.11.2
	English IV	W.12.2



Detailed HOLLA Integration Alignment to Mississippi State Standards	Language Arts (Continued)	
#12 Video Podcasting	6th	W.6.6, L.6.1, L.6.2, L.6.3
	7th	W.7.6, L.7.1, L.7.2, L.7.3
	8th	W.8.6, L.8.1, L.8.2, L.8.3
	English I	W.9.6, L.9.1, L.9.2, L.9.3
	English II	W.10.6, L.10.1, L.10.2, L.10.3
	English III	W.11.6, L.11.1, L.11.2, L.11.3
	English IV	W.12.6, L.12.1, L.12.2, L.12.3
#23 Java: Creating a Word Search	English I	L.9.6
	English II	L.10.6
	English III	L.11.6
	English IV	L.12.6

Detailed HOLLA Integration Alignment to Mississippi State Standards	Mathematics	
#2 Blender3d	1st	1.OA.6
	2nd	2.OA.2
	3rd	3.NBT.1
	4th	4.NBT.1
	5th	5.NBT.3
	6th	6.NS.8
#7 Scratch the Cat: Elementary Programming	Kindergarten	K.G.2
	1st	1.G.1
#8 Scratch the Cat: Object Oriented Programming	3rd	3.G.1
	4th	4.G.2
#8 Scratch the Cat: Object Oriented Programming	5th	5.G.3
#30 Creating and Saving Fractals	Algebra II	F-IF.3
#39 Learning to Program with LOGO	Kindergarten	K.G.4
	1st	1.G.1
	2nd	2.G.1
	3rd	3.G.1
	4th	4.G.2

Detailed HOLLA Integration Alignment to Mississippi State Standards	Science	
#5 Brain-Computer Interface	8th	P.8.6
	Anatomy & Physiology	HAP.6
	Physical Science	PHS.6
	Physics	PHY.4