MIDDLE SCHOOL PATHWAYS IN COMPUTER SCIENCE

Curriculum as developed by Dawn M. Munro (Sumner G. Whittier school, Everett, MA) and
Denise Salemi (Keverian school, Everett, MA)

June 1, 2017

Sequence and Topic	What we did.
1	Overview and permission form distribution
2	Partnerships
3	Apps and giving computers instructions
4	Tablet and file basics
5	Meow app and Intro to computer science
6	Logging into App Inventor, Connection of Tablet and Computer through QR Code, Overview of Designer and Block Screens. Share what was learned through a Google Form.
7	Brainstorming App Ideas- Silent sorting with discussion. Initial planning on a storyboard sheet.
8	Technology Breaking Down Barriers- Identifying through Digital Directions Videos.
9	Analyzing Computer Science Professional Careers (Think, Pair, Share)
10	Beginner Talk to Me App- Review Routines and Program Features after Teacher Guided Questions.
11	Incorporation of Downloaded Media in Apps (Virtual Symphony)
12	Various Starter Apps- Ball Bounce, Talk to Me 2, Digital Doodle
13	IF/THEN/ELSE with downloaded starter app MLK/RFK
14	Computer Science Professional Visit (Guest Speaker)
15	Writing Proposals for Final Apps, thank you cards to guest speaker, final app rubric review
16	Final App Creation-Mini Sessions
17	Showcase
	After-school work on final apps (once a week) for those who come.

Lesson Plan 1: Overview and permission form distribution

<u>Main Goal</u> –

After students have completed pre-surveys, inform students of the Middle School Pathways Grant and explain the role they will play in utilizing specially issued androids and creating their own app.

<u>Overview</u> –

Permission slips will be disseminated to each and every student to be brought home and signed by student and parent/guardian to participate in a survey to appraise their current technology knowledge prior to beginning the course.

<u>Relevant Learning Standards</u> -

IT 2.5 - IT 2.9 Society - Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands. Identify and describe the effect technology has had on society.

IT 2.11 - Health and Safety - Provide examples of safe and unsafe practices for sharing personal information via e-mail and the Internet.

CSTA 1:6-1 Community, Global, and Ethical Impacts - Discuss basic issues related to responsible use of technology and information, and the consequences of inappropriate use.

MA DLCS: 6-8.CAS.b.6 - Demonstrate compliance with the school's Acceptable Use Policy [AUP].

<u>Learning Objective(s)</u> –

Students will:

1. Listen to the teacher recite the letter that will be going home to their parent/guardian.
2. Interpret and discuss questions that may arise in the process.
3. Discover what the grant is about and recognize the role/responsibility they will participate in throughout the process.
4. Discuss the importance of returning the permission slips as soon as possible so they can participate in the pre-survey process to establish their current baseline knowledge in order to measure their growth at the end of the course

5. Confer ideas and formulate possible examples that could be possibilities of creating..
6. Leave class with a concrete summarization of what they need to examine, create and design in the lessons ahead.

Materials –

Permission slips in English, Spanish, Arabic, etc.
Android and usb cable.
Permission Check-Off Sheet

Class Prep/Prior Knowledge –

Basic computer technology skills.

Teacher Prep –

Assess each student's home language by utilizing X2.
Have enough of reproduced copies made ahead of time in each of the different languages.

Have a "Permission Check-Off Sheet" to track turned in student consent forms similar to example below.

MSP Permission Slip Turned In

Homeroom	LastName	FirstName	Student Form	Parent Form	

Lesson Plan 2: Partnerships

Main Goal/ Overview / Timing

25 min: In this session, students learn about how partnerships and/or small teams can collaborate to create an App (common goal). We will brainstorm some requirements of teamwork to create a class poster as a reminder in order to keep focused on cooperative work. We will discuss the importance of selecting the right partner (not just a pal).

20 min: Once these ground rules and partnerships are formed, the students will observe how to set up their workstation for App Inventor use. The class will be introduced on procedure of how to get their supplies in an orderly fashion, as well as how to put them away. They will fully walk through this procedure. Time permitting, students will practice setting up their workstation with the tablet and Google account.

Relevant Learning Standards -

IT 3.1 - Research - Explain and demonstrate effective searching and browsing strategies when working on projects.

IT 3.6 - Develop and use guidelines to evaluate the content, organization, design, and use of citations, and presentation of technologically enhanced projects.

CSTA 1:6-3 - Collaboration- Identify ways that teamwork and collaboration can support problem solving and innovation.

CSTA 1:6-1 - Community, Global, and Ethical Impacts- Discuss basic issues related to responsible use of technology and information, and the consequences of inappropriate use.

CSTA 1:6-1- Computers and Communication Devices- Demonstrate an appropriate level of proficiency with keyboards and other input and output devices.

CSTA 2-5- Computers and Communications Devices- Apply strategies for identifying and solving routine hardware problems that occur during everyday computer use.

MA DLCS 6-8.DTC.b.1 - Communicate and publish key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources.

Learning Objectives (both skills and knowledge)

By the end of class, students should be able to….

collaborate in creating a class guideline for working with a partner(s) towards meeting a common goal (app creation).

choose a partner to work best with.

follow class routines for workstation setup.

practice setting up their workstation for App Inventor use.

Materials (physical things needed: Handouts / Hardware / File Access)

Eno board projector

Google account

Handout a visual of workstation set-up.

Android Tablet

USB Wire

List of assigned digital materials as depicted below:

	A	B	C	D	E	F	G	H
1	First Name	Last Name	Email Address	Password	Homeroom	Students	Tablet Numbers	Workstation #
2								
3								
4								

Class Prep / Prior Knowledge (completed?)

Before class, get your Eno Board prepped for brainstorming terms

Teacher Strategy or Tips (this will be something that will be easier to see after you are completed)

Steps of Activity (try to estimate timing)

I.   Working with a partner
     A. Activate students thinking by telling them why you hate to play
        Volleyball.
        1. People jump in front of me when it is my turn
        2. I never get a chance to hit the ball and just stand there.
        3. I'm afraid I will get crashed into.
        4. This makes me feel upset.
     B. Ask students to think of what they don't like when they are working
        in a team or partnership
II. Brainstorm a list of "Terms" for working with a partner
     A. Tell the students that we will create a "Terms Agreement" for
        working with a partner in which we can all sign.
     B. Ask students for ideas of what to put for working with their partner.
     C. Save this document to print for signatures then keep on display.
     D. Tell the students that this is what you will use to assess their ability
        to work with a partner, and that they may use this list in the future to
        assess each other.
III. Routine for Workstation Set-Up
     A. Tell the students that from now on, upon walking into the
        classroom, they may get their tablet 5 at a time. This must be
        orderly so time is not wasted during our 45 min session.
     B. If waiting to get a tablet, they may sit in their seat.
     C. Students must be gentle with the equipment.
     D. Have the students practice this.
IV. Workstation set-up

Lesson Plan 3: Apps and giving computers instructions

<u>Main Goal</u> -

Students will be introduced over the next 2 hours to what an "App" is, some of the simple basic steps involved in creating an app, and an opportunity to practice writing code.

<u>Relevant Learning Standards</u> -

IT 1.6 - Word Processing -Demonstrate use of intermediate features in word processing applications.

IT 2.5 - Society - Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.

CSTA 1:3-2- Collaboration- Work cooperatively and collaboratively with peers, teachers, and other using technology,

CSTA 1:6-3- Collaboration- Identify ways that teamwork and collaboration can support problem solving and innovation.

MA DLCS: 6-8.CT.a.1 - Describe how data is abstracted by listing attributes of everyday items to represent, order and compare those items (e.g., street address as an abstraction for locations; car make, model, and license plate number as an abstraction for cars).

<u>Overview</u> -

Approx. 10-15 minutes
Students will watch teacher launch a simple basic App i.e. "Meow app" and interact with it by passing around and taking turns. Discuss the interface and blocks design portion of the app using new vocabulary.

Approx 10-15 minutes
Students will break up into groups of 2 and construct an enumerated procedure on how to make a peanut butter and jelly sandwich in Microsoft Word.

Aprrox 10-15 minutes
Students will reconvene together and collaboratively make a final/master list with the teacher and edit their set of instructions.

Approx 10 minutes
Students will listen to President Obama's speech regarding CODE and discuss.

Approx 45 minutes to 1 hour
Students will practice coding with active demo site.

Approx 10 minutes
Follow-up discussion.

Learning Objectives -

Students will:

1. Collaboratively compile a set of instructions for making a peanut butter and jelly sandwich.
2. Critique the instructions with the teacher and revise them by visually acting out each step.
3. Listen to Obama's Code Speech: https://www.youtube.com/watch?v=JDw1ii7aKwg
4. Compose and write simple code using a demo internet program i.e. "studio.code.org/s/frozen" or "learn.code.org/hoc/1"
5. Discover the differences between a program and a code and the importance these skills have on attaining successful careers in the 21st century.

Materials -

Android and usb cable
Computers with working Internet and MicroSoft Word software.
Handouts of new vocabulary.

Class Prep/Prior Knowledge -

Computer skills - Internet access, Word Processing, 21st Century Technology Careers

Teacher Prep -

Have App Inventor open to Meow app.

Have basic App assembled and ready to launch via Android and USB cable.
Have vocabulary handouts ready for distribution.
Have Obama's "Code Speech" ready to launch.
Have Word accessible and formatted enumeration style.

Lesson Plan 4: Tablet and file basics

Main Goal

Students will be introduced to the proper procedure to create, save, store, navigate, download, etc. folders and files from various storage devices.

Relevant Learning Standards:

MA DLCS: 6-8.CAS.b.9 - License original content and extend license for sharing in the public domain (e.g., creative commons).

MA DLCS: 6-8.CAS.b.1 - Explain how copyright law and licensing protect the owner of intellectual property.

MA DLCS: 6-8.DTC.a.3 - Integrate information from multiple file formats into a single artifact.

MA DLCS: 6-8.DTC.a.4 - Individually and collaboratively use advanced tools to design and create online content (e.g., digital portfolio, multimedia, blog, webpage).

MA DLCS: 6-8.DTC.c.2 - Evaluate quality of digital sources for reliability, including currency, relevancy, authority, accuracy, and purpose of digital information.

Overview

10 min- A blank handout of a desktop or an actual desktop projected with an Eno board containing items (folders, files, download/upload symbols) for vocabulary/identification will be given for discussion.

10 min- Demonstrate and discuss downloading pictures and sounds. Just for this lesson we will download a picture only from a Creative Commons type of website. Stress the importance and reason for this.

20 min- Practice saving and naming files and/or downloaded image into designated areas of the computer (student created folder, other drives). Students will view this in a demonstration and then be given a handout of directions to create a "mock" file and save it.

10 min- Wrap up. Students will check off what they were able to accomplish right on the handout as a check for skill accomplishment.

Learning Objectives

Students will:

1. Be able to create folders on the desktop and name them.
2. Be able to download and copy files to desktop folders by:
    a. Dragging and Dropping
    b. Right clicking and selecting the file save command
3. Be able to save files to other resources from the Desktop File Folders:
    a. My Documents
    b. Flash Drives
    c. Future Cloud Accounts
4. Be able to define new vocabulary associated with lesson.

Materials

Activity handout
Flash Drives
Android and USB cable
Computers with working Internet and Microsoft Word software.
Handouts of new vocabulary.

Class Prep/Prior Knowledge

Computer skills Internet access, Word Processing, 21st Century Technology Careers

Teacher Prep

Working Computers
Have vocabulary handouts ready for distribution.

Steps of Activity
1. Introduce desktop vocabulary
    a. Give vocabulary handout.
    b. Define each new word for clarity.
    c. Explain how these are used in today's careers.
2. Creation of files and folders
    a. Demonstration
    b. Handout

3. Downloading
   a. Demonstrate and discuss downloading pictures and sounds.
      i.   Visit a Creative Commons site
      ii. Download an image pointing out the steps while doing so.
   b. Stress the importance and reason for using Creative Commons site(s) this. Ask for student experience and feedback of thoughts on using pictures and sounds they did not create.
4. Activity handout

Practice saving and naming files and/or downloaded image into designated areas of the computer (student created folder, other drives). Students will view this in a demonstration and then be given a handout of directions to create a "mock" file and save it.

10 min- Wrap up. Students will check off what they were able to accomplish right on the handout as a check for skill accomplishment.

Two Column Notes
File Basics

Please write your definition of the following terms, and then turn and talk to a partner about what you wrote. Discuss your differences and make changes if to your sheet if necessary. Be prepared to share!

File	
Download	
Creative Commons	
Plagiarism	
Copyright	
Fair Use	

Lesson Plan 5: Meow app and Intro to computer science

Main Goal -

Students will be introduced over the next 2 hours to what an "App" is, some of the simple basic steps involved in creating an app, and an opportunity to practice writing code.

Relevant Learning Standards -

IT 1.4 Basic Operations - Identify and provide a rationale for using a certain media (e.g., DVDs, flash drives, school servers, and online storage spaces), and provide a rationale for using a certain medium for a specific purpose.

IT 1.6 Word Processing - Demonstrate us of intermediate features in word processing applications (e.g., tabs, indents, bullet and numbering tables).

IT 2.5 - 2.9 Society - Identify, discuss, explain, analyze the technology proficiencies needed in the workplace; the effect these technological changes have had on society; and how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.

CSTA 1:6-5- Computing Practice and Programming- Construct a program as a set of step by step instructions to be acted out.

CSTA 2-4- Computing Practice and Programming- Demonstrate an understanding of algorithms and their practice application.

CSTA 1:6-9- Computing Practice and Programming- 1:6-9- Identify a wide range of jobs that require knowledge of or use of computing.

CSTA 2-7 Computing Practice and Programming- Identify inter-disciplinary careers that are enhanced by computer science.

MA DLCS: 6-8.CT.a.1 - Describe how data is abstracted by listing attributes of everyday items to represent, order and compare those items (e.g., street address as an abstraction for locations; car make, model, and license plate number as an abstraction for cars).

CSTA 2017 2-AP-16   6-8 Incorporate existing code, media, and libraries into original programs, and give attribution.

<u>Overview</u> -

Approx. 10-15 minutes
Students will watch teacher launch a simple basic App i.e. "Meow app" and interact with it by passing around and taking turns. Discuss the interface and blocks design portion of the app using new vocabulary.

Approx 10-15 minutes
Students will break up into groups of 2 and construct an enumerated procedure on how to make a peanut butter and jelly sandwich in Microsoft Word.

Aprrox 10-15 minutes
Students will reconvene together and collaboratively make a final/master list with the teacher and edit their set of instructions.

Approx 10 minutes
Students will listen to President Obama's speech regarding CODE and discuss.

Approx 45 minutes to 1 hour
Students will practice coding with active demo site.

Approx 10 minutes
Follow-up discussion.

<u>Learning Objectives</u> -

Students will:

1. Collaboratively compile a set of instructions for making a peanut butter and jelly sandwich.
2. Critique the instructions with the teacher and revise them by visually acting out each step.
3. Listen to Obama's Code Speech:
   https://www.youtube.com/watch?v=JDw1ii7aKwg
4. Compose and write simple code using a demo internet program i.e. "studio.code.org/s/frozen" or "learn.code.org/hoc/1"

5. Discover the differences between a program and a code and the importance these skills have on attaining successful careers in the 21st century.

Materials -

Android and usb cable
Computers with working Internet and MicroSoft Word software.
Handouts of new vocabulary.

Class Prep/Prior Knowledge -

Computer skills - Internet access, Word Processing, 21st Century Technology Careers

Teacher Prep -

Have App Inventor open to Meow app.
Have basic App assembled and ready to launch via Android and USB cable.
Have vocabulary handouts ready for distribution.
Have Obama's "Code Speech" ready to launch.
Have Word accessible and formatted enumeration style.

Lesson Plan 6: Setting It Up

Main Goal/ Overview / Overall Timing

The main goal of this lesson is to get the students able to independently connect to App Inventor through logging in using their Google Account, as well as setting up their Android tablet for use with the program.

Relevant Learning Standards -

IT 1.2 - Basic Operations - Identify successful troubleshooting strategies for minor hardware and software issues/problem.

IT 1.3 - Basic Operations - Independently operate peripheral equipment.

IT 1.18 - Internet Networking and Online Communication - Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).

IT 1.19-1.23 - Internet Networking and Online Communication - Explain and correctly use internet related terms and be able to explain and identify the correct way to utilize district assigned e-mails.

IT 2.4 - Ethics - Describe appropriate and responsible use of communication tools.

IT 2.11-2.13 -Health and Safety - Be able to explain potential risks associated with the use of networked digital information and the identify/detect both safe and unsafe practices affiliated with sharing information via an e-mail account and/or internet.

IT - 3.1-3.2 - Research - Be able to explain and demonstrate effective searching and browsing strategies; collect, organize, and analyze digital information from a variety of sources with attribution.

IT - 3.9 - Communication - Use a variety of telecommunication tools to collaborate and communicate with peers and other audiences.

CSTA 2-7 Computational Thinking- Represent data in a variety of ways: text, sounds, pictures and numbers.

CSTA 2-5 Computational Thinking- Act out searching and sorting algorithms.

CSTA 2-1 Computational Thinking- Use the basic steps in algorithmic problem solving to design solutions.

CSTA 2-3 Computers and Communication Devices- Demonstrate an understanding of the relationship between hardware and software.

CSTA 2-5 Computers and Communication Devices- Apply strategies for identifying and solving routine hardware problems that occur during everyday computer use.

CSTA 2-3 Collaboration- Collaborate with peers, experts and others using collaborative practices such as pair programming, working in project teams and participating in group active learning activities.

MA DLCS: 6-8.CS.s.1 - Explain the difference between physical (wired), local and wide area, wireless, and mobile networks.

MA DLCS: 6-8.CS.s.3 - Describe how information, both text and non-text, is translated and communicated between digital devices over a computer network.

Learning Objectives (both skills and knowledge)

- Students will be able to successfully login to their account using an assigned Gmail password and username.
- Students will independently connect to the App Inventor "Create" page in order to access tools for App creation.
- Students will be able to connect their Android device to the computer for communication with the App Inventor program.
- Students will have an overview of the program dynamics (blocks page, design page, menu options and abilities)

Materials (physical things needed: Handouts / Hardware / File Access)
- Computers with Internet access.
- Android Tablets
- USB Wires
- Handout: App Inventor- How it all connects together-USB
- Ticket to Leave slip

Class Prep / Prior Knowledge (completed?)
Students should have a partner at this point and assigned Android number as well as assigned Google account for weekly use.

Teacher Prep (have a plan b)

If Internet is down, students can still be assigned a particular Android device to use (be responsible for) in every interaction. We will practice handling of devices, USB cables and utilize handout listed in above materials list.

Teacher Strategy or Tips (this will be something that will easier to see after you are completed)

Demonstrate first, and go slowly to ensure each student can accomplish proper set up.

Steps of Activity (try to estimate timing)

- Make sure students are with their partners and that they have their Android and Google account assignments
- Give Handout to each pair and ask students to put into words their understanding of what they see.
- Discuss dynamics of set up.
- Have pairs connect to App Inventor site/program with computer and Android.
- Students will write at least one sentence on a Ticket-To-Leave (Attached Below) sheet to sum up what we did today. Encourage students to use technical vocabulary.

Exit Slip

Choose from the words below.

Word:_____

Function and
Purpose:_____

_____

_____

_____

_____

What was learned?

_____

_____

_____

Lesson Plan 8: The Effect of Digital Technology Upon Goal Attainment

Main Goal/ Overview / Timing

The goal of this lesson is to have students analyze and recognize the ways that emerging technologies in computing effect education, the workplace, individuals, and our global society.

Learning Objectives (both skills and knowledge)

Students' will be able to identify and describe the effects of technology upon education, the workplace, individuals, and our global society.

Materials (physical things needed: Handouts / Hardware / File Access)
- Access to Eno Board
- Handouts
- Pencils

Teacher Tip:

Pause for a few moments after each video, to give students time to record their observations and thoughts on the Digital Directions Video Tracking handout.

Teacher Prep (have a plan b)

- You could do this with articles if computers are not available.
- Have videos on tabs, ready to present.

Steps of Activity (try to estimate timing)

This lesson should take one class period, or it can be divided up at the teacher's discretion.

-Discuss with the class the idea of technology breaking down barriers which previously prevented people from helping and working with each other. Also

point out that careers which are not necessarily directly related to technology could be enhanced by digital tools, helping to attain goals.

-Show Several [Digital Directions](#) videos pausing to allow students writing, before starting a new one (Several short: QR Codes, Hangouts, etc.)

-Have the students track the technologies used to help these projects on a given sheet, where they note specific observations and thoughts (see attached). They may write on this while watching the videos, in addition to the time after to complete, before starting a new video.

-Discuss

-Hand out an exit slip (See Attached)

-Share what was learned (also what is on the exit slip).

Site for Videos:

(https://cspathways.org/teacher/cs-careers/)

Lesson Plan 9: Analyzing Computer Science Professional Careers

Main Goal –

Students will describe and summarize the different occupations of a Computer Scientist and how important their role and involvement is in various areas of our society.

Relevant Learning Standards -

IT 3.9 Communication - Use a variety of telecommunication tools to collaborate and communicate with peers and other audiences.

IT 2.5 Society - Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.

IT 2.6 Society - Identify and describe the effect technological changes have had on society.

IT 2.7 Society - Explain how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.

IT 2.8 Society - Analyze and explain how media and technology can be used to distort, exaggerate and misrepresent information.

IT 2.9 Society - Give examples of hardware and applications that enable people with disabilities to use technology.

CSTA Standard- Collaboration- 2-4- Exhibit dispositions necessary for collaboration: providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.

MA DLCS: 6-8.CAS.c.1 - Describe current events and emerging technologies in computing and the effects they may have on education, the workplace, individuals, communities, and global society.

MA DLCS: 6-8.CAS.c.2 - Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs.

MA DLCS: 6-8.CS.b.1 -   Explain why some problems can be solved more easily by computers or humans based on a general understanding of types of tasks at which each excels.

MA DLCS: 6-8.CS.b.2 -   Describe how humans and machines interact to solve problems that cannot be solved by either alone (e.g., "big data" experiments that involve drawing conclusions by analyzing vast amounts of data).

Overview –

Each pair of students will read and analyze a different highlighted section of a computer article depicting the career path of a person with a degree in Computer Science.

Learning Objective(s) –

Students will:

1. Prepare and write their own definition of a "Computer Scientist" and set aside.
2. Break out into pairs.
3. Read, analyze and discuss their assigned article section.
4. Think, Pair, Share: create a new definition of a "Computer Scientist."
5. Analyze their differences between their 1st and 2nd definition results
6. Share and discuss with the class.

Materials –

Printed Article:
http://www.collegexpress.com/interests/science-and-engineering/articles/careers-science-engineering/what-can-you-do-computer-science-major/

OR…other more current comparable to above

Class Prep/Prior Knowledge –

Basic computer technology skills

Teacher Prep –

Browse the internet or explore the local library for resources pertaining to Computer Science education and occupational careers. Possibly subscribe to one and have articles available for students' extracurricular use.

Lesson 10: Talk to Me (Text to Speech)
Originally authored by Michael Scarola, Edited by Akira Kamiya

<u>Main Goal</u>
Give students the a moment of discovery where they can see their own power of block programming via this quick tutorial. The idea of this to happen quickly in the course of one class.

<u>Learning Objectives (both skills and knowledge)</u>
Knowledge - How hardware and software work together. How apps work "under the hood." Playing with Text to Speech Properties demonstrates this well

Skills - Following a Tutorial from beginning to end

<u>Materials (physical things needed: Handouts / Hardware / File Access)</u>
Desktop computers, tablets
Handouts:
https://drive.google.com/open?id=0Bybh57FAfb7aanJDamIwRHVzNkU
https://drive.google.com/open?id=0Bybh57FAfb7aZ2VfU1RYQVZVQU0

Class Prep / Prior Knowledge (completed?)
How to save and find files.

Teacher Prep
Have website links to tutorials if needed my teacher website, so that the students can navigate to and download files.

Teacher Strategy or Tips (this will be something that will easier to see after you are completed)

Have students learn how to follow the PDF handout for guidance, don't demo on screen unless you see a number of people encountering obstacle. The demo on case by case basis.

Note if you skipped Lessons 3 and 4 then you may need to scaffold this activity with some on screen step by step demonstration

Steps of Activity (try to estimate timing)
        Distribute Talk to Me Handouts (include the Language and Country Codes
located here: https://drive.google.com/file/d/0BwUr9zwHYM30bGJrT1ZtUmoyY0E/view

Login to App Inventor

Follow Steps of Tutorial on paper.
Circulate around the room make note of time to swap roles with computers, and
observe for good pair work protocol and those with trouble.

Make sure to have enough time at the end of each of the App Inventor sessions to allow
students to reflect on their own experience, what did they learn.

Lesson Plan 11- : A Day at the Zoo or A Day at the Symphony

MAIN GOAL

The main goal of this lesson is for students to learn how to download audio files, mp3, to a newly created desktop folder or drive (storage).

MA DLCS:6-8.DTC.a.2 - Identify the kinds of content associated with different file types and why different file types exist (e.g., formats for word processing, images, music, three-dimensional drawings.).

MA DLCS:6-8.CAS.b.1 - Explain how copyright law and licensing protect the owner of intellectual property.

MA DLCS:6-8.CAS.b.2 - Explain possible consequences of violating intellectual property law and plagiarism.

MA DLCS:6-8.CAS.b.3 - Apply fair use for using copyrighted materials (e.g., images, music, video, text).

MA DLCS:6-8.CAS.b.5 - Differentiate among open source and proprietary software licenses and their applicability to different types of software and media.

MA DLCS:6-8.DTC.c.1 - Perform advanced searches to locate information using a variety of digital sources (e.g., Boolean Operators, limiters like reading level, subject, media type).

MA DLCS:6-8.CAS.b.9 - License original content and extend license for sharing in the public domain (e.g., creative commons).

Learning Objectives (both skills and knowledge)

- Students will be able to successfully login to their account using an assigned Gmail password and username.
- Students will create a desktop folder.
- Students will select the name of an animal and/or bird species from a container.
- Students will search online for an image of their assigned animal/bird or an instrument and save it as a jpeg file to their newly created desktop folder.
- Students will go to www.freesound.org and register and activate a new account for their partnership or teacher could set-up a general account.
- Students will search and download an audio file from "freesound.org" and save it as an mp3 file to their newly created desktop folder.
- Students will independently connect to the App Inventor "Create" page in order to access tools for App creation.

- Students will be able to connect their Android device to the computer for communication with the App Inventor program via WIFI and scanning the bar-code.
- Students will create an app depicting an image of their theme based topic, whether an animal or instrument, to their droid that when pressed will emulate a sound that said species or instrument makes.
- When students are all done, one person from each group will form a line at the back of the class. At the count of three, they will hold up and press their app so that all students can see their image and hear the sound of their virtual zoo or symphony.

Materials

- Computers with Internet Access
- Android Tablets
- Small folded up papers, each containing the name of a specific and different species of animal/bird or musical instrument written on it, all inside a container.

Class Prep/Prior Knowledge

Teacher will determine one theme: either zoo (animals/birds) or symphony (various types of instruments)

Students will be working with an already determined partner and assigned Android number as well as assigned Google account for use for all classes.

Students are already familiar with coding pictures and simple text to speech media blocks.

Students are familiar with creating desktop folders and saving articles/objects to them.

Students are comfortable at working independently and applying different strategies to map out how to make things work properly.

Teacher Strategy or Tips

- Demo how to download audio file to computer.
- Demo how to save to desktop folder (drag from download folder into new desktop folder.)

- Tell students that they need to use their own personal e-mail to register and activate www.freesound.org site.
  - Or... set up general account for freesound.org ahead.
- Remind students to record their Username and Password on their index card inside their classroom folders.
  - Prepare small folded up papers, each containing the name of a specific and different species of animal/bird or musical instrument written on it, all inside a container.

Lesson Plan 12: Digital Doodle and Talk to Me Part 2

Main Goal/ Overview / Overall Timing

Student will be able to successfully incorporate additional App Inventor interfaces in order to create starter apps with varying abilities. This should take approximately 2 -45 min. session.

Relevant Learning Standards -

IT 1.2 - Basic Operations - Identify successful troubleshooting strategies for minor hardware and software issues/problem.

IT 1.3 - Basic Operations - Independently operate peripheral equipment.

IT 1.18 - Internet Networking and Online Communication - Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).

IT 1.19-1.23 - Internet Networking and Online Communication - Explain and correctly use internet related terms and be able to explain and identify the correct way to utilize district assigned e-mails.

IT 2.4 - Ethics - Describe appropriate and responsible use of communication tools.

IT 2.11-2.13 -Health and Safety - Be able to explain potential risks associated with the use of networked digital information and the identify/detect both safe and unsafe practices affiliated with sharing information via an e-mail account and/or internet.

IT - 3.1-3.2 - Research - Be able to explain and demonstrate effective searching and browsing strategies; collect, organize, and analyze digital information from a variety of sources with attribution.

IT - 3.9 - Communication - Use a variety of telecommunication tools to collaborate and communicate with peers and other audiences.

IT 1.25 - Multimedia - Use a variety of technology tools to maximize the accuracy of work.

CSTA 2-4- Collaboration - Exhibit dispositions necessary for collaboration, providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.

MA DLCS: 6-8.CT.b.2 -   Use logical reasoning to predict outputs given varying inputs.
MA DLCS: 6-8.CT.b.3 -   Individually and collaboratively decompose a problem and create a sub-solution for each of its parts (e.g., video game, robot obstacle course, making dinner).
MA DLCS: 6-8.CT.b.5 -   Recognize that boundaries need to be taken into account for an algorithm to produce correct results.
MA DLCS: 6-8.CT.d.3 -   Create a program, individually and collaboratively, that implements an algorithm to achieve a given goal.
MA DLCS: 6-8.CT.d.4- Implement problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.
MA DLCS: 6-8.CT.d.5 -   Trace programs step-by-step in order to predict their behavior.

Learning Objectives (both skills and knowledge)

- Students will be able to create a starter app through reading/viewing a given tutorial, and class instruction.
- Students will be able to practice debugging an app which does not achieve a desired outcome.
- Students will be able to modify the app with their own additions.

Materials (physical things needed: Handouts / Hardware / File Access)

- Computers and tablets
- A way of connecting the tablet for communication between the App Inventor site (computer) and the tablet.
- Talk to Me 2 extension packet.
- Digital Doodle tutorial packet or on-screen PDF
  http://appinventor.mit.edu/explore/sites/all/files/hourofcode/DigitalDoodle.pdf

- Additional support: on-screen video tutorial
  http://appinventor.mit.edu/explore/ai2/beginner-videos.html

Class Prep / Prior Knowledge (completed?)

Prep: Have handouts, Androids and any other supportive materials from previous lessons out and ready to be accessed by the students.

Prior Knowledge: Student must already know how to connect necessary devices, access sites and materials, and manipulate the designer/blocks components of app creation.

Teacher Prep (have a plan b)

If computer lab is unavailable, you may project video from one computer to the entire class http://appinventor.mit.edu/explore/ai2/beginner-videos.html. Next, brainstorm possible alterations which could be made to the app, and discuss how those changes may be achieved.

Teacher Strategy or Tips (this will be something that will easier to see after you are completed)

Be sure to have a class routine in place for students to automatically retrieve all necessary materials for their team as they enter the room in order to make the most of the allotted time.

Steps of Activity (try to estimate timing)

1. Students enter using class routine of gathering materials (packets, handouts, folders, Androids and any other supportive items) and making hardware connections upon entering. 5 min.
2. Discuss how to create a new project in App Inventor. 2 min.
3. Discuss the goal of the newest starter apps. 3 min.
   a. Talk to Me 2- Do not start as a new project. Open the original app and add on (Text to speech when shaken).
   b. Digital Doodle- Must be named as a new project.
4. Review necessary vocabulary and steps of designer vs. block application. 2 min.

5. Review vocabulary: Interface, Project, Block Programming through a teacher made slide presentation (see below for example) etc. 2 min.
6. Allow students to explore tutorial and build apps. Rest of class.
7. Students check off apps built next to their names and may work to add their own alterations to Digital Doodle with time remaining.
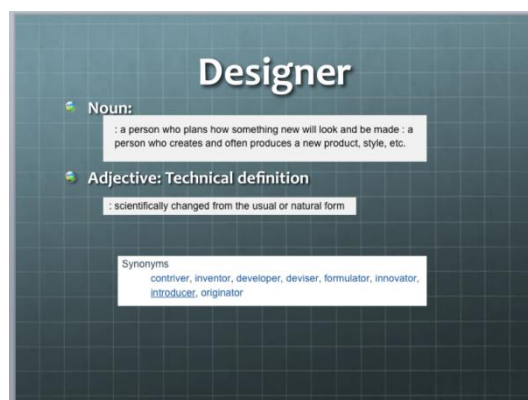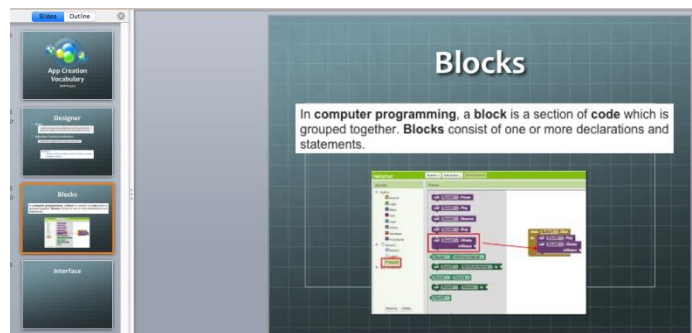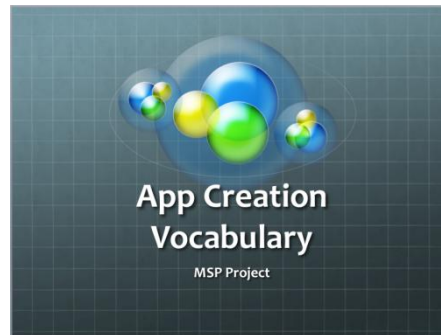
Lesson 13:- MLK Player App

Main Goal
Have students create a basic player app. show the students more of the capabilities of App Inventor. As a by-product Introduce increased complexity of function and the concept of Computational Thinking. Starter App will have all media loaded, so aim of lesson is purely about assembling the blocks to get both players to play, then have one pause while the other plays

Learning Objectives (both skills and knowledge)
Knowledge - How to Open a Starter AIA file, How to Follow Onscreen Instructions
Skills - Gain increased confidence with navigating the Design and Block Interface
Be able to create a sophisticated layout with multiple buttons in the Design View of App Inventor

Materials (physical things needed: Handouts / Hardware / File Access)
Desktop computers, tablets
MLK/Malcolm Handout:
http://goo.gl/oFdwv4
Note: this handout cuts off the pages that show you how to pause the player, that will happen in Lesson 8

Online Tutorial:
http://www.appinventor.org/content/ai2apps/simpleApps/dream
Add to Website, Google Classroom, or send via student's email
(note this is not in the App Inventor Guide section, this David Wolber's page)

Class Prep / Prior Knowledge (completed?)
Some familiarity with App Inventor already

Teacher Prep
Be able to build a basic app with one button and one player from memory

Teacher Strategy or Tips (this will be something that will easier to see after you are completed)
Go over steps to get App Inventor up and running, if necessary.

Have them use handout only if needed. Try to do things on screen and ask questions rather than showing answers!

If they get done early have them, modify the app so that when you shake it,
It speaks out the first names of the two students. Think back to Talk to Me and how we did that.

Steps of Activity
- Explain what this app will do when done. (Optional Demo a player app.)
    - In this case all we are trying to do is to get two sound files to play via two buttons on the screen. One button will have a picture of MLK, the other button will have Malcolm X
- Show Tutorial video onscreen, Have students navigate to tutorial after.
    - http://www.appinventor.org/content/ai2apps/simpleApps/dream
    - Stop the video at 5:40 marker of Step 3
        - All we want is both players to play. Lesson 8 will deal with Pausing.
    (Show Book Format Tutorial for those that prefer print)

- Starter App will have all media loaded, show them where the aia starter file is and have them get familiar with their file names. It is available here:
    http://http://www.appinventor.org/starterApps (note: case sensitive)

Lesson Plan 14: Professional career visit

<u>Main Goal</u> –
Guest speakers will visit the classroom and share their professional careers with students and the importance Computer Science has influenced them.
<u>Relevant Learning Standards</u> -

IT 3.9 Communication - Use a variety of telecommunication tools to collaborate and communicate with peers and other audiences.
IT 2.5 Society - Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.

IT 2.6 Society - Identify and describe the effect technological changes have had on society.

Overview –
Students will have the opportunity to listen first hand to someone who is in the Computer Science industry and how coding interacts with their occupations.

Learning Objective –
Students will:
1. Listen to the guest speaker's delivery.
2. Interpret and discuss questions they may have pertaining to their personal presentation.
3. Recognize the relevance of the information that will be demonstrated and be able to recognize the importance of the skills they have acquired thus far.

Materials –
Computer.
Droids.
Eno Board.
Working Sound System.

Class Prep/Prior Knowledge –
Basic computer technology skills, 21st Century Computer Skills, App Inventor Computer Skills, etc.

Teacher Prep –
Find, coordinate and confirm each guest speaker.

Lesson Plan 14: CS Professional's Visit

Main Goal –

Guest speakers will visit the classroom and share their professional careers with students and the importance Computer Science has influenced them.

Overview –

Students will have the opportunity to listen first hand to someone who is in the Computer Science industry and how coding interacts with their occupations.

Learning Objective –

Students will:

1. Listen to the guest speaker's delivery.
2. Interpret and discuss questions they may have pertaining to their personal presentation.
3. Recognize the relevance of the information that will be demonstrated and be able to recognize the importance of the skills they have acquired thus far.

Materials –

Computer.
Droids.
Eno Board.
Working Sound System.

Class Prep/Prior Knowledge –

Basic computer technology skills, 21st Century Computer Skills, App Inventor Computer Skills, etc.

Teacher Prep –

Find, coordinate and confirm each guest speaker.

Lesson Plan 15, 16, 17 – App Development (This will require 3-4 class sessions.)

Main Goal –
Students will create an original, community friendly, app utilizing all the tools they have learned thus far.

Relevant Learning Standards -
IT 1.2 - Basic Operations - Identify successful troubleshooting strategies for minor hardware and software issues/problem.
IT 1.3 - Basic Operations - Independently operate peripheral equipment.
IT 1.18 - Internet Networking and Online Communication - Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).
IT 1.19-1.23 - Internet Networking and Online Communication - Explain and correctly use internet related terms and be able to explain and identify the correct way to utilize district assigned e-mails.
IT 2.4 - Ethics - Describe appropriate and responsible use of communication tools.
IT 2.11-2.13 -Health and Safety - Be able to explain potential risks associated with the use of networked digital information and the identify/detect both safe and unsafe practices affiliated with sharing information via an e-mail account and/or internet.
IT - 3.1-3.2 - Research - Be able to explain and demonstrate effective searching and browsing strategies; collect, organize, and analyze digital information from a variety of sources with attribution.
IT - 3.9 - Communication - Use a variety of telecommunication tools to collaborate and communicate with peers and other audiences.
CSTA 2-4- Collaboration - Exhibit dispositions necessary for collaboration, providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.
CSTA 2-1- Computers and Communication Devices- Recognize that computers are devices that execute programs.
CSTA 1:6-2- Computing Practice and Programming- Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning.
CSTA 2-3- Computing Practice and Programming- Design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts.
MA DLCS: 6-8.CT.d.3 - Create a program, individually and collaboratively, that implements an algorithm to achieve a given goal.
MA DLCS: 6-8.CT.b.1 - Design solutions that use repetition and conditionals.

Overview –
Students will convene in their paired groups, follow teacher's instructions and create an original app using familiar skills and tools.

Learning Objective –
Students will:
1. Locate their partner and sit in their paired groups.
2. Receive their group assigned androids.
3. Follow teacher's instructions and access the App Inventor account using their assigned email accounts.
4. Watch the demonstration of the step-by-step process involved in creating their first app.
5. Apply the tools to the design screen first.
6. Apply the tools to the block design screen next.
7. Experiment and practice applying the procedure independently.
8. Test the app to see if it operates properly.
9. Allow time for students to enhance their app by applying colors, text, etc.
10. Showcase their app in their groups to the class and outline the extra tools they may have applied in making their app more unique.
11. Peer editing - Class discussion i.e. constructive criticism, trouble-shooting problems encountered, etc.

Materials –
Student desktop computers.
Student email accounts.
Teacher's Web site.
Handouts – Step by step guide instructions. *Talk to Me
Androids.
USB cables.

Class Prep/Prior Knowledge –
Basic computer technology skills.
Email skills.
Downloading/uploading media files.
Saving files.
Accessing the class Web page.

Teacher Prep –
Preparing user friendly handouts for app inventor.
Insuring that the app inventor site is up and running.