Lesson #1: App Inventor- App Inventor Basics

Overview: In this lesson, students will understand the importance of MIT App Inventor and the power of the web-based program to create applications for Android devices. They will work through a series of tutorials to learn how to use the components and blocks to create their first app.

Student Agency: Students will have an opportunity to add their own unique flair to their app as they follow a series of three tutorials to learn how to use the basic tools of the program. Students may change the layout of their apps including colors, pictures, and sounds.

Pathway: Coding/Computational Thinking

Duration: This lesson will take roughly 1-½ - 3 hours to complete based on student background and teacher familiarity.

Essential Question:

- How can apps be used to help your community?
- How can businesses use apps to reach more people?

Objectives:

- Students will be able to navigate through the interfaces and components on MIT App Inventor.
- Students will be able to use various components in the designer and program blocks on MIT App Inventor to create their first apps.

Competencies & Practices	**Student Artifacts/Evidence**

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Collaboration	Students will collaborate with each other to work through problems that arise while completing their first apps.
Simulation	MIT App Inventor simulates what an app will look like on an emulator or tablet.
Abstraction	Apps use abstraction to remove complex details such as coding so it is user friendly.
Algorithms/Procedures	Students program a series of algorithms so that the app knows what it should do next.
Test and Debug	Students will be testing and debugging all of their apps in order to make sure the work seamlessly.
Reuse and Remix	Students can remix their apps to have their own unique pictures, sounds, and layouts.

Teacher Preparation:

- Teachers should familiarize themselves with the website appinventor.mit.edu.
- Teachers should also review the attached Google Slide (App Inventor Class Introduction). Click here for Outline.

  Teacher Tip: Complete HelloPurr, MagicEightBall, and MoleMash tutorials to ensure you understand the components and how to use the blocks. Follow the step by step tutorials found at: https://appinventor.mit.edu/explore/ai2/tutorials.html

Materials for Students:

- Students will need a computer with access to the internet and a Gmail account.

Students Prior Knowledge:

Students should explore previous projects that were completed on MIT App Inventor to see what the program is capable of.

- http://appinventor.mit.edu/explore/about-us.html

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Concepts:

- User Interface - Actions determining how the user and application interact
- Layout - The arrangement and alignment of the application
- Media - Media-Related tools for application (Sound, Camera)
- Drawing and Animation - Animating Sprites for application
- Control - If then, and other dependent functions
- Logic - Compares values
- Math - Uses operations and random numbers
- Text - Compare texts
- Lists - Make lists of different variables
- Colors - Colors, used for graphics
- Variables - Store different values in a single place
- Procedures - Create functions that do certain task

Habits of Mind:

- Persisting
- Managing Impulsivity
- Applying Past Knowledge to New Situations
- Creating, Imagining, Innovating
- Thinking and communicating with clarity and precision

Lesson Sequence:

1. **Anticipatory Set: Anticipatory Set:** Introduce this topic by playing this inspirational video.
   - Video Connection:https://www.youtube.com/watch?v=ip051U7Rvds
   - Questions to Ask Students:
     - ➢ What was the point of the video? *Rethink our way of communicating, being open-minded, etc…*

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- ➢ How can apps help people? *Provide news, entertainment, education, reviews, business use, health, organization, and more.*

2. **Engaging Activities:**
   a. **Tutorials:** Students are going to follow three separate tutorials at their own pace to learn how to use the components to create their app. They will then learn how to code their app to make it work.
      i. **Hello_Purr**- Students will program an image that will act as a button and make a noise when it is clicked on. https://appinventor.mit.edu/explore/ai2/hellopurr.html
      ii. **Magic_Eight_Ball**- Students will program an image that will call a prediction (label) when clicked and then shook using an accelerometer sensor. https://appinventor.mit.edu/explore/ai2/magic-8-ball.html

      Teacher Tip: Teacher may utilize the Google Slide to help struggling students better understand Magic_Eight_Ball. Click here for outline. https://docs.google.com/presentation/d/1tfeZSDSVE4xfwD3g9eBfcBtmBbos4sgrVJ86JdHxv9k/edit#slide=id.g3beaadec62_0_713
      iii. **Mole_Mash**- Students will create a game where an image sprite randomly pops up on a canvas and the user has to click the image to score points. (whack-a-mole). https://appinventor.mit.edu/explore/ai2/molemash.html

      Teacher Tip: Let students find their own pictures online to make their apps interesting to them. You will have more “buy-in” if they get to choose their pictures, sounds, etc… (Ex: Magic Pokemon Ball instead of an 8 Ball) Let your students work on their own or in small groups while acting as a facilitator. Encourage students to work as a class team to solve problems that arise. Tell students if they are stuck, they must ask two classmates for help before asking the teacher.
   b. **Class Discussion:** Have students discuss their favorite part of using App Inventor and areas they are having concerns with. Allow them to have

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time to collaborate with each other to work through some of the problems that they are having.

c. **Share Out:** Students will show each other how they manipulated their apps to make them unique.

3. **Wrap Up:** Finish the lesson by having students come up with ideas for their own apps using the skills that they learned in the tutorials.

Assessment Questions	**Yes**	**No**
Can students use the designer to create an app?		
Can students successfully program an app to work?		
Are students able to work as a team to overcome problems that arise?		

Activities for Relearning:

Students will follow along with video tutorials to complete the tasks above.

1. Hello_Purr
2. Magic_Eight_Ball
3. Mole Mash
    a. Part 1
    b. Part 2
    c. Part 3

Activities for Enrichment:

Students will be challenged to complete more difficult versions of the apps.

1. Hello_Purr- students can change between different noises when the cat is clicked.
2. Magic_Eight_Ball- students can add the text to speech feature allowing the app to read the fortune.
3. Mole_Mash- students can add a timer or multiple levels with different mole speeds to make it more challenging.

Resources for Teachers:

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- https://appinventor.mit.edu/explore/resources.html
- https://appinventor.mit.edu/explore/ai2/tutorials.html
- https://docs.google.com/presentation/d/1tfeZSDSVE4xfwD3g9eBfcBtmBbos4sgrVJ86JdHxv9k/edit#slide=id.g3beaadec62_0_713
- https://www.youtube.com/watch?v=ip051U7Rvds
- https://www.youtube.com/watch?v=GViGYAsTk4A
- https://www.youtube.com/watch?v=HCdvJ7rpJuY
- https://www.youtube.com/watch?v=Ya1ejdRwKvw
- https://www.youtube.com/watch?v=IPSG7bYXN2M
- https://www.youtube.com/watch?v=h9wpQx6k3j4