ANDROID APP DEVELOPMENT

Building Magic 8 Ball App

Session 3

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Teacher Lesson Plan

Session Name:

Building Magic 8 Ball App

Summary:

This course teaches the basics of mobile app development using the App Inventor development tool.

Time Allotment:

75 minutes

Learning Objectives:

- *Utilize the App Inventor Designer to create a mobile app user interface*
- *Utilize the App Inventor Blocks Editor to program the behaviors for a mobile app*
- *Test the application using either a Android phone*
- *Modify the created app to change the user interface and/or programmed behavior*

Supplies:

- *Scrap paper / notepad to take notes*
- *Android tablet*
- *Laptop / computer with Internet access*

Learning Activities:

- **(2 minutes) - Session overview**

  During this lesson, we will continue working with the App Inventor development tool. We will build a mobile app together and then you will use what you have learned to modify and customize the app.

  - *Review App Inventor Tool*
    - *Designer & Blocks Editor*

- *Coding Concepts - Review Development Blocks*
  - *Event Handlers*
  - *Commands*
- *Building in App Inventor*
  - *Mobile 8 Ball Project*

- **(2 minutes) App Inventor Designer & Blocks Editor**

  Designer

  - *Used for designing how the app will look to the user*
  - *The app "user interface"*
  - *This is also where you add non-visible elements and user input features*
  - *Media files*
  - *Sensors - (e.g. AccelerometerSensor for shake inputs)*

  Blocks Editor

  - *Used for designing the app behavior*
  - *The app "programming"*

- **(5 minutes) Coding Concepts - Review Development Blocks**

  Event Handlers

  - *The brown blocks are "event handlers" that are used to determine how the phone responds to user input (e.g. click, shake)*
  - *In App Inventor, "event handler" blocks begin with the word "when"*

  Commands

  - *The purple blocks are "command" blocks that fit within"event handlers".*
  - *The "command" blocks indicate the action that happens in response to the user input.*
  - *When fit together, the blocks can be read to describe the user and phone action*
  - *When Button1.click do call Sound1.Play (i.e. when button 1 is clicked play sound 1)*

- **(7 minutes) - Video: Magic 8-Ball Tutorial**

  https://www.youtube.com/watch?v=9EiBEFUU-xk

- **(10 minutes) - Group Activity : Build Mobile 8 Ball**

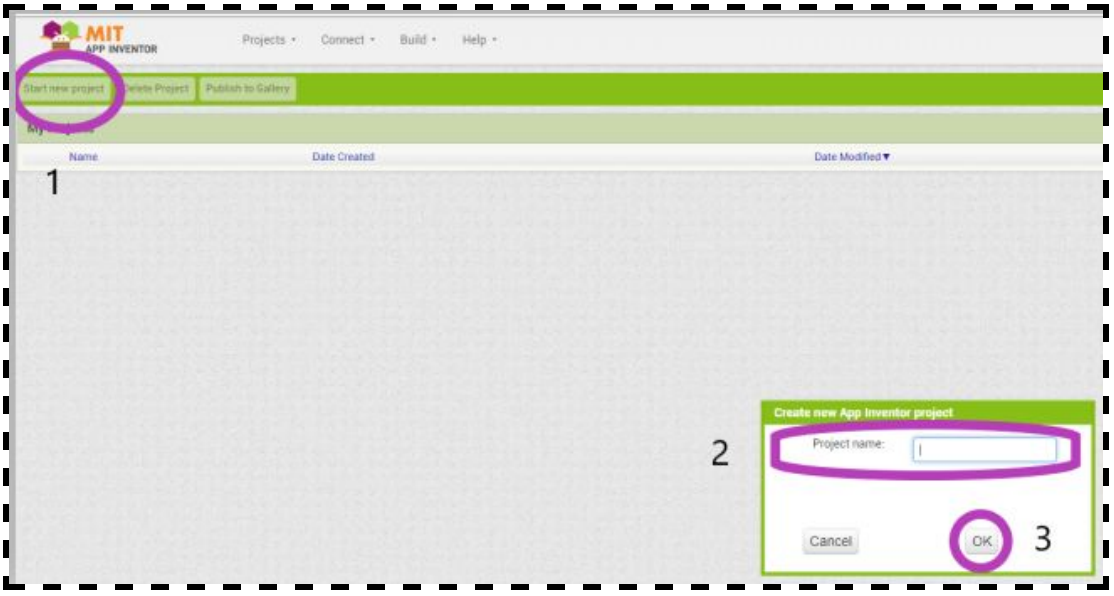
  Introduce materials

  - *"Assets Folder" - contains images and sounds for use in activities*
  - *Login http://appinventor.mit.edu/explore/ai2/hellopurr.html*
  - *We are going to begin by building and testing an app in App Inventor together (Login http://appinventor.mit.edu/explore/ai2/hellopurr.html)*
  - *Later, you will use what you have learned to modify and customize the application*

  ****** Switch from slide show to Instructor screen share ******

  Start New Project Build Mobile 8 Ball

  - *Login to App Inventor*
    - *ai2.appinventor.mit.edu*
  - *Select "Start new project" (1)*
  - *Enter Project name (2) and click OK (3)*

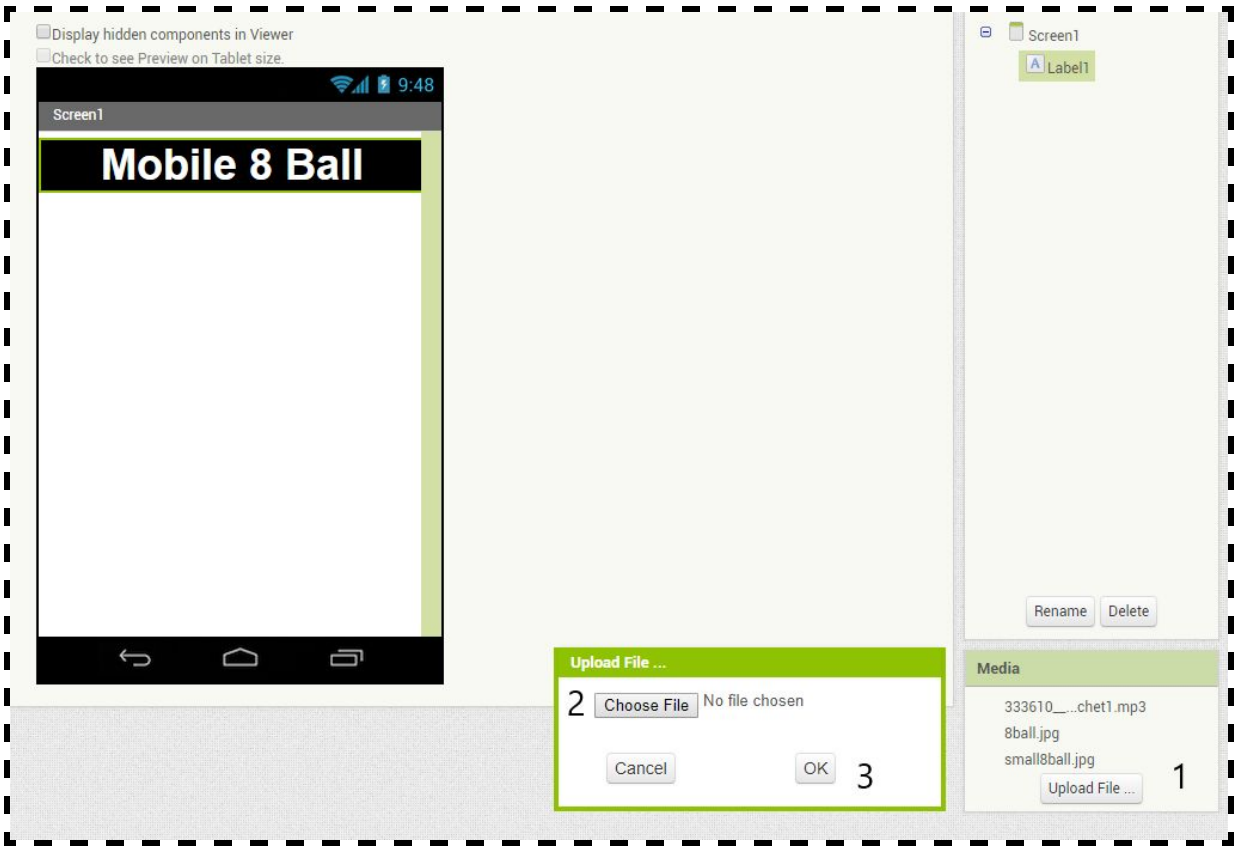


- **(30 minutes) - Group Activity : Build Mobile 8 Ball App User Interface**

  Select **Label** from Palette and Drag to Screen1 in Viewer (1)

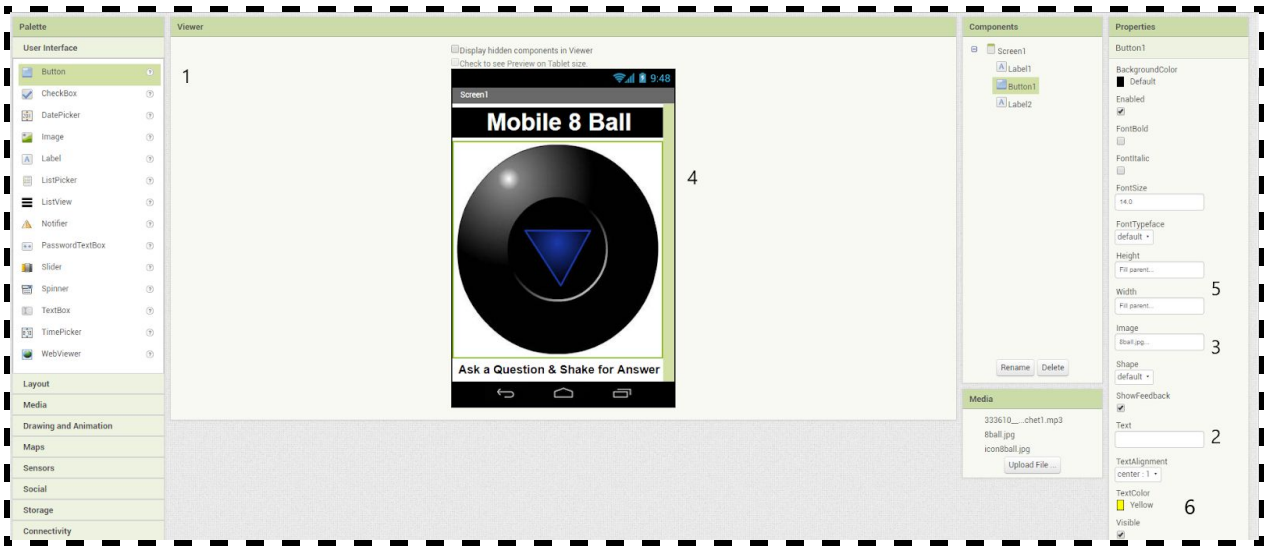
  - *Enter Title for App in Text Box (2)*
  - *Set Font Size (3)*
  - *Set Background Color (4) - optional check FontBold box*
  - *Set Text Color (5)*
  - *Set TextAlignment to center (6)*
  - *Optional - Set Width to "100%" to set to full screen width*

  - *Click Upload File button in the Media Pane to open Upload File Window (1)*
  - *Click Choose File button and select image and sound files from ProjectFiles Folder (2)*
  - *Click OK to upload media (3) - Repeat steps 2 and 3 to upload all media files*



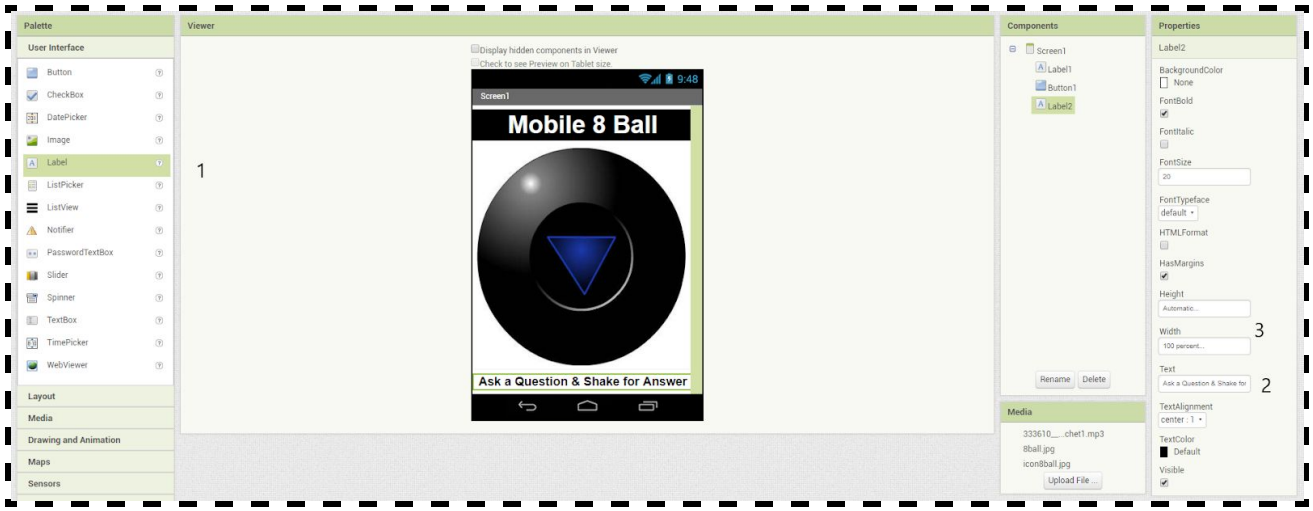
Select **Button** from Palette and Drag to Screen1 in Viewer (1)

- *Clear Text box (2)*
  - *This will prevent any text from displaying over the image*
- *Click into Image box to open media dropdown - select image file (3)*
- *Image populates Button element (4)*
- *Set Height and Width to Automatic (5)*
- *Set Text Color to Yellow (or another light color) (6)*



Select **Label** from Palette and Drag to Screen1 in Viewer (1)

- *Enter "Ask a Question & Shake for Answer" in Text box (2)*
- *Set Height to Automatic and Width to 100% (3)*



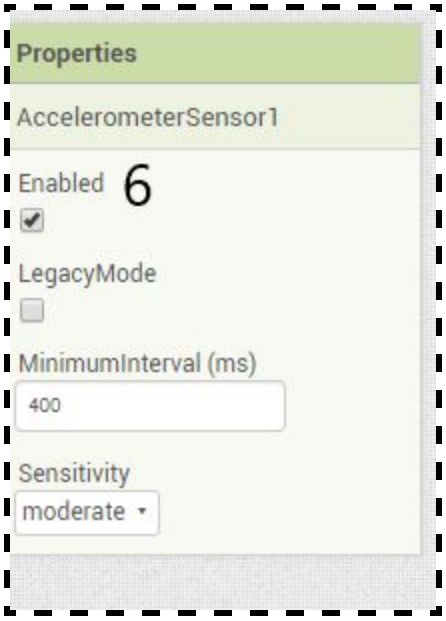
- *We will now set the invisible components for Media and Sensors*

Select **Media>Sound** from Palette and Drag to Screen1 in Viewer (1)

- *Tool will create Non-visible components Sound1 element below Screen (2)*
- *Click Source and select the sound file from the dropdown menu (3)*

Select **Sensors>AccelerometerSensor** from Palette and Drag to Screen1 in Viewer (4)

- *Tool will create Non-visible components AccelerometerSensor1 element below Screen (5)*
- *Enabled will be checked by default (6)*
  - *Note: If app shake does not work, check LegacyMode box and/or increase Sensitivity and retest*



- **(20 minutes) - Group Activity : Build Mobile 8 Ball App Behavior Programming**

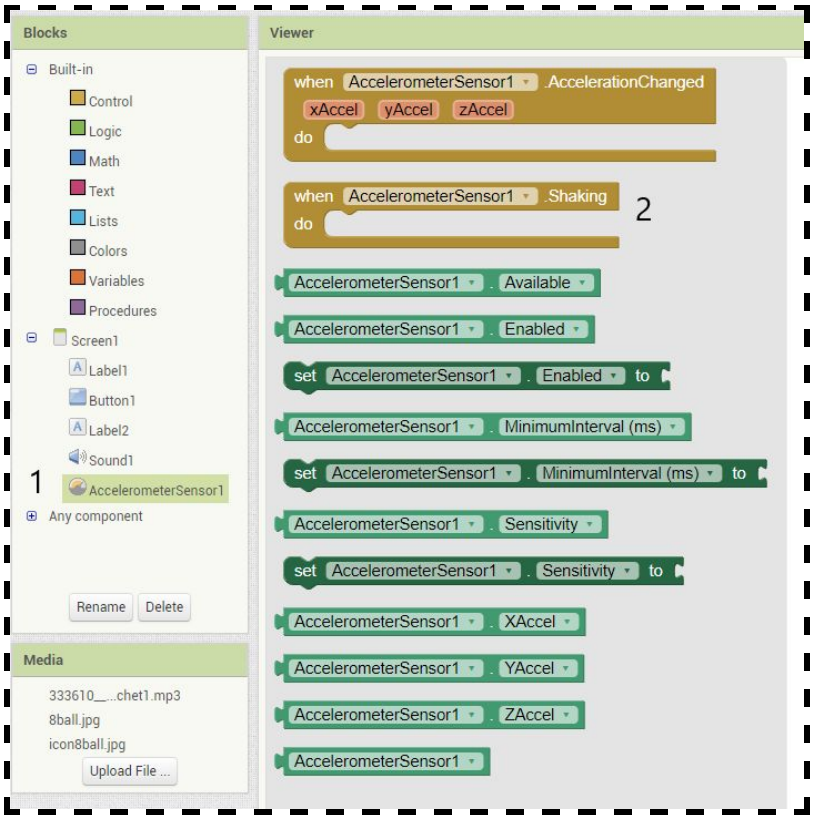
  Select **Blocks Designer** button from Title Bar

  - *Select AccelerometerSensor1 from Blocks (1)*

- *A Window will pop open with a different coding block options*

Select the “when AccelerometerSensor1.Shaking” block and drag to workspace (2)

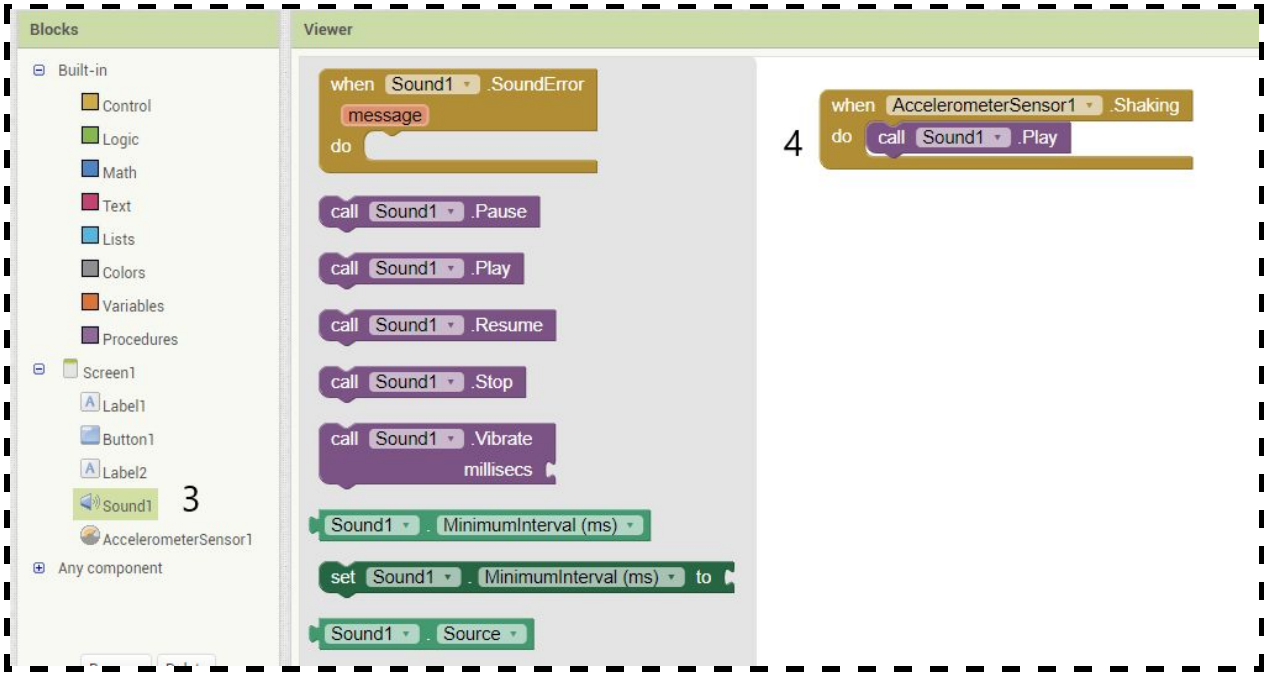
- *The brown blocks are “event handlers” that are used to determine how the phone responds to user input (e.g. click, shake)*
- *In App Inventor, “event handler” blocks begin with the word “when”*



Select **Sound1** from Blocks (3)

- *A Window will pop open with a different coding block options*
- *Select the “call Sound1.Play” block and drag it into the “when AccelerometerSensor1.Shaking” (4)*
  - *The purple blocks are “command” blocks that fit within“event handlers”. The “command” blocks indicate the action that happens in response to the user input.*

- *When fit together, the blocks can be read to describe the user and phone action*
- *When when AccelerometerSensor1.Shaking do call Sound1.Play (i.e. when the phone is shaking, play sound 1)*

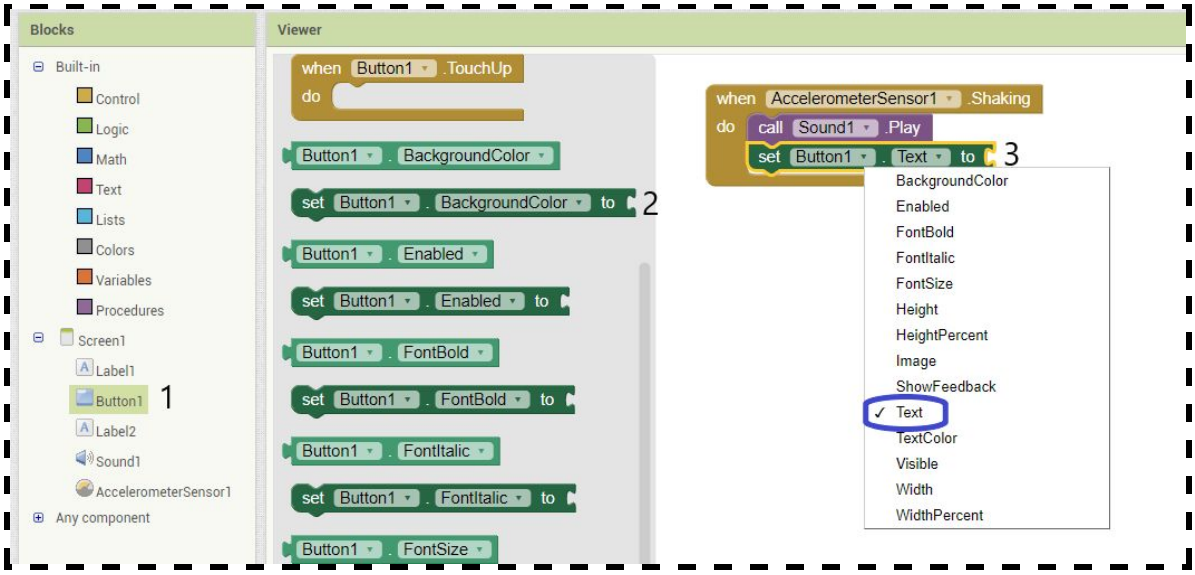


Note: Now we are going to add the list of variables from which the 8 Ball response will be randomly selected and displayed

Select **Button1** from Blocks (1)

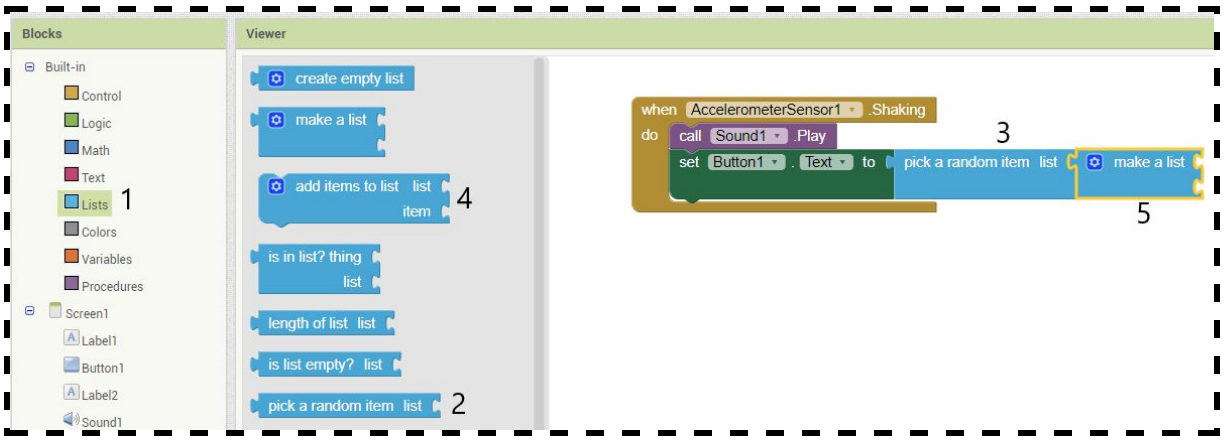
- *A Window will pop open with a different coding block options*
- *Select the "set Button1.BackgroundColor" block and drag it into the "when AccelerometerSensor1.Shaking" and snap in below the "Call Sound1.Play" (2)*
- *The click the down arrow next to BackgroundColor and select the Text value from the dropdown list (3)*
- *The green blocks are expressions that either get or set the current value of a property (aka getter or setter blocks)*
- *"getter" blocks establish (contain) the value of a property (e.g. FontBold)*
- *"setter" blocks change the value of a property*

- *They are formatted as "set" something "to" some value (e.g. set Button1.Text to "Hello")*
- *In this app, they set (change) the response that is displayed in the Text box of Button1 in the user interface.*

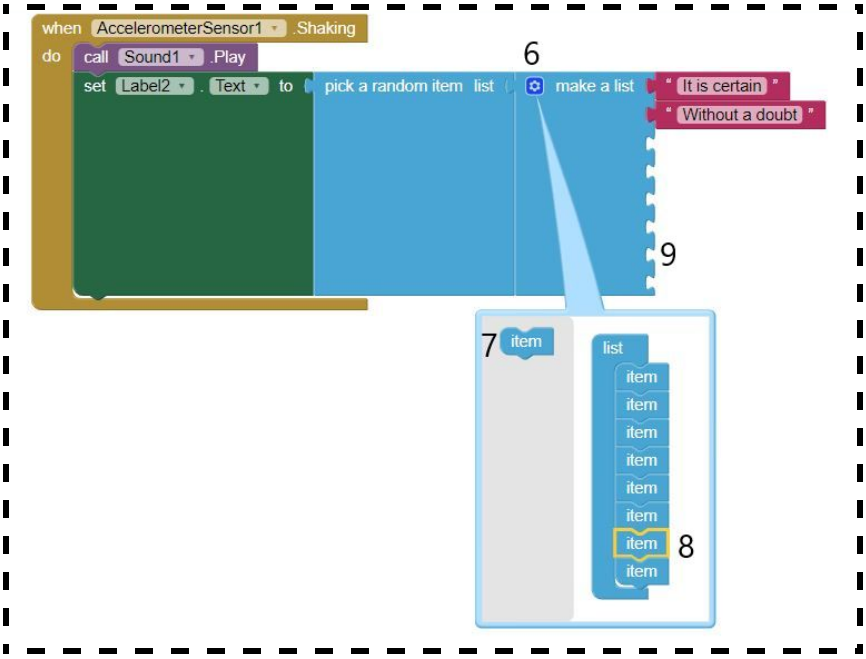


Select **Lists** from Blocks (1)

- *A Window will pop open*
- *Select the "pick a random item list" block (2) and drag it into the "set Button1.Text to" and snap in (3)*
- *Select the "make a list" block (4) and drag it into the "pick a random item list" and snap in (5)*

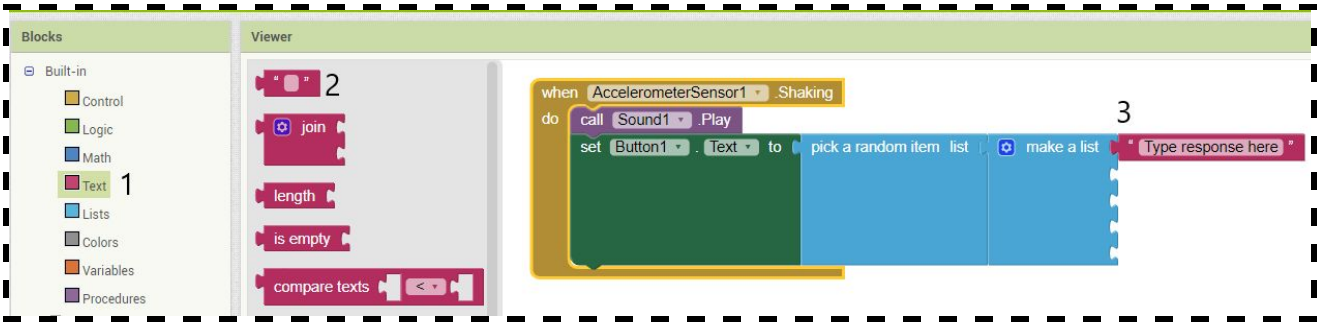


- *Click on the gear icon to open the "mutator block" (6) which will allow you to add sockets for the individual items on your list (in our case, the question responses*



- *Click on the item piece (7) and drag it into place in the list (8) to create a new socket in the "make a list" block (9)*
- *Select **Text** from Blocks (1)*
  - *A Window will pop open*

- *Select the " " block (2) and drag it into an open socket on the "make a list" and snap in (3)*
- *Type a question response in the text box of block*
- *Repeat until you have all sockets filled with responses*

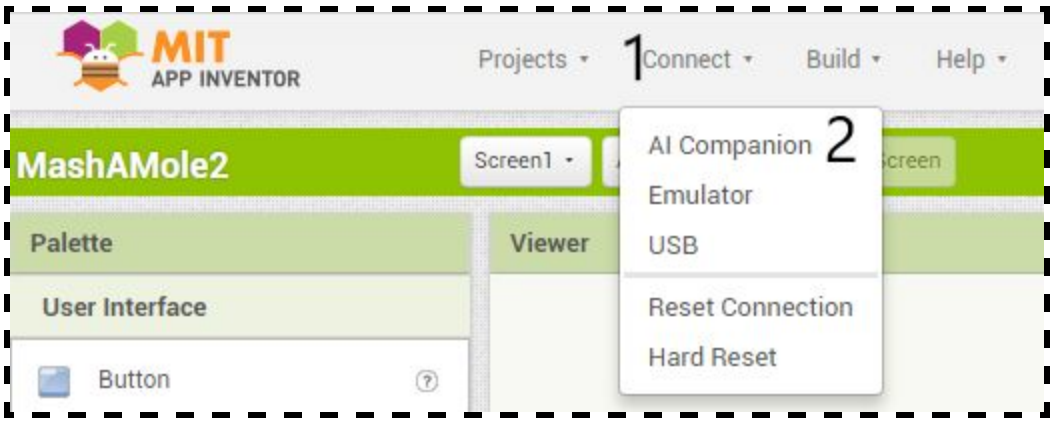


- **(10 minutes) - Group Activity : Test Mobile 8 Ball App**

  Test using QR code

  - ***On your phone/tablet:*** *Open the MIT AI2 Companion App*

  - ***On your computer:*** *Select* ***Connect*** *(1) dropdown*
  - *Select* ***AI Companion*** *(2) wait while system compiles and packages the code (progress bar may be displayed)*



- *When packaging is complete, QR code will be displayed.*

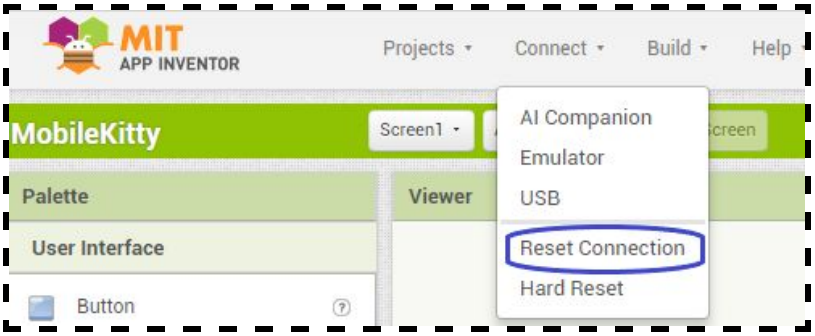
On your phone/tablet: Select scan QR code (1) and scan.

- *Note: If you do not want to use the QR scanner, you may select the connect with code button (orange) and enter the six character code (below "Your code is:" from the Connect to Companion window) in the app text box*

- ***On your phone/tablet:*** *The app you created will run. Test all functions and when done, use the back arrow to exit.*
- ***On your computer:*** *Click cancel to clear QR code window popup.*
- *Make any necessary changes and continue the process until you are satisfied with your results.*

Note: If re-packaging and re-testing, causes the the AI Companion dropdown to stop responding (grey out) complete the following steps to reset:

- ***On your phone/tablet:*** *Stop the app from the "3dot" menu in the upper right corner and select Stop and Exit from the pop-up window*
- ***On your computer:*** *From the Connect dropdown select Reset Connection*



- **(15 minutes) - Student Activity : Modify & Test Magic 8 Ball App**

  This is student time to use App Inventor to make the Mobile 8 Ball app their own.

  - *Encourage students to change the appearance & behaviors of the app*
  - *Modify colors, text, images*
  - *Change the title from "Screen 1"*
  - *Add buttons to enable additional features*
  - *Make app accessible for users without accelerometer sensor equipment*
  - *Add vibration to sound*
  - *Add text to speech*
  - *Add additional behaviors based on different user inputs*
  - *Change Icon Image*
  - *Change App Name*
  - *Have students test their new apps for functionality & share with class if time allows*

- **(2 minutes) - What's next?**

  Inform students to head back to cafeteria for a 15 minute snack break, and remind them to use restroom before next session starts.