**Testing**

Unit tests were written for each of our Activity classes, PickSet, MainActivity, EndSet, and HelpActivity. The tests evaluated components like the handling of intents at the start of activities, the finishing of activities, the successful download of files, words, and hints through AsyncTasks, successful updates of layout components, the clicking of most buttons, as well as evaluated the internal states of the Activities.

Unit tests could not be written to test the SQLite database because we could not determine how to obtain a valid context in the testing environment to use for database creation. Unit tests for the speech recognition and image correctness could not be written because we could not find functionality built into the testing environment that would allow us to test them.

To more completely cover more difficult test scenarios (like most UI elements), we have written a list of specifications which can be followed:

* PickSet Test
  + Open the app
  + Select a set that has a lock icon next to it
  + **Assert:** A popup stating that the set is locked should appear, and prevent you from starting the set.
  + Select a set that has a checkmark icon next to it
  + **Assert:** the app should launch the MainActivity, and the first picture should load
* Phrase Hint Test
  + Beginning from the MainActivity screen, select the "Phrase" button
  + **Assert:** A text-to-speech hint involving the use of the word in a phrase should be played
* Rhyme Hint Test
  + Beginning from the MainActivity screen, select the "Rhyme" button
  + **Assert:** A text-to-speech hint involving a rhyming word should be played
* Word Hint Test
  + Beginning from the MainActivity screen, select the "Word" button
  + **Assert:** A text-to-speech hint that says the word answer should be played
* Skip Test
  + Beginning from the MainActivity screen, select the "Skip" button (marked with an arrow)
  + **Assert:** You should be taken to the next image in the set
* HelpActivity Test
  + Beginning from the MainActivity screen, select the "Help" button (marked with a question mark)
  + **Assert:** The HelpActivity should appear, describing how the app functions.
  + **Assert:** Pressing the "Back" button should return you to the MainActivity.
* Correct Speech Test
  + Beginning from the MainActivity screen, select the microphone icon
  + **Assert:** Google's Speech Recognition popup should display, requesting that you speak into the microphone
  + Say the correct word into the microphone
  + **Assert:** You should see a popup that says "Correct", has a checkmark, and has text displaying the word it thinks you said. The popup should also display the points you received for this answer, deductions for hints used, and add up the net points to your set score. The popup should give you one button option to continue to the next word
  + Click the "Continue" button
  + **Assert:** You should be taken to the next image in the set
  + **Assert:** Your score in the upper right hand corner should increment by the same amount depicted on the popup. It should also be animated and change color.
* Wrong Speech Test
  + Beginning from the MainActivity screen, select the microphone icon
  + **Assert:** Google's Speech Recognition popup should display, requesting that you speak into the microphone
  + Say an incorrect word into the microphone
  + **Assert:** You should see a popup that says "Not Quite", has an X, and has text displaying the word it thinks you said. The popup should also display blank entries for the points for this answer and deductions for hints used. It should display your set score, with no changes. The popup should give you one button option to try again.
  + Click the "Try Again" button
  + **Assert:** You should be taken back to the previous screen (same image in the set)
  + **Assert:** Your score in the upper right hand corner should remain unchanged.
* End of Set Test
  + Beginning from the MainActivity screen, keep clicking the "Skip" button (slowly, too fast and you may induce a program failure) until you reach the end of the set
  + **Assert:** The EndSet activity should be launched. This screen displays information about the set that was just completed, including all-time high score and longest streak on this set, (highlighted if new), a stamp if you obtained a new high score, text indicating how many pictures were answered correctly, and what that maps to in terms of the three stars for the set.
  + **Assert:** The EndSet activity should count down the points earned in this set to add to the total score.
  + Click on the "Finish" button (marked with an arrow)
  + **Assert:** You should be taken back to the PickSet screen as the EndSet and the MainActivity both finish
  + **Assert:** The number of stars seen on the previous EndSet should update the stars now seen next to the set in PickSet.
  + **Assert:**  If you did well enough on the previous set, a harder set should be unlocked.
* Report Generation Test
  + On the PickSet screen, after a set has been completed, click the "Send Report" button.
  + **Assert:** A chooser should launch that allows you to choose several ways of dealing with the generated report (for example, Gmail, Google Drive, etc, depending on what apps are installed on the device).
  + Click on the "Gmail" icon
  + **Assert:** A Gmail "Compose" message screen should be launched. The contents of this email should contain a paragraph for each word completed in the sets that have been done. Within each paragraph, stats about the hints used, words the user guessed, and number of tries should appear.