User Instructions

Android Emulator:

1. First, the user needs to have an Android device or emulator with the ability to use AR features. A method used for testing was to utilize Android Studio's ability to use emulators for different android devices.

   To use the Android Emulator, the user will need Android studio installed:
   a. Download android studio (https://developer.android.com/studio)
   b. Set up an android emulator that supports the ARCore functionality. (https://developers.google.com/ar/develop/java/emulator)
      i. Click **Create Virtual Device**, at the bottom of the *AVD Manager* dialog.
      ii. Select or create your desired *Phone* hardware profile and select **Next**.
      iii. Select an `x86` or `x86_64` system image running **API Level 27 or later** and select **Next**.

         1. While physical ARCore devices are supported on API Level 24 or later, Android Emulator support requires API Level 27 or later.
         2. Only x86-based Android Emulator architures are supported. Other architectures such as `arm64-v8a`, `armeabi-v7`, are not currently supported.

      iv. Verify that your virtual device is configured correctly:
         1. Click **Show Advanced Settings**.
         2. Make sure that **Camera Back** is set to **VirtualScene**.
      v. Click **Finish** to create your AVD.
   c. Update Google Play Services to support AR
      i. The latest .apk can be found at this link: https://github.com/google-ar/arcore-android-sdk/releases
      ii. Download the .apk and drag onto your emulator to install

2. Second, the user must use the MathGo.apk APK file from the zip file submitted called "MathGO!_Application/APK_File" and copy this into the android emulator. Dragging and dropping the file into the emulator is the best way to accomplish this.

3. Once the above steps are complete, the app will be installed on the device and the user will be able to launch the current iteration of the software by opening the now installed math_go app.

Android Device:

The below is adapted from this guide:
https://www.wikihow.com/Install-APK-Files-from-a-PC-on-Android

1. First, the user needs to have an Android device with the ability to use AR features.
2. Open Android Settings
3. Scroll down and tap Security
4. Slide the “Unknown sources” switch to the on position
5. Extract the MathGo.apk APK file from the zip file submitted called “MathGO!_Application/APK_File”
6. Connect your Android device to the PC using a USB cable
7. Tap the USB for notification on your Android device
8. Tap Transfer Files on your Android
9. Navigate to the MathGo.apk file on your computer
10. Right click the MathGo.apk file and send to Android device desired
11. Open your ANdroid’s file manager and locate the MathGo.apk file
12. Install the MathGo.apk file
13. Once the above steps are complete, the app will be installed on the device and the user will be able to launch the current iteration of the software by opening the now installed math_go app.

Note: If the application is crashing when attempting to capture beasties, please refer to 1.c in the android emulator section of this report to update google play services for AR. This apk file will need to be installed in the same fashion as the MathGo.apk file.