Iona Physics: Lab exercise Smartphone axes identification
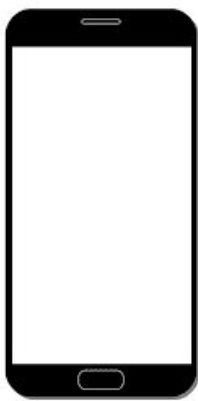
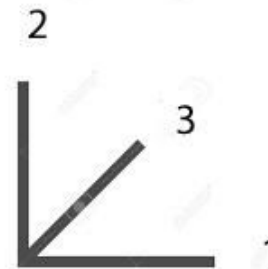Br. R.W.Harris

Diagram 1

Diagram 2

Diagram 1 is a generic Smart Phone. We are going to use it during the year to measure several variables. When we measure angles and accelerations, you need to know how it is set up in 3 dimensions, and the setup may be different for different phones.

If the phone is laying on a horizontal table and you are looking down on it, there are three axes, as shown in diagram 2. Axis 1 is parallel to the short dimension of the phone, going from left to right, axis 2 is parallel to the long axis of the phone, going from the bottom to the top and axis 3 is perpendicular to the phone, going out of and into the table.

The challenge is for you to figure out which one is X,Y, and Z on YOUR cellphone.

One way to do this is to set Phyphox to measure acceleration and move it sharply parallel to axis 1 and see which (x,y,or z) reacts most strongly. Repeat by moving it sharply parallel to axis 2 and dedtermining which of the remaining reacts most strongly. You know the final axis by elimination.

Your Name _____Smartphone type and model: _____

1 (Parallel to short side) is (X,Y,Z)

2 (Parallel to long side) is (X,Y,Z)

3 (Perpendicular to the screen) is (X,Y,Z)