YSP EKG Demo with the PowerLab26T:

1. Make sure the PowerLab26T is plugged in, connected to the computer, and turned on.
2. Connect the Bio Amp Cable to the Bio Amp plug on the PowerLab26T.
3. Connect the Pulse Transducer to Input #1 on the PowerLab26T.
4. Clip the Reusable ECG Electrodes to the ends of the Bio Amp Cables.
    a. Green Electrode to Green Cable
    b. Black Electrode to Black Cable
    c. **RED** Electrode to **WHITE** Cable
5. Make sure LabChart software is open on the computer.
6. Adjust the Chart View so that only displaying Channel 1 (Pulse) and Channel 3 (ECG). This can be done simply by sliding the other channels out of view.
7. Make sure the sample rate is set to 1k/s, and adjust the filter settings for Channel 3.
    a. Left click Channel 3 (on the right hand side of the screen)
    b. Select Bio Amp
    c. Range should be set to 2mV
    d. Low pass filter should be set to 20Hz
    e. High pass filter should be set to 10Hz
    f. Check the box for the Mains filter
8. Set up your "patient".
    a. Clip the Green Electrode on the Left Ankle
    b. Clip the Red Electrode on the Right Wrist
    c. Clip the Black Electrode on the Left Wrist
    d. Velcro the Pulse transducer around an index finger
    e. Tell the patient to be as still as possible, as electrical activity from skeletal muscle can interfere with the recording quality
9. Press the "Start" button in the bottom right corner.
10. After a few seconds, auto adjust the Y axis scale of your channels. This can be done either by right clicking anywhere in the channel and selecting "Auto Scale Channel" or by clicking the "Auto Scale All Channels" button in the top "Commands" panel.
11. Point out important features on the ECG. The **P wave** should be there (although small) and the **QRS and T waves** should be obvious. **Explain what these represent again (i.e. atrial activation, ventricular activation, ventricular "resetting" or repolarization).** Also point out the most prominent wave on the Pulse channel. This is the **systolic pressure pulse**. Point out how there is some delay between the QRS complex and the systolic pulse wave (representing the time it takes for the blood to travel from your heart to your fingers).
12. Stop the recording by clicking the "Stop" button (which was originally the "Start" button).
13. Talk about the ECG some more. Tell them two of the main things that a doctor will evaluate on an ECG are **rate** and **rhythm**. Show them how you can estimate heart rate from the ECG. Count the number of boxes between two successive R waves. Then use the simple rule 300 beats/min for 1 box, 150 for 2, 100 for 3, 75 for 4, 60 for 5, and 50 for 6. The normal range of heart rate for adults and children over the age of 10 is **60-100 beats/min** (some say 50-100). For children ages 1-10, the normal heart rate is **70-130 beats/min**. The more athletic a person is, the slower their resting heart rate will be, so sometimes slower heart rates are not abnormal. For rhythm, the important thing to notice is that a **P wave precedes every QRS** (sometimes this may be difficult to see on the recording). When the heart follows this normal pattern of activation, we say it is in **normal sinus rhythm**.