**Heart Rate Sensor:**

* Heart rate is measured using technology called photoplethysmography (PPG)
* Green LED and infrared LEDs are fitted which flash 100s of times per second.
* Blood reflects red light and absorbs green light
* When heart beats, there is higher blood flow implies which leads to more green light absorbed
* Photodiode sensors are present which measure the light reflected from the skin
* Light is converted to electrical current
* Apple Watch has 2 operating modes:

1. Workout mode – tracks heart rate continually
2. Infrared light measures heart rate every 10 minutes

**Sp02 Sensor:**

* Blood oxygen level is measured using pulse oximetry.
* Red and Infrared light sensors measure light absorption in oxygenated blood.
* Show blood oxygen levels throughout sleep (output to estimated oxygen variation graph)
* Can help detect sleep apnea
* Can lead to obesity, heart attack and high blood pressure

**3-Axis Accelerometer:**

* Measures acceleration

**GPS Receiver:**

* Triangulation is used
* The time difference between sending a signal and the time at which the signal is received, determines the distance from satellite.
* Repeated for a number of satellites to determine the sensor’s position.
* Position measurement using GPS facilitates calculation of route, velocity, and pace.

**ECG:**

* Records electrical signals generated by beat of the heart
* Presents this as a trace
* Can determine:
* Heart rhythm
* Usage:
* Hold finger on device.
* Wait 30 seconds
* Electrical activity of heart drawn on the screen
* Notification afterwards of whether the rhythm was normal or abnormal

**Reference:**

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