

Health Monitoring Bracelet

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Baby Engineering Systems



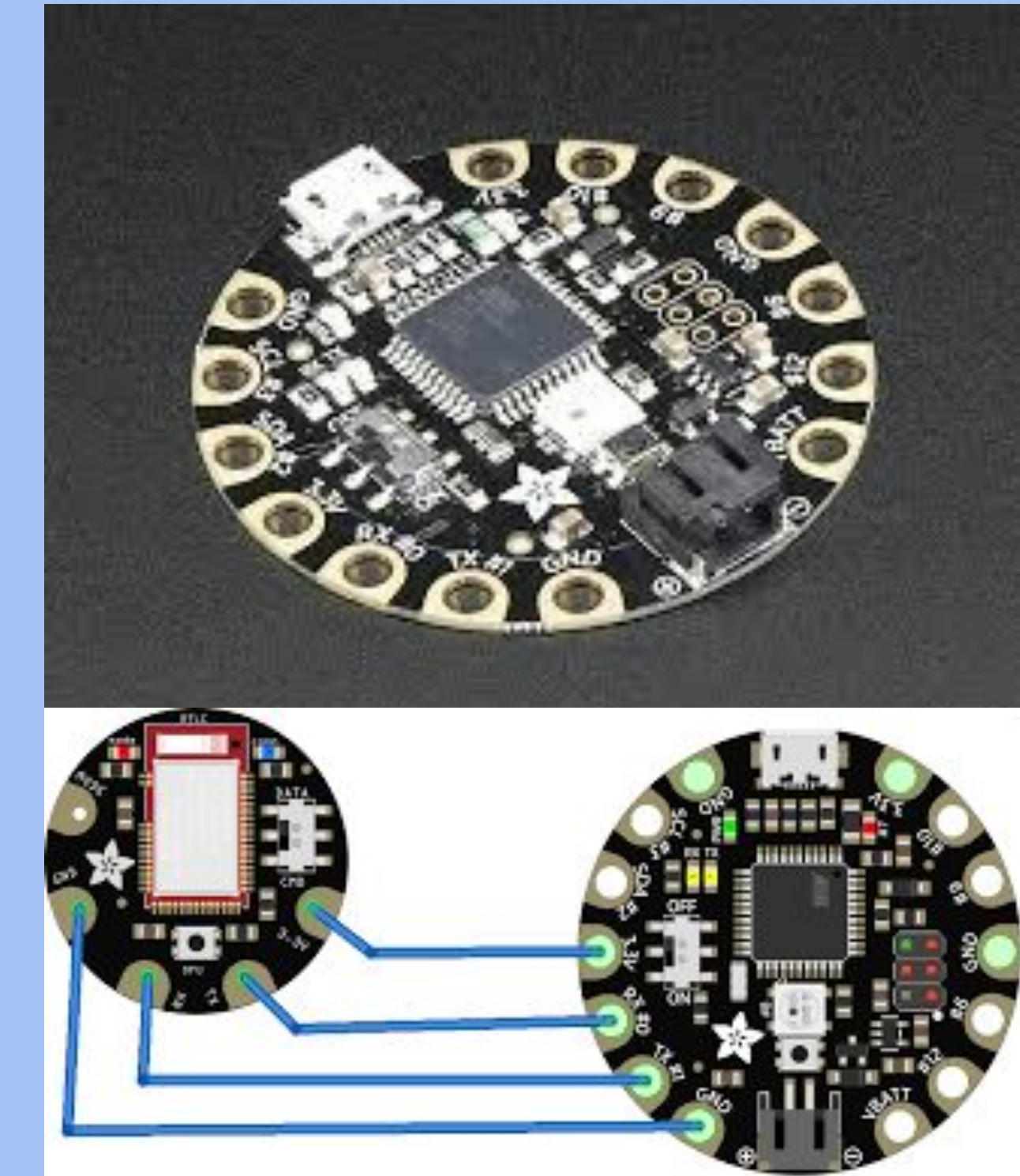
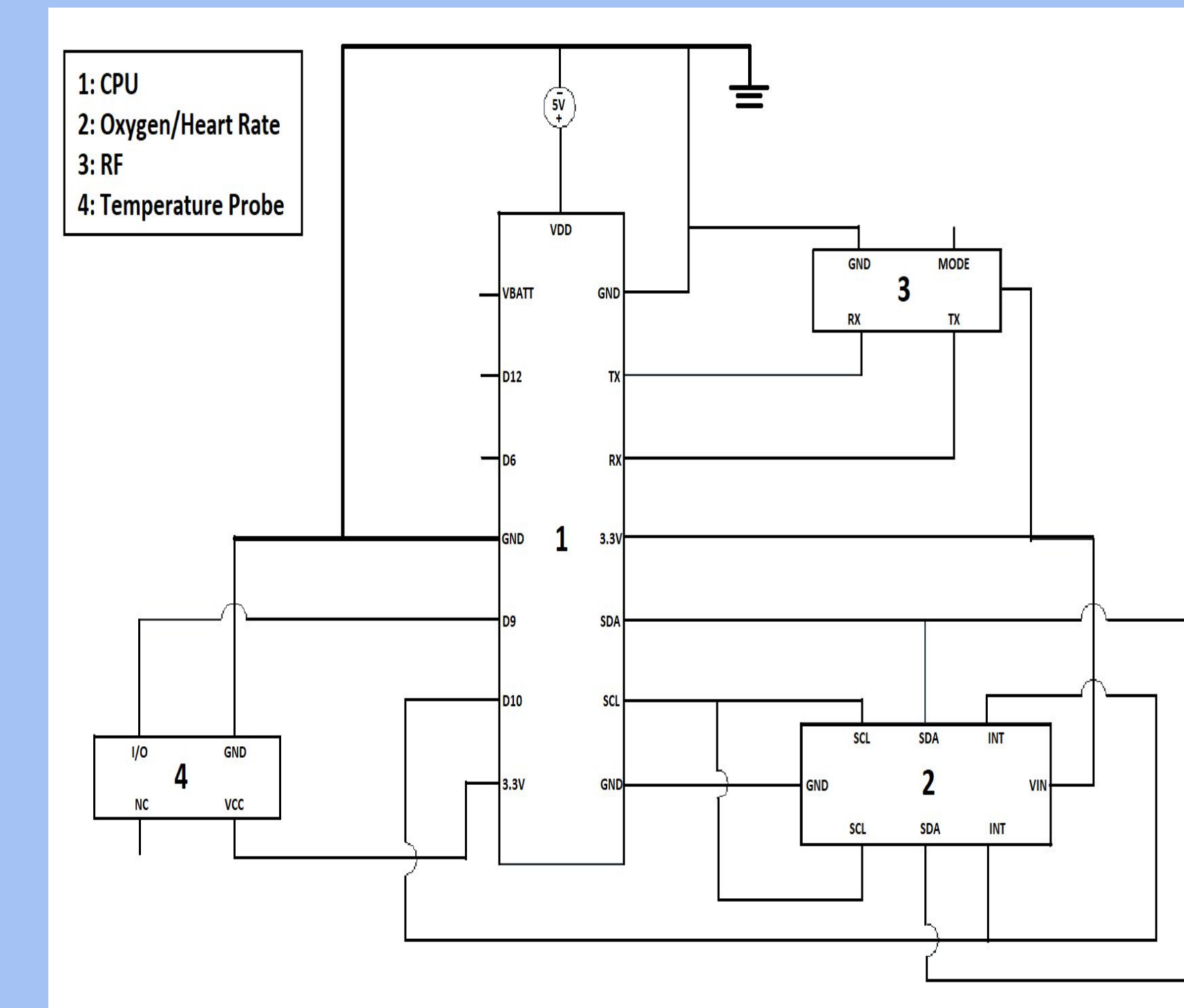
Abstract

After extensive market research, the design team of Baby Engineering Systems and Technologies (BEST) has come up with an innovative solution to a potentially life threatening situation that may arise when an infant experiences the sudden onset of a dyspneic condition. Sudden Infant Death Syndrome (SIDS) or asphyxiation is usually caused by prolonged exposure in the prone position, and infants do not possess the required musculoskeletal system to sustain extended periods of flexion and extension of their heads. Because most parents cannot monitor a newborn throughout the entire day here at B.E.S.T. we have engineered an integrated vital signs monitoring bracelet that would send and store the babies vital signs while issuing alerts via Bluetooth to the chosen personal electronic device of the consumer. If a potential compromising situation were to occur a piezo switch will be tripped and an alert will be broadcasted to the user to determine if any further course of action is necessary.

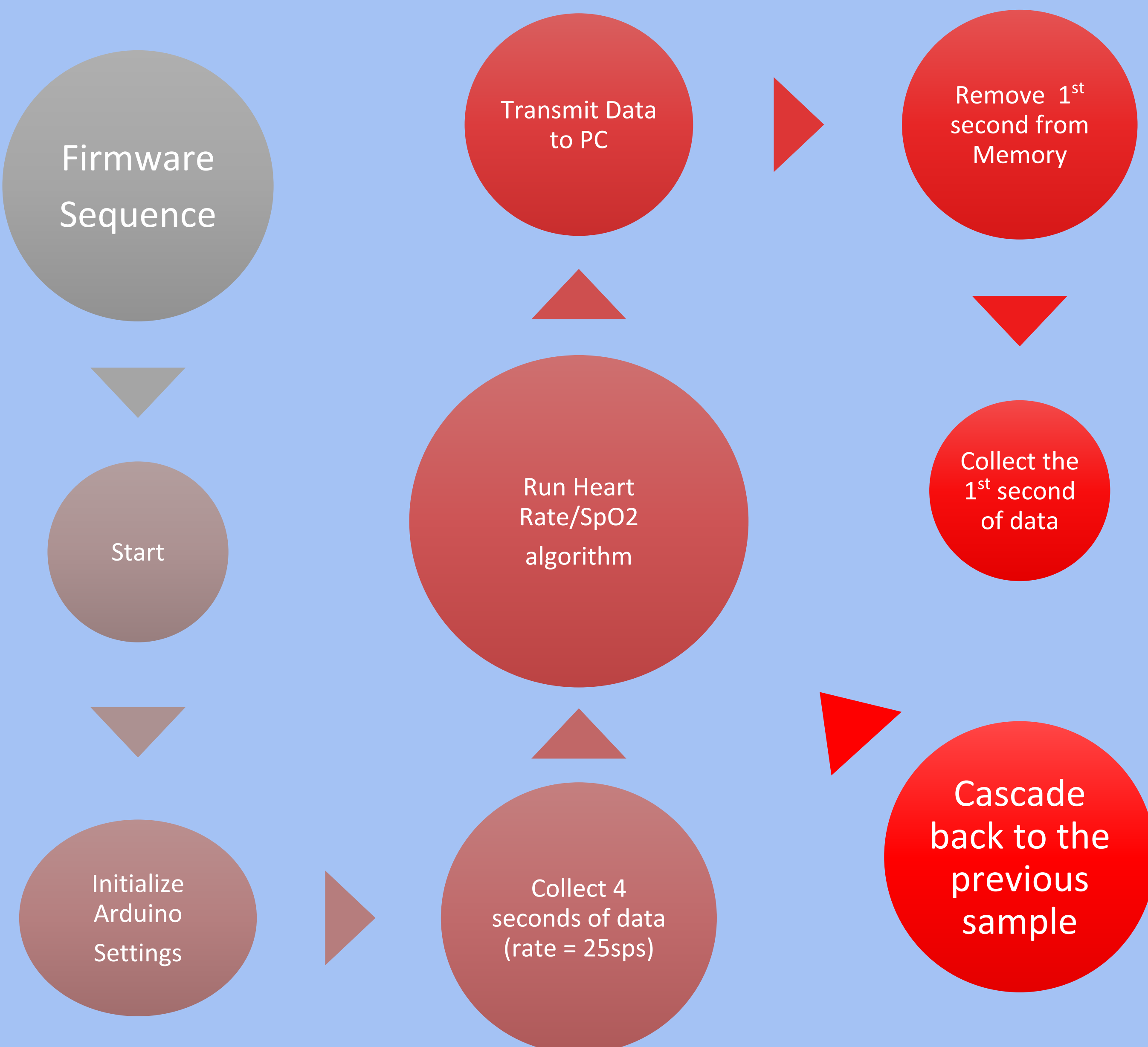
Engineering Requirements

- System needs to last for at least 6 hours of sleep time
- Detecting and analysis of child's heart rate or temperature should be around 90%
- Power: 3 - 5V battery (Rechargeable)
- A warning system via app/SMS (sound, LED)
- Material: Silicon, Elastomer
- Cost should be less than \$250
- Dimensions:
 - 5" Circumference for the bracelet. Roughly 3" in diameter
 - Sock size must range from 0-24 months.

INTERGRATED SYSTEM SCHEMATIC



Software Control



Design Alternative

Portable Adjustable Sock



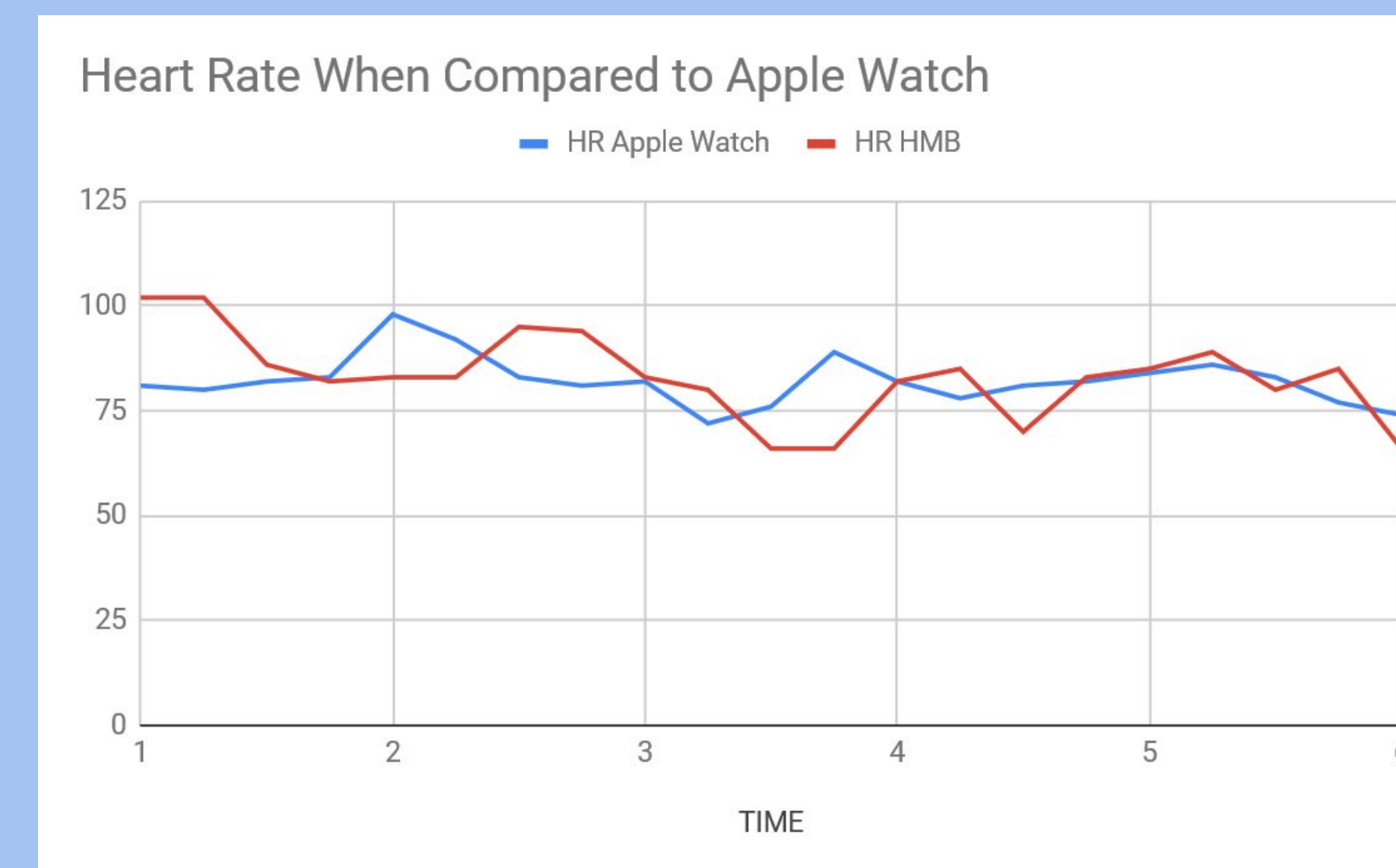
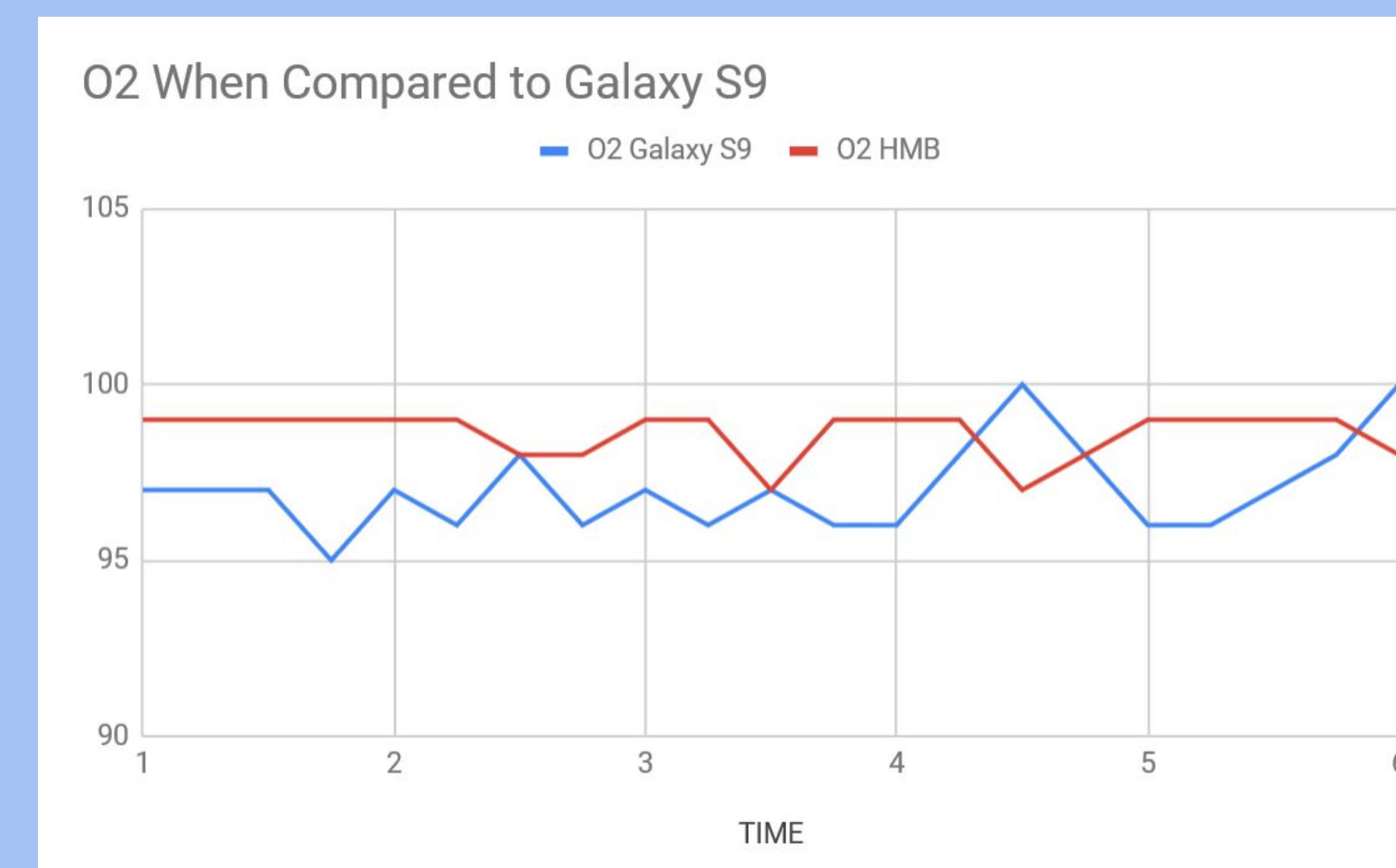
Iterative Process

```

//Code Snippet
//Multiple Iteration
//Used to Set Heart Rate
{
    static double oldValue = 0;
    static double oldrefresh = 0;
    int beat = analogRead(A0);

    double value
    =alpha*oldValue+(0-alpha)*beat;
    refresh = value - oldValue;
// ...
    
```

Test/Results



Conclusion

The goal of our project was to create a device to make sure parents' know the overall health of their child, especially when the parent is not in the room. Using the design process we were able to showcase a proof of concept that met most of our requirements. Due to limited time and knowledge, we were not able complete what we originally wanted. However, the basic principle of our design was met and if we had better resources and better time management, our product could have met out desired outcome.

