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Description & Purpose

- **What:** Create wearable wireless baby monitor using a Circuit Playground and Python scripts
- **Why:** Sudden Infant Death Syndrome (SIDS) is a deadly phenomenon for infants less than one years old
- **Purpose:** Detect SIDS indications and give peace of mind to parents who are worried about risk factors
- **Results:** Our device will detect the most common indicators of SIDS, and we have designed an application for parents' ease-of-use

For future development, real time wireless data transfer between hardware and software for a SIDS monitoring system can be built in with Circuit Playground Bluefruit over low frequency bluetooth.

The Concept

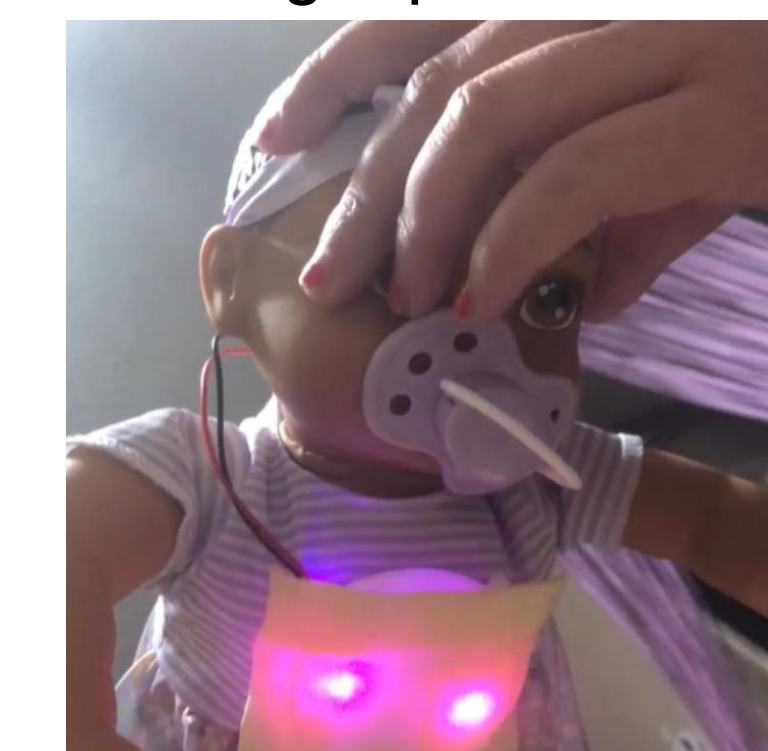
Breathing Mode:

Uses the accelerometer to check for the absence of movement. After 5 seconds of no movement being detected, the alert goes off and a blue circular light pattern is seen.



Roll-over Mode:

Uses the accelerometer on the circuit to track the Z-movement and detect if the baby is rolling over. After 5 seconds of the baby being on their belly, an alarm will sound and display a purple comet light pattern.



Temperature Mode:

Uses the temperature sensor on the circuit to monitor the environmental temperature. If 80° F is exceeded, an alert will sound with red flashing lights.

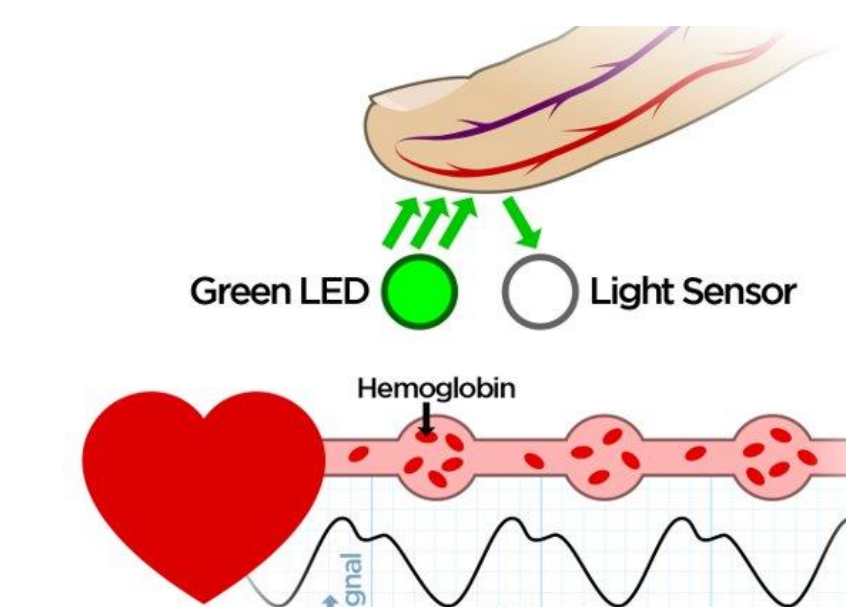


Sound Mode:

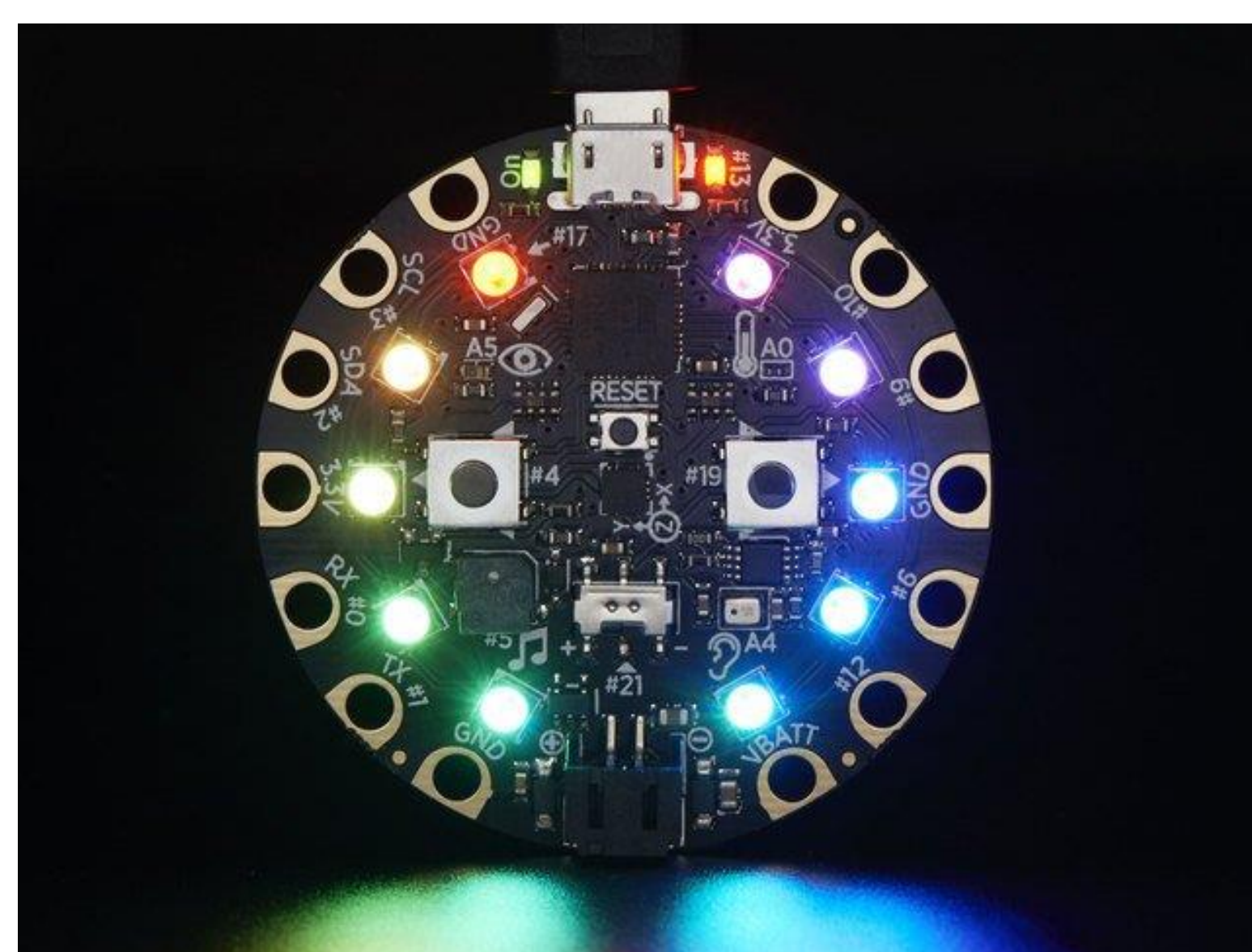
Utilizes the circuit's sound sensor to detect sounds of distress from baby. Differentiates between baby cries and other external noise through decibels and frequency.

Pulse Mode:

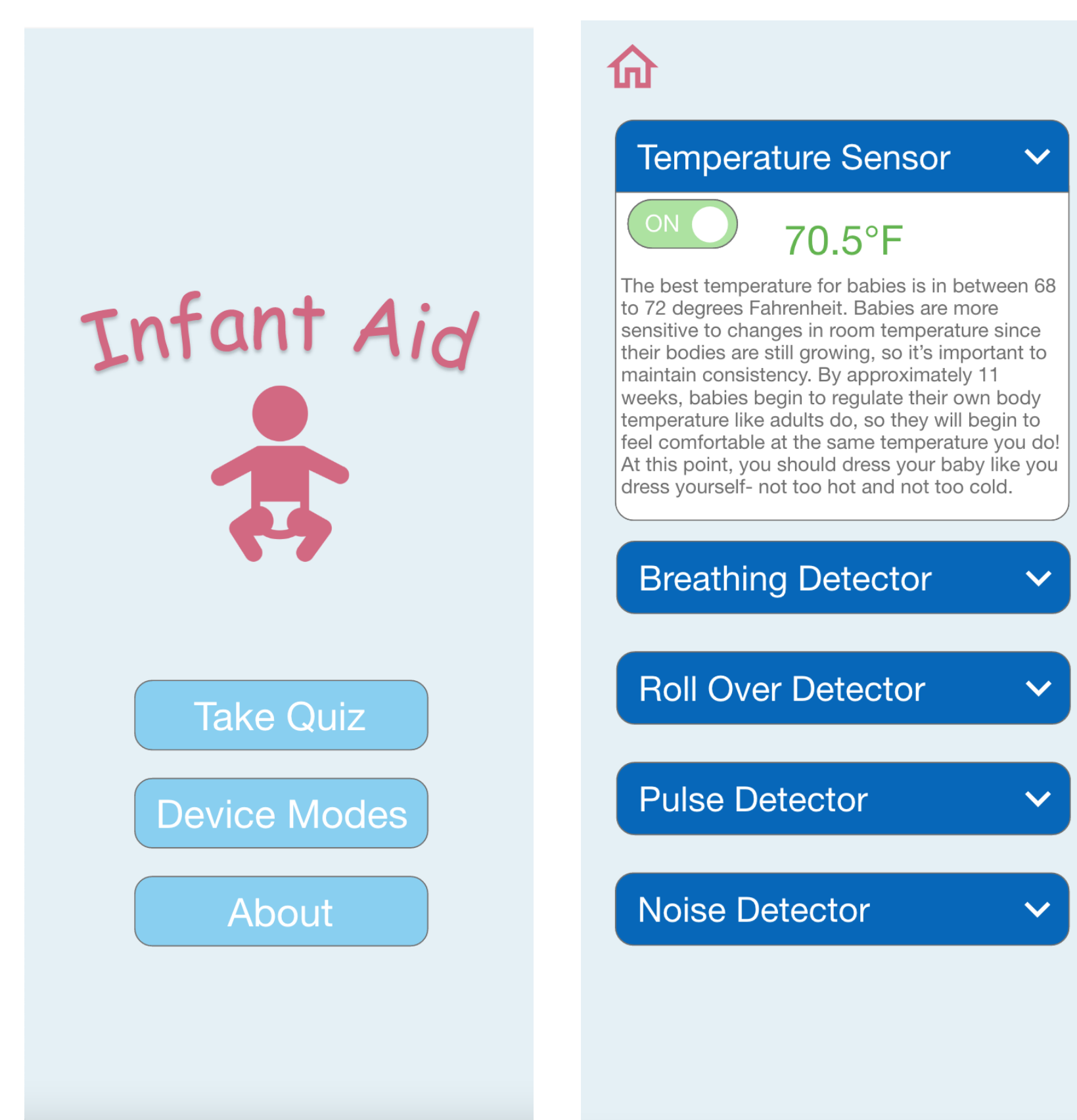
The light sensor measures how much light is reflected back from the green LED light that shines onto the baby's finger. This green light should be absorbed by red blood cells and vary as blood flows.



Design



Circuit Playground has 3 main modes
Detections run simultaneously
Alert System (Lights and Alarm)
1. Temperature Alert: Flashing red light
2. Roll-over Alert: Comet purple light
3. Breathing Alert: Cycling blue light
Sound & Pulse Mode are other modes developed but will not run concurrently with the three main modes.



App prototype created in Adobe XD

Ethical & Intellectual Property Issues

Ethical Issues:

- If someone were to hack the Bluetooth connection to the app, a hacker could obtain information from circuit
- Minimized by not storing any data, simply displaying it, so the hacker could not receive any historical data

Intellectual Property Issues:

- There are similar baby monitoring devices on the market, but according to our research we did not find any that were specifically marketed towards detecting risk factors of SIDS

Liability Statement: Should our device fail to detect abnormal life patterns or indicators of SIDS due to low battery life, circuit being out of place, or circuit degrading due to elements or age, we are not liable for any event that occurs due to circuit's failure.