Team 15 | Non-Invasive Hydration Sensor During Water Dispensing

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Need:

- **Dehydration** → *Fatigue, confusion, poor focus*
- *Kidney stones ($375M pediatric cost in 2009)*
- *Concerns over student hydration and hydration station usage*
  - *Eat Right Philly needs objective method to measure hydration and record station usage*
- *Users: Students in Philadelphia schools, Eat Right Philly*

Design Inputs:

Key Requirements:

1) Accuracy: ±10% error in hydration measurement

2) Measurement Speed: ≤7 s

3) Device Usage: log and store user interactions locally on SD card

Key Constraints:

1) Policies: child-safe, non-invasive, anonymous data collection → NIRS technology

2) Station Integration: should not interfere with the water fountain's function and circuitry

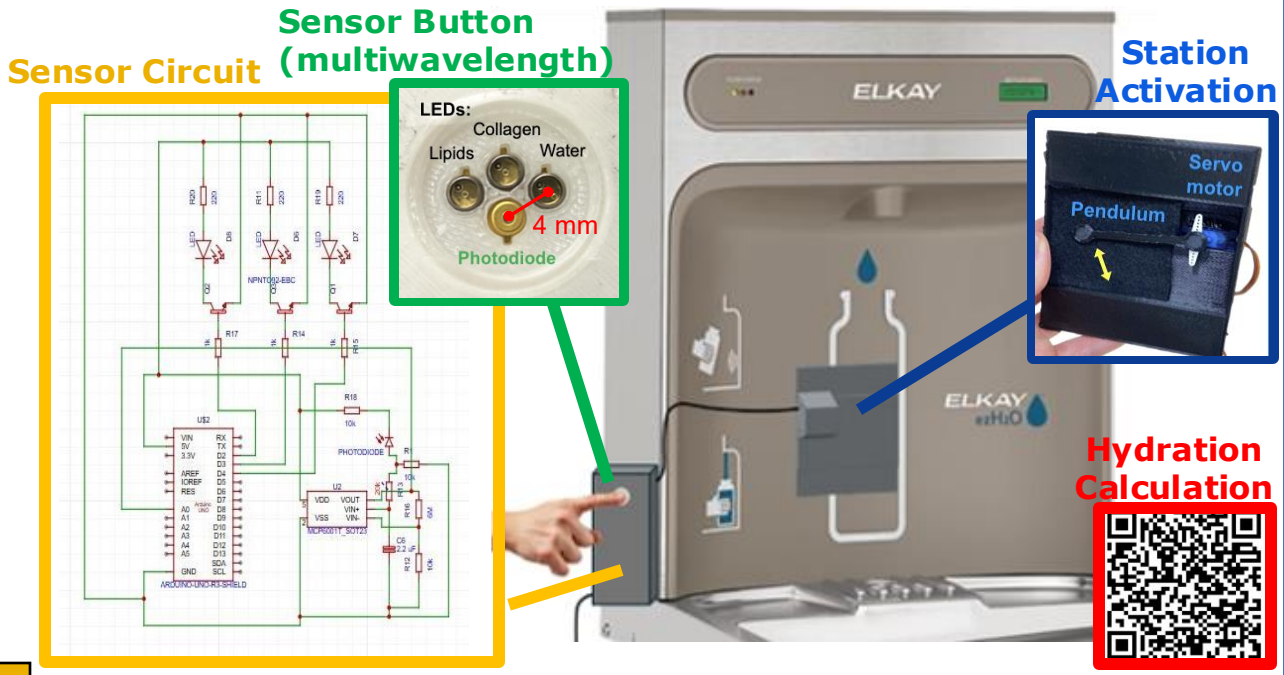
Future Revisions

- *Re-examine consistency of measurements, enhance housing design and full sealing of all components*

Impact

- *Enables Eat Right Philly to monitor hydration trends → target interventions to promote student hydration and overall well-being*

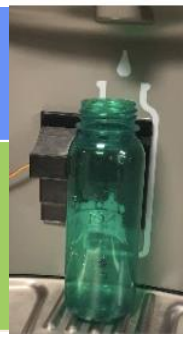
Solution Design and Build:



Verification Testing:

- Sensor triggers station and blocks external activation by other objects

Condition	Trials (#)	Activation Successes (#)
Device trigger	10	10
External object	10	0



- Sensor passed accuracy requirement with blinded phantom test