

Problem Definition

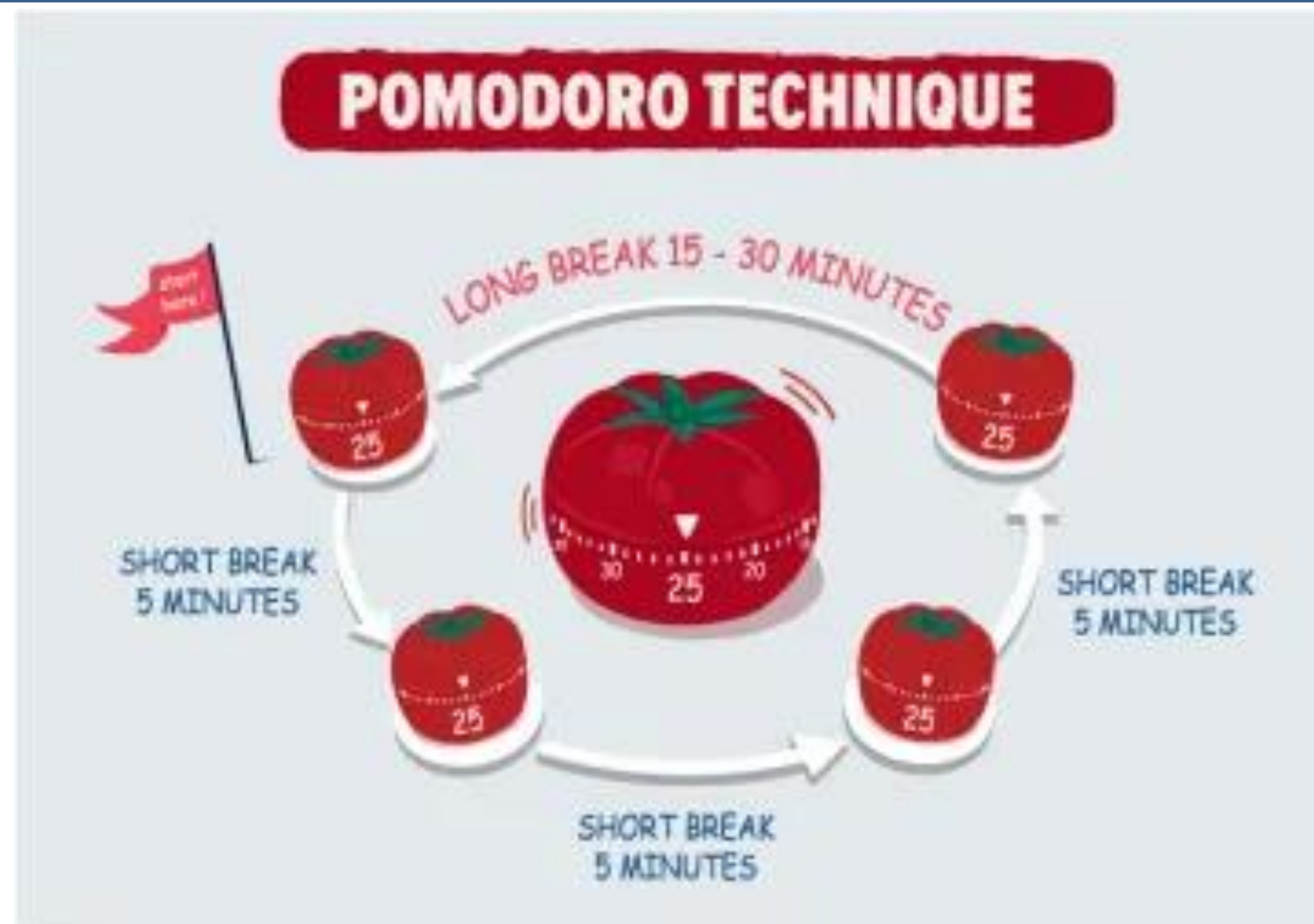


Figure 1. Overview of the Pomodoro Technique: 25 minute focus blocks followed by 5 minutes short breaks, and finally a long break after the completion of a task¹

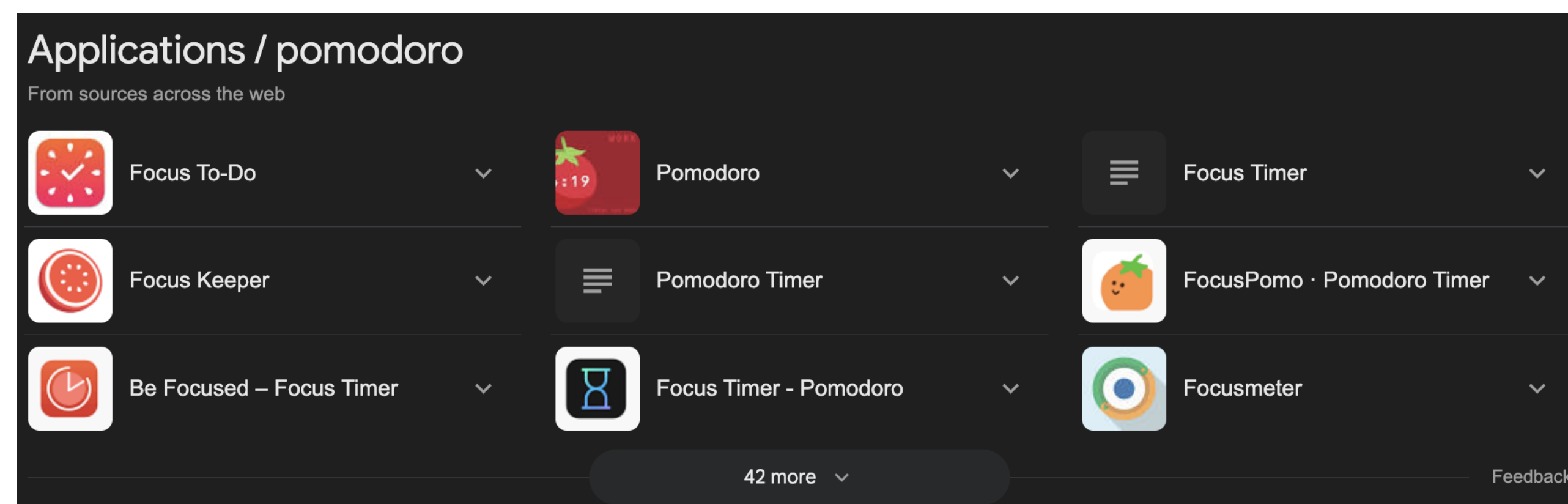


Figure 2. Results from looking up "Pomodoro Apps", showing the extensive amount

- Phones are a top study distractor and significantly reduce focus³
- Structured, timed breaks, and blocking of studying outperforms unstructured studying²
- Aim to keep the method off the phone to reduce temptation of usage

Prototype

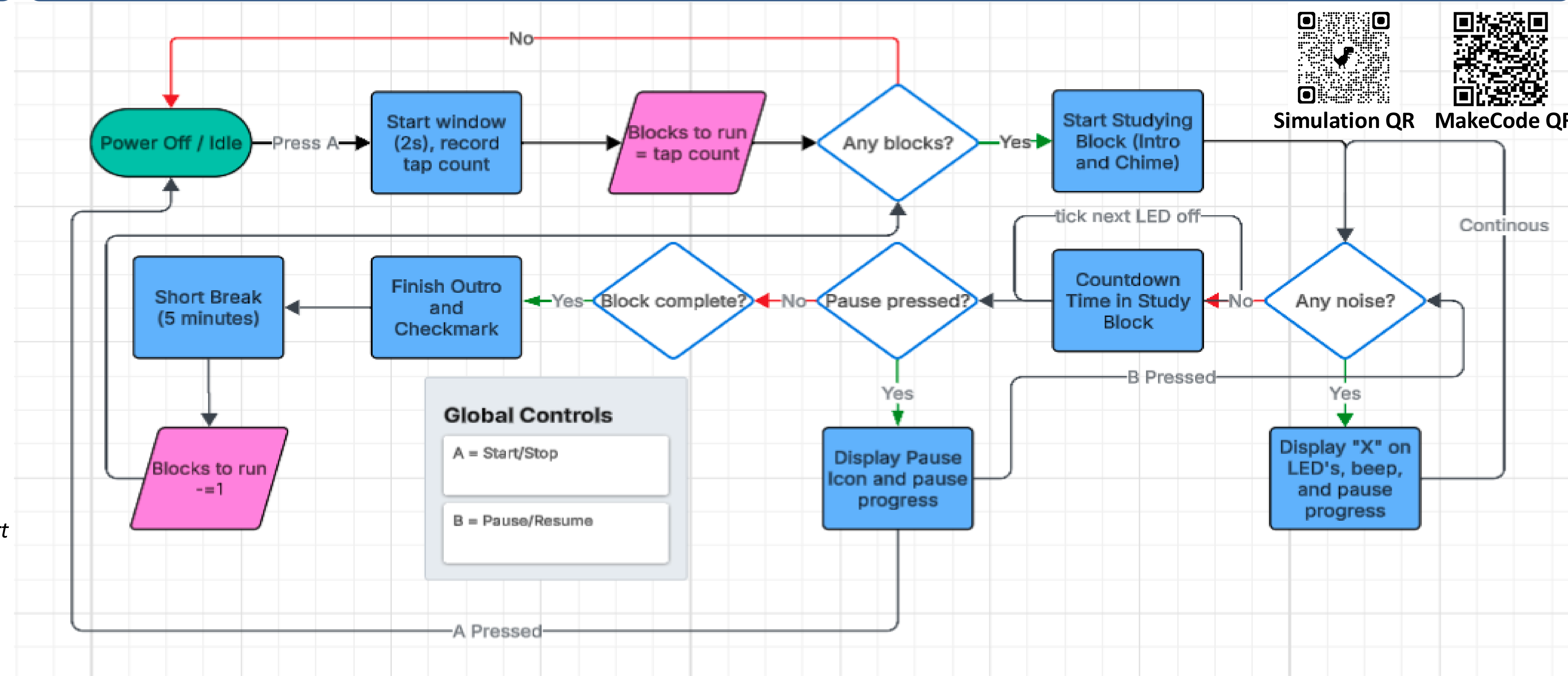


Figure 4. High-level flow chart for The Silent Study Tile, created in Lucidchart¹

- User Instructions: Tap A once to turn on and then quickly N times to choose N study blocks (Within 5 secs). The block will start and the 5x5 LEDs will turn off one per minute. If it gets noisy the device will display an X and beep repeatedly. Press B to pause/resume anytime and press A during the study block to turn off. Once the block ends a check mark will display. 5 min break before next block or device will turn off if no more blocks.¹
- Sensors: Microphone (sound level), Buttons; Actuators: 5x5 LED matrix (Progress & States), Speaker (Beeps)
- Simulation: <https://youtu.be/DwXlfS96k24?si=4ErYAXZaSrEDjqe>
- MakeCode: <https://makecode.microbit.org/S38022-16616-31324-20743>

Design

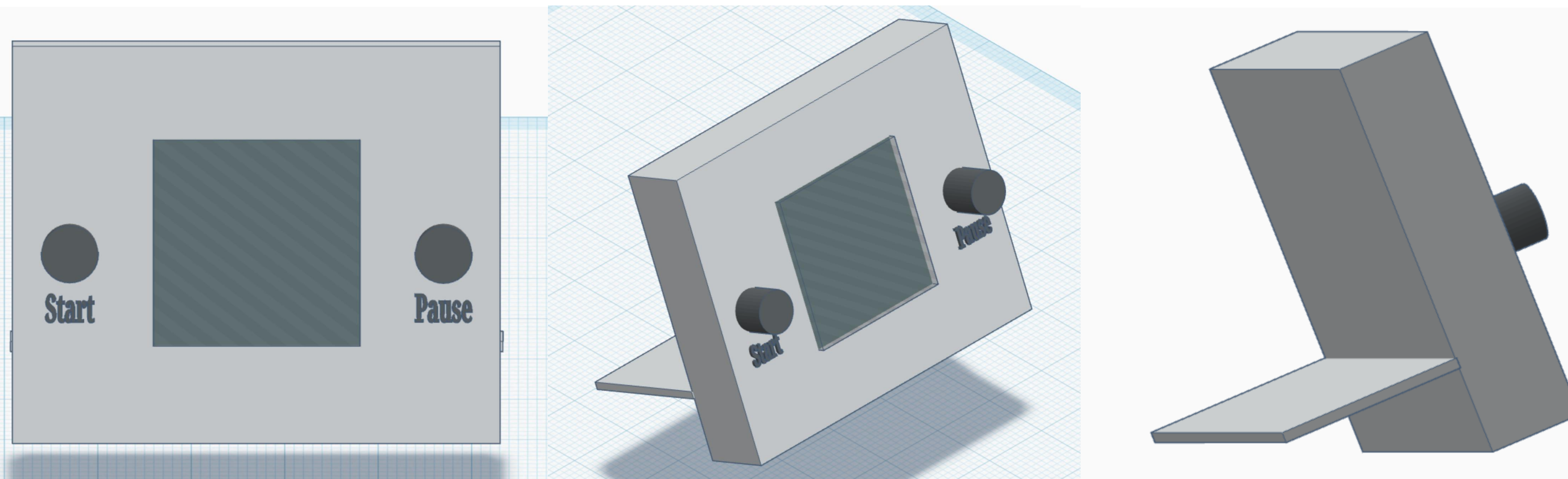


Figure 3. Proposed Initial Design for Frame to hold the micro:bit, showing three different angles of the frame, design made in Tinkercad

- Slide-on frame with fixed kickstand to sit beside laptop for glanceable viewing, blends in
- Simplistic interface, two buttons Start/Stop (A), and Pause/Resume (B)
- In the opening lies the 5x5 LED portion of the micro:bit

Future Work

- Good initial design but still several changes that should be done to optimize user experience and expand the environments that this device is usable in
- Phone and headphones link: simple app or browser extension that can send a distracted flag to the micro:bit when phone itself is turned on, plays beep into headphones
- Personalization: adjustable noise threshold, different length study blocks allowed
- Design tweaks: Diffuser for ovetop LEDs, make kickstand fold up and replace multi-tap A button for blocks

References

- ¹Cirillo, F. (2018). *The Pomodoro technique: The acclaimed time-management system that has transformed how we work*. Crown Currency.
- ²Biwer, F., Wiradhany, W., Oude Egbrink, M. G., & De Bruin, A. B. (2023). Understanding effort regulation: Comparing 'Pomodoro' breaks and self-regulated breaks. *British Journal of Educational Psychology*, 93, 353-367.
- ³Kind, T. (2024). "I have a five-minute break, I pick up the phone, and then 40 minutes have passed": A study on time management apps, systematic breaks, and mobile phone use while studying.
- ⁴Malik, H. (2025). *Sustaining Student Motivation Through Holistic Digital Design: A Case Study* (Master's thesis, Iowa State University).