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PROJECT 3

TEAM 2
SECTION 2
10:30AM

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Introduction

Our team has 5 members that are UX Design, Web Programming and Design, Game Design, and Animation majors. For this project, our goal is to design a fitness-tracking device and application that encourages students with special needs to make healthy lifestyle changes.

In today's technology-driven world, the growing popularity of wearables and personal informatics has revolutionized health and fitness. Fitness trackers, a key component of this trend, promise valuable insights into physical activity patterns by converting everyday movements into quantifiable "body data." Employers and insurance providers have embraced these devices to promote healthy lifestyles and reduce healthcare costs, while users benefit from a better understanding of their personal well-being.

However, concerns surrounding data manipulation and the efficacy of fitness trackers in promoting behavior change have emerged. This project aims to develop an innovative activity tracker application that connects to a basic wearable device, systematically altering the user's mental model to focus on genuinely beneficial activities. By prioritizing and rewarding these behaviors, our solution aims to address common "cheats" and empower users to adopt healthier habits, contributing to overall individual and collective well-being.

Methodology

Initial Design Space

Purpose

Design an accessible fitness tracking device and application that motivates neurodivergent students to make healthier lifestyle choices by making exercise fun and engaging.

Stakeholders

- Parents
- Teachers
- Family and friends

User Group

Students that are neurodivergent wanting to make healthier lifestyle choices.

- Both children and adults
- Special needs teachers

Initial Scenario

Jane is a middle school student with ADHD. They often struggle to get enough exercise during the day. To help them and other students achieve a daily exercise goal, Jane's teacher Ms. Star has added a fitness tracking system to their class. At the start of each class, Ms. Star opens the teacher dashboard application on her computer, which monitors each of her student's activity levels with 3 statistics: Target, Movement, and Rewards. With her teacher's watch, Ms. Star can actively engage with her students without being stuck to the dashboard on her computer. On the other hand, her students can track their daily activity levels, answer questions, and earn rewards all through an accessible fitness watch.

Problem Scenario

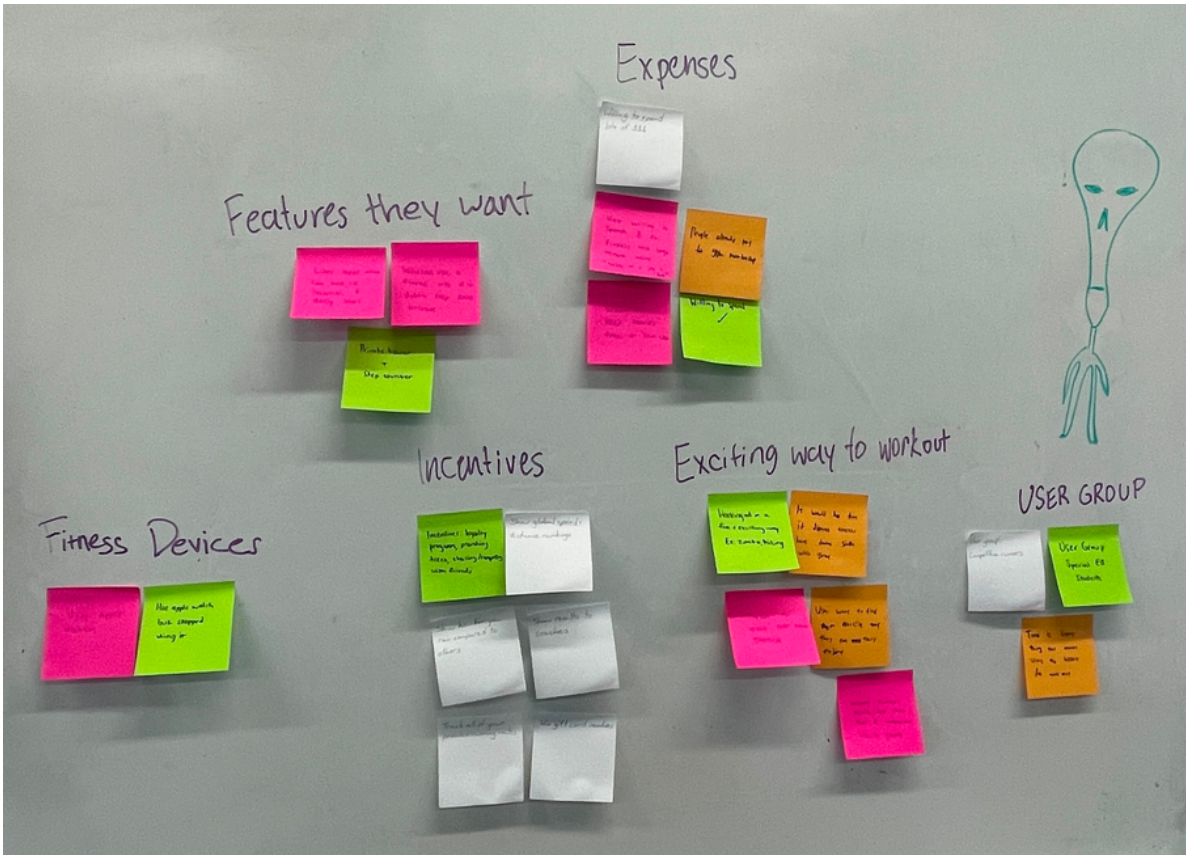
The fitness tracker is a helpful device in our day-to-day life. However, the majority of users are not using what it was originally designed for, building a healthy lifestyle with the activity tracker.
This can happen due to a variety of reasons, but we all agree the main reason is a lack of motivation. This is where STRIDE can help neurodivergent children to build healthy exercise habits.

In 2022, more than 113 million units of smartwatches were sold. This means many individuals already have experience using some sort of smartwatch on their wrist. With more and more advanced technology, the design of the watch is getting bulkier, and it can be distractive during our daily activities. This becomes more dramatic when it comes to neurodivergent children, and they refuse to wear the watches when they feel uncomfortable or distracted. Neurodivergent children need a proper break time and enough exercise to perform their best, and this is why Stride has a built-in interactive character that motivates the users to reach their daily exercise goal and never forget the break time. Also, neurodivergent children are very sensitive to colors, and they can choose or customize their own bands to minimize repulsion.

User Interviews

Purpose and Goals

Our team's goal was to gain a general consensus of our users wants and issues with fitness tracking devices and applications. We interviewed 1 occupational therapist, 3 everyday fitness device users, and a student with ADHD.

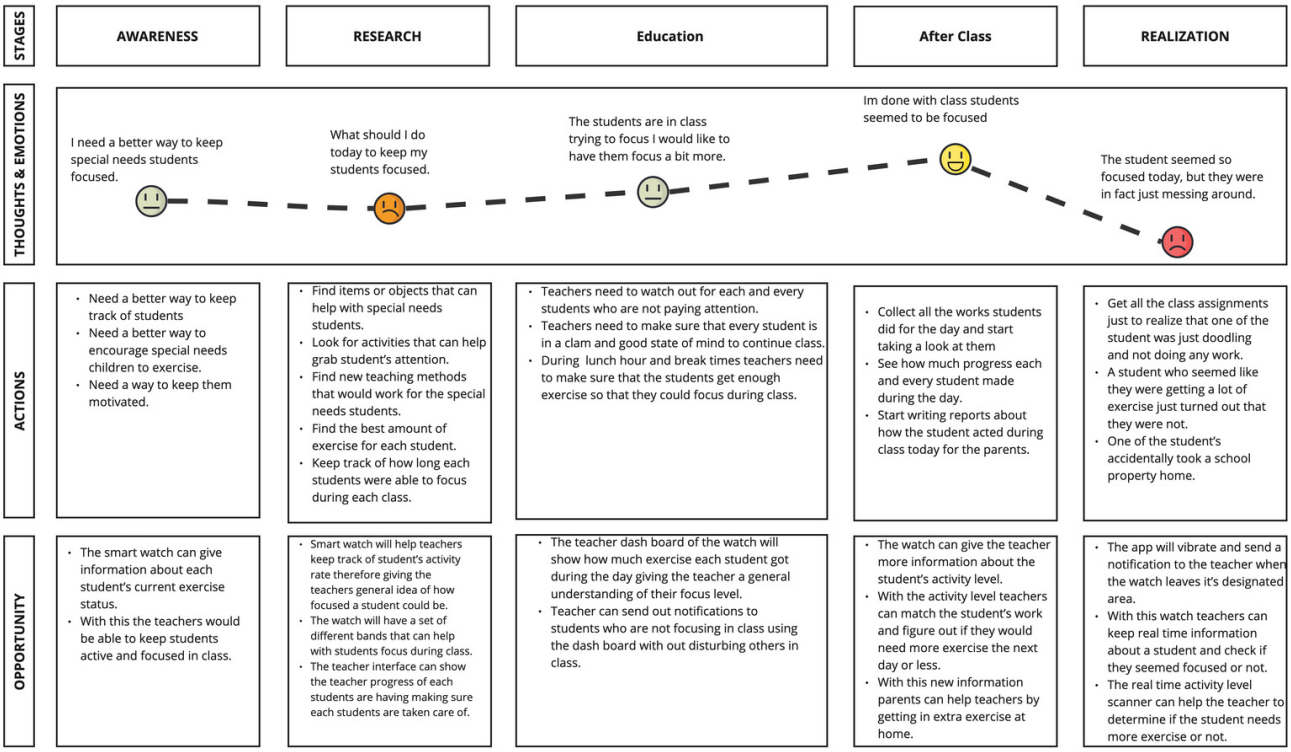


Results

From our interviews, we found that users want devices that keep exercise **fun** and engaging, while still **keeping costs low**. We also discovered by interviewing an occupational therapist and neurodivergent students that device durability and minimal distractions are important to be effective for users with ADHD and autism. As a result, we decided to design a reward system through our fitness watch designs that tracks users activity levels and enables special needs teachers to give users the corresponding rewards. We found that neurodivergent children and adults can benefit the most from a fitness device redesign and therefore narrowed our user group to neurodivergent students and special needs teachers, as current devices and applications are often inaccessible and distracting for this specific user group.

Journey Mapping

Purpose: From this journey map we wanted to find out what the users were doing now with out our product and we wanted to see if there were any opportunity where our product could be used in.



Reflection: We have found out that there are a lot of opportunities in a classroom setting when we focus on special needs student. We found out that the little sounds and shouting out an answer in a classroom is actually a form of distraction of the special needs students. With our device we were able to solve problems in and outside of the classroom since the students were getting the needed amount of exercise during school time. Also from this journey map we saw an opportunity where we would be able to lift some stress factors off of the teachers.

INSIGHT

Insight 1:

Students with special needs may sometimes forget to take breaks, which are essential for optimizing their concentration abilities.

It is recommended to take a 15-minute break every hour to maintain focus and productivity.

Insight 2:

A certain level of exercise can help to reduce the symptoms of Autism Spectrum Disorder (ASD). According to Harkla research, it can reduce symptoms by up to 35%.

Vigorous exercise has been found to have a more meaningful impact on reducing stereotypical behaviors in individuals with ASD.

Insight 3:

The main reason why special needs individuals like wearing or using the fitness tracker is because of its design. The bulky design makes them uncomfortable, and it can distract them.

Providing a variety of colors and band types can fulfill special needs individuals' needs and help them reduce their repulsion. Also, the interactive feature can make this experience like playtime instead of exercise.

Secondary Research

Purpose & Goals

Our team's goals for secondary research are to discover ways a fitness device can be incorporated into the daily life of an individual with special needs. We also want to find out any relevant issues or problems that our users have with fitness trackers and how exercise can serve as a benefit.

Articles Found

1) **"Exploring the link between ADHD and Exercise":**
https://www.healthline.com/health/fitness/adhd-and-exercise#exercises-for-kids-with-adhd

- Exercise can improve the following in individuals w/ ADHD:
  - Dopamine production
  - Attention span and organization
  - Anxiety and depression
  - Social and behavioral problems
- Best exercises for individuals with ADHD are: hiking, jogging, HIIT, CrossFit, and weightlifting.

2)**"Kids with autism show the biggest drop in physical activity":**
https://www.news-medical.net/news/20210202/Kids-with-autism-show-the-biggest-drop-in-physical-activity-between-ages-9-to13.aspx

- Kids with autism don't like fitness watches and often break the watch
- At 13, kids with autism reported 1-2 days of moderate to vigorous physical activity in the past 2 weeks, compared with 9+ days among youth without autism.
- This decline continued through ages 17+, with youth without autism having higher rates of physical activity than youth with autism
- Team sports also helps with social skills - without developing basic coordination and stamina, it is difficult for kids to participate in these activities

3) **"Engaging Children with Autism in Interaction using Haptic and Tactile Interfaces":**
https://ido2016.sciencesconf.org/123292/JN_Internet_des_Objets_Perusseau_Lambert_.pdf

- Multi-position wearable devices are key as individuals with ASD have differing sensory reactions
- Fine motor skills + grip are often deficient in users with low functioning autism
- Material and size of device matter alot: can distract more than help. Need simple, durable, soft materials.

4) **"How many steps/day are enough? Children and adolescent":**
https://www.researchgate.net/publication/51529447_How_many_stepsday_are_enough_Children_and_adolescent

- Children in the age of 12-15 needs 12,000 steps daily to get their requiered exercise.
- It is benefitial for the children to hit their step goals for the day to keep their growth hormones at their peak.

Secondary Research Cont.

Articles Found

5) “Easily Distracted? How to Tune Out Distractions & Focus on School”:
https://www.additudemag.com/end-distractibility-improving-adhd-focus-at-home-and-school/

- ADHD students are easliy distracted by classroom environment.
- To minimize the distraction level there are a lot of cautions that the classroom has to follow.
- With distraction it minimizes the student’s academic learning and the fellow student’s academic learning around them.

6) “17 Ways to Help Students With ADHD Concentrate.”:
https://www.edutopia.org/discussion/17-ways-help-students-adhd-fidget

- Fidgets and pop its can help with concentration problems ADHD students have.
- Less classroom noice can help create less distraction problems for ADHD students.
- Making sure that students know when they are allowed to speak up can minimize distraction of the class.

7) "5 Important Exercises for Autistic Kids" :
https://www.healthline.com/health/exercises-for-kids-with-autism#:~:text=For%20autistic%20kids%20studies%20show,leads%20to%20better%20overall%20health

- List of different exercises that can help autistic kids
- Reasons why this helps and how it helps

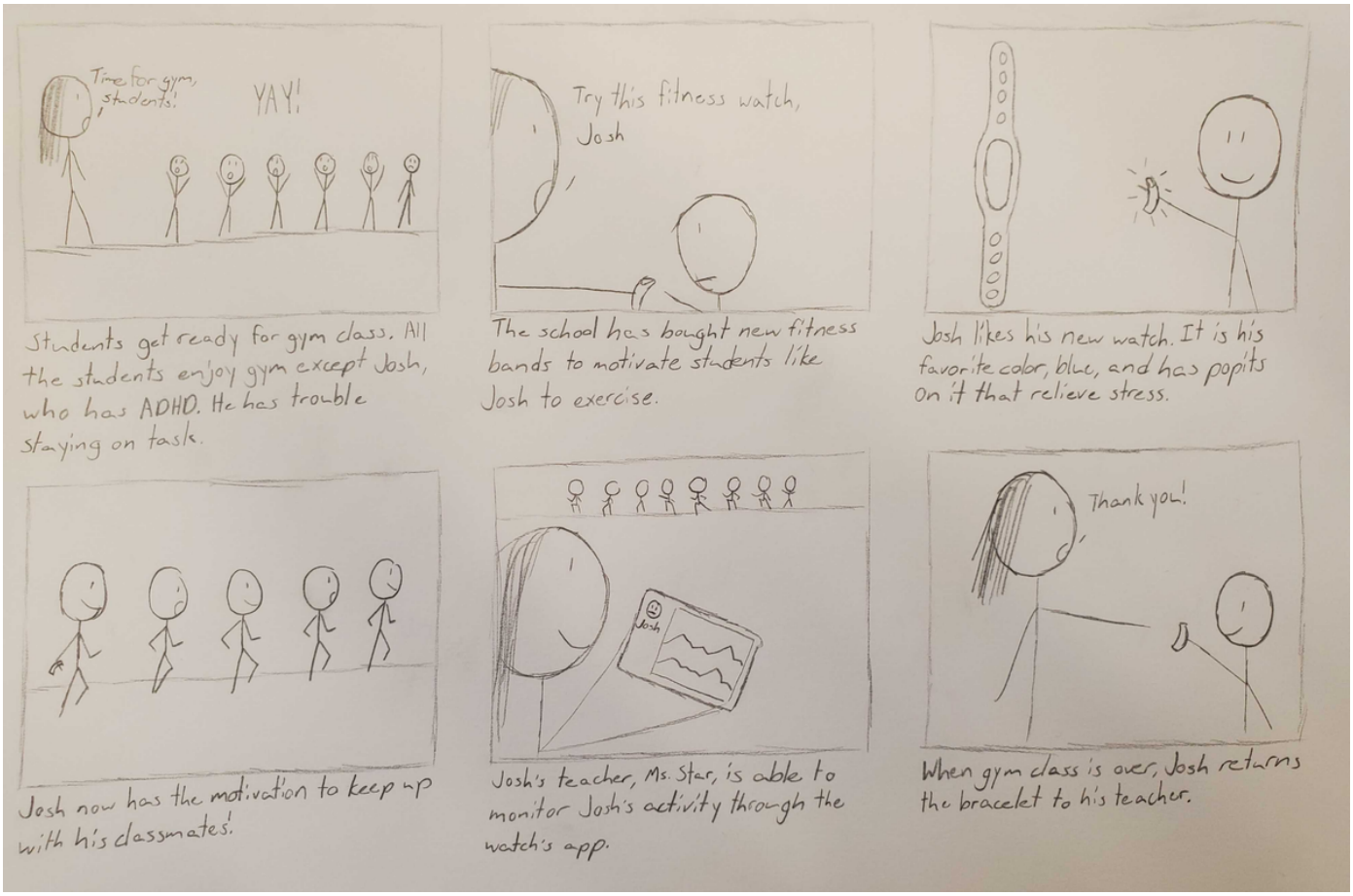
8) "Researchers studying how smartwatches might help children with autism":
https://www.boston25news.com/news/researchers-studying-how-smartwatches-might-help-children-with-autism/RGJ6EKFC3RGYPA6HQJTEKK3TR4/

- This article shows how a smart watch can help with children with autism
- This has a list of research that has been conducted to see how it helps

Results

From this secondary research we have found out that certain exercise can help special needs students to perform well in a classroom environment. In addition, we learned that exercise benefits neurodivergent students by reducing symptoms of ADHD and autism, including lessened anxiety, depression, and improved attention span. We also learned that neurodivergent children are at a greater risk for an inactive lifestyle, but devices that could help, such as fitness watches, are often inaccessible and break easily. From the articles above, we have narrowed down how much exercise is needed for each age group and what the positives of these exercise can give to the special needs children. Through this secondary research phase, we are now able to conclude that smart watches can help a special need student's health.

Storyboard



Explanation

This storyboard demonstrates how our product could potentially be used. John is an elementary school student with ADHD, and he struggles to stay motivated and on task in class. Recently, his school bought our fitness bands, and his teacher, Ms. Star, gave one him to use. He likes using the band and now has an easier time keeping up with his peers in the and other subjects. Ms. Star can monitor his activity from the watch's application and a dashboard application on her computer.

Design & Ideation - Screen Size

Purpose

Since special needs students have different needs than regular every day smartwatch users, we need to research and finalize the shape for it.

Goals

Confirm the screen size display for the smart watch.

Research

Square and Circle displays are more fragile since they're not on the band itself. This leads to a lot more damage and issues. Also, having a bigger display may distract the students, making our product less effective in the classroom. We are going to go ahead and use a smooth rectangular display that will be big enough to show animations, steps, and other information, but small enough to not divert the students' attention. Also,having a smaller screen would mean that cost per unit will go down making the product more affordable for the schools.

Reflection

We are choosing the smooth rectangle display on our watches, because of cheap costs per unit, less distractions, durability, better battery power, and improved safety.

Design & Ideation -Different Bands

Purpose

Since special needs students have different preferences and needs when it comes to design of things we would need to consider different types of bands that we offer for our product.

Goals

Confirm a list of different bands that we can offer for the variety of use. We to use cheap, yet durable materials that can be replace with ease. We must make sure that the materials are soft so it won't annoy the wearer of the watch.

Research

Conventional watch sports watch bands would not be enough when it comes to special needs students. From one of the interviews with a parent of a special needs student we have found out that if the child dislikes the color or design of a certain object they refuse to wear the object. With this knowledge we would like to create a band with a soft, but durable material so that it is comfortable to wear and would not require the user to change it out often. We have chose silicon for the material it is flexible, durable, and cheap to produce so if the child wants a different color band for each month, it won't cost too much to buy a lot of bands.

Pop-it bands

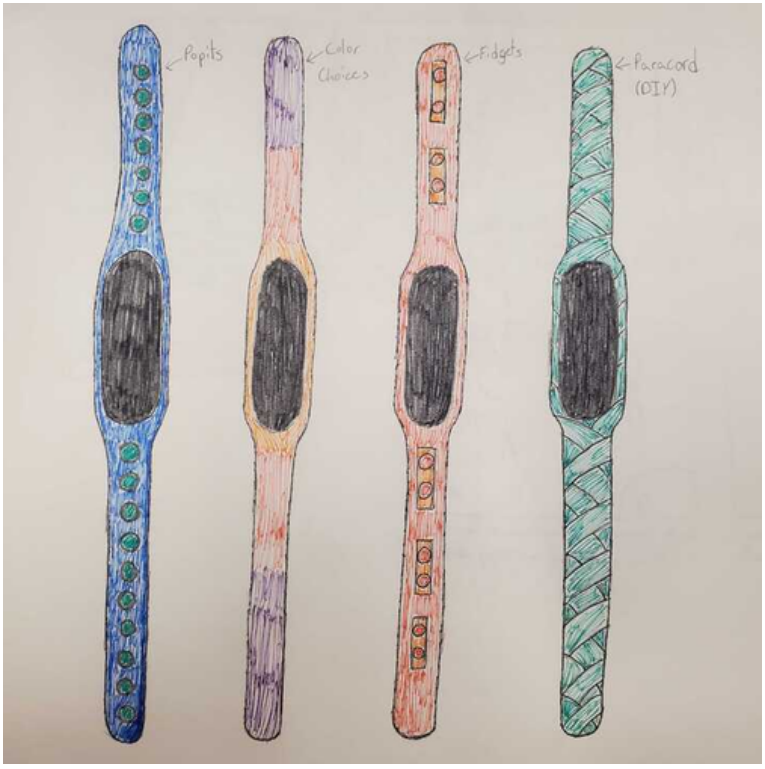
DIY band (example)

Multicolor silicon bands

Reflection

We choose to use silicon for the material of the band and offer different types of bands so that we can satisfy a lot of special needs children. The different types of bands will include, fidget bands, different color bands, and DIY bands where students can braid their own bands out of Para-cord and have full customization. From our interview with a father of two autistic children, we found out that a DIY band would be very useful since the child can form an emotional connection with the watch and will be more incentivized to use it.

Initial Design Sketches



A sketch showing different designs for the fitness watch bands. From our secondary research, we learned that neurodivergent individuals prefer bands made of smooth, durable materials. We decided to use silicone and Paracord bands as these are flexible, durable, and have minimal distractions.

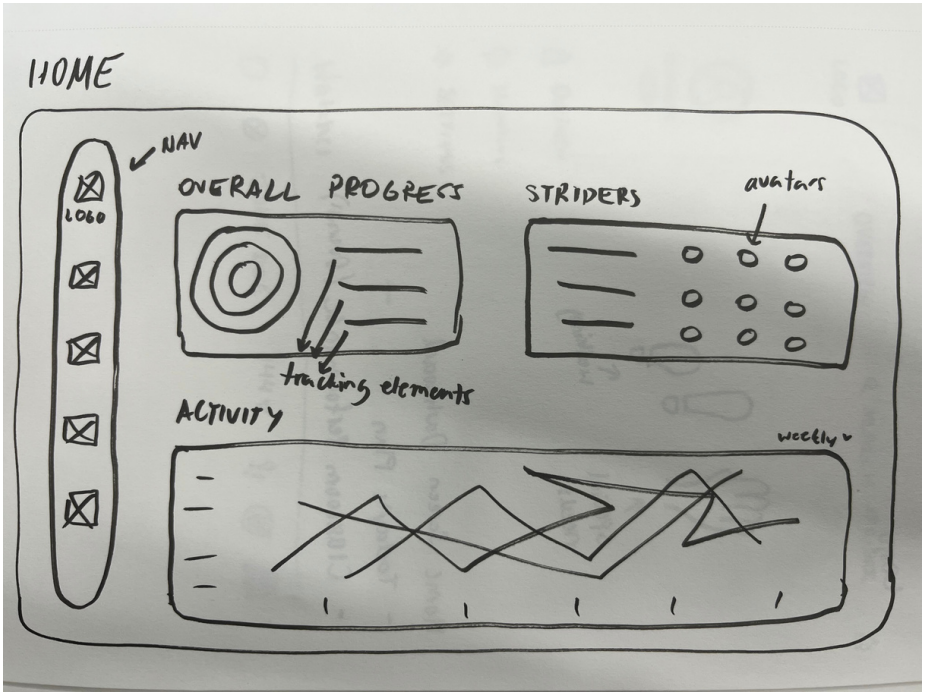
From left to right:

- Popit band
- Color choices
- Fidget band
- Paracord (DIY) band example

A sketch showing the interface of the Stride app dashboard. This dashboard would be used by teachers in class to monitor student's activity levels throughout the day.

Features include:

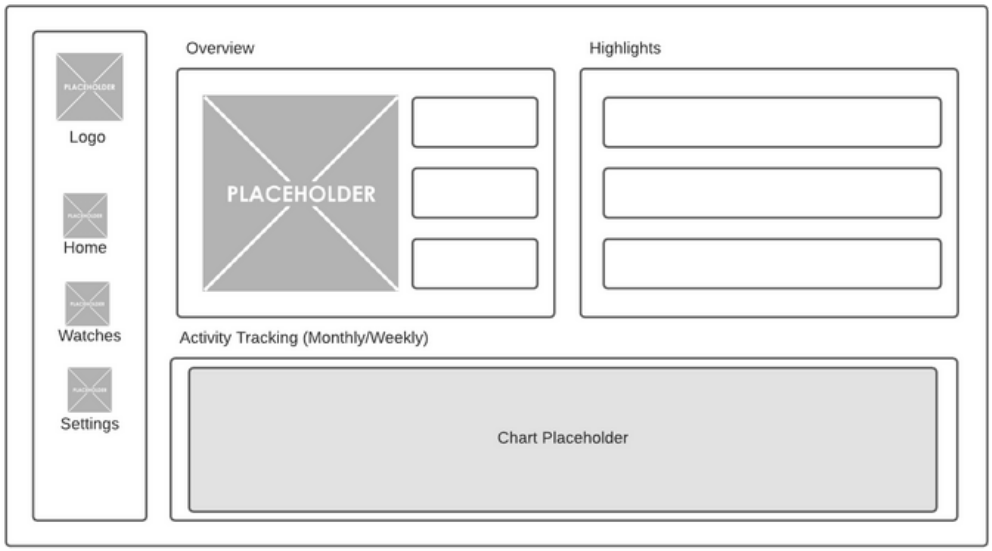
- Navigation bar
- Progress chart
- Activity level graph
- List of students/avatars

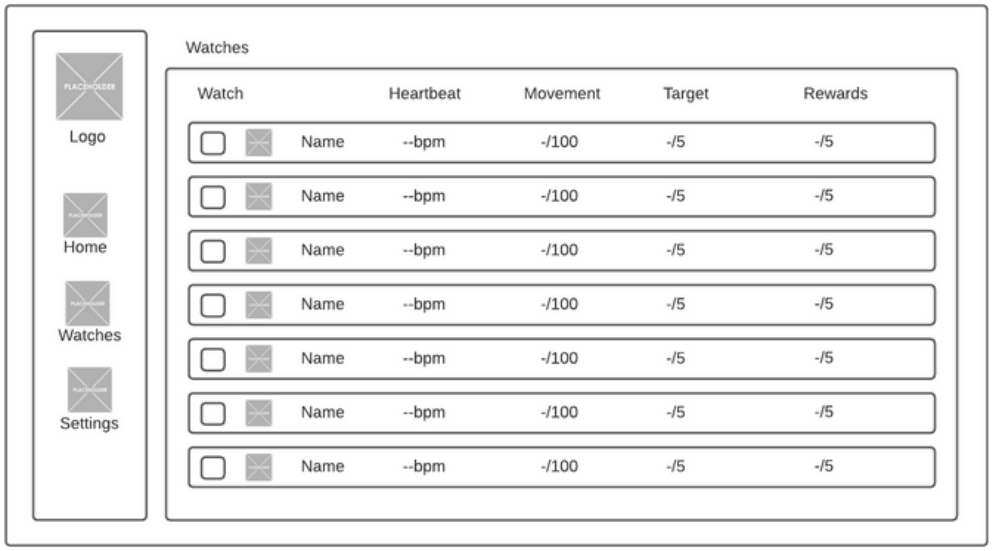


Dashboard Application Lo-Fi

Purpose

From interviews, the teachers and therapists that we interviewed expressed that having a single place to overview all student's activity levels would be helpful. Therefore, our team decided to create a teacher's dashboard application that will connect to the teacher's watch, providing a summary of student's progress towards their activity goals. In addition, this wireframe is going to be the main visual shown during concept testing. It will help us iterate and design a high-fidelity design to present to the class.





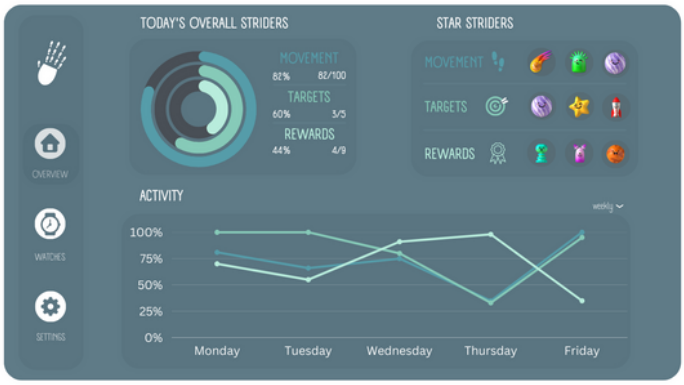
Reflection

We were able to build 2 low-fidelity mockups. The first mockup is the home screen that will show the overview of all the watches' activities and highlights. The second screen will breakdown the individual watches into 4 categories. The next step is to put them through concept testing with both children and teachers.

Dashboard Concept Testing

Purpose

This is going to be the main visual shown during concept testing. It will help us iterate and design a high-fidelity design to present to the class.



Goals

After creating the 2 low-fi models of the dashboard application, we decided to design the hi-fidelity prototype before conducting concept testing. This decision was finalized, due to not being able to do concept testing in person. Since our participants were busy therapists and teachers, showing them completed visuals would take the least amount of time, and give us the most effective feedback to make further interactions on.

Pain Points

Color: The color is too dark and dull. Autism and special needs symbols always are light and bright. They try to include as many colors as possible without making the visuals difficult to see.
Navigation Bar: The navigation bar is straightforward however is not very intuitive. Maybe try adding the watches section underneath the main dashboard. The other page can be for choosing/editing activity goals.
Heartbeat: This may be a privacy issue, I would hold off on it for now.

Reflection

This concept testing round was incredibly helpful. It gave us some great insight into color theory, functionality, and content. We are going to implement these changes in our dashboard application redesign.

Watch Interface Lo-Fi

Purpose

Our team created 3 screens of wireframes for the watch interface. These are to show the student's perspective and what features they will interact with when using the watch.

Results

We were able to design 3 screens as wireframes for our student watch design.

The first screen is the **Home screen.**

- Students can see a summary of their activity: move (total daily activity score /100), steps (total daily steps), and target (on scroll - reaching their target goals)

The second screen is the **Goal Reminder screen**

- This alerts students with a vibration when their goals haven't been reached.

The third screen is the **Goal Completion page**

- This will also vibrate and alert students when they have reached their daily goals.

Each student will also have a cartoon character displayed on their watch for added interactivity and engagement, which was an important need that our users expressed in previous interviews.

Watch Concept Testing

Goals

Our team wanted to discover what our users thought of our designs, including any errors or problems they have while using our prototypes by concept testing.

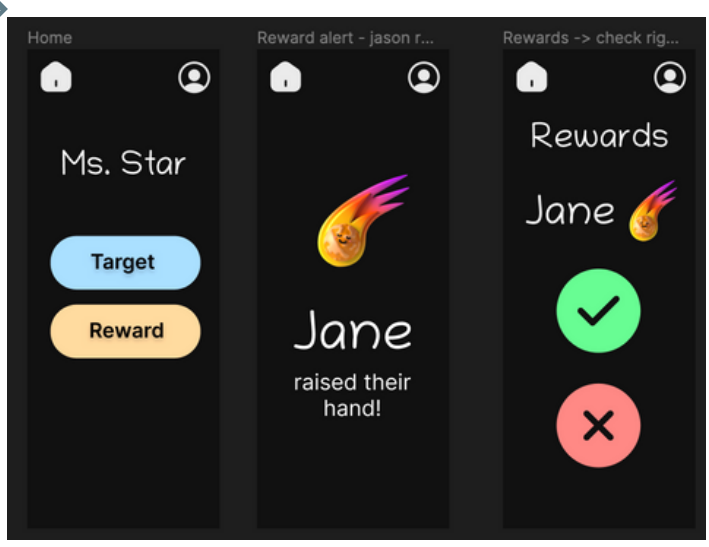
Process

Our team conducted concept testing on our initial wireframes of the watch interfaces for students and teachers. For students, we tested with two children with ADHD. For teachers, we tested with two occupational therapists and a special needs teacher at a local high school. To test, we showed our designs to our user group and then asked various questions regarding their preferences and the effectiveness of the watch interfaces in hypothetical teaching scenarios. One limitation is that our group was unable to test with actual students, so our feedback may be skewed as we only tested with professionals and school-age neurodivergent children.

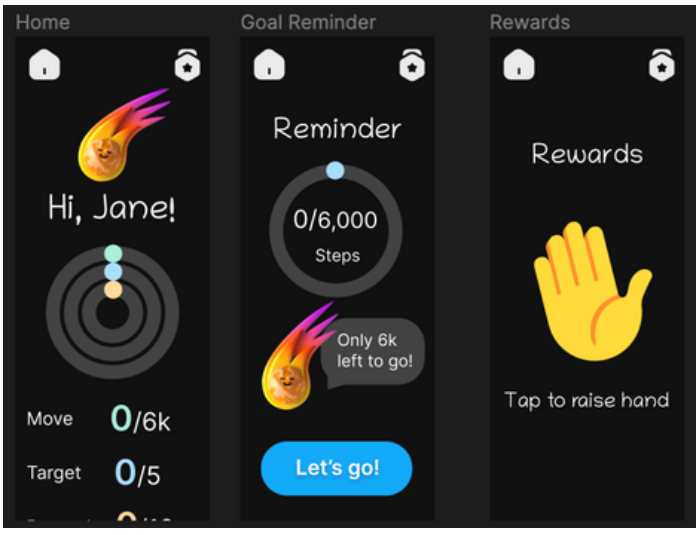
Results

Through testing, we found that users were confused with the visual indication of their activity progress. Users were unable to distinguish between 'Movement', which is intended to be a daily movement percentage, and 'Steps' which is intended to be a number of total daily steps. To solve this problem, we removed the 'Movement' and 'Steps' statistic and replaced both with a 'Move' statistic that counts the total daily steps compared to a relative step goal.

We also discovered that teachers were concerned with being able to engage their students properly and were worried that the watches may be too distracting. To counteract this, we added a 'raise hand' feature that enables students to alert teachers when they have a question and enable teachers to give rewards if the student answers a question correctly.



The new 'raise hand' feature to give rewards to students, as shown through the teacher's POV



Student's POV of the watch interface with the newly added 'raise hand' feature.

Informing Our Design

Purpose

To document which participants during concept testing helped us inform our design.

Dashboard Application

Pinky Parekh
Pediatric Occupation Therapist/Teacher
Design Change: Dark to Light colors

- "Adding lighter colors would motivate students more. They usually help them understand the content better and reduce distractions."

Kranti Jeeva
Pediatric Occupation Therapist
Design Addition: Auditory Feedback

- "Along with vibrating upon completion and visual feedback - add auditory positive motivational feedback for the student achievements at the end of the day"

Kamal Shah
Occupation Therapist
Design Addition: Reward/Punishment

- "Is it positive reinforcement or if they don't hit the goals is it negative reinforcement? I would think about how that would play out with these students?"

Watch Interface

Wendy Johnson
Speech Therapist & University Professor
Design Change: Application Integration

- "Would this be incorporated with existing smartwatches, like Apple Watch? Or is it completely unique?"

Elizabeth Baker
Child Psychologist
Design Change: Onboarding

- "I would make the screens less wordy for younger students. So maybe having beginner and advanced screens depending on how far the student is in their education journey?"

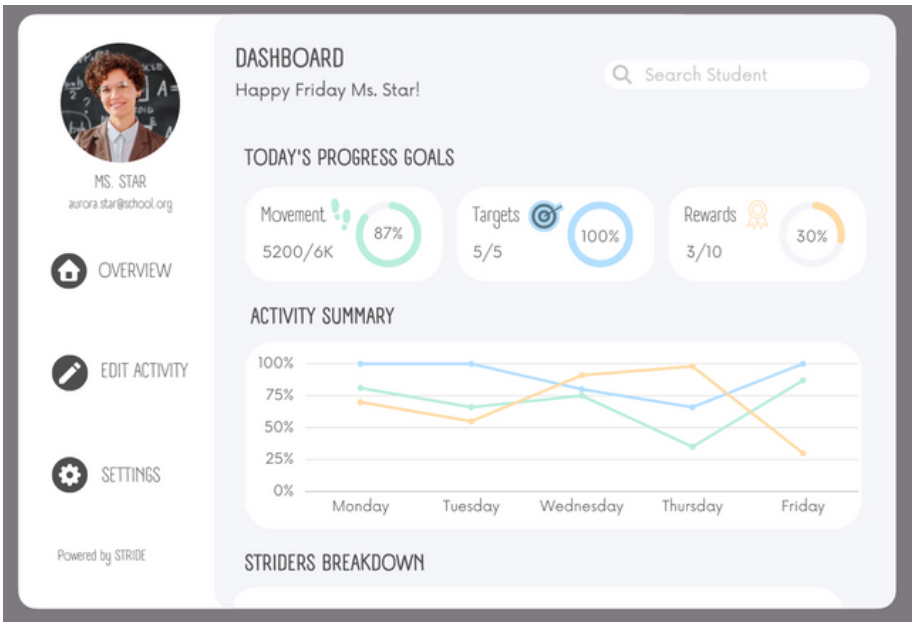
Reflection

This page is super effective to help show the credibility of our design ideas and changes. Since most of us don't have a background in this particular field, running it by professionals is a huge advantage.

Dashboard Redesign

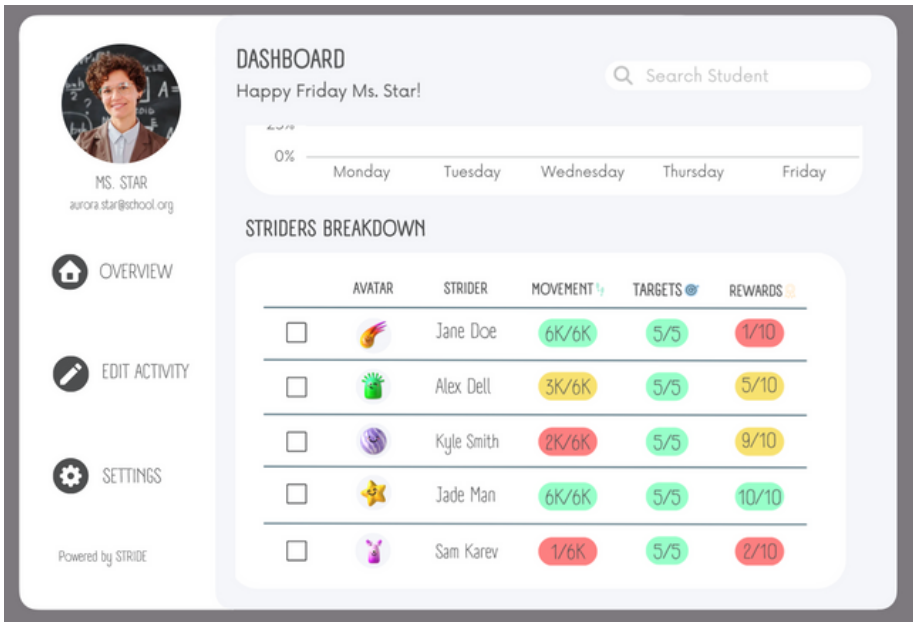
Purpose

After taking the great feedback from our concept testing evaluations, we wanted to redesign our dashboard screen to be more accessible and intuitive.



Changes made based on feedback:

- Removed heartbeat data due to privacy concerns
- Adjusted colors and visual design to be easier on the eyes
- Redesigned navigation bar to allow teachers to edit their activities and be more intuitive



Reflection

We are pretty content with how it looks so far. There's always room for growth and changes, however, for the amount of time we have for this project, we have decided to leave this as our last design iteration. We will still conduct concept testing again to gather our last thoughts and feedback on the project before handing it in.

Final Solution:
Multimedia Component

Goal

Create an automated video that will walk through all our product interfaces during our presentation.

Steps

1. Design all watch faces
2. Design finalized high-fidelity prototype
3. Create a user persona to walkthru the project
4. Dashboard scroll and highlight animation
5. Watch interface-switching animations
6. Script Writing
7. Script Audio Scanning
8. Video and Audio Alignment
9. Music Library Research
10. Music and Video integration
11. YouTube Video Upload
12. Video connection to the presentation

Click to view

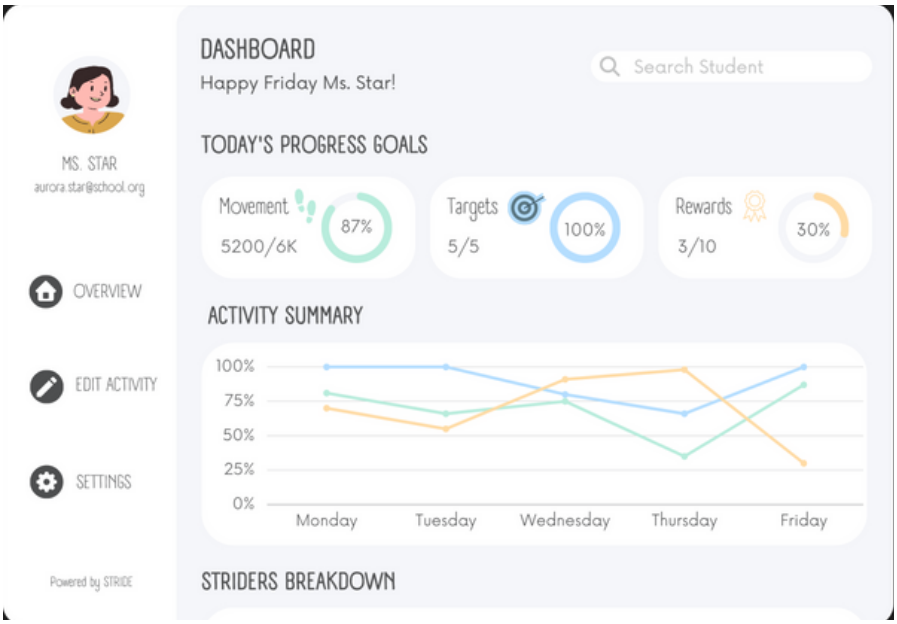
Reflection

We are super happy with the result of this component. One problem we encountered was time, as a little more time would have been helpful to fine tune some of the animations.

Final Solution: Prototypes

Our team's final solution consists of three deliverables to be implemented into a classroom for special needs students, specifically students with ADHD and autism:

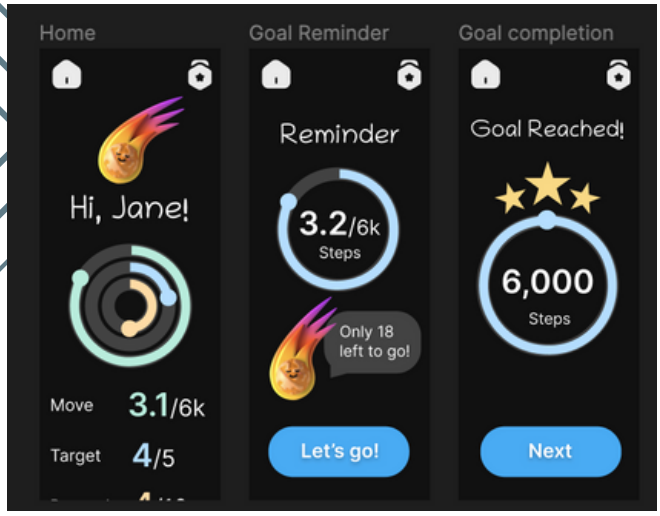
- **Student watch interface:** View activity summary and track daily steps
- **Teacher watch interface:** Give rewards and interact with students in a mobile way
- **Teacher dashboard application:** set goals, rewards, and monitor student activity.

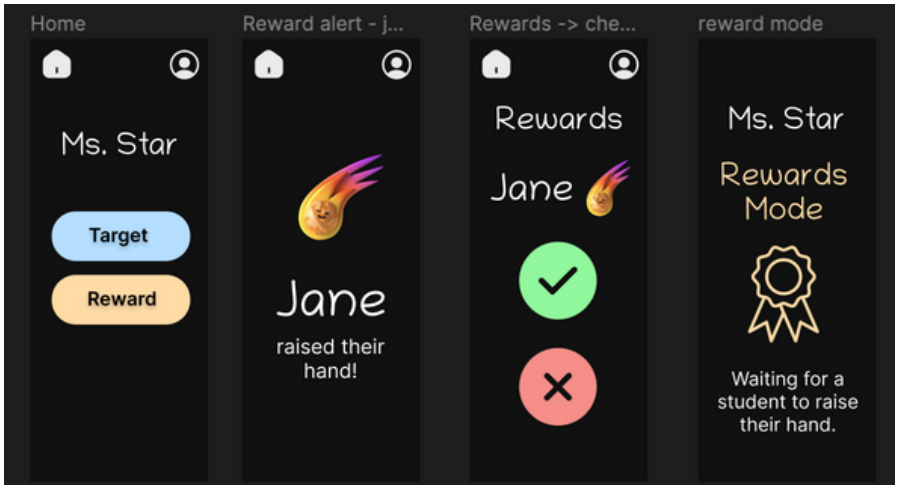


To the left is the Teacher's dashboard hi-fi prototype. Teachers can see an overview of their students' activity progress over a week, including total movement, target goals reached, and rewards given.

A second page allows teachers to view individual student's activity levels, however, a problem we encountered is data privacy issues - parents may not want to share their child's health data.

From concept testing with our dashboard application, our users wanted a way to monitor student activity while still having mobility and positive interactions with students. To overcome this, we designed a watch design for teachers (pictured bottom right) on top of students (bottom left).





- Home: see summary of daily movement, target goals, and rewards
- Goal Reminder: Notify user of unfinished activity goals
- Goal completion: Notify user when a goal is reached

- Teachers can go into target mode, where they give target goals to students.
- Rewards mode: teachers are alerted when a student raises their hand and can answer student's questions
  - Rewards can be given after a question is answered correctly.

Limitations & Next Steps

Purpose

To clearly define all pieces of feedback given to us from teachers, therapists, presentations, desk reviews, and concept testing.

Pain Points

- Not being able to interview neurodivergent students in person and gather usability testing data for part of our user group (students specifically)
  - Solution: doing more secondary research and testing with professionals (occupational therapists and teachers)
- Incorporating more autonomy for older students (removing teacher integration)
- Not having enough background knowledge in this field
  - Solution: We conducted extra secondary research on how exercise impacts neurodivergent children and adults and researched what features would be the most effective
- The watch and dashboard faces are not uniform visually
- Balancing a visual design that is engaging but not too distracting
  - Solution: using color and haptic interactions to draw users attention to the most important features

Future Steps

- Having an onboarding page that allows the teachers and students to understand how the watch and dashboard works
- Creating dark and light modes of the interfaces
- Making this platform accessible for all students and possibly senior members
- Figuring out how the schools will pay/fund the watches for their students
- Understanding how to keep the watches in school without setting up a tracking location feature
- Include a 1 on 1 focus setting

Reflection

After completing a majority of the design aspects, it's good to recap all the limitations that the product currently has. We listed the pain points of the current prototypes and the next steps to take if we were to continue this project.

CONCLUSION + REFLECTION

Team Reflection

Overall, our group successfully conducted research and developed a solution that encourages and supports our target user group. Based on the initial research conducted with people from various fields, we narrowed down our focus to neurodivergent individuals. To gain further insights, we interviewed occupational therapists and parents of neurodivergent children.

There were several key aspects to consider when designing the product, such as ensuring the watch does not disrupt the children and making it enjoyable for them to wear and use. With this in mind, we focused on creating a fitness tracker that is both engaging and versatile, tailored to our users' unique needs. There were several key aspects to consider when designing the product, such as ensuring the watch does not disrupt the children and making it enjoyable for them to wear and use. With this in mind, we focused on creating a fitness tracker that is both engaging and versatile, tailored to our users' unique needs.

We designed a watch face and teacher's dashboard, incorporating features like a customizable band and character. These features allow users to personalize their watch with their favorite colors and create a workout avatar within the watch. The primary purpose of the dashboard is to monitor students' activity levels and maximize their engagement in class.

During our second user testing cycle, we received positive feedback from occupational therapists. However, if we could revise our approach, we would clearly state that the app is specifically designed for neurodivergent students in order to avoid confusion regarding personal data concerns.

Our current goal is to help our users adopt healthier habits in their daily lives. As a next step, we will explore how our solution can be integrated into their lives beyond school hours.

Team Contributions

All:
Conducted primary and secondary research
Assisted with team documentation
Created team slideshow

Aashika

- Created and completed the multimedia component video.
- Sketched and designed low-fi/high-fi dashboard mockups
- Conducted concept testing and interviews

Jason

- Conducted two interviews and added that into the documentation.
- Secondary research and summary of the research
- Journey Mapping.

Nicole

- Drew the storyboard
- Sketched designs for different watch bands
- Created the interview protocol

Mikaela

- Conducted concept testing on student watch interface designs
- Sketched initial watch interface designs
- Wire-framed student watch interface
- Created hi-fi prototype of student and teacher watch interface

YounSung Eum

- Created slideshow presentation
- Wrote introduction and conclusion for documentation
- Secondary research and persona

Appendix

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Interview Protocol

Purpose

This activity is done to iron out the details of what's included in our stakeholder interviews. It will have our teams goals, stakeholder qualifications, and interview questions.

Goals

Find out the common issues that users have with smart fitness trackers and discover ways to motivate users to make healthy lifestyle changes.

Questions

- Introduce yourself
  - Tell the participant about our project
- Basic screening questions
  - What is your name?
  - What is your age?
  - Gender? (Optional)
  - Occupation?
  - How often do you exercise?
- What type of fitness tracking device do you use? (App, watch, etc.)
  - What is the initial reason that made you get the device?
- What is the most used feature on your fitness tracker?
  - How often do you use that device?
- What would make you hesitate to use fitness applications?
- Are you willing to spend money in order to reach your exercise goals?
  - If not, please explain further.
  - If so, how much would you be willing to spend?
- Have you struggled with being able to reach your fitness goals in the past?
- What incentives would motivate you to actually make healthy lifestyle changes using a fitness tracker?
  - For example: sharing with friends, planting trees, discounts, loyalty programs, etc.
- Have you had success with any fitness trackers in the past?
  - What went wrong and what went right?
- Have you cheated when using the activity trackers?

Reflection

This protocol was an effective way to ask our stakeholders questions about our design space. We are ready to go ahead and interview 5 potential users.

Interview Participant #1

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age? 49
  - Gender? (Optional) Female
  - Occupation? Occupational Therapist
  - How often do you exercise? Last few weeks I'm trying to walk 3 miles a day.
- Tracking Device Questions
  - What type of fitness tracking device do you use? (App, watch, etc.) I have the Apple watch but I forget to turn on the outdoor walk feature, I'm not sure how to use it.
    - What is the initial reason that made you get the device? It can tell me how much I walked, and it holds me accountable.
  - What is the most used feature on your fitness tracker? The heart rate, picking up calls, breathing, and stand-up time. Don't know how to use the steps or see how many steps I've taken.
    - How often do you use that device? Not likely, because I forget to charge it, wear it, or it comes in the way of cooking and cleaning.
  - What would make you hesitate to use fitness applications? The security/privacy, click and start feature, learning process.
  - Are you willing to spend money to reach your exercise goals? If it's free then it's great! But a small amount is not a problem if it acts like a private trainer.
    - If so, how much would you be willing to spend? Yearly subscription - $50, Monthly - $5 (like this better), If there are additional features like Zumba time, nutrition, Yoga, Mindfulness, and things like that I will be more willing to pay.
  - Have you struggled with being able to reach your fitness goals in the past? Yes.
  - What incentives would motivate you to make healthy lifestyle changes using a fitness tracker?
    - For example: sharing with friends and new people I meet on the app, planting trees, discounts, loyalty programs, etc.
    - Excited about fitness so it makes me want to work out! It gets super boring to just walk
  - Have you cheated when using the activity trackers? No, I haven't I don't know how to cheat on it.
- Thoughts on our current solution
  - I like this idea, it's something I would certainly do. I would pay $50 a month and walk to pay it off.
  - Her school has an insurance program that works just like this! It's successful.
  - If you do this through insurance, it may grow the company's scale.
  - This would be perfect for kids with special needs.
    - Incorporate sensory breaks and haptics like vibrations
    - As well as a social platform that can attack social skills

Interview Participant #2

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age? 60
  - Gender? (Optional) Male
  - Occupation? IT Consultant
  - How often do you exercise? A couple times a week, usually walking or biking.
- Tracking Device Questions
  - What type of fitness tracking device do you use? (App, watch, etc.) I use an Apple Watch and I use the exercise setting on my apple watch. I also use the Pacer app on my phone and that keeps track of my steps and GPS location to tell me how far it goes.
    - What is the initial reason that made you get the device? Because its a cool Apple watch that can work with my phone over bluetooth so the two can work together. The battery lasts several days. I like the watch interface and there are many different settings and features on the fitness app.
  - What is the most used feature on your fitness tracker? The Fitness app
    - How often do you use that device? Almost every day
  - What would make you hesitate to use fitness applications? I wouldnt use a fitness app if it was sharing my data without my knowledge or if the results were not private (data privacy issues, dislike TikTok storing my data) or accurate. I only want the data to be accessible to an authorized user like myself.
  - Are you willing to spend money to reach your exercise goals? No, because I'm cheap and I think that value of the service isn't worth it because lots of things you can do to get exercise without spending money, like going on a jog or to a park. I already spend money on a membership.
    - If so, how much would you be willing to spend? N/A
  - Have you struggled with being able to reach your fitness goals in the past? Yes, I want to get exercise 5 days a week but I frequently miss out on that because of work.
  - What incentives would motivate you to make healthy lifestyle changes using a fitness tracker?
    - For example: sharing with friends and new people I meet on the app, planting trees, discounts, loyalty programs, etc.
    - Making it like a game, where its fun and interactive. I would want it to praise you for progress and give you rewards or points when you do stuff. I don't want it to involve money at all, make it completely free. I would be more excited and interested then to go workout.
-
  - Have you cheated when using the activity trackers? No, why would I cheat myself?
- Thoughts on our current solution
  - I like the incentives ideas but I personally wouldn't use it unless the app or device itself is engaging and fun. I think if you make it into a game it would get people to use it without making them pay too much money.

Interview Participant #3

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age? 18
  - Gender? (Optional) Male
  - Occupation? High School Student
  - How often do you exercise? Every day
- Tracking Device Questions
  - What type of fitness tracking device do you use? (App, watch, etc.) I use the Garmin Forerunner watch
    - What is the initial reason that made you get the device? I'm a competitive runner and Garmin is very good at tracking running and gives a lot of data related to that.
  - What is the most used feature on your fitness tracker? The GPS to keep track of my running
    - How often do you use that device? Every day
  - What would make you hesitate to use fitness applications? Sometimes a fitness app will upload online so everyone can see where I have been running and it is a privacy concern.
  - Are you willing to spend money to reach your exercise goals? Yes, I spend money to reach my fitness goals with the fitness watch, running shoes and other equipment.
    - If so, how much would you be willing to spend? No more than $150 because that is how much my running shoes cost.
  - Have you struggled with being able to reach your fitness goals in the past? Yes, I have pretty big goals for myself and try to do too much and can cause myself to get injured
  - What incentives would motivate you to make healthy lifestyle changes using a fitness tracker?
    - For example: sharing with friends and new people I meet on the app, planting trees, discounts, loyalty programs, etc.
    - Being healthier makes quality of life better, also the validation of being an athlete are all I need to motivate myself
-
  - Have you cheated when using the activity trackers? Maybe a little because of where I wear the watch when I turn it adds a little extra distance
- Thoughts on our current solution
  - I like the idea of publicly posting my fitness goals, first to prove to my coaches that I actually ran and also to see what my competitors are doing.

Interview Participant #4

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age? 26
  - Gender? (Optional) Male
  - Occupation? Architect
  - How often do you exercise? 2~3 times a week
- Tracking Device Questions
  - What type of fitness tracking device do you use? (App, watch, etc.) Apple Watch
    - What is the initial reason that made you get the device? It was a gift for my birthday
  - What is the most used feature on your fitness tracker? The notification feature is what is used most. It helped me to check the messages and calls I got during the work
    - How often do you use that device? Almost 8 hours a day
  - What would make you hesitate to use fitness applications? It feels bad when I see the progress bar staying at the very bottom of the graph all the time.
  - Are you willing to spend money to reach your exercise goals? Yes, I already spend money on exercise, the fitness center.
    - If so, how much would you be willing to spend? 35~45 dollars per month, just like the .
  - Have you struggled with being able to reach your fitness goals in the past? Yes, all the time. It is really challenging to keep up with my goal while I suffer from work.
  - What incentives would motivate you to make healthy lifestyle changes using a fitness tracker? I would love to find an exercise that I can truly enjoy and does not take a lot of time.
    - For example: sharing with friends and new people I meet on the app, planting trees, discounts, loyalty programs, etc.
  - Have you cheated when using the activity trackers? I'm not sure what measure the success of a fitness tracker, but I keep trying to work it out as possible.
- Thoughts on our current solution
  - I think showing what others are doing can really encourage me to keep working out since it can be a great motivation. But the most important thing is that it has to be fun to use.

Interview Participant #5

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age? 22
  - Gender? (Optional) Male
  - Occupation? Student (Golf team)
  - How often do you exercise? Everyday minimum of 2 hours not including golf practice.
- Tracking Device Questions
  - What type of fitness tracking device do you use? (App, watch, etc.) What is the initial reason that made you get the device?
    - Since I am on the golf team for my school I like to use Garmin smart watch (S62). The initial reason for me to get this device is because it has a lot of golf function in the watch that can help me with my practice and workouts.
  - What is the most used feature on your fitness tracker?
    - The GPS for golf courses, shot trackers, and tempo clock.
  - How often do you use that device?
    - Everyday, aside from the days I play in competition we are not allowed to use GPS watchs on competition.
  - What would make you hesitate to use fitness applications?
    - They don't offer anything that I would require.
  - Are you willing to spend money to reach your exercise goals?
    - For exercise goals I wouldn't for the golf function I am spending money on it.
  - If so, how much would you be willing to spend?
    - I am spending about $99 an year for the golf function.
  - Have you cheated when using the activity trackers?
    - The whole point of me using this watch is so that I won't cheat my practices and know my golf game for what it is.
- Thoughts on our current solution
  - I really don't care about running this might not be the product for me, but I can see that by posting the results online and having it open so that it is viewable by everyone would motivate a lot of people.

Interview Participant #6

Questions

- Introduce yourself
  - Tell the participant about our project and ask if they agree to take part in the survey.
- Basic screening questions
  - What is your age 55
  - Gender? (Optional) Male
  - Occupation Golf business
  - Do you know anyone who is Autistic. Yes, I have two child who is Autistic
- Tracking Device Questions
  - Have you ever tried using a smart watch for your child?
    - Yes, got both of them Apple watches for each of their birthdays.
  - What were the benefits of the watch?
    - They liked it a lot, and it was easier for me to keep track of where they are.
  - What were somethings you did not like about the watch?
    - With the amount of activity my children has I had to replace the watch screen twice it was too weak and easliy broken. Some other thing that kind of bothered me was the price of the bands it was kind of expensive. (He had to buy a lot of bands, because his children wanted different color so often)
  - What feature did you find yourself using the most?
    - I personally don't use the Apple watch, but I have seen my children doing a lot of things with it. I personally use it to make sure that they are safe and they are at a safe place.
  - Do you think the watch helped your child get more exercise?
    - Yes, my children liked the fact that they could fill the whole cricle and finish the exercise and get a notification that said good job.
- After giving information about our product
  - Would you be ok with schools using such device?
    - I would love to see such device in schools. I really think that this could help with focus spans and general education for my children.
  - Do you think this would be helpful?
    - Yes, I think that this would be helpful.
  - Do you have any issue with the product Right now?
    - Payment. I don't think our schools are funded enough to spend extra money in special educations, and parents won't be able to help out a lot.
  - Would you change anything about the product?
    - Maybe instead of buying it out I would make some sort of rental option.
- Thoughts on our current solution.
  - It really looks like a good idea. As a parent who has used the smart watch on my child I know that it can help if you know what you are looking for and looking at. People would need to know what the data means and how this can help as a parent I did a lot of research and learned what is best for my child I am not sure if the teachers would do the same for my child.

DESK RESEARCH

73% Decline in Physical Activity Among Autistic Children Ages 9-13

In our research regarding physical activity and autism, we found two insightful articles that shed light on the issue. According to a study featured on News Mxedical Life Sciences, children with autism **experience a 73% decline in physical activity** between the ages of **9** and **13**, compared to a **51% decline among neurotypical children.**

> A recent study from Oregon State University has found that to best help kids with autism maintain healthy rates of physical activity, interventions should be targeted during the ages of 9 to 13, as that's when kids show the biggest drop in active time.

This significant decrease in physical activity might exacerbate the challenges faced by autistic individuals, affecting their overall health and well-being.

> A meta-analysis that looked at 16 different studies found that there were "robust benefits of physical exercise on the patients' motor and social functioning." To be more specific, they saw a 35% improvement in the ASD symptoms as a result of exercise.
>
> They went on to say that it wasn't because the physical activity tired the kids out, because their on-task behavior, academic responding, and appropriate motor behavior increased after the exercise.

Harkla further highlights the importance of exercise for children with autism, suggesting that it can improve **motor skills**, **social interaction**, and **behavior**. The article also emphasizes the need for tailored exercise programs to better suit the unique needs and preferences of autistic children.

Competitive Analysis

Purpose: A good UX designer always researches products that closely fit into the field of interest of the one that they're designing. We wanted to conduct what kinds of smart watches exist for special needs, what people exist, and what is the limitation of existing products/services.

SPACETALK Adventurer

fitbit

Results: Currently, in the market, more than 30+ companies produce fitness trackers and applications that work with their products. However, the main target audience of this product is able-bodied people. Yet, even certain levels of exercise can not only reduce the symphony of autism and increase productivity. Special needs children often need help with using the fitness tracker due to its bulky design and lack of features that can decrease the user experience.

Brainstorming

Features

- Timer for brain breaks
- Goal steps per day
- Fidget toy on the watch
- Location Tracker
- Heart Rate
- Steps
- Waterproof
- Scheduler
- Time
- emotion tracker

bands with different colors!

https://www.androidauthority.com/circular-vs-square-smartwatches-3075815/

Persona

Purpose

To better understand our target users, special needs teachers and students, and direct our attention to a specific design space we created 2 personas. We listed their bio details, personality, user story, goals, and pain points.

Sarah

About

Age	38
Occupation	Special Education Teachers
Status	Married
Location	Indianapolis

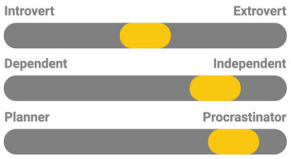
User Story

As a 38-year-old teacher of neurodivergent students. I really enjoy working with my student, but sometimes it is challenging to manage the entire class by myself. I need a solution that helps my students engage in regular exercise during PE class, while accommodating their unique needs and challenges, so that they can perform their best in other areas.

Goals

- Adaptive and engaging PE program that caters to the unique needs of neurodivergent students.
- Improve students' overall performance in other subjects by incorporating regular exercise in their daily routine.

Personality



Pain Points

- Difficulty in managing the entire class by oneself, especially during PE classes.
- Addressing the diverse needs and conditions of neurodivergent students during physical activities.
- Ensuring students remain motivated and interested in participating in physical exercises, despite their individual challenges.

Jean

About

Age	14
Occupation	Student
Location	Indianapolis

User Story

Hi! My name is Jean, a 14-year-old student who loves participating in various activities with friends and my teacher, Sarah. Playtime is my absolute favorite part of school, and I often find it hard to take breaks when I'm fully engaged in play. However, I understand the importance of balancing play and rest in order to maintain a healthy daily routine. I'm looking for something that can help me achieve this balance and make the most of my time at school.

Goals

- Balancing daily routine that incorporates both playtime and rest, ensuring overall well-being.
- Strategies that can help manage time effectively, allowing for a more structured and enjoyable school experience

Personality

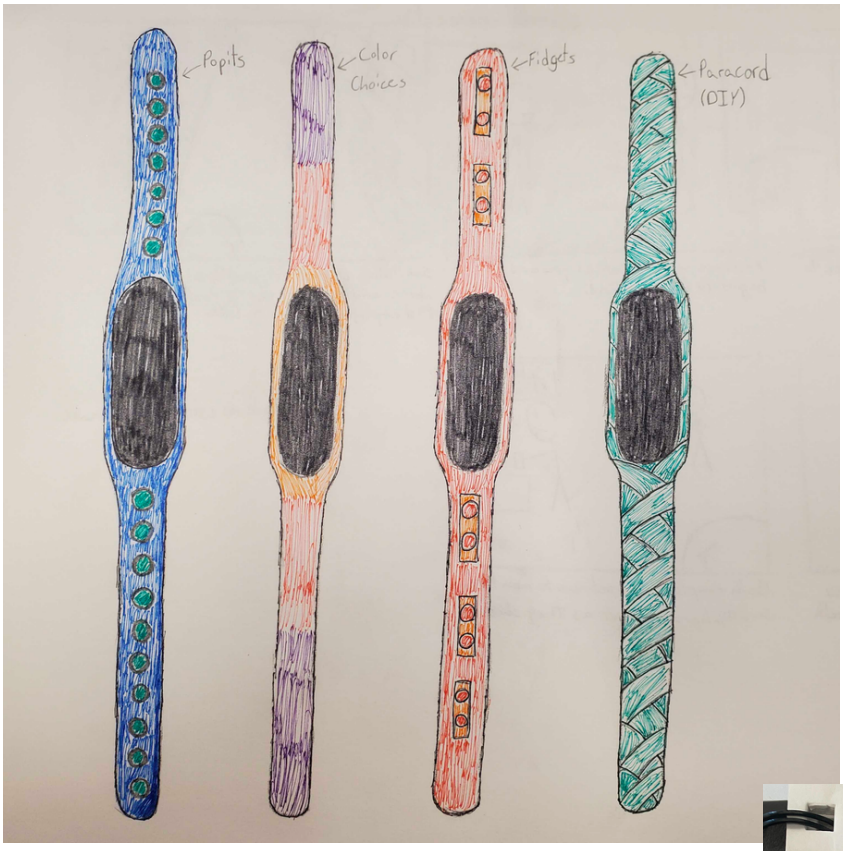
Pain Points

- Difficulty in remembering to take breaks during playtime, leading to potential fatigue or decreased focus in other activities.
- Struggling to find a balance between play and rest, which may affect overall well-being and academic performance.

Reflection

From the insights provided by Sarah and Jean, we gained a better understanding of our stakeholders and the current challenges they face. Based on this information, we identified issues/problems and used them as a foundation for developing our initial solution.

Sketches



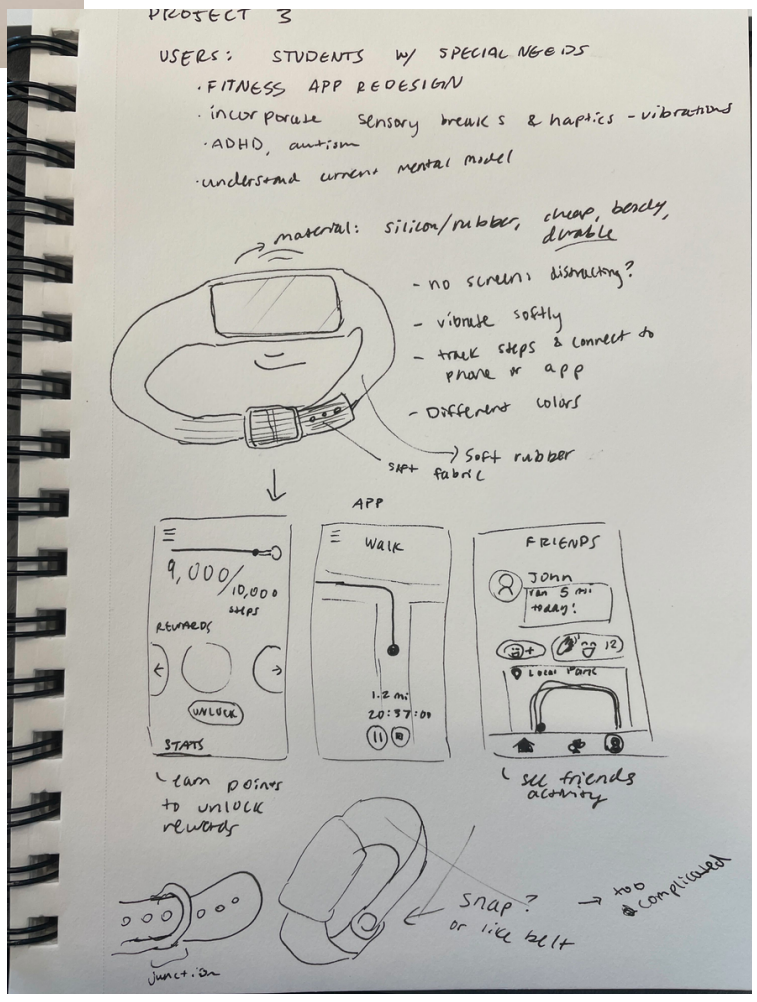
Student watch bands sketch pictured below

Features:

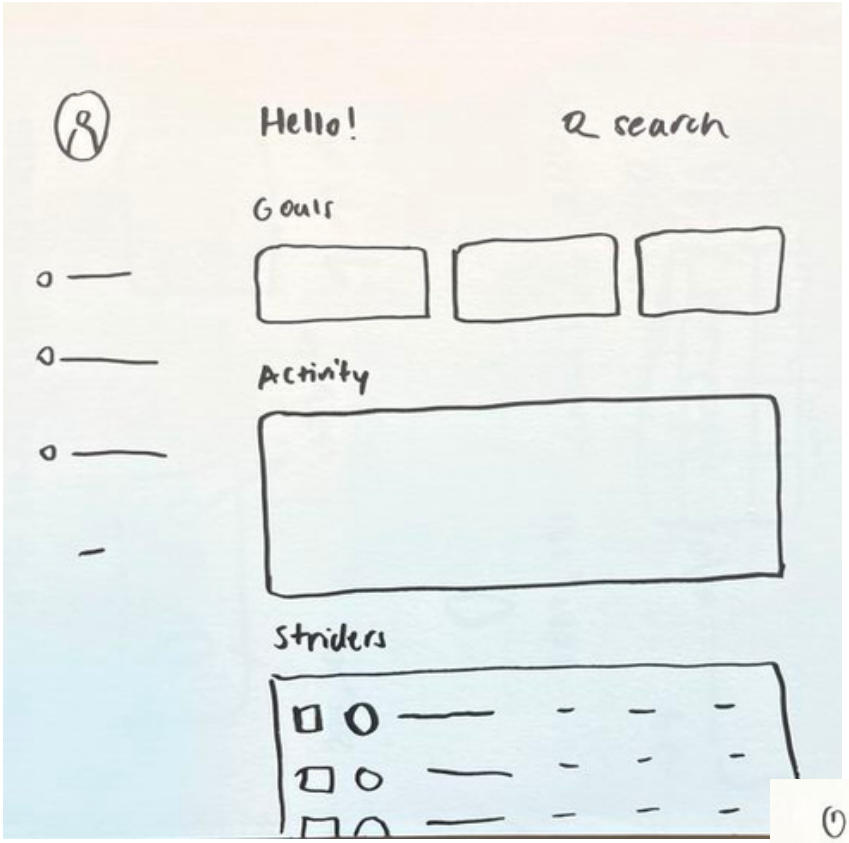
- Popits
- Fidgets
- Paracord
- Band color customization
  - Improve attention and focus
  - Incentivize younger students to want to use the watch

Initial watch sketch pictured to right:

- Watch application featuring:
  - GPS/location tracker (later removed due to privacy concerns with users)
  - Reward and goal system
- Adjustable silicon and Paracord band
- Haptic sensations for engagement



Sketches

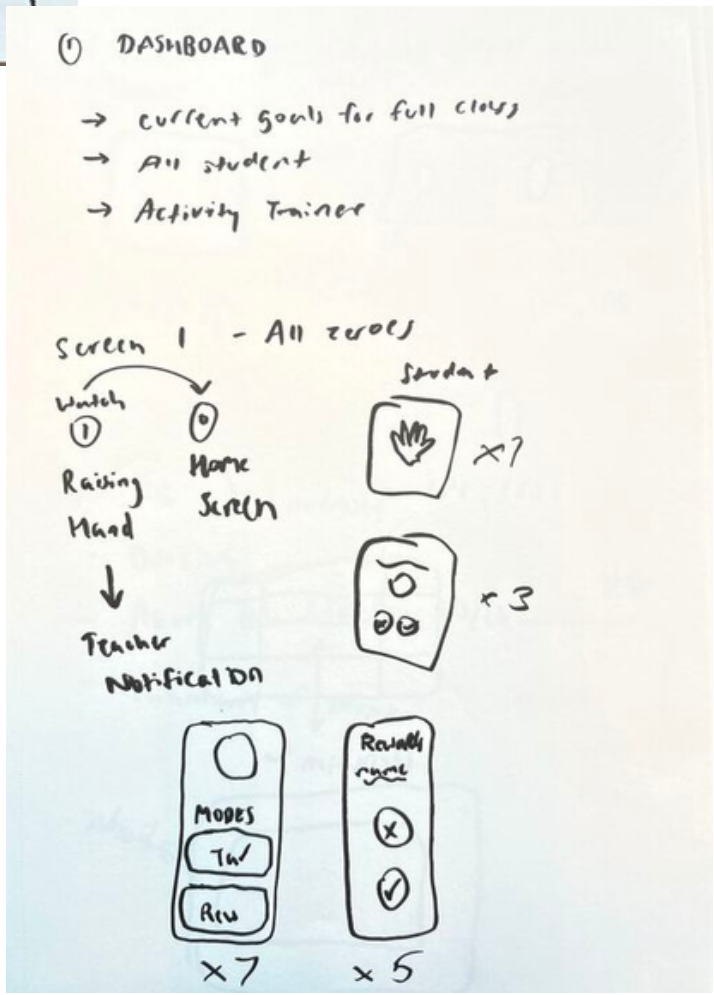


Sketching after dashboard concept testing

- New navigation bar with an account showing
- search a student's capability
- notification bell

Interfaces needed to complete multimedia component

- Dashboard
  - current and individual progress goals
  - activity week/month recap
- Watches
  - Student: Home, Reminder, Goal Complete, Updated Home 1, Rewards Mode, Raised Hand, Updated Home 2
  - Teacher: Home, Rewards Mode, Accepting answer



Concept Testing Protocol

Purpose

This activity is done to iron out the details of what's included in our concept testing process, so we can conduct similar tests for all participants.

Goals

Have the users evaluate the design, content, structure, and methodology of the product, by answering questions, giving opinions, and asking questions.

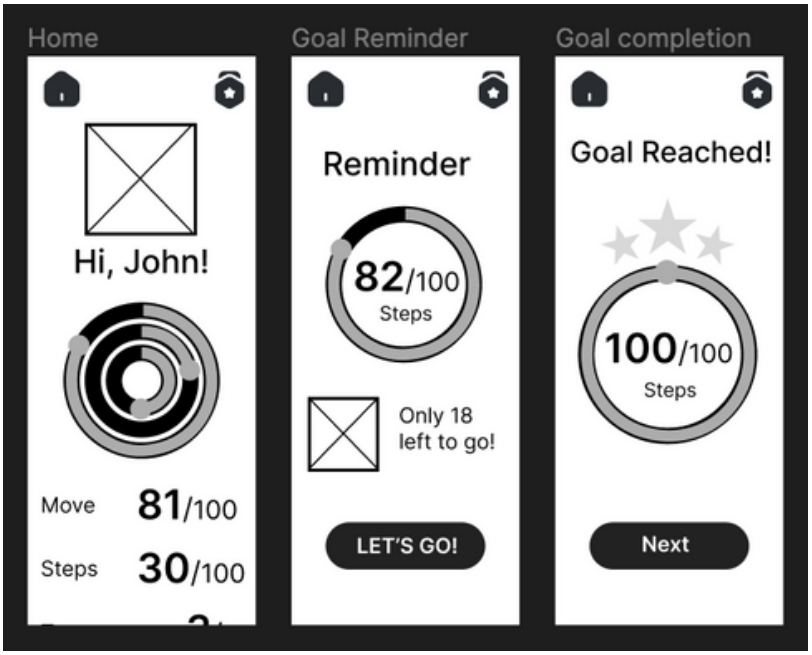
Questions

- Introduce yourself
  - Tell the participant about yourself and the project background
- Basic screening questions
  - What is your name?
  - Occupation?
  - Years of experience?
- Project Overview
  - Describe project goals, scope, and purpose
  - Review secondary research and the need for the product
- Independent Time
  - Give them 5 minutes to go through the interfaces and build their own mental model
  - Have them say their thoughts out loud and show brutally honest emotions when using the product
    - (Tester should note down feelings and actions)
- Prototype Walkthrough
  - Play multimedia component
  - Show dashboard application and watch interfaces
    - Have them say their thoughts out loud and show brutally honest emotions when using the product
      - (Tester should note down feelings and actions)
- Ask them if they have any last-minute thoughts and questions.
- Thank them for their participation

Reflection

This protocol was an effective way to ask our stakeholders their thoughts on the design presented in front of them. We'll use their feedback to make iterations.

Prototypes



Watch Interface Wireframe pictured to the left.

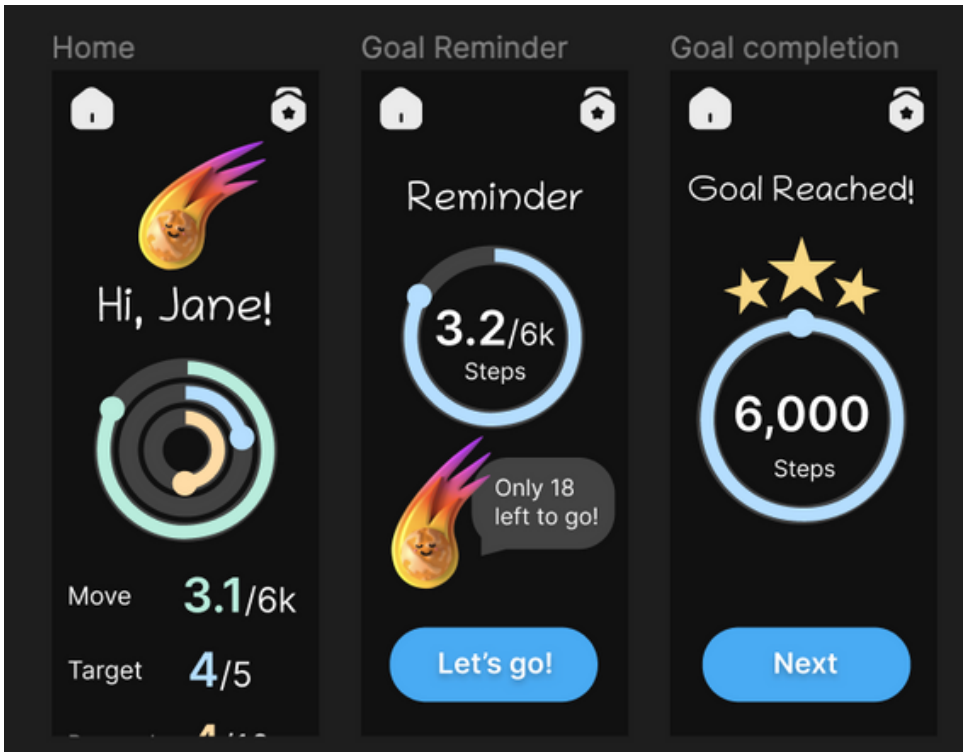
Features:

- Track users movement, daily steps, progress towards goals, and rewards
- Assigned characters for engagement
- Watch vibrates and alerts user at goal reminders and when a step goal is reached

Student Watch Interface final hi-fidelty prototype pictured to the left.

Changes:

- Replaced 'move and steps' to an overall 'Move' score that tracks users steps and compares to a daily step goal.
- Why? In concept testing, users were confused with the difference between the 'move' and 'steps' goals.

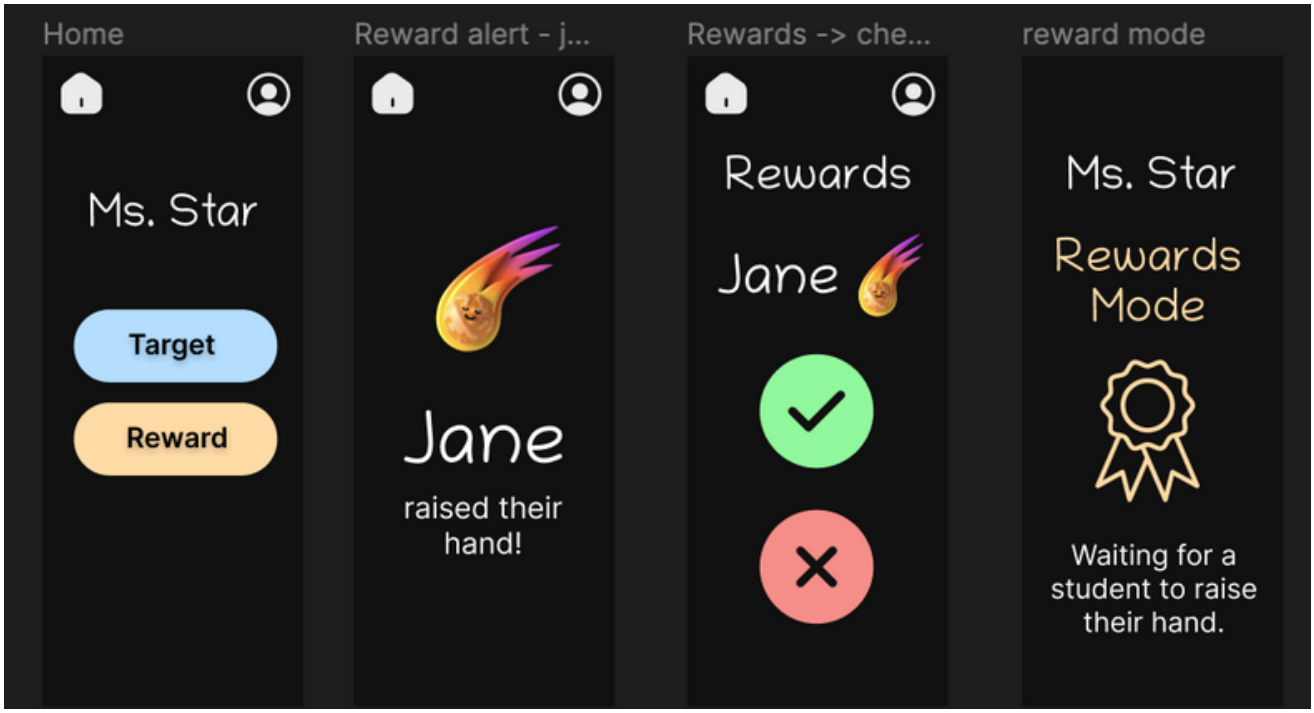


Here there are 3 pages:

- Home: see summary of daily movement, target goals, and rewards
- Goal Reminder: Notify user of unfinished activity goals
- Goal completion: Notify user when a goal is reached

Prototypes continued

Pictured below is the Teacher's watch interface hi-fi prototypes.
From concept testing with our dashboard application, our users wanted a way to monitor student activity while still having the mobility to move around the classroom and interact with students. To overcome this problem, we designed an additional watch interface for physical fitness teachers.

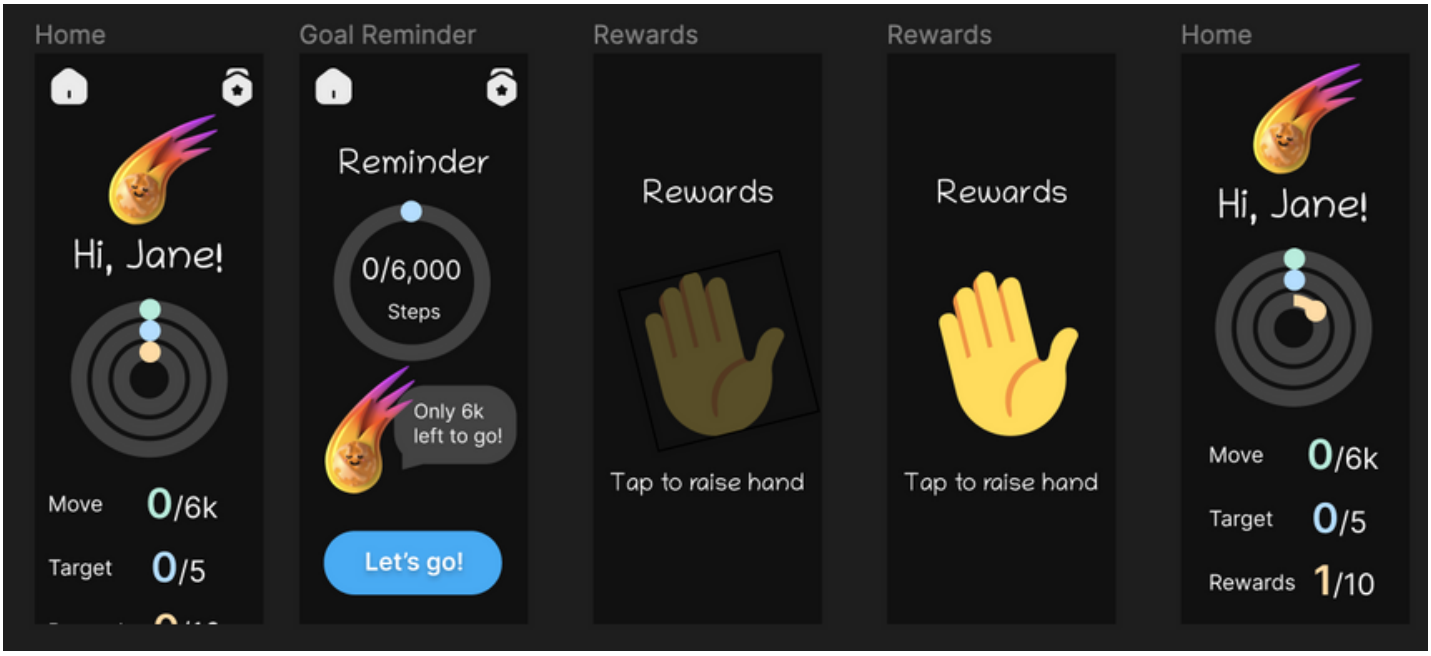


Features:

- Teachers can go into target mode, where they give target goals to students.
- Rewards mode: teachers are alerted when a student raises their hand and can answer student's questions
    - Rewards can be given after a question is answered correctly.

Prototypes continued

Below is additional interfaces that we designed for students.
The initial screens shows a hypothetical home. screen when no progress has been made.
The Rewards screens allow students to alert teachers when their hand is raised
The final Home screen shows an updated progress summary after a reward was earned.



To the left is the Teacher's dashboard hi-fi prototype.

Teachers can see an overview of their students' activity progress over a week, including total movement, target goals reached, and rewards given.

A second page allows teachers to view individual student's activity levels, however, a problem we encountered is data privacy issues. Some parents may not want to share their child's health data with a teacher.

Multimedia Comp. Script

Hi! I'm Ms. Star! I've been teaching neurodivergent students for more than 10 years now! Before utilizing STRIDE, my main difficulty when teaching was trying to align my students' sensory break times as well as keeping them focused throughout the school day. I noticed that my students were not able to be active in and out of school, like the rest of the students. So, I needed a method that would be able to keep them engaged, while helping them stay fit!

After spending time learning about new techniques and tools, I came across STRIDE! A smart activity wrist tracker designed specifically for neurodivergent students.

The product comes with a box of watches that all connect to the main teacher's dashboard and watch.

The dashboard home screen gives users a quick summary of the activity progress.

Currently, this morning all progress goals are at zero since the students haven't gotten to class yet. To change the goals, the teacher can click on the boxes or go to the edit activity page. The weekly summary is will update as soon as the students have finished their day.

Each student's individual goals and progress are shown below in red, yellow, and green for easy understanding.

The watches all connect to the main teacher's watch.

Let's focus on Jane.

During the day, the watch will send reminders to the students, updating them on their progress. Once a goal is completed, the watch will vibrate and alert the student.

The Target and Reward category is controlled by the teacher. For example, say I'm teaching about the phases of the moon. During this period I can ask questions during my lectures to see if my students are understanding the topic. If Jane wants to respond, they can simply tap the hand icon on the watch and notify me. If she answers correctly, my screen will go back to the waiting period on the Rewards mode, and add 1 point to Jane's rewards goal.

You can continuously check the progress of the class throughout the day.

I highly suggest special needs teachers use STRIDE! It is a great resource to help motivate your students and help them stay active. Our students actually look forward to hitting their step count and finishing their target and reward goals.

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