Sample Data Task for the NYC Dept. of Education UX Analyst Position

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Scoping the Project

1. The Assignment

To create a Minimum Viable Product (MVP) for an app to help school administrators measure the physical health of their students.

2. Initial Thoughts and Approach

The first step in approaching this assignment was to define what exactly the "physical health of students" consists of. Physical health can cover many different criteria, including physical fitness, medical health, mental health, diet/nutrition, and more. Ideally, the bounds of "physical health" would be defined by our users themselves, as gleaned through interview questions about how they view physical health and what their main thoughts are when they hear the term. But, considering that many of these criteria involve other outside individuals (doctors, social workers, parents, etc.), for the sake of this exercise I decided to **limit the scope of "physical health" to physical fitness** as attended to by Physical Education instructors in their classes.

By limiting the scope as such, the solution can focus primarily on concrete, measurable data as recorded by PE teachers in their classes (or even by the students themselves). Within this scope, my initial assumption is that there is currently no easy way for teachers to keep track of student fitness data, with so many classes and so many students under their tutelage. Thus, **how might we enable teachers and administrators to quickly and easily enter and/or examine student fitness data in order to notice changes over time?**

3. Users

With this scope in mind, the proposed solution has two primary users - **school principals** and **Physical Education teachers.** Through this application, principals and teachers should be able to manage fitness data for all their students and classes within their school.

Secondary users would be **students** themselves. Student access would be limited to accessing one's own data, and entering any data or completing any assignments requested by teachers.

4. Research

With these users in mind, we could conduct initial research in several ways to help confirm our assumptions and develop our ideas. First, we would conduct a detailed **competitive analysis** with other fitness tracking applications such as Fitbit and FitStats to see what industry standards already exist for fitness tracking, recording, and organizing.

Then, we would conduct extensive **user interviews** with our primary users, principals and teachers, to gather insights about their experiences around student fitness from their respective points of view. From this information, we could create an **affinity map** to amalgamate insights from our interviews to discover trends across our user base, allowing us to identify the actual problems we would like to solve. We could also create **user personas** to embody our users' desires, needs, pain points, and habits, allowing us to make sure we're designing for our actual audience.

5. Assumptions about Research Results

Without being able to conduct the above-mentioned research, we must make assumptions about what that data would yield in order to move on to the design phase of this exercise. The primary assumption I made to transition into the design phase is that **teachers need a quick way to** In general, the main assumption for the direction of this MVP app would be for principals and teachers to record, monitor and visualize student progress in their PE classes. In terms of functionality, I decided to focus on the first point of contact between these users and the app: teachers entering fitness data and being able to create visualizations to assess student progress over time. Additionally, there would be a forum section for educators across the entire school system to exchange and discuss ideas, allowing them to share successful practices and ask for and receive helpful advice.

In general, with this app, principals would be able to manage and supervise the general measuring of physical fitness, as well as communicate with teachers within their school and others via the forums (and perhaps later a messaging system). Teachers would be able to create class and student entries, add metrics to keep track of for each student and class, and create and access visualizations of student progress over time. In addition, students would be able to complete and submit assignments or requested data entries from their teachers, as well as view their own tracked fitness data.

Principals would be able to:

- Create classes and students, assign teachers/students to classes
- Collate and access school and class physical fitness data
- Access message forums to communicate with other principals and teachers

Teachers would be able to:

- Create new students and add them to class rosters
- Customize, add, and edit data types and values to be recorded for each class
- Create assignments and/or request data from students
- Access individual student performance data
- Create, save, access, and edit student data visualizations
- Access message forum to share and discuss ideas with other PE teachers in the same or other schools
- Access change logs for all student entries

Students would be able to:

- View all of their own data
- Create, save, access and edit their own visualizations
- Complete assignments or enter other requested data from teachers

Design Phase

1. Design Approach and Philosophy

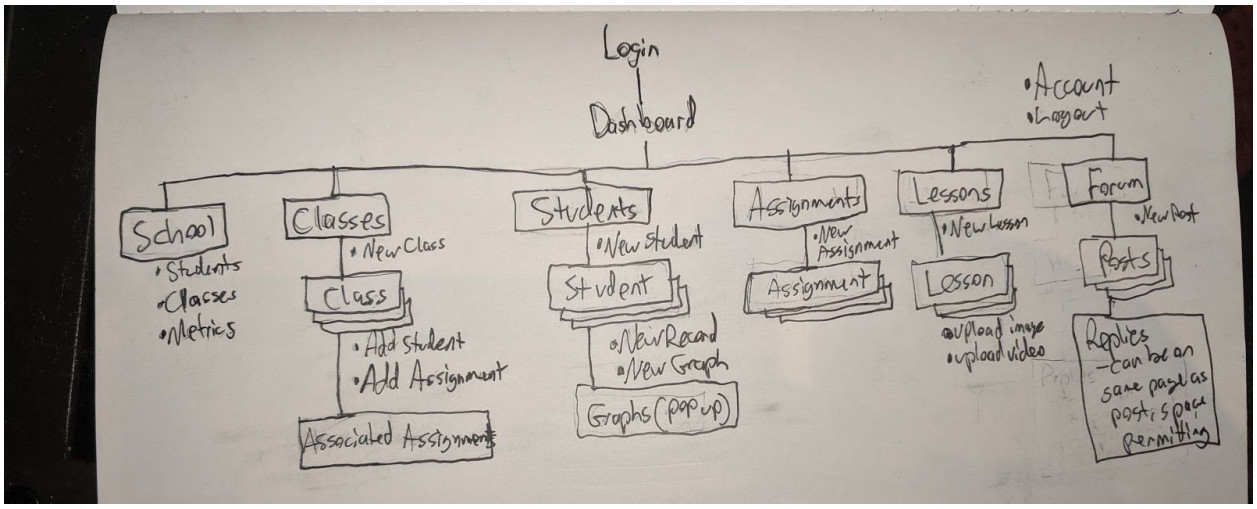
In terms of **systems design,** I approached the design of app using an "**object oriented**" design principle. Coming from engineering principles, this system allows for easy-to-navigate data structures consisting of an "object," in this case a "class" or "student", and their attributes, like "name", "age", or "1 mile time" with associated values. For each object, a user with the proper permissions should be able to **create, read** (view)**, update** (edit)**,** or **delete** an object. These functions are collectively referred to as **CRUD.** In this framework, clicking on any object name should take you to the "read" page for that object, allowing for easy navigation between different page views and site sections.

To accomplish the primary goal of **recording and visualizing student fitness data over time,** the primary actions in this app are for teachers to create metric names (like "1 mile time" or "sit-ups/minute"), enter their values, and be able to continually update these values with new entries over time. From these entries, the app would include a feature to instantly create graphs to visualize the progress for any student over time. This would enable teachers to easily see fitness progress (or regression) over the course of a semester or other time period. Principals in turn would be able to monitor all classes at his or her school, as well as access data about general fitness progress for students over many years to get a bigger-picture view of school performance.

Each group of objects, like “Classes” or “Students,” would have its own index page with a list of all such objects available to the account holder. Clicking on any individual instance of a class, student, etc. will take the viewer to the details page for that instance. Anywhere an instance is listed can be linked to the view page for that instance. For example, whether you click on a particular student from the general listing of all students or from a particular class the student is in, you can access the student’s information with one click.

2. Application Wireframe

Below is a hand-drawn outline of the MVP sitemap for this application. The main navigation is broken up into the following sections: **School, Classes, Students, Assignments, Lessons,** and **Forum** (Note: Teachers as a separate section is not included in this MVP, though a Teacher Portal/Index page would be a useful next addition).



In addition to the previously described students and classes, assignments is a section in which teachers can create exams, homework, or tasks for students to complete through the app (such as entering a resting heart rate every evening, for example. Lessons is a section in which teachers can create documents describing exercises or lectures which they can send to students as handouts or use in their instructions. Each lesson document could include images or videos, the latter being viewable directly in the app.

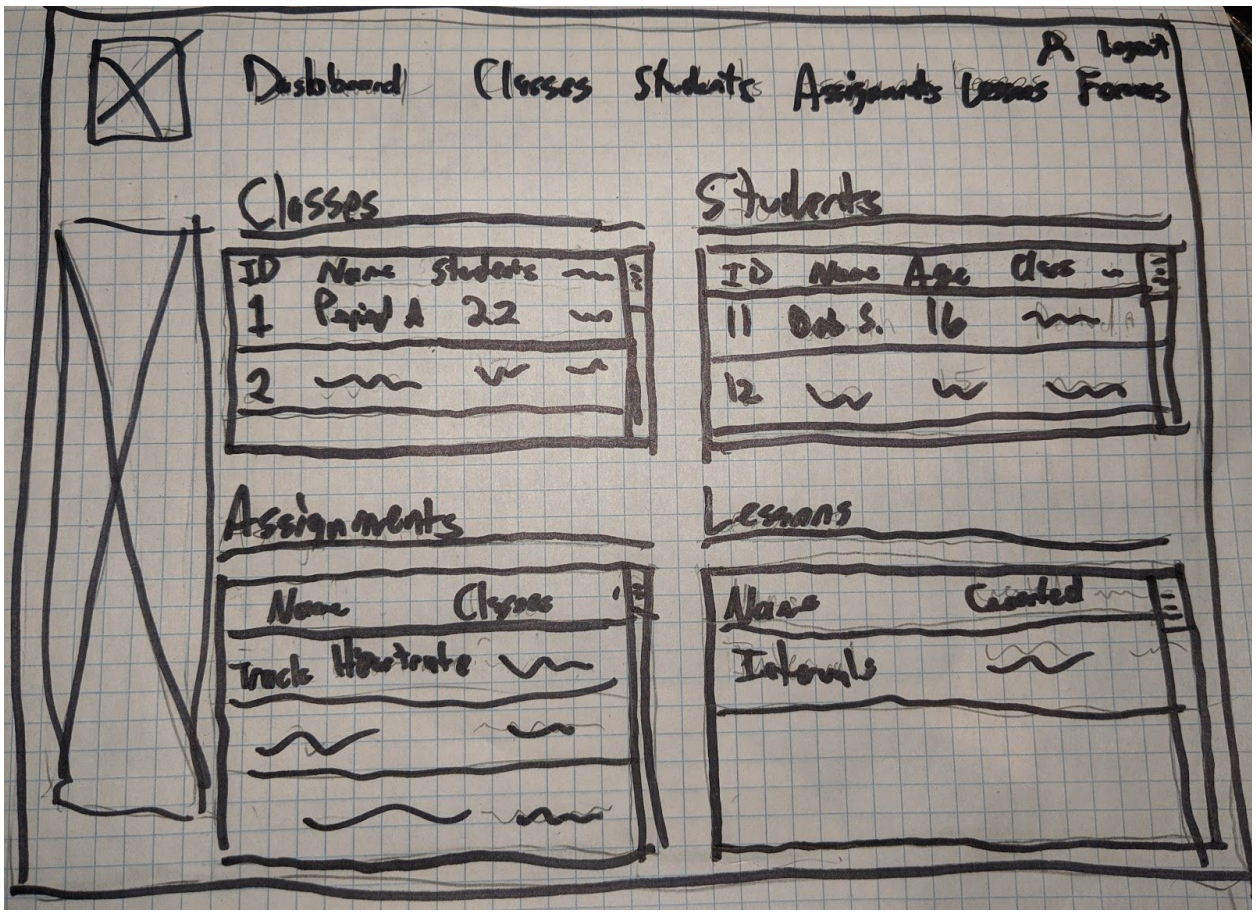
Note: The accessible sections may be different depending on the permissions and access rights granted to each user based on their role at the school. For example, the principal would most likely have access to different data than teachers, particularly under the “School” section. This section would include advanced metrics and measurements over time that the administrator (or teacher, if the teacher is given access) can use to assess overall school progress over a longer period of time. Data such as collected average performance measures across all students for a particular record/event, how those averages have changed from year to year, and other data points may be required, and these needs will certainly change in the future. Similarly, any section can be expanded to include more data and operations.

3. Section Mockup: Students

Included in this section are sketches of the Students section of the application, along with the Home Dashboard screen, which a teacher or administrator would see when he or she signs in. The following pages and associated pop-ups are included below to illustrate the full section of the app:

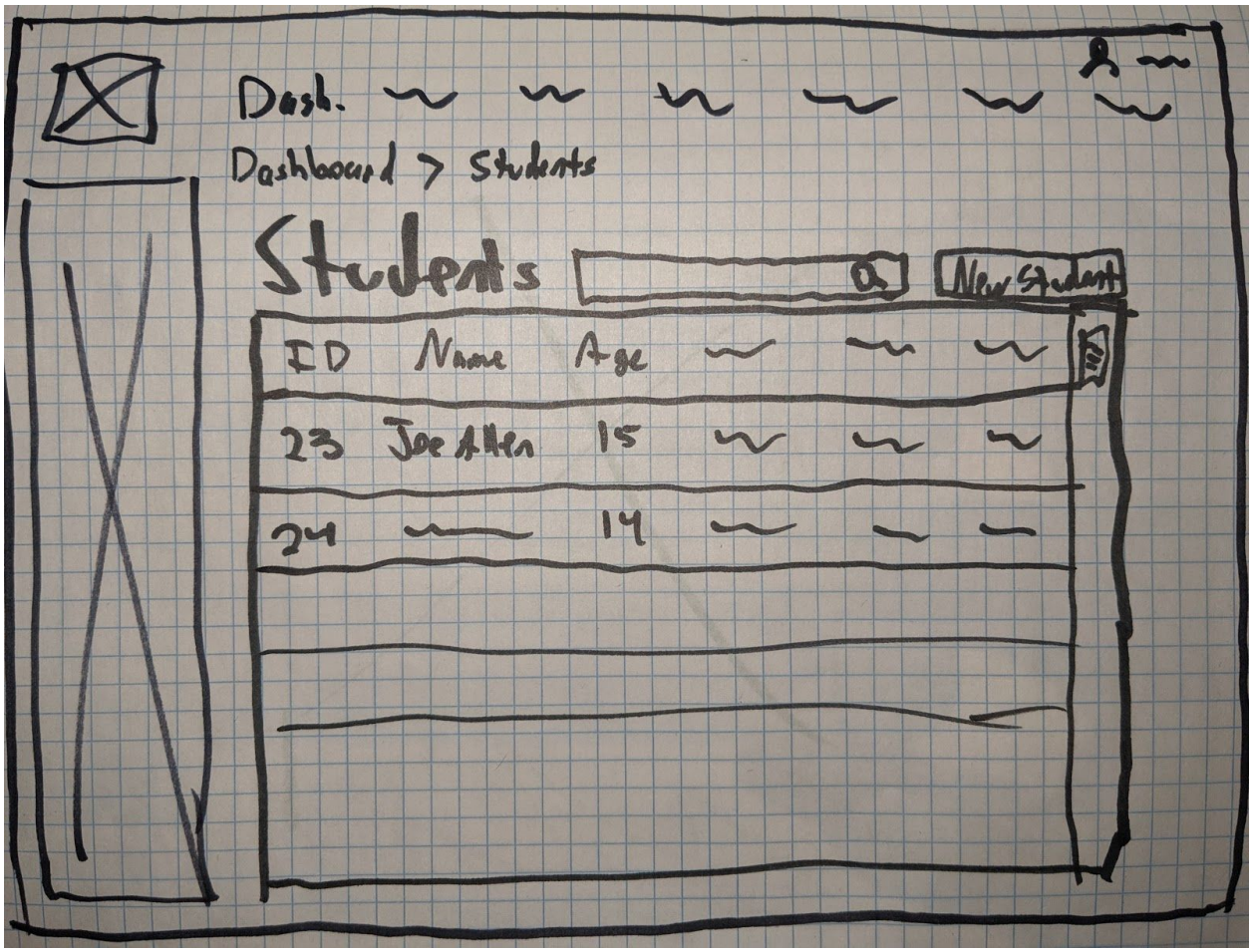
1. Home Dashboard
2. Student Index page
3. Create a New Student pop-up
4. Student Details page
5. Add New Record pop-up
6. Student Graphs index
7. Create New Graph pop-up

3.1 Home Dashboard



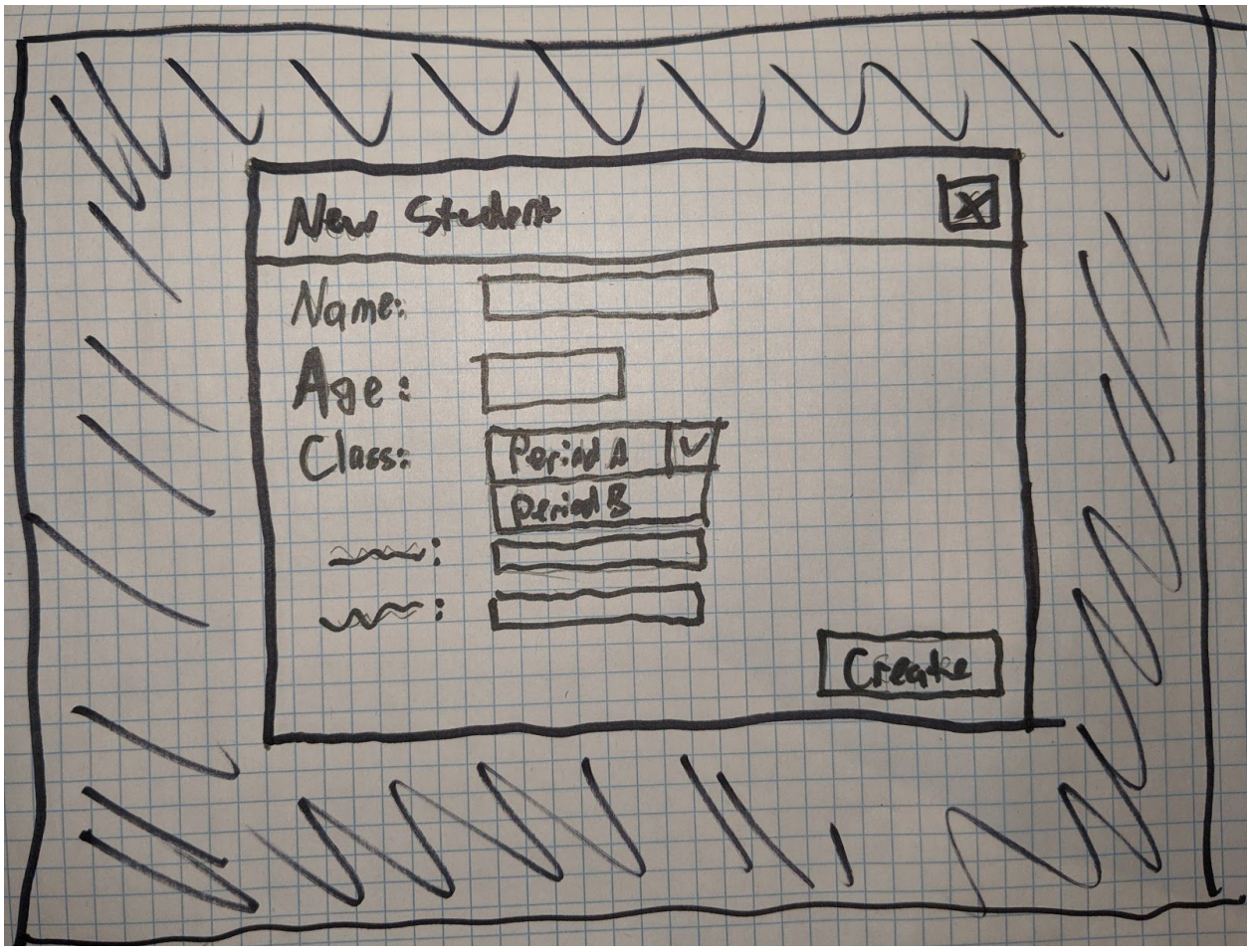
Dashboard screen, which functions as a home page. Note the quick access to scrollable indexes for each of the main app sections.

3.2 Students Index Page



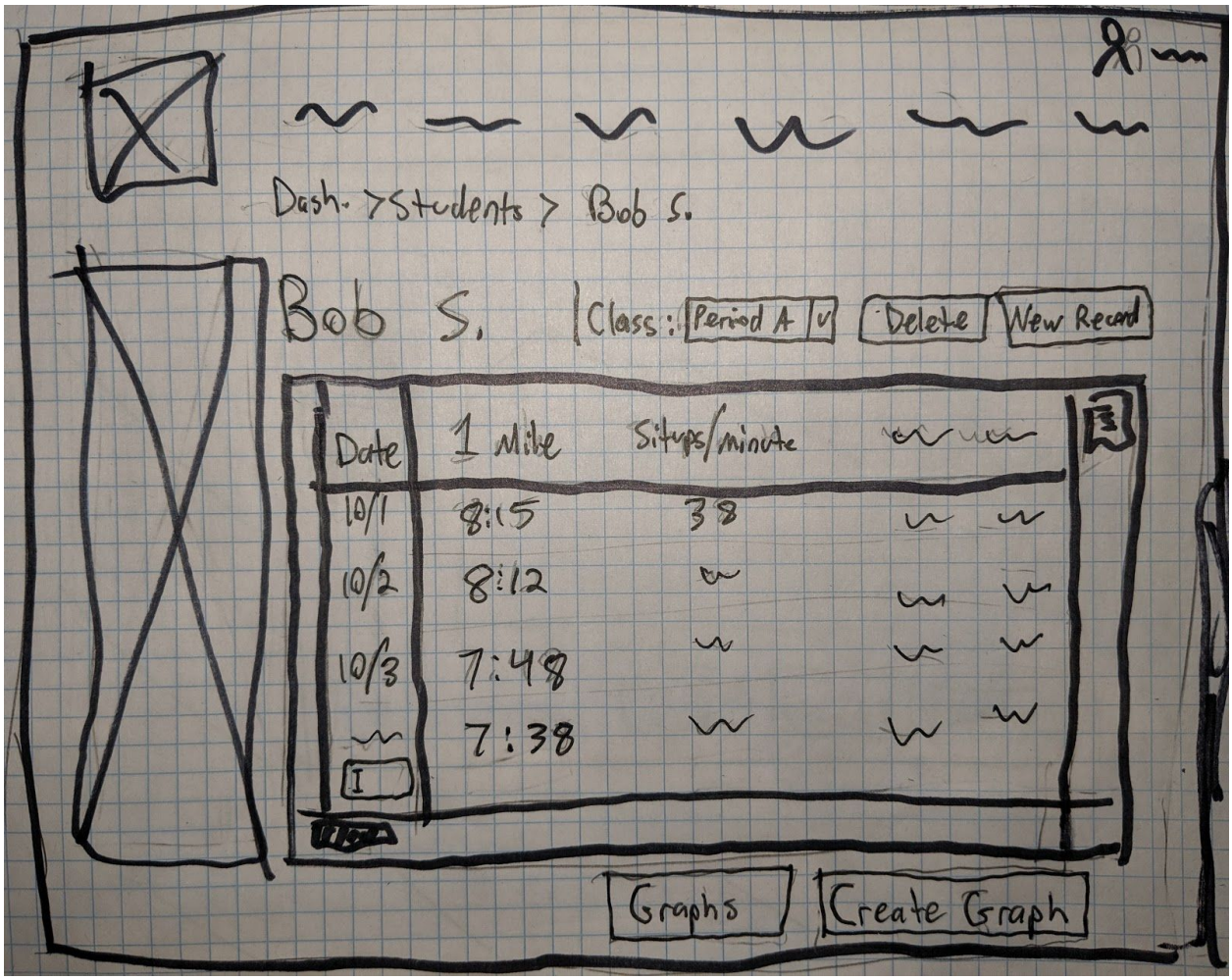
Student Index page. Note the search field to quickly find a student, and a button to create a new student entry.

3.3 Create New Student Pop-up



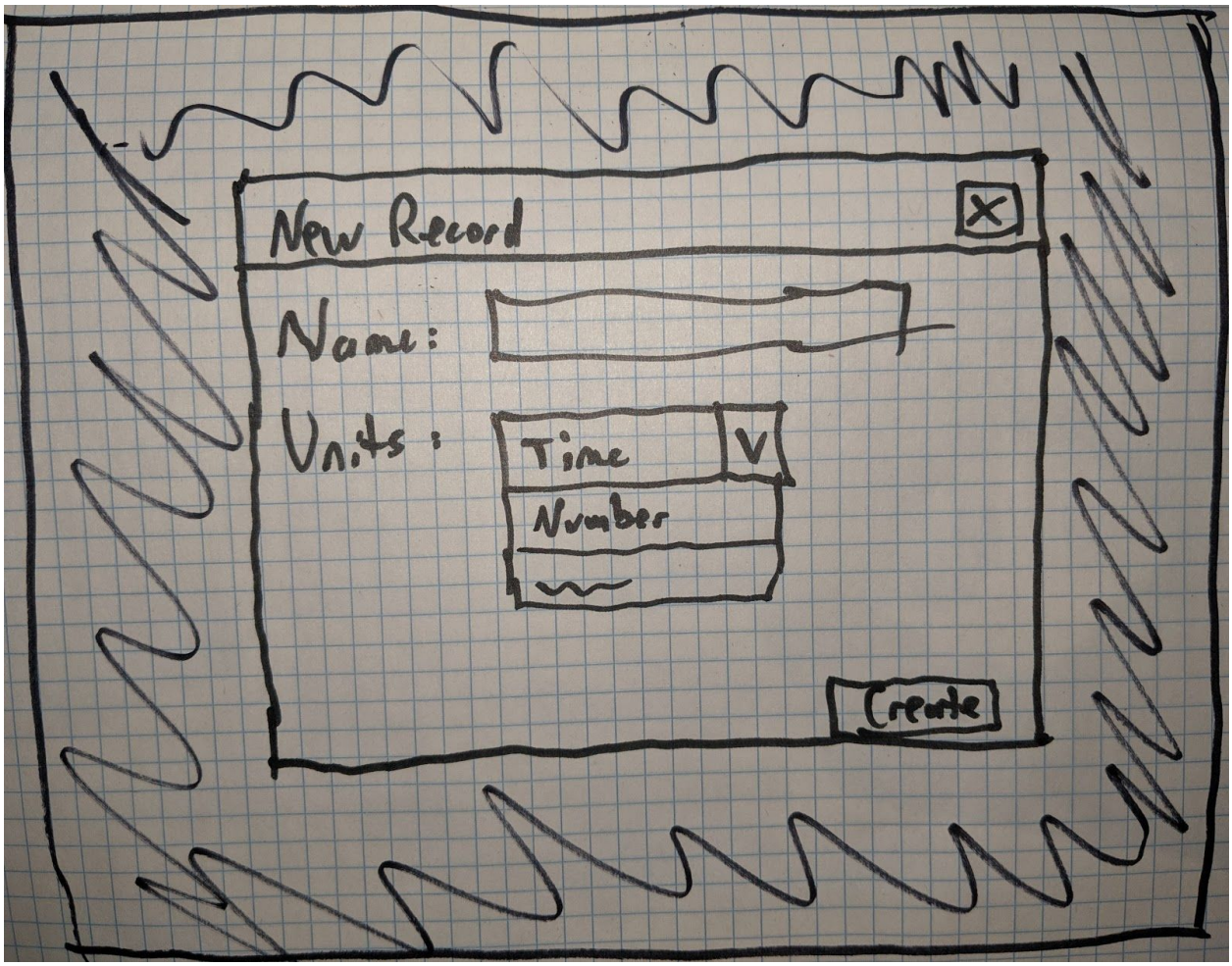
New Student pop-up. Students can be assigned to a specific class from a dropdown menu here at creation. Other attributes can be added to the creation form as dictated by database needs.

3.4 Student Details Page



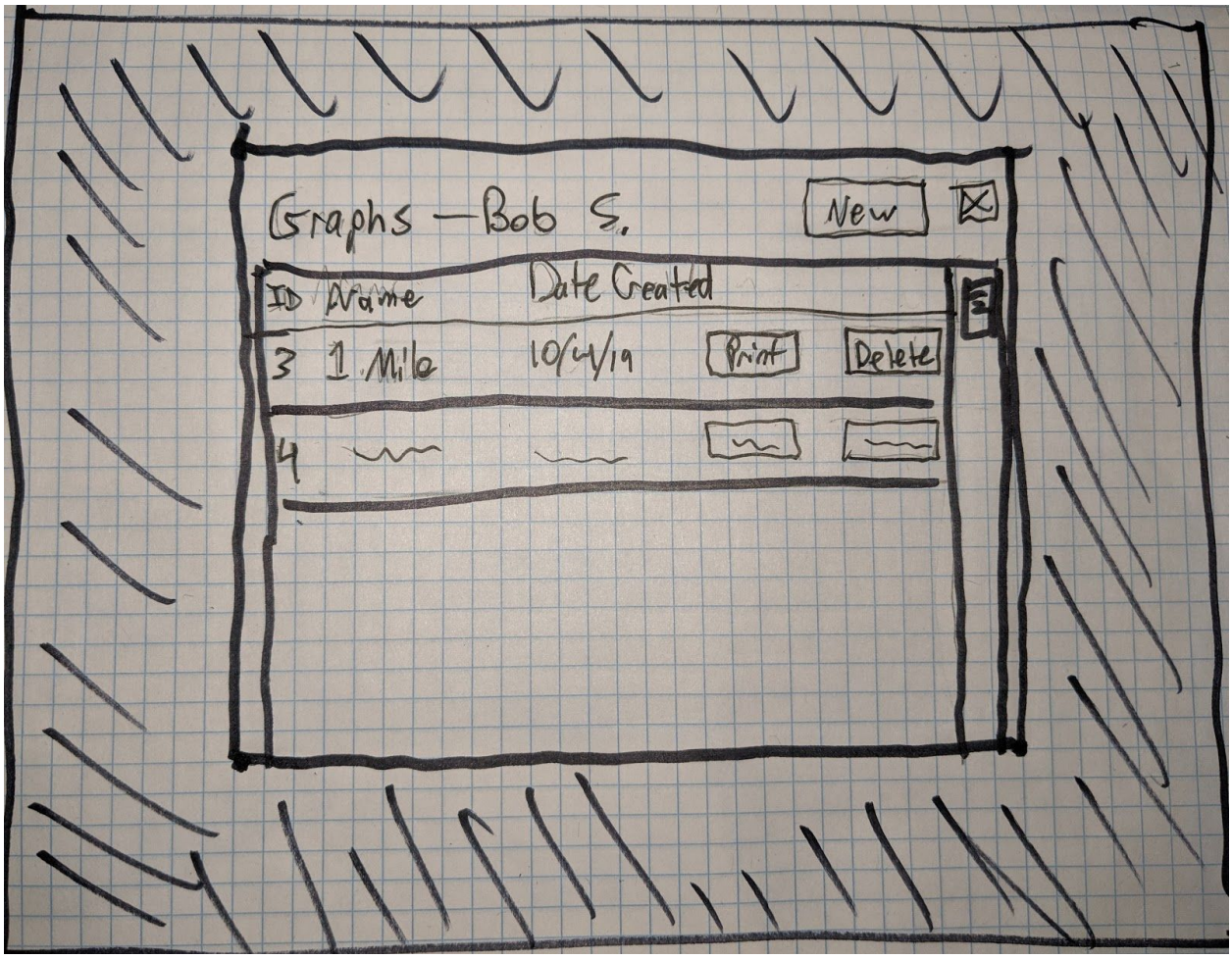
Student Details view page. If a student has been in multiple classes, you can select which class to view from the dropdown to the right of the student's name. A record consists of a fitness metric name and a recorded value ("1 Mile" and "8:15" for example). To create a new date entry, the user only needs to click in the blank date spot at the bottom of the date column and begin typing. Note the buttons to add a new record, view graphs, and create a new graph.

3.5 Add New Record Pop-Up



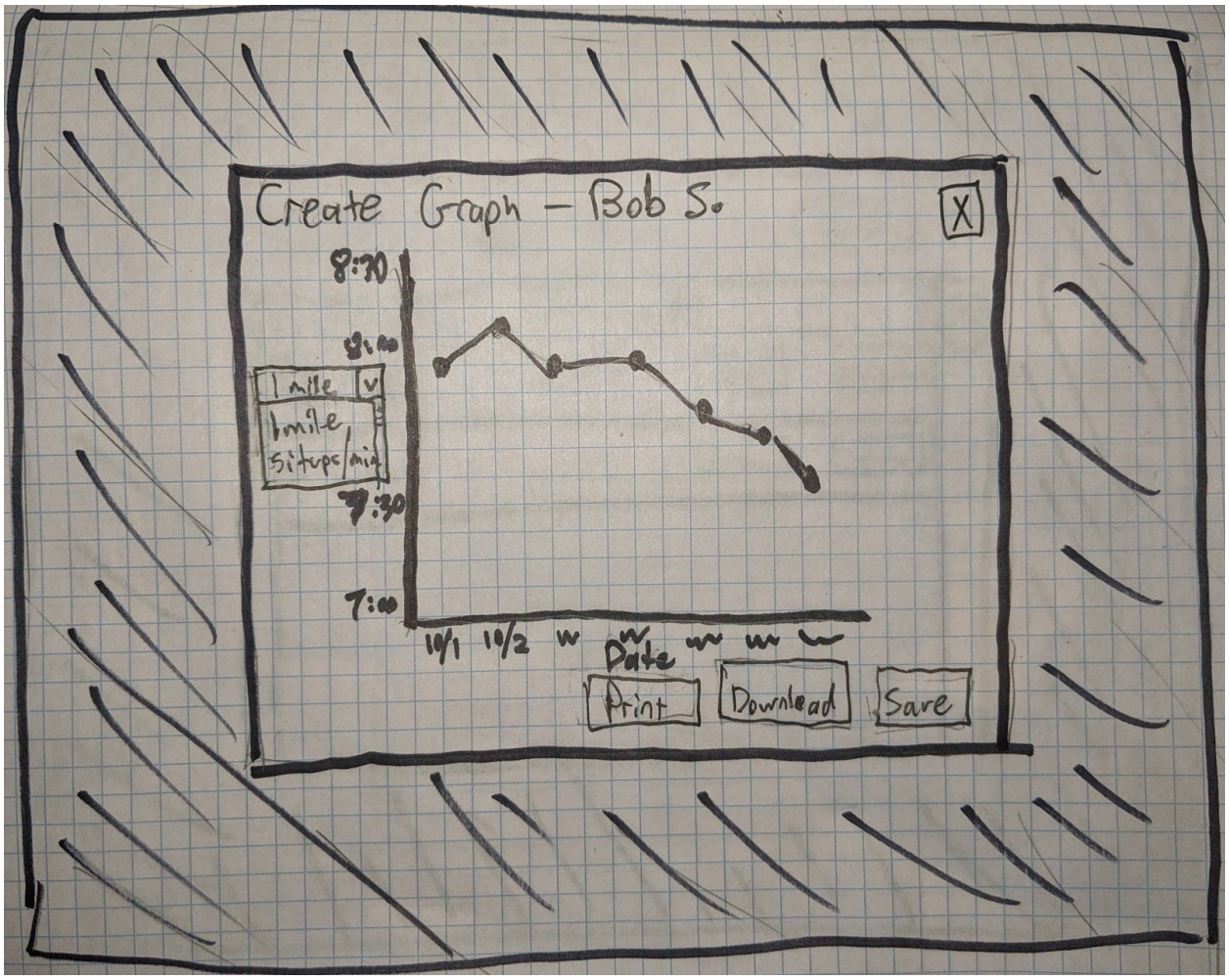
New Record pop-up. All that is required is the name of the record, like “pull-ups”, and a unit of measurement, which are available from a dropdown. When created, the new record will be added as a column in the student’s view page.

3.6 Student Graphs Index Pop-Up



A list of graphs previously created for this student. There are options to print or delete a graph, create a new one, or view a current one by clicking it.

3.7 Create New Graph Pop-Up



New Graph pop-up. The graph will automatically populate with data and plot lines when a record is chosen for the vertical axis. Options to print or download as an image to the hard drive are available. Viewing an existing graph would look identical, but without the option to change the record on the vertical axis.

Evaluation and Testing

Upon creating a clickable prototype for this MVP version of the app, there are several factors that I would like to test for usability and clarity. First and foremost, I would like to see how users feel about navigating between different sections of the application. Are viewing Class, Student, Assignment, and other pages easily navigable? Do they make sense? Are they useful?

Within the Students section itself, I would like to get user input to discover what other data or capabilities teachers in particular would benefit from having. There are certainly more

types of fitness data to record, which would ideally be discovered via initial user interviews and research at the onset of the project. It would probably be useful to interview or at least consult a data scientist to gain a better understanding of what types of data needs would appeal to physical education teachers and school principals. I would guess, for example, that teachers would want a way to easily calculate average data for each type of exercise recorded per class, as well as bulk-create a new physical activity record for every student in a class.

1. Usability Testing

To answer the above and other questions, it would be necessary to conduct extensive usability testing with sample users from our target user group--in this case, primarily Physical Education teachers and school Principals. Ideally we would present them with specific tasks to perform, measuring their path to completion (direct, indirect, or failed) and time to completion. Sample tasks could include:

- Create a new class
- Create a new student and add him/her to a class
- Add a new fitness record to a student
- Create a graph of student progress with an existing record
- Start a new discussion thread on the message forum
- Create a new lesson page with an uploaded sample video or image
- Create an assignment and add it to a class

Additional questions to usability testers could include:

- Did you find the app useful?
- What draws your eyes or makes you want to click on it on certain pages?
- What does the app NOT do that you would want it to do?
- Did you find anything confusing?
- Rate each task you completed on an easiness scale of 1-5.
- General questions or thoughts about the app?

To synthesize the results of these usability tests, we could create tables of completion rates and times. Then, after using this data to make improvements over another design iteration, we can test again with new users and compare their completion times with our first set of users. This would allow us to determine if our changes result in performance improvement.

All research and testing data would be assembled in a comprehensive research report, which can itself be amended as new research is performed. This way, we would maintain a complete log of all research and results, complete with interpretations and insights, that we can continuously refer back to if needed as the app is built out further.

Next Steps

With an initial MVP constructed and insights gleaned from usability testing, future steps could include:

- Add new features and fix any problems suggested/desired by usability testers
- Add a messaging system
- Add a system to directly give assignments to students, and allow them to complete and submit them in the app when appropriate
- Add a new section specifically for Teachers
- Create a mobile/tablet app companion to the desktop version
- Integrate a permissions system and add more system roles (e.g. admin assistant) with customizable permissions
- Add an Alerts system so teachers can receive notifications when a student's performance drops below a specified level (or other metric)

Thank you very much!