

Product Design Portfolio

Andrew Brimer
2019

Project: **Wing**[®]

the first FDA-cleared smartphone
sensor to measure lung function

Roles: Mechanical Engineering, Manufacturing,
Product Design, Product Management,
Graphic Design, Front End Development

Wing[®] Sensor



Roles: Mechanical Engineering, Prototyping, Product Design, Manufacturing, & Supply Chain







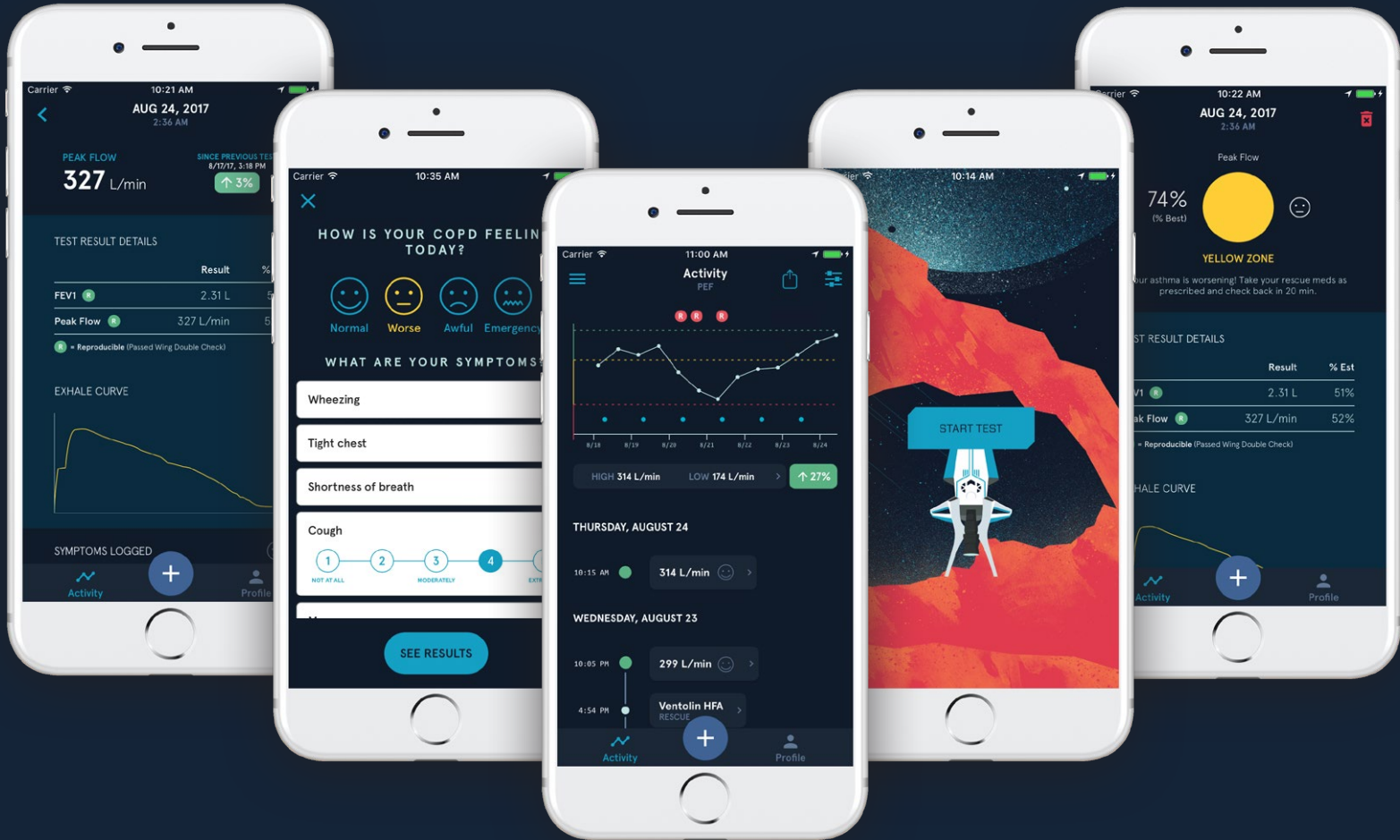

wing



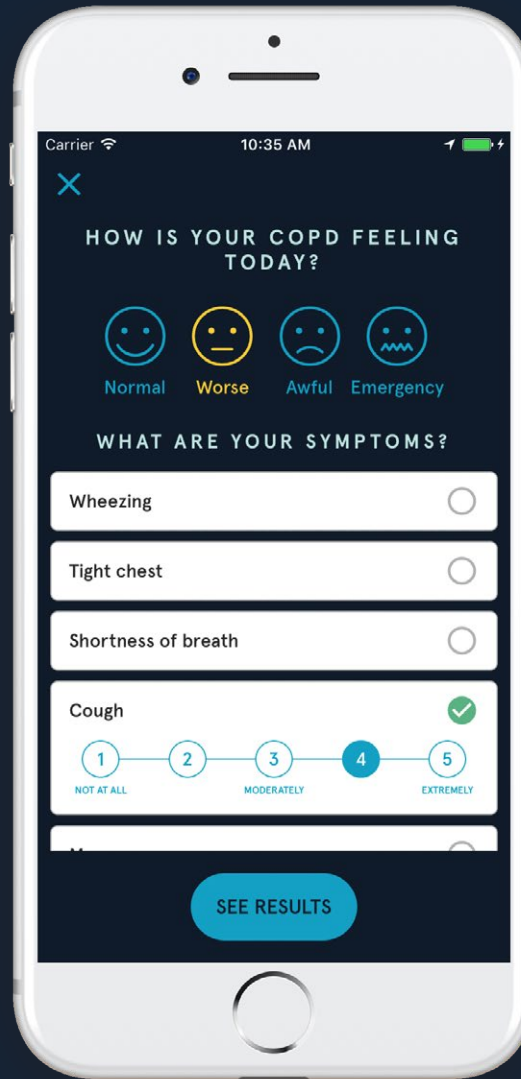
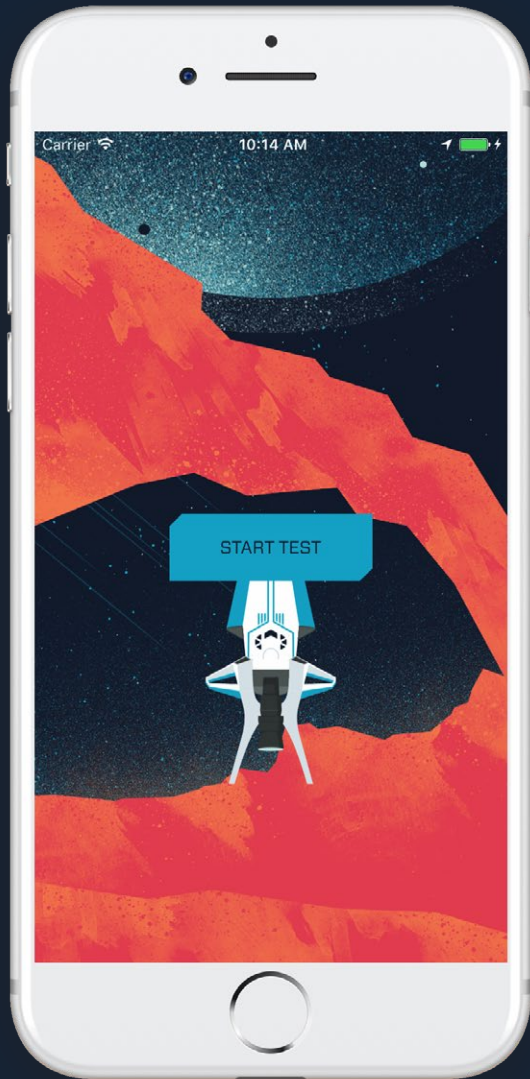

Wing

Medically Accurate. Powerfully Simple.
Smart FEV1 and Peak Flow Meter

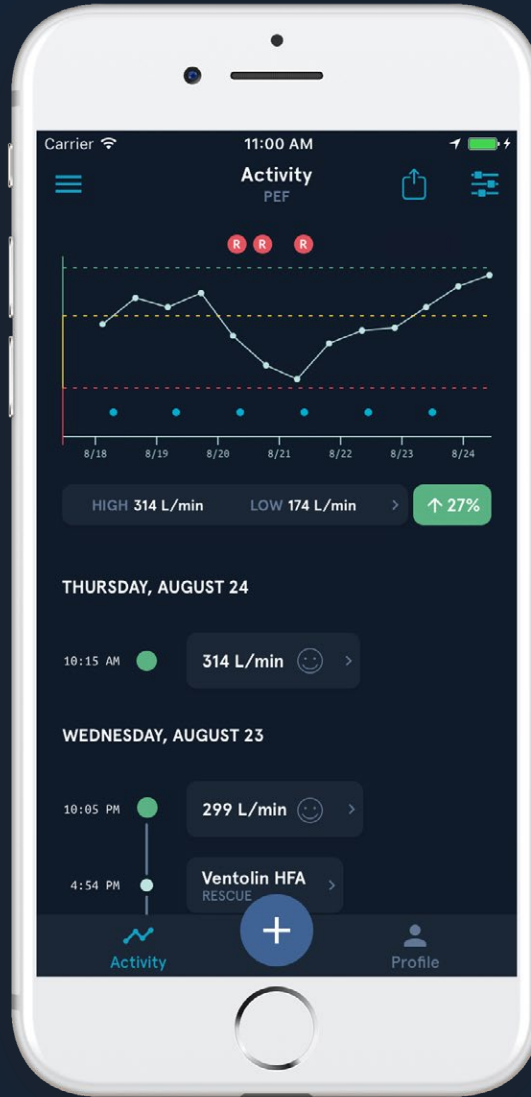
Wing[®] iOS App



Roles: Product Design, UX Design, Product Management, & Game Design



Closeup of Wing app screens, showing space-themed game during measurement & symptom feedback.



Closeup of Wing app screens, showing results after taking a measurement & tracking dashboard with event feed.

Wing[®] iOS App Features

WING APP



Peak Flow & FEV1

Cleared by the FDA, Wing measures Peak Flow & FEV1 with medical-grade accuracy.



Asthma Diary

Track your medications, symptoms, and asthma triggers all in one place.



Wing Double Check™

Wing confirms your measurements with built-in American Thoracic Society reproducibility check.



Smart Reminders

Get smart reminders for your medications and Wing measurements.



Asthma Color Zones

Wing automatically calculates your Asthma Color Zone after each measurement.



Cloud Sync

Wing securely syncs your data so it's backed up and up to date.



Tracking & Trends

See trends in your Peak Flow and FEV1 over time.



Monthly Reports

Easily share a Wing monthly report with your doctor, family, and friends.



Personal Best Goals

Wing estimates Peak Flow and FEV1 goals based on your age, height, gender, and ethnicity.



Multiple Patient Profiles

Manage up to 4 profiles (Wing Sensors) on one Wing Account.

Compatible

Designed for iOS 9 and later

Adaptive interface for asthma and progressive respiratory conditions (COPD, CF, PF)

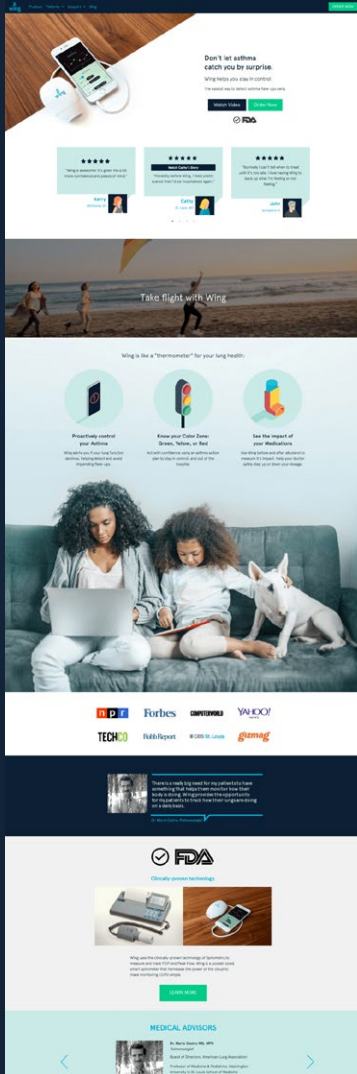
Easy to Use

User-centric design

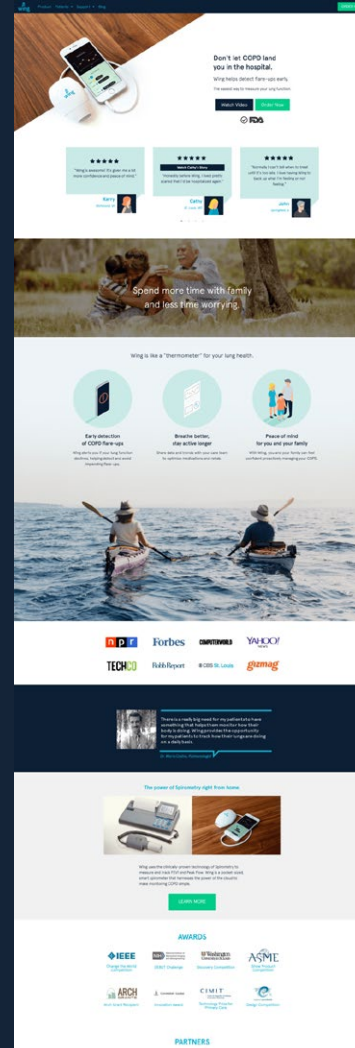
Guided app tour with instructional video

Motivational game & animations with technique coaching

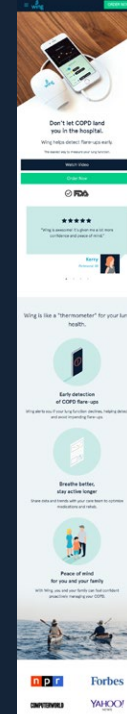
Website - Wing[®]



Responsive Asthma Landing Page



Responsive COPD Landing Page



(Mobile Screen)

Roles: Front End Development, Content Development



Don't let asthma catch you by surprise.

Wing helps you stay in control.

The easiest way to detect asthma flare-ups early.

Watch Video

Order Now



★★★★★

"Wing is awesome! It's given me a lot more confidence and peace of mind."

Kerry

Richmond, VA



★★★★★

Watch Cathy's Story

"Honestly before Wing, I lived pretty scared that I'd be hospitalized again."

Cathy

St. Louis, MO



★★★★★

"Normally I can't tell when to treat until it's too late. I love having Wing to back up what I'm feeling or not feeling."

John

Springfield, IL



Closeup of Wing landing page showing the product, user testimonials, and calls to action.

Wing is like a "thermometer" for your lung health:



Proactively control your Asthma

Wing alerts you if your lung function declines, helping detect and avoid impending flare-ups.



Know your Color Zone: Green, Yellow, or Red

Act with confidence using an asthma action plan to stay in control, and out of the hospital.



See the impact of your Medications

Use Wing before and after albuterol to measure its impact. Help your doctor safely step up or down your dosage.



npr

Forbes

COMPUTERWORLD

YAHOO!
NEWS

TECHCO

Robb Report

CBS St. Louis

gizmag



There is a really big need for my patients to have something that helps them monitor how their body is doing. Wing provides the opportunity for my patients to track how their lungs are doing on a daily basis.

Dr. Maria Castro, Pulmonologist

Closeup of section of the Wing landing page showing the core values of the product to help proactively manage asthma.

Pitch Deck – Wing[®]

(Selected Slides)

wing

Simple, Actionable Data.
Peace of Mind.

wing

The 1st over-the-counter smartphone sensor to measure lung function.

Anytime. Anywhere.

FDA
CLEAR

Patented Technologies

Simple

Very Low COGS
If plastic, reusable, modular parts, 1 simple circuit board with 3 off-the-shelf components.

Plug & Play Connection
Connects through reusable port or lightning cable and no adapter. Powered directly by the phone – No batteries, no charging, no disposables.

Elegant

Durable & Strong
No moving parts. No calibration.

Easy to Clean & Maintain
Single patient use. Wash with soap and water.

Compatible
Designed for iPhone 5 and later.

Wing helps you detect flare-ups early & stay out of the hospital.

Measure
Accurately measure your lung function. Anytime. Anywhere.

Manage
Track lung function symptoms, & meds to catch flareups early.

Prevent
Share data with your care team to adjust therapy proactively.

Designed for Patients

Simple. Beautiful. Powerful.

Value to Providers

- Improve Adherence**
Wing closes the feedback loop with clear data and alerts so patients can use the impact of taking their medication.
- Data-Driven Prescribing**
Wing equips physicians with objective data on medication efficacy and disease progression to ensure patients have optimal treatment.
- Reduce Healthcare Utilization**
Wing empowers patients and their providers with actionable data for shared decision-making to detect flareups early and prevent unnecessary ED visits and hospitalizations.
- Improve Quality of Life**
Wing helps you reduce medical costs, while also providing personalized care for patients resulting in a better patient experience and health.

Business Model

Direct to Consumer (Self Pay)

Wing Sensor
Single Purchase

Mobile App
Free

Enterprise (B2B)

Wing Sensor
Wholesale Purchase

SDK Integration
Tiered Licensing Fees

Product Roadmap

Wing Premium Subscription

Self-Pay upgrade for patients that enables web app access and additional features.

Wing Control Program

Full-service, intelligent, and personalized care programs for high-risk asthma and COPD patients.

Market Opportunity

30 million

United States Asthma Market

People currently living with asthma

30 million

United States COPD Market

Estimated people with COPD

16 million

Currently Diagnosed with COPD

Clinically diagnosed with COPD

Competitive Advantages

Wing[®] is the 1st and only FDA-cleared, OTC smartphone sensor for measuring lung function.

Patented Technologies	User Experience	AI-Powered Platform
U.S. Patent Granted Covering patent portfolio in areas of signal processing, deep learning, & usability.	Strong Brand Memorable name, strong focus on brand and design, growing social communities.	Cloud Architecture Enables the largest repository of lung function data ever assembled.
Very Low COGS Re-use, reusable, low-costing, technology with no batteries, and no moving parts.	User-Centric Design Easy-to-use app designed with patients, continuously improved based on feedback.	Deep Learning Proprietary algorithms to personalize user experience and detect new insights.

Accomplished Milestones

Proof-of-Concept		Development		Production
2013	2014	2015	2016	2017
Initial Demo Feb 2013 Seattle, WA	Raised \$1.5M Apr 2014 Seattle, WA	Raised \$1M Apr 2015 Seattle, WA	Raised \$1M Apr 2016 Seattle, WA	Production May 2017 Seattle, WA
Begin Full Time Feb 2013 Seattle, WA	FDA Submission Apr 2014 FDA Approval	FDA Clearance Apr 2015 FDA Approval	Begin Shipping May 2016 Seattle, WA	
Patent Filed Mar 2013 Seattle, WA		Patents Filed Mar 2014 Seattle, WA	Patents Granted Mar 2017 Seattle, WA	

Medical Advisors

 Pulmonologist Board of Directors, Seattle Lung Association Professor of Medicine & Pediatrics, Washington University in St. Louis	 Pulmonologist Director of Research, Division of Pulmonary and Critical Care, Johns Hopkins Board Member, COPD Foundation
 Pulmonologist Assoc. Chief of Research, Division of Respiratory & Critical Care, UCLA Medical Center Medical Director, Rehab, Clinical Trial Center LA Biomed	 Former CEO & Executive Director, American Assoc. of Respiratory Care Board Member, COPD Foundation
 Pulmonologist Clinical Research Center of St. Louis Former Professor of Clinical Medicine, Washington University in St. Louis	 Pulmonologist Pulmonary Critical Care, and Sleep Medicine Specialist of St. Louis

Roles: Graphic Design, Content Development




wing

The 1st over-the-counter
smartphone sensor to
measure lung function.

Anytime. Anywhere.

FDA
CLEARED

Patented
Technologies

MacBook Pro

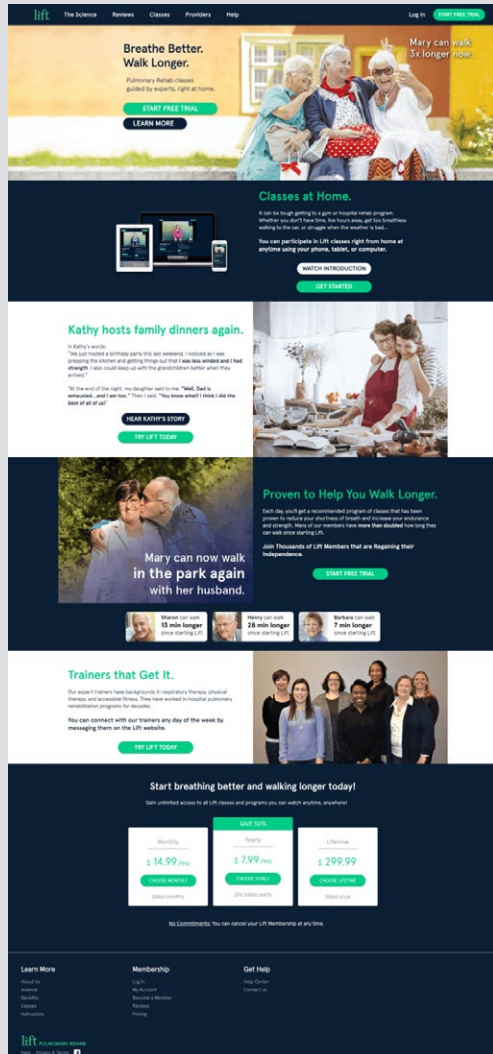
Closeup of a slide
introducing the
product Wing.

Project: **Lift Pulmonary Rehab**

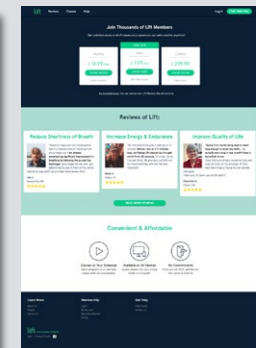
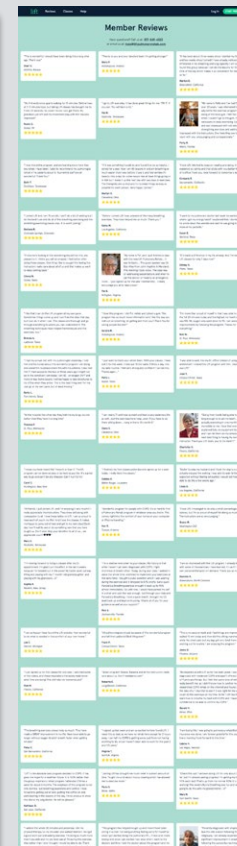
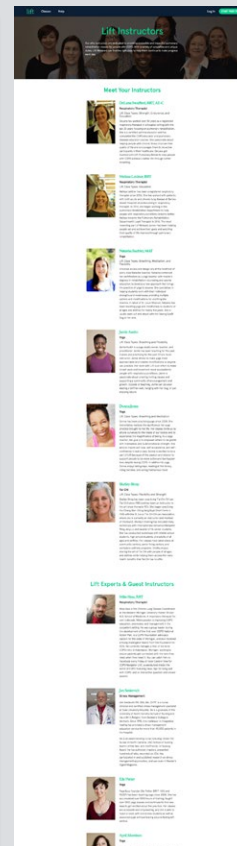
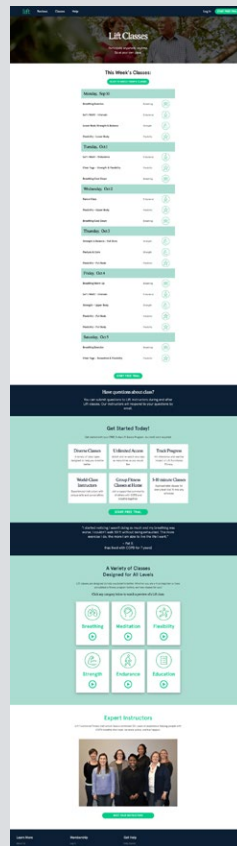
video-based education & rehabilitation program
for people with COPD & other respiratory conditions

Role: Product Design, Product Management,
Graphic Design, Front End Development

Website - Lift Pulmonary Rehab



Landing Page + Secondary Pages



Roles: Visual Design, Front End Development, Content Development

Breathe Better. Walk Longer.

Pulmonary Rehab classes
guided by experts, right at home.

[START FREE TRIAL](#)

[LEARN MORE](#)

Mary can walk
3x longer now.

Classes at Home.

It can be tough getting to a gym or hospital rehab program. Whether you don't have time, live hours away, get too breathless walking to the car, or struggle when the weather is bad...

You can participate in Lift classes right from home at anytime using your phone, tablet, or computer.

[WATCH INTRODUCTION](#)

[GET STARTED](#)

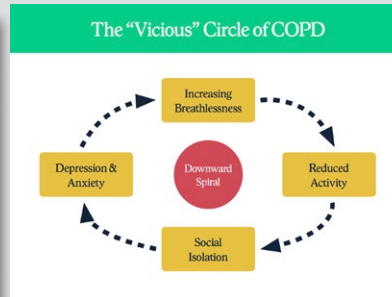
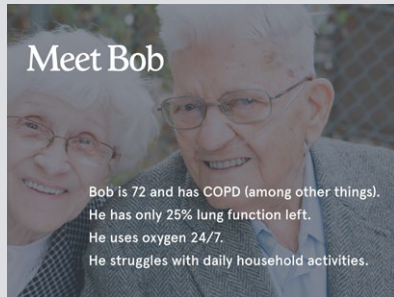


Closeup of landing page for Lift Pulmonary Rehab.

This page focuses on the positive impact for people with COPD of participating in the Lift program.

Pitch Deck – Lift Pulmonary Rehab

(Selected Slides)



"Pulmonary Rehab" could change Bob's life.

Decades of research has proven that Pulmonary Rehab can...

- INCREASE ENERGY AND ENDURANCE
- IMPROVE QUALITY OF LIFE
- REDUCE SHORTNESS OF BREATH

But 97% of COPD patients (like Bob) don't have access to Pulmonary Rehab, due to...

- COST**: HOSPITAL-BASED PROGRAMS ARE EXPENSIVE
- TRANSPORTATION**: TRAVELING BY A WEEK TO A HOSPITAL CAN BE DIFFICULT
- LOCATION**: ONLY LOCATED IN MAJOR HOSPITALS

Introducing: lift PULMONARY REHAB

An expert-guided, digital fitness and wellness program.

Lift is a comprehensive program focusing on endurance, strength, balance, education, mindful meditation and more!

- DAILY VIDEO CLASSES
- ACCESS TO HEALTH COACHES & INSTRUCTORS
- DIGITAL SUPPORT COMMUNITY

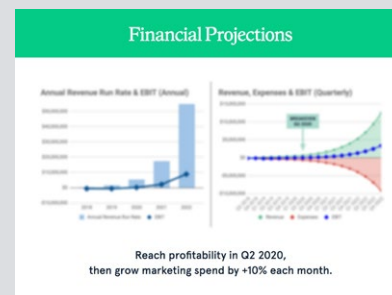
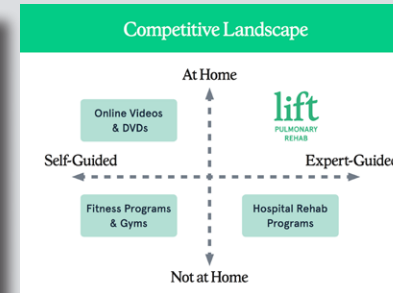
Members Love Lift

"Going from hardly being able to stand long enough to brush my teeth to actually exercising in one month's time is incredible to me."
 -Charlotte H., Member with COPD

"LIFT is the absolute best program devoted to COPD. It has given me hope for a healthier future. It is 100% better than the group respiratory rehab program I attended twice a week for about 3 months."
 -Kathleen D., Member with COPD

"Today I was able to walk into my doctor's office instead of using my wheelchair. I shared the wonderful Lift program with him. Thank you Lift!"
 -Robin H., Member with COPD

"I am so impressed with the Lift program. I already feel better with the exercises I've learned. It's like my own personal therapist on-demand!"
 -Maryanne S., Member with COPD



Roles: Graphic Design, Content Development

Introducing: **lift** PULMONARY REHAB

An expert-guided, digital fitness and wellness program.



Lift is a comprehensive program focusing on endurance, strength, balance, education, mindful meditation and more!

**DAILY VIDEO
CLASSES**

**ACCESS TO
HEALTH COACHES
& INSTRUCTORS**

**DIGITAL SUPPORT
COMMUNITY**

Closeup of a slide
introducing the service
of Lift Pulmonary Rehab

MacBook Pro

Product Brochures & Info Sheets



About the Company

Company History

Abby Cohen and Andrew Brimer started Sparo in 2012 as students at Washington University in St. Louis, initially focused on helping people with respiratory conditions, like asthma and COPD. Two of Abby's grandparents have COPD, which helped motivate her and the Sparo team to develop tools to help people with this condition live better. With a background in biomedical engineering and mechanical engineering, respectively, Abby and Andrew built a team and developed Sparo's first product - a medical device called Wing® designed to monitor respiratory conditions.

After achieving FDA clearance for Wing as the first smartphone-connected device for measuring lung function and selling out of their first batch of product, Abby and Andrew saw a broader opportunity to make an impact.

Helping People Regain Independence

Abby and Andrew saw that many people with COPD struggle to stay independent due to shortness of breath, atrophied muscles, fear of falling, and anxiety. After putting together a team of physical therapists, respiratory therapists, doctors, and specially-trained fitness instructors, Sparo launched Lift Pulmonary Rehab in 2017 to help people increase their stamina and strength, reduce shortness of breath, and improve balance and mental wellness.

With 1,500+ people using Lift across the country, the Sparo team saw the huge impact of the program on people's lives. On average, Lift members increase the distance they can walk by over 150% in just a few months of following the Lift program. But, the Sparo team also saw something else - doctors, friends, and family were asking Lift members about what had helped them improve so much. Very quickly, all types of people struggling with mobility and independence (not just those with COPD) were reaching out to the Sparo team to see if they could use the Lift program to help them improve their quality of life and regain their independence.

Abby and Andrew rebranded Lift Pulmonary Rehab to "Lift Functional Fitness" and expanded the program in 2019 to bring the benefits of the program to anyone that wants to increase stamina, strength, and balance, improve their mobility, and regain their confidence and independence.

Press and Recognition for The Founders and Team

Abby Cohen and Andrew Brimer named to the Forbes 30 Under 30, Healthcare List Sparo Selected to Present their Innovative Products at the First Ever Whitehouse Demo Day Sparo Won CIMT Technology Prize for Primary Care Sparo Won the IEEE Change the World Competition



Example Schedule

- Participate in Lift classes from the comfort of home at anytime. Each day, Lift recommends a new set of classes.

You can easily return to previous days to watch earlier classes

Date	Total Duration	Class	Icon
Wed, Apr 15	24 min	Breathing	🌬️
		Endurance	🏃
		Strength	💪
Thursday, Apr 18	19 min	Lift's Walk + Warm-Up	🚶
		Strength & Flexibility - Chair Yoga	🧘
		Breathing Cool Down	🌬️
Friday, Apr 19	28 min	Senior Class - Mental	🧠
		Strength - Upper Body	💪
		Flexibility - Upper Body	🧘
Saturday, Apr 20	21 min	Breathing Cool Down	🌬️
		Breathing Exercise	🌬️
		Postural Practice	🧘
Sunday, Apr 21	36 min	Breathing	🌬️
		Flexibility - Core	🧘
		Respiratory Practice	🌬️
Monday, Apr 22	24 min	Strength	💪
		Endurance	🏃
		Health	🧠



Frequently Asked Questions

Can I try some more classes before I commit?

Yes, set them up with an account without payment information and they will have a 7-day free trial. Plan with them when they are going to do their first day of classes. Confirm they can get to the website and know how to get in touch with you. Schedule when you should check back in to see how it is going.

How long has Lift been around?

Our owner, Abby Cohen, started the business in 2013 with a mission of helping people live better and remain independent as they age. The company headquarters are in St. Louis, Missouri. We have over 1,500 members using Lift across the country.

How do I get back to Lift Functional Fitness? Or How do I watch classes?

You watch classes on our website or on our app. To get back to Lift, they go to the website: copdlift.com. Once they are logged in, all they have to do when they get to the website is click "Continue".

If they have any trouble they can call us at 877-869-6023.

Is it the same classes over and over or are there new classes?

There are new classes! We recommend a new set of classes every day and we add new classes on a weekly and monthly basis.

Do I have to participate at a specific time or place?

They can participate whenever they want, wherever they are feeling their best. Participate from home, don't need any specific equipment.

What if I miss a day?

You can go at your own pace. We will hold your spot - come back after a few days or later that day and continue where you left off.

New classes every week, but you can always go back to previous days of classes.

Explain the Favorites feature and the On Demand feature.

Can I watch classes more than once?

Favorites feature: You can add classes to your favorites to easily find them in the future and rewatch classes.

Pause and play class feature: You can always pause a class or replay a class.

Next class feature: You can always skip a class you don't want to take.



Products & Services

Available Now:

Lift Membership

All-Access Pass, watch anywhere, anytime via Smartphone, Tablet, or Computer.

SAVED 50%	SAVED 50%	SAVED 50%
Monthly	Yearly	Lifetime
\$14.99/mo	\$7.99/mo	\$299.99
3 billed months	3 billed yearly	1 billed once

Coming Soon:



Pulse Oximeter
\$39.99



Arm Pedaler
\$49.99



Starter Kit
\$99.99



Balance to Prevent Falls
DVD Set - \$79.99



0-10min Buildup
DVD Set - \$79.99



Full-Body Chair Yoga
DVD Set - \$79.99



Example Schedule

- Participate in Lift classes from the comfort of home at anytime.
- Each day, Lift recommends a new set of classes.
- You can easily return to previous days to watch earlier classes

Monday, Apr 15		Total Duration: 24 min	Thursday, Apr 18		Total Duration: 19 min
Breathing Warm Up	Breathing		Let's Walk! - Warm Up	Endurance	
Let's Walk! - Intervals	Endurance		Strength & Flexibility - Chair Yoga	Flexibility	
Balance Exercise	Strength		Breathing Cool Down	Breathing	
Flexibility - Lower Body	Flexibility		Friday, Apr 19		Total Duration: 28 min
Tuesday, Apr 16		Total Duration: 40 min	Dance Class - Mambo	Endurance	
Let's Walk! - Warm Up	Endurance		Strength - Upper Body	Strength	
Strength - Full Body	Strength		Flexibility - Upper Body	Flexibility	

Closeup of example schedule page showing a typical week of Lift Pulmonary Rehab classes.

Business Plans & Investor Materials

SPARO LABS

Business Plan

Confidential - Unsanctioned Distribution and/or Replication is Prohibited

Andrew Birner | Co-Founder | andrew@sparolabs.com
 Alcy Cohen | Co-Founder | alcy@sparolabs.com

February 1, 2017

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Sparo Labs - Business Plan (Confidential)
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SPARO LABS

1. Executive Summary

Sparo Labs is an award-winning, digital health company in St. Louis, Missouri committed to transforming care on the individual with asthma from reactive to proactive. Sparo Labs' flagship product, Wing™ (www.sparolabs.com), is the 1st FDA-cleared, over-the-counter smartphone sensor for measuring lung function. Wing helps patients and patients proactively self-manage asthma and prevent asthma attacks and flare-ups. Wing also helps physicians provide personalized care.

Problem: Asthma is a large and growing problem affecting nearly 1 in 10 people in the United States. For children, asthma is the #1 condition causing ER visits, hospitalizations, and missed school. Asthma is currently managed reactively by many children and adults with asthma struggle to recognize and communicate early warning signs of an asthma attack using only their symptoms. However, almost every asthma attack, ER visit, hospitalization, and death due to asthma is preventable.

Solution: Sparo Labs' flagship product, Wing™, is a pocket-sized sensor and powerful app that provides peace of mind, empowering patients to proactively manage and control asthma. With Wing, users can measure and track lung function with medical grade accuracy - anytime, anywhere. Wing's simple, straight-forward system allows parents to detect early warning signs and take action to prevent asthma attacks. Using Wing's cloud-based platform, users can also work with their asthma care team to identify and avoid things that trigger their asthma and optimize their treatment plan based on lung function data and seasonal changes.

Proprietary Technology: Wing's patent-pending technology uses an ingest and novel approach to solve the barriers that have previously limited patient access to respiratory - the gold-standard medical device for diagnosing asthma and other respiratory conditions. Wing combines novel fluid mechanics and an acoustic sensor with proprietary signal processing algorithms to drastically reduce cost and complexity. Unlike typical spirometers, Wing has no moving parts and no need for daily calibration. Sparo Labs has filed utility and design patents in the US, Australia, Europe, Canada, China, and Israel. Sparo Labs is continuing to expand its IP portfolio with additional utility patent filings in the areas of signal processing, machine learning, fluid mechanics, and game design.

Market: There are ~400 million people with asthma worldwide, with 30 million in the United States. Roughly 60% of U.S. have uncontrolled asthma and are at risk for serious asthma attacks and flare-ups. Wing's initial target market is the 3.5 million people who either wear nebulators or have visited the ER or the hospital for their asthma in the last year.

Business Model: Wing can be purchased directly by patients or parents for \$129 from the Wing website. Over the next five years, a 20% penetration goal for the 3.5M target market (150,000 individuals) will result in \$45 million in revenue. Sparo Labs plans to roll out additional product features and revenue streams including Wing for Android, a premium Wing subscription, and disposable

Sparo Labs - Business Plan (Confidential)
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3. Solution

Introducing Wing™

Wing is the 1st over-the-counter smartphone sensor for monitoring lung function. Medically accurate and powerfully simple, Wing combines a powerful app with a pocket-sized sensor that monitors lung function.

Wing's underlying technology uses an ingest and radically different approach to solve the barriers that have previously limited patient access to spirometry. Wing combines a novel and patent-pending acoustic sensor with proprietary signal processing algorithms - drastically reducing cost and complexity. Wing has no moving parts and no need for daily calibration.

Wing optimizes hardware for availability in specialty clinics and hospitals for diagnostics. They have been available to patients in order to meet the needs of patients managing their asthma on a daily basis, which is very different than the traditional use case for spirometry. Sparo Labs took a user-centric approach to Wing's development. As a result, Wing brings the gap between a medical device and consumer tech product through a meaningful and engaging brand and user experience.

How Wing™ Works

Wing takes the fear and uncertainty out of asthma and empowers patients to proactively manage their condition. With Wing, patients with respiratory conditions, like asthma, can accurately measure their lung function at any time to see how their lungs are doing. Wing measures FEV1 and Peak Flow.

FEV1: How much air you can blow out in one second

Peak Flow: How fast your lungs can blow air out

These metrics view how swollen and tight a patient's lungs are and how their asthma is doing at that time. Wing doesn't just give patients a number. Rather, Wing empowers patients with actionable data by incorporating the standard action plan along with light color bands and associated education into the results. This simple-to-light green system provides an easy way to know when a change in lung function is too big based on the lung function values that are in their action plan (personalized). This simple system provides users instant feedback about how their or their child's asthma is doing, what action they may need to take to stay on top of their asthma based on their physician prescribed treatment plan, and also allows users to see if a given action they took was effective.

Sparo Labs - Business Plan (Confidential)
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11. Financial Projections

The following financial projections were made based on specific key assumptions about the company's future revenue and growth potential. These projections and assumptions are based off of internal data, industry research, discussions with advisors, customers, and the medical community.

Note: see attached 3. Sparo Labs Financials, monthly projections, and further details.

Sparo Financials	2018	2019	2020
Revenue			
• If New US Markets	\$3.0M	\$6.0M	\$6.0M
• If New US Markets	\$1.0M	\$1.0M	\$1.0M
REVENUE	\$4.0M	\$7.0M	\$7.0M
• US Revenue	\$4.0M	\$7.0M	\$7.0M
TOTAL REVENUE	\$4.0M	\$7.0M	\$7.0M
EXPENSES			
Marketing & Advertising	\$60,000	\$80,000	\$80,000
Salaries	\$22,000	\$27,000	\$27,000
Legal	\$5,000	\$5,000	\$5,000
Overhead	\$1,000	\$1,000	\$1,000
Software Costs	\$2,000	\$3,000	\$3,000
Consultants	\$10,000	\$10,000	\$10,000
Research & Testing	\$10,000	\$11,000	\$11,000
Travel	\$4,000	\$4,000	\$4,000
TOTAL EXPENSES	\$110,000	\$133,000	\$133,000
EBIT	\$3.9M	\$6.7M	\$6.7M

Sparo Labs - Business Plan (Confidential)
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3. Solution


Lift Pulmonary Rehab

Lift is an expert guided, online pulmonary rehabilitation program available right on a user's phone, tablet, or computer. Lift classes are designed for people with moderate to severe COPD.

Lift Pulmonary Rehab includes:

- Weekly Lift Programs specifically designed to help people with COPD breathe better, be more active, and live happier
- A variety of 5-10 minute on-demand classes including strength, endurance, breathing, meditation, flexibility, and education) users can watch anytime
- Access to Lift instructors for questions about COPD and discussions with pulmonologists and peers from across the country

Lift Pulmonary Rehab's evidence-based, interactive classes are developed and taught by a multidisciplinary team of instructors that include respiratory therapists, pulmonologists, dietitians, physical therapists, fitness instructors, and therapists.



Lift Pulmonary Rehab leverages technology, qualified instructors, and a scalable content model to increase access to pulmonary rehabilitation. At Lift, we have a customer and data driven approach to product development and are focused on providing a solution that:

1. Encourages authentic relationships between and among our team and Lift members
2. Enables users to participate whenever and wherever they want
3. Provides direction and demonstrates impact

To further fulfill the vision of our solution listed above, we plan to continue developing features focused on efficient personalization that leverage customer input, data from our all-in-one (including Sparo's lung function monitoring product, Wing™), and artificial intelligence.

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4. Landscape / Why Now?

COPD is a Growing Problem

Across the world, COPD is a large and growing problem. In the United States alone there are approximately 30 million people living with COPD. Worldwide, there are estimated to be over 600 million people living with COPD, with many yet to be officially diagnosed. COPD is becoming a core focus for healthcare systems across the United States and the world, as this insidious disease continues to rise in prevalence each year. The opportunity to implement impactful solutions for this growing population will only become increasingly critical as time goes on, compounded by the rising direct and indirect healthcare costs from COPD.

Internet Adoption is Growing

Particularly in the 65+ age group, adoption of the internet and social media such as Facebook has increased in the past 3-5 years. As seen in the table to the right, new Facebook reports: "In 2016, some 62% of online adults ages 65 and older now use Facebook, a 24-point increase from the 48% who reported doing so in 2015."

This sudden surge in adoption means that older adults are now becoming more comfortable navigating the internet as well as buying products and services from the internet. This offers a new opportunity to target this population through social media channels such as Facebook in a way that offshoots common whereas previously only more traditional channels of TV, radio, or print advertising were feasible for reaching this demographic.

The Impact of Pulmonary Rehab is Growing, but Programs are Not Scalable

Despite hopes from studies over the past 10-20 years have proven that Pulmonary Rehabilitation is effective at reducing symptoms of breathlessness, increasing activity, and improving quality of life for people with COPD, while many hospital systems have pulmonary rehab programs, these are not designed to scale rapidly, and rather serve the regional area. The potential for a scalable, personalized, and data driven solution to help due to lack of access, cost, and a number of other factors, making this space ripe for disruption.

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Other Respiratory Conditions in the Monitoring Space:

Smart Inhalers Trackers (Proprietary Health, Adhucore, CareTribe, etc.)

Companies with connected inhalers, such as Proprietary Health and Adhucore, have smart inhaler solutions. None of these companies are pursuing self-pay strategies. Proprietary Health is one of the most active in this space and has developed a CDiSpirometry tool that fits on top of inhalers to log when a patient uses medication and their location. Their business model targets insurance providers and is positioned to improve adherence leading to improved outcomes and reduced costs. Outcomes, IM, and pharma companies, such as Teva (CareTribe) or AstraZeneca (invested in Adhucore), have also been developing medication tracking technology for inhalers. These companies are not currently focusing on a direct to consumer approach or self-pay.

Cohere Health

Cohere Health has an inhaler tracking (Cohere) and a nebulated O2M generator from an Hong Kong supplier company (The Global Systems), which creates a nebulated oxygen stream for a patient's inhaler. The Global Systems summary states that their application is not only for use by a physician in the office setting, and requires a prescription. Specific government or a preexisting laboratory requirement for performing basic lung function tests in adults and children over the age of four years, it is intended to be used by physicians or professional medical personnel for testing in physicians' offices, ambulatory medical, and hospital settings. Similarly to Proprietary Health,

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11. Financial Projections

The following financial projections were made based on specific key assumptions about the company's future revenue and growth potential. These projections and assumptions are based off of internal data, industry research, discussions with advisors, customers, and the medical community.

Note: see attached 3. Sparo Labs Financials, monthly projections, and further details.

Sparo Financials	2018	2019	2020
Revenue			
• If New US Markets	\$3.0M	\$6.0M	\$6.0M
• If New US Markets	\$1.0M	\$1.0M	\$1.0M
REVENUE	\$4.0M	\$7.0M	\$7.0M
• US Revenue	\$4.0M	\$7.0M	\$7.0M
TOTAL REVENUE	\$4.0M	\$7.0M	\$7.0M
EXPENSES			
Marketing & Advertising	\$60,000	\$80,000	\$80,000
Salaries	\$22,000	\$27,000	\$27,000
Legal	\$5,000	\$5,000	\$5,000
Overhead	\$1,000	\$1,000	\$1,000
Software Costs	\$2,000	\$3,000	\$3,000
Consultants	\$10,000	\$10,000	\$10,000
Research & Testing	\$10,000	\$11,000	\$11,000
Travel	\$4,000	\$4,000	\$4,000
TOTAL EXPENSES	\$110,000	\$133,000	\$133,000
EBIT	\$3.9M	\$6.7M	\$6.7M

At the end of 2016, the company anticipates raising additional funding to drive growth, likely a \$2.5m Series A round to reach profitability by 2019-2020. The next 3 years are focused on driving growth and adoption of Lift in the COPD population, as well as exploring additional revenue streams and strategic partnerships.

After 2020, Sparo would likely plan to find a strategic acquirer with the capacity to scale and expand Lift to reach new customers and markets. Our current outlook and positioning is to focus on establishing strong evidence of product-market fit and revenue traction to make Sparo an attractive acquisition opportunity within the next 2-5 years.

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Project: **Game & Map Design**

cartography generation & board game design

Roles: Front End Development, Graphic Design, Game Design

Infinite River Map Generator



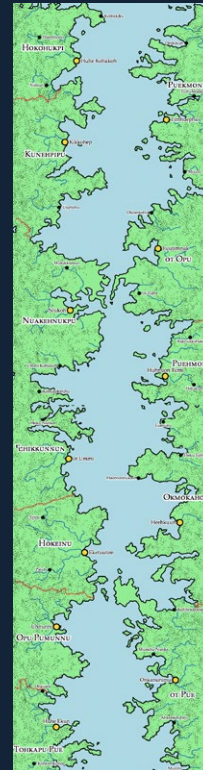
Initial Procedural
Map Generator
(JS source project)



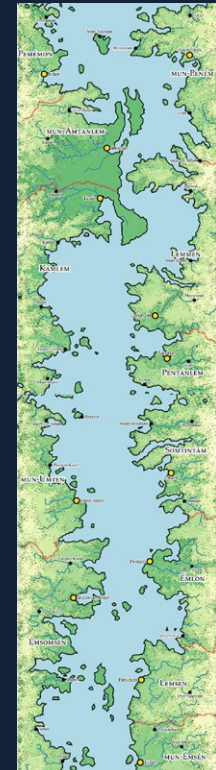
Added global terrain vector
constraints to form coastline



Integrated
simplex noise to
create central
river



Added color,
updated simplex
noise and erosion
mechanics



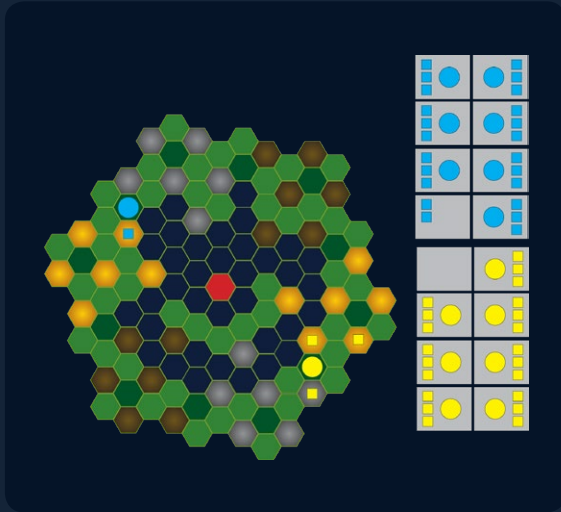
Added dynamic
color based on
terrain, forced
terrain alignment



Closeup section of the river.
Simulated meander through
simplex noise with erosion
bounded by vertical edges.

Dynamically colored based
on terrain.

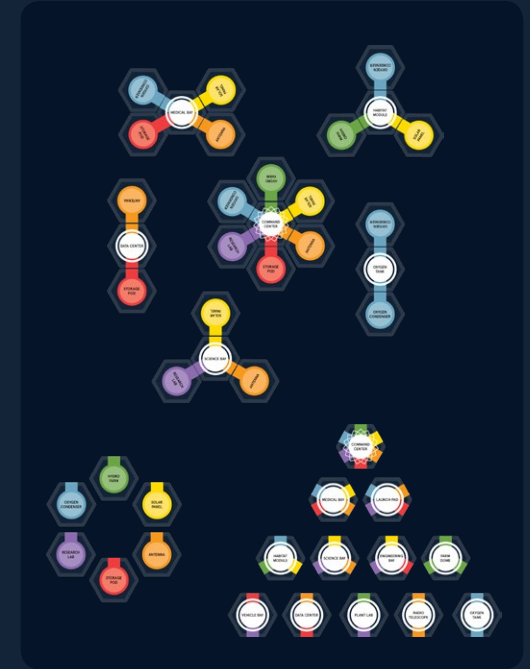
Board Game Design



Game Design
(Medieval Theme)



Game Design
(Space Theme)



Game Design
(Moon Base Theme)



Closeup of planetary system game where competing factions vie to gain control in a growing power vacuum.

Thank You!

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2019

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