

## Dream Flight Adventures — Mission Ops

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Example URL: <http://www.workingexamples.org/example/show/634>

Mission Ops is a sister product that accompanies Dream Flight Adventures simulators. Whereas the standard simulators are heavily themed immersive environments, Mission Ops is less themed and more suitable for a variety of typical learning environments (classrooms, after school programs, labs, etc.). Dream Flight simulators and Mission Ops work hand-in-hand—the former sending crews of students on epic missions throughout time and space, and the latter enlisting students to work as the “mission control” behind the scenes of these missions. Together, they provide engaging learning experiences.

### Seed

#### Tell us about your idea or project. What’s your vision?

*Mission Ops* is a companion product that accompanies [Dream Flight Adventures](#) full immersion [simulators](#). It began as a spin-off from these simulators, so it’s important that one has a basic understanding of Dream Flight Adventures before this information about *Mission Ops* will make much sense.

Therefore, we strongly recommend you visit [www.DreamFlightAdventures.com](http://www.DreamFlightAdventures.com) to learn about the broader program. Past experience has shown that viewers probably won’t heed this advice, so here’s a brief summary about the program. Dream Flight Adventures works with schools and museums to transform traditional classrooms into fully themed and immersive spaces that resemble the command bridge of a science fiction vessel. Groups of students enter these simulator classrooms, assume a variety of roles (physicist, engineer, biologist, pilot, etc.) and work together to complete a challenging mission that blends science, technology, and engineering with social studies, humanities, and the arts. The students view the experience as an epic adventure, and little do they realize that they are learning crucial curriculum as well as a variety of 21st century skills such as teamwork, critical thinking, and problem solving.

These full immersion simulators are elaborate permanent installations, so despite their tremendous reception and results they are not suitable for all schools and museums. Mission Ops arose as an answer to our question of “How can we repackage this successful learning experience such that it is more accessible in a wider variety of environments?”

*Mission Ops* uses the same underlying principles of themed, immersive, story-driven learning adventures, but it employs a different format that emphasizes hands-on lab-style projects and specific exercises with less reliance on a technology-rich setting. It has lower technology and environmental requirements, so it can be more readily deployed in a traditional classroom or lab setting.

A specific example will help contrast the two programs. One of the Dream Flight Adventures simulation scenarios is [Vesuvius](#). In it, students fly their simulated vessel into a virtual volcano, take scientific measurements, and determine whether an eruption is imminent. This all takes place inside a decoratively themed immersive environment. Without this environment the learning adventure is not possible.

Mission Ops, on the other hand, offers a learning adventure that teaches complementary topics (the structure of volcanoes, etc.) in a standard classroom. It does this by guiding students through some hands-on activities, such as building a gelatin volcano to learn how magma flows, creating calderas with a box of flour and a balloon, and making a vinegar and baking soda model of an eruption. All of these activities could be done by a motivated teacher in a standard classroom, but Mission Ops packages and delivers them via an interactive story-based adventure similar to what students experience in the immersive Dream Flight Adventures simulators. This layer of interactive storytelling increases the students' interest and engagement level, which contributes to deeper learning.

The two programs can work side by side, but as it turns out Mission Ops also can function as a standalone solution for schools and museums that do not have a full immersion simulator installation.

### **What problem are you trying to solve and why does it matter?**

There are many challenges facing modern education that motivate *Mission Ops* on a deep level, but the clearest and most direct problem *Mission Ops* addresses is one posed by its sister product—[Dream Flight Adventures](#) simulators. These simulators only hold about 17 students, while most standard K-12 class sizes are closer to 30 students. So, when half the class is doing a Dream Flight Adventures mission, what do the rest of the students do?

It's important to note that the Dream Flight Adventures simulators are extremely complex systems, with each of the 17 student stations tightly interconnected. Due to game design, balance, and space constraints, it simply isn't feasible to make a simulator that supports up to 30 students. Instead, the program opts to divide a standard class in half, allowing one half to use the full immersion [simulator](#) while the other half does other activities. But what are these "other activities"?

Our initial answer to this question was a series of projects that the students could do in class—multimedia projects, creative writing assignments, group discussions, etc. However, these were a bit too mundane (especially in contrast to the Dream Flight Adventures simulator) and never really caught on. It quickly became clear that we needed something more special and compelling.

That said, we didn't want to fall subject to the same constraints as the Dream Flight simulators. Namely, we didn't want to require extensive construction, decorative theming, or expensive technology equipment. Furthermore, we wanted to support a wider variety of project-based learning (things like chemistry experiments, messy building projects, arts & crafts, etc.).

*Mission Ops* was created as a spin-off product that fits within these constraints and still delivers an engaging story-based learning adventure. It had some surprising and positive side effects too, which we'll elaborate on elsewhere in this Example.

### **What are your goals and how will you know if you've achieved them?**

*Mission Ops* has a variety of goals that seem to oppose each other at times. Getting them to all work nicely together will be tricky... but then again, all worthwhile things are tricky at times. Besides, it's what we love to do. These goals are:

- 1 Create a framework that can readily accept all types of educational projects (from full-blown labs and classroom activities to mundane drill-and-kill exercises).
- 2 String these projects together into an interactive story that motivates, entertains, and teaches students.
- 3 Package the entire experience such that educators in essentially any setting with minimal technology and funding will be able to implement the experience.
- 4 Develop a scalable process so content can be expanded easily and cost-effectively down the road.

One of the first metrics to gauge success in these goals is simply measuring adoption. If schools and museums learn about *Mission Ops* but don't use it, that's a clear indication that we missed the mark on at least one of our goals.

Once schools do implement the program, success can be measured by observing the students and comparing their interest, attitude, and academic performance against students who do not participate in the program.

### **Who will your work impact? What do you know about them?**

*Mission Ops* is designed to accompany Dream Flight Adventures simulators, which means that it will be embedded within elementary, middle, and high schools, as well as in museums and community centers.

That said, our goal is for *Mission Ops* to be flexible enough that it can stand alone as a viable and attractive experience for teachers nationwide (if not around the world), even without a full Dream Flight Adventures simulator.

Teachers everywhere struggle to keep their students motivated and engaged. Game-based learning principles have caught on quite a bit lately, but their adoption is still rocky at times, and teachers often wonder if their attempts are effective (rather than inadvertently providing a "playtime" that lacks sufficient educational value). *Mission Ops* is our attempt to package rich educational experiences in a motivating story-based adventure that simultaneously entrances students while satisfying rigorous educators.

### **How can our community support you? (expertise, resources, etc.)**

*Mission Ops* was born out of [an idea that didn't quite fit what modern educators need](#), so the idea was twisted and tweaked until it took its current shape. This twisting and tweaking will undoubtedly continue. We hope to continue to work with this community to get feedback, validate ideas, and shape our development.

Once *Mission Ops* is complete we also hope to test it and deploy it at classrooms accessed through this community.

## **Sprout**

### **Tell us about your process and how your idea is evolving throughout the project.**

The first implementation of *Mission Ops* will be at a high school in the greater Pittsburgh area. Our original hope for the program was to embed content and activities from the school's science curriculum into *Mission Ops* to create a compelling STEAM Lab for the school. However, as it turns out, the school didn't provide any science projects or group activities for us to build upon. Instead, the burden fell upon our team to design the lab and its related activities ourselves. Although we're working through this challenge and are still on track for a successful launch in the summer of 2014, the situation is clearly less than ideal and it has taught us important lessons regarding how we expand the program to more schools. Specifically, at the very earliest stages of working with a school we have learned to verify that it has curriculum-based activities in place. We're much better at making exciting interactive experiences than we are at writing curriculum, so we want to partner with schools and leverage their expertise: they provide the qualified content, and we provide the layer of engaging interactivity.

Another important challenge we've faced is the problem of bottlenecks. In *Mission Ops*, classes of students are divided into small teams of 4-5 students each. Each team receives an iPad running our custom app, which guides them step-by-step through curriculum-based activities. However, some of these activities require special equipment (e.g. a microscope), but not all labs will have enough of each piece of equipment for all the teams to use them at once. As a result, we have to be careful in how we design the experience to ensure that groups move between equipment in an orderly fashion that avoids potential bottlenecks with multiple groups trying to use the same piece of equipment at the same time.

### **What interesting patterns or insights have you discovered?**

One of the exciting things that we've learned through this project is the applicability of *Mission Ops* to a wide variety of labs and classroom settings. We originally designed the program to be a companion to our Dream Flight Adventures simulator classrooms, but we've discovered that *Mission Ops* can effectively stand alone as its own experience, even without a simulator classroom.

We've also been pleased with the versatility it offers. The program is essentially a fancy mechanism for delivering instructions to students and capturing their responses—a high tech worksheet, of sorts—that lends itself to use in



a variety of situations. We originally envisioned it being used in science labs and STEAM rooms, but we've begun to see teachers and schools consider using it in more settings as well (e.g. in a school library, etc.). We're excited to see where this will ultimately lead.

**What are some of your initial concepts or designs? We'd love to see them.**

Here are some screenshots showing the iPad software with a mission designed around an elementary-level volcano unit.



Figure 1: Welcome screen on student team mobile devices.

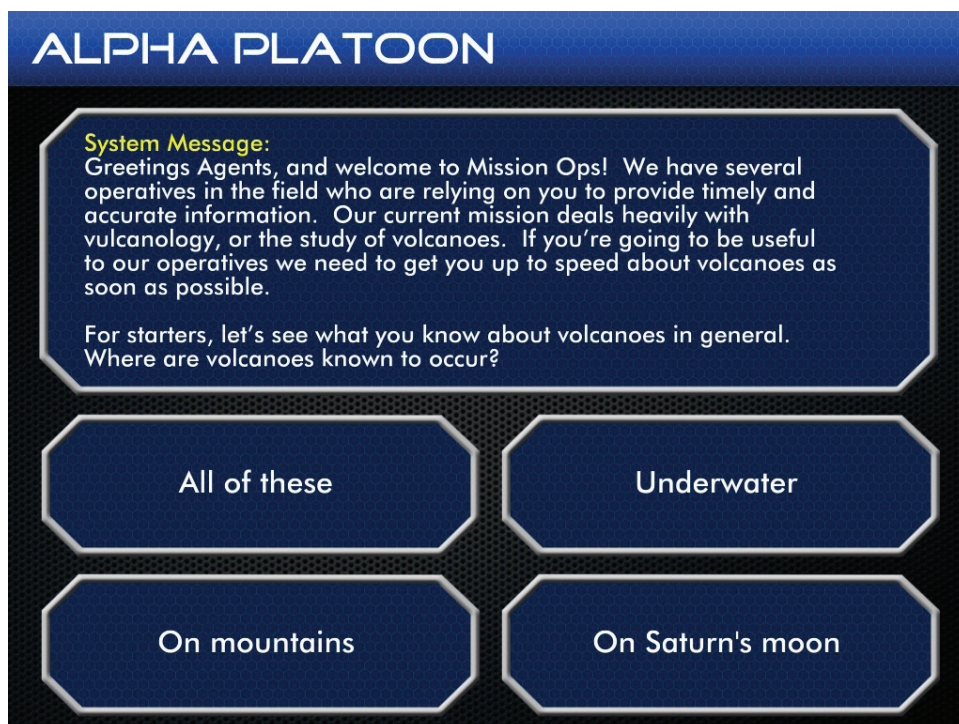


Figure 2: Sample multiple-choice screen.

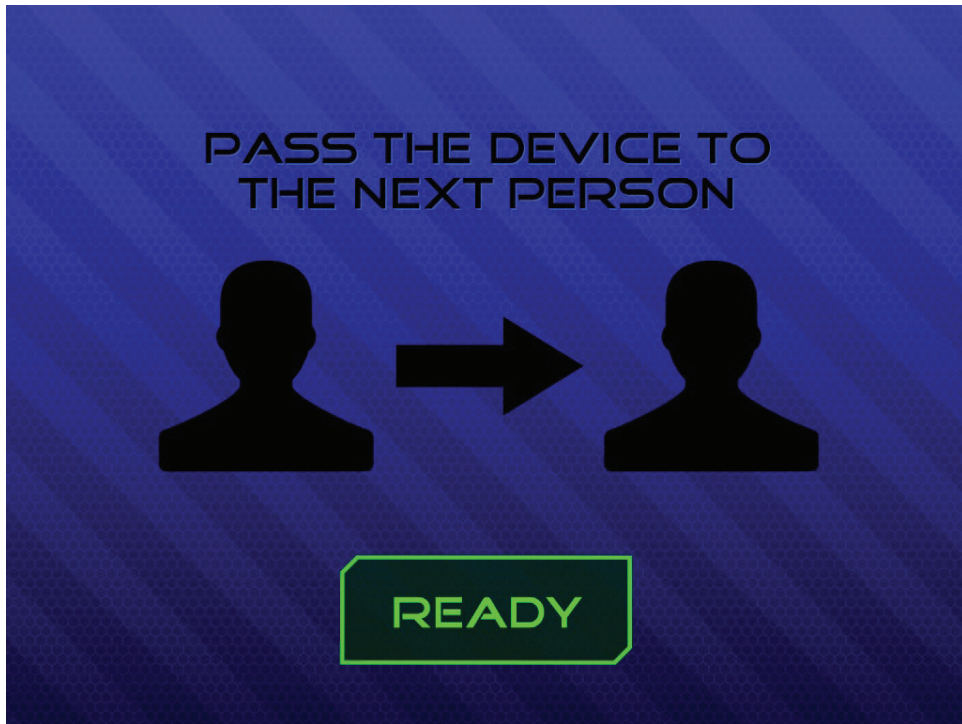


Figure 3: Sample student prompt.

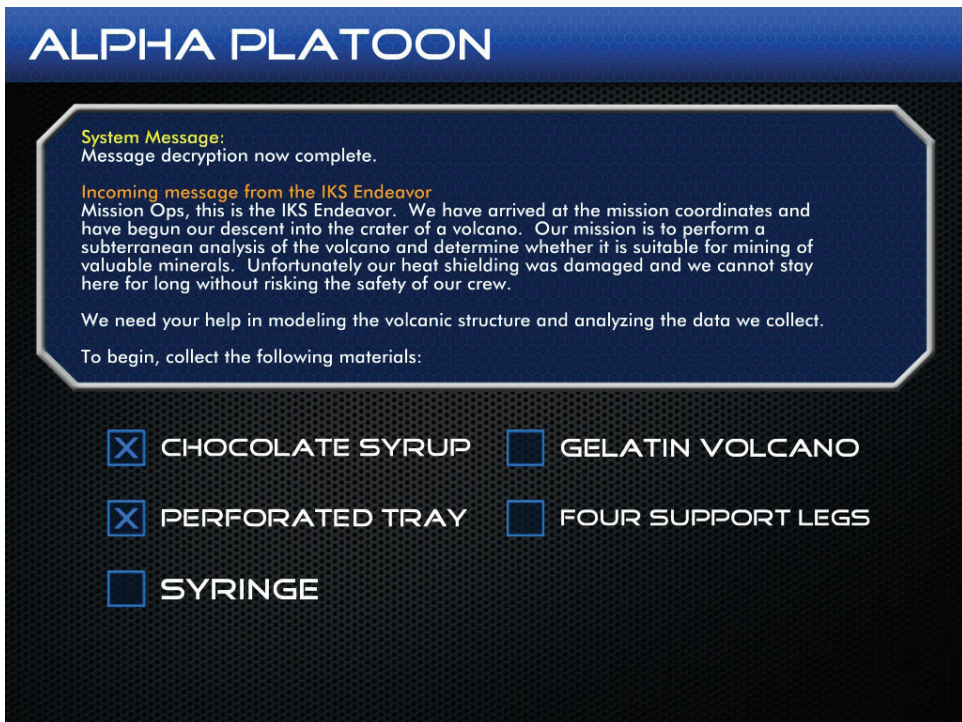


Figure 4: Sample checklist screen.





Figure 5: Sample photo screen.

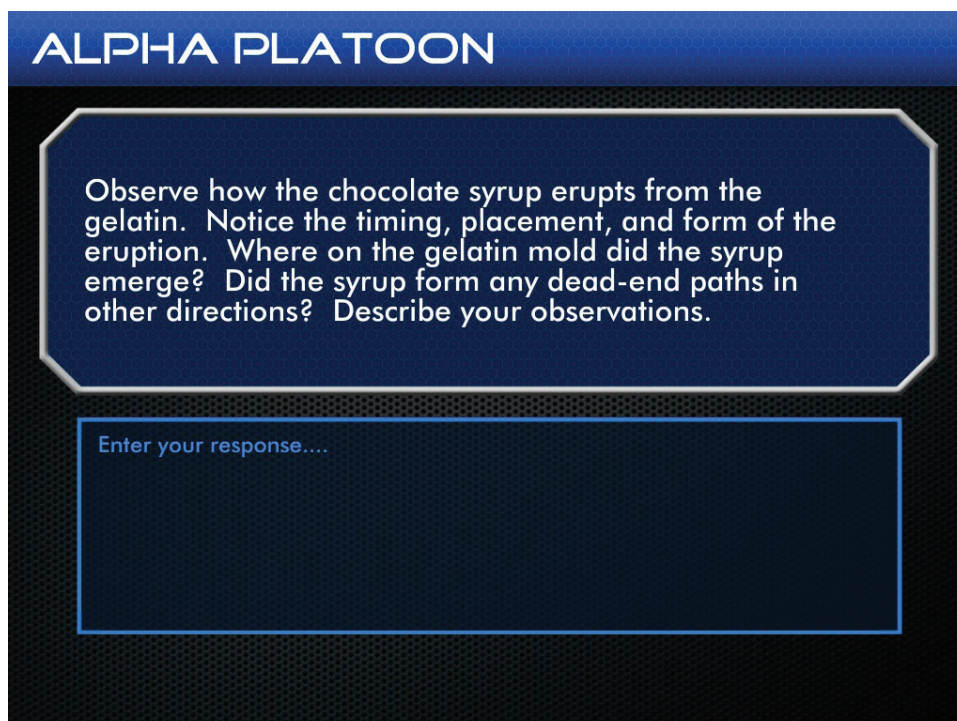


Figure 6: Sample free response screen.