

# Hexpods

## Education

Hexpods gamify science learning by adding quests to complete and achievements to unlock. Activities and video games supplement the experiments; help the child review important concepts; and offer insight into their knowledge retention.

A separate app for parents keeps them directly involved in the learning process. They can receive notifications about their child's progress, and view additional material and activities they can engage in with their children.

## Open Platform

Hexpods is designed with the community in mind. The Apps, component lists, and kit blueprints are made available so that anyone can design their own kit.

Writing new experiments for the app is straight-forward for anyone willing to learn a little XML.



## Concept

The last twenty years of advancement in technology are not well represented in most science kits available today.

We created Hexpods to incorporate interactive learning with the timeless satisfaction of making things in the real world.

## Design

Every piece in a Hexpod, down to the box it comes in, is designed to be both useful and interesting. Each contains the materials needed to complete the experiments and activities.

A content-rich tablet application serves as a virtual laboratory, lab notebook, and entertainment center. New kits are easily added within the app by scanning a code printed on each kit. The app uses kit inventory and content progression to customize material.



## **HEXPODS**

Created by Meg Richards & Pete Friedman

### **Concept**

The last twenty years of advancement in technology are not well represented in most science kits available today. While they can still teach important concepts, the format makes them less engaging and less desirable than many other recreational activities. We created Hexpods to incorporate interactive learning with the timeless satisfaction of making things in the real world.

Each Hexpod is a set of themed experiments with an interactive digital assistant to guide learning and discovery. A dynamic tablet application hosts the assistant while serving as a virtual laboratory, lab notebook, and entertainment center. A child can easily add new kits from the home screen by scanning the “KitCode” featured on each package. The app uses the child’s kit inventory and progress to customize material. A separate app for parents keeps them updated on their child’s progress and provides additional resources for continuing education. Kits can be ordered individually or as part of a sequence. New kits are recommended to parents based on the educational goals for their child and the child’s performance in other kits.

Hexpods is a framework for science education, not a limited set of experiments in a box. The core app is extensible and content agnostic, allowing it to easily support different subjects. The kit design is modular and highly scalable. Every piece in a Hexpod, down to the box it comes in, is engineered to be both useful and interesting.

### **Educational Value**

The interactive nature of Hexpods makes it an excellent platform to encourage curiosity and scientific learning. It can dynamically illustrate abstract concepts, provide instant feedback to reinforce key information, and simulate experiments too dangerous or impractical to be included in a kit.

Hexpods gamify science learning by adding quests to complete and achievements to unlock. Activities and video games supplement the experiments: They help the child review important concepts, offer insight into their knowledge retention, and keep the learning experience exciting. Activities can take advantage of the tablet’s cameras and sensors so

children can observe and document the world around them. Integrated tools like the lab notebook promote the use of scientific methods.

The app for parents keeps them directly involved in the learning process. They can receive notifications about their child's new achievements and monitor progress within each kit. The app also includes science briefings and supplemental activities for each kit, so parents can reinforce scientific concepts with their children and foster a learning-positive environment in the home.

The Hexpods platform is designed to be flexible; material can accommodate any skill level. While our example kits focused on the 8-12 range, content difficulty can easily scale to even advanced topics.

## **Social Impact**

We firmly believe that a quality science education should be made available to all children. To realize this goal, we intend to make the app, complete details of each kit, and even package blueprints available for free. Sale of the assembled kits would subsidize development of the app as well as new kits, sustainably allowing us to offer learning opportunities to a wide and diverse audience.

By documenting and releasing the technical details of the platform, we would foster an open kit developer community. Our framework would provide an easier path to production, create a wider variety of available science kits, and give children a way to learn new concepts in a familiar environment. As children mature we would encourage them to transition from consumer to creator, giving them the opportunity to develop new skills, contribute back to the community, and continue the learning process in a new and exciting way.

## **Future Potential**

Hexpods has real potential as both a marketable product and for hosting a vibrant, online community. The versatility of the platform ensures a healthy ecosystem of add-ons and its open nature prevents vendor lock-in.

Our background in computer science and information technology makes us well-suited to assess the initial and ongoing IT infrastructure requirements, but we would require

additional expertise to successfully produce the physical component of the product. The next step for us would be to pursue manufacturing options while refining the app. We would want a rigorous user-testing phase for the app and each kit, subject to the same scientific methodology we are trying to instill. Working as developers in higher education has prepared us for security-focused technology development, and we are especially conscious of privacy concerns.

We think Hexpods will be a valuable tool for children in their exploration of science. Success for us is a wide audience of children excited about using Hexpods to explore science; respect among scientists for the value of Hexpods in promoting scientific literacy; and a passionate community of Hexpoders committed to making the experience even better.