Virtual reality describes artificial environments that users experience via sensory stimuli provided by computers. Headsets used in conjunction with mobile applications represent the most simple way to experience VR. This tech kit guides users in “virtual” worlds using a headset.

Augmented Reality involves the superimposition of artificial information into real world environments. This tech kit provides an introduction to AR that illustrates its ability to enrich users’ lives and provide significant opportunities for learning.

3D printing is an evolving, additive manufacturing process that involves creating layers of heated plastic to form printed parts. The innovative process allows models of a variety of shapes and sizes to be produced quickly and inexpensively. This tech kit teaches users the basic steps required to 3D print.

Drawing a cube on a piece of paper would be two-dimensional, but viewers would perceive it as a 3D figure. 3D modeling provides an advanced way to create this perception. It uses software to create models of physical objects. This tech kit guides users in beginning to hone their modeling skills.

Qlone is a 3D scanning app created by EyeCue, available on any Android or iOS device. While the results are not to the quality of a commercial scanner or other advanced methods, this app works as a first foray into 3D scanning.

In aviation, drone refers to an unpiloted aircraft. Drones were initially only used for military purposes, but today limited private sector use is permitted. In light of this growth in the commercial sector, this kit introduces users to the basics of drone capabilities.

Computer-Aided Design, or CAD software is frequently used to create precision drawings or technical illustrations. This tech kit provides an introduction to CAD modeling. It challenges users to create their very own CAD models.

Photogrammetry is the method of reconstructing and measuring of objects through images. Meshroom is an open source photogrammetry software that will let us scan objects at scale/precision, provided we have enough pictures.

One of the most widespread, important applications of drone technology today is undeniably quite simple: photography. This kit guides users as they pilot a drone in varying flight modes to take high-definition photos and videos using the drone’s built-in compact camera.

This tech kit explores the feasibility of integrating AR and big data software solutions. It guides users in creating AR objects for business decision-making using one such software.

Building upon the rudimentary VR experiences, this tech kit introduces more advanced VR technologies, devices, and platforms. Respectively, these include “room scale” tracking technology, motion-tracked handheld controllers, and a VR game platform.

Augmented Reality is one of the commercial solutions to 3d scanning, and uses a method called structured light scanning. It is more expensive than scanning with a phone and a turntable, but it is much more accurate and has many more tools to learn and apply.
## EMERGING TECH TRACK

### BEGINNER

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
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| **Internet of Things** | **Intro to the Internet of Things** 30 mins  
The Internet of Things (IoT) refers to extending Internet connectivity to traditionally non-Internet-enabled physical devices and objects. This tech kit provides an introduction to such devices. It additionally guides users in developing their own IoT services. |
| **Voice Tech** | **Intro to VoiceFlow** 60 mins  
Voice Tech is a range of technologies that utilizes and takes in speech in order to function. Examples of this are Siri or Amazon's Echo. VoiceFlow is a program for visually designing and prototyping voice apps for Amazon Echo and Google Home devices. |
| **Microcontrollers** | **Intro to Microcontrollers** 30 mins  
A microcontroller is a compact integrated circuit that is designed to perform a given operation in an embedded system. This tech kit explores the Arduino, an electronic prototyping platform that consists of circuit board used to write code. |
| **Wearables** | **Intro to Wearable Technology** 30 mins  
The Adafruit FLORA is an Arduino-compatible microcontroller designed for wearable applications. This tech kit guides users as they interface the FLORA with NeoPixels. LED lights can be used to add blinking and color-changing effects to wearable projects. |
| **Artificial Intelligence** | **Intro to Artificial Intelligence** 45 mins  
Artificial intelligence is the theory and development of computer systems capable of performing tasks that normally require human intelligence. This tech kit guides users in broadly leveraging artificial intelligence and creating a simple chatbox |
| **Blockchain** | **Intro to Blockchain** 45 mins  
A blockchain is an incorruptible digital ledger of economic transactions that can record financial or other types of exchanges. This tech kit guides users in creating a blockchain simulation using code. It introduces cryptography, offering a tangible understanding of a “block.” |

### INTERMEDIATE

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| **Internet of Things** | **Exploring Virtual Assistants** 45 mins  
Virtual assistants are applications that can understand voice commands and complete tasks. This tech kit guides users in developing their very own “skills” for virtual assistants. These are the capabilities that allow users to train virtual assistants to perform tasks. |
| **Voice Tech** | **Code Blocks in VoiceFlow** 60 mins  
VoiceFlow is a program for visually designing and prototyping voice apps for Amazon Echo and Google Home devices. For this tech kit, code blocks and variables will be utilized in order to create a voice enabled base converter and a number guessing game |
| **Microcontrollers** | **Sensing Motion** 45 mins  
This tech kit expands upon the Arduino introduction. It guides users through the Arduino Integrated Software Environment (IDE). At the end of this tech kit, users can develop a basic motion sensor that activates an LED light when movement is detected. |
| **Wearables** | **Data: Sensor to a Microcontroller** 45 mins  
Velostat is a thin, flexible material that can be used as a pressure or stretch sensor. This tech kit guides users as they read data from a Velostat sensor to an Adafruit FLORA. The code utilized in the kit is capable of reading data from a variety of other sensors. |
| **Artificial Intelligence** | **Exploring Machine Learning** 45 mins  
Machine learning defines the study of algorithms and statistical models. This kit explores leveraging an open-source library used to build machine learning models. It guides users in executing code to train a model to recognize handwritten digits. |
| **Blockchain** | **Distributing a Blockchain** 45 mins  
A powerful characteristic of blockchain technology is the distribution of blockchains over networks. This tech kit introduces users to blockchain mining and guides users in simulating a simple distributed blockchain using code. |

### ADVANCED

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<th>Technology</th>
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| **Internet of Things** | **Merging IoT and AI** 45 mins  
Virtual assistants can operate as hubs for a variety of IoT devices and artificial intelligence (AI) platforms can interact similarly with IoT devices and provide data analysis capabilities. This tech kit guides users as they develop a functioning IoT device network using an AI platform. |
| **Voice Tech** | **Advanced Blocks in VoiceFlow** 60 mins  
VoiceFlow is a program for visually designing and prototyping voice apps for Amazon Echo and Google Home devices. For this tech kit, advanced blocks will be used to design a voice enabled word bank to find rhymes, synonyms, antonyms, definitions or examples of a word. |
| **Microcontrollers** | **Raspberry Pi** 60 mins  
A Raspberry Pi is a small computer that plugs into a monitor and functions using a mouse and keyboard. It provides the functionality of the Linux OS but serves as a low-power alternative to using a full computer. This kit introduces the Raspberry Pi. |
| **Wearables** | **Heart Rate Monitor** 60 mins  
This tech kit guides users in connecting the Adafruit FLORA to a PulseSensor, a portable heart rate sensor. By teaching users how to incorporate biometrics data, it helps create a heart rate monitor that provides warnings when an observed rate falls out of range. |
| **Artificial Intelligence** | **Machine Learning Models** 45 mins  
Machine learning has a wide range of potential applications. One application involves taking data in an unusable format and transforming it into a suitable format. This tech kit guides users in creating a script to format digits and leverage a trained model to classify numerical digits. |
| **Blockchain** | **Web App Monitor a Blockchain** 45 mins  
To maximize the effectiveness of blockchain technology, it is crucial that individual blockchains are conveniently and publically accessible to relevant stakeholders. This tech kit guides users in developing a small interface to view and manage a blockchain. |