Verizon Innovative Learning Labs

Overview

The Verizon Innovative Learning Lab curriculum, developed in partnership with the J.Orin Edson Entrepreneurship + Innovation Institute at Arizona State University, offers four different courses with varying technological focus. These courses are built on the four pillars of Design Thinking, Entrepreneurial Mindset, Emerging Technology, and Sustainability, and all lessons are aligned to Common Core State Standards (CCSS), International Society for Technology in Education (ISTE), Next Generation Science Standards (NGSS), and National Content Standards for Entrepreneurship Educations (NCEE).

Courses are designed so that they can be taught independently over the course of a quarter or semester, or paired with another course to be completed over a semester or a year. The courses or tracks that pair best together are **Immersive Media** (IM) and **Digital Product Innovations** (DPI) or **Smart Solutions** (SS) and **Artificial Intelligence** (AI).

Continue on to learn more about each course!

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Immersive Media
The Immersive Media (IM) course empowers students to become digital storytellers and 3D content creators by using virtual reality (VR), augmented reality (AR), and branching narrative software. Students travel to four virtual planets in this galactic-themed adventure to complete a series of "missions" that hone their technical and soft skills. Students then put their skills to the test by choosing from a menu of three sustainability projects per planet!

Technology
Virtual Reality Headsets
VR headsets are used to enable students to experience places and things that are not normally accessible, either due to distance in time or space, size, or because they are imaginary. Through VR, students can walk the streets of ancient Rome, then fly through space to Mars. They can enter the bloodstream and watch white blood cells attack a virus, and finish their day exploring a zoo on an alien planet.

360 Cameras
360 cameras allow students to create immersive 360 videos and images that catch everything above, below, and in a full circle around the camera. These images and videos can then be dropped into software programs to create immersive virtual reality experiences.

Smartphones and/or Tablets
Students use smartphones or tablets to interact with the curriculum hardware and software, record their thoughts and experiences, and to become *creators*, and not only consumers, of engaging content.

Merge Cube
The Merge Cube is a physical cube that you can hold in the palm of your hand. A wide variety of educational apps, including Merge Edu, can be used to bring the Merge Cube to life for a multi-sensory learning experience in augmented or virtual reality.

Software
CoSpaces
CoSpaces Edu is a 3D, AR/VR creation software that allows students to design an entire 3D environment and experience. CoSpaces can be used on any device and experienced through the lens of a VR headset. Experiences can be designed using 3D design tools available in the software or taken to the next level with block coding or advanced scripting.

Inklewriter
Inklewriter is a free software that allows students to create interactive branching narrative stories to become digital storytellers and, through design, provide their readers with various narrative pathways and outcomes.

ThingLink
360 images are immersive, fun and informative. ThingLink enables students to take 360 images and make them interactive by adding points of interest that include text, additional images, and videos.

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Digital Product Innovations

The Digital Product Innovations Course (DPI) takes students through the basics of user-centered research, product design, branding, Computer-Aided Design (CAD) modeling, and 3D printing in this time-travel themed course. Students travel into the past to learn design concepts in the groovy sixties, with projects focused on racial and gender equality. They travel further back to build 3D models of ancient architecture and learn about economics. A trip to the future emphasizes sustainability and pushes students to consider solutions with minimal environmental impact and maximum potential. Art meets engineering in this amazing world of digital design.

Technology

3D Printers

Imagining and designing tools, worlds, characters; it can be fun and exciting, but at the end of the day, it lives on paper or in the digital world with no tangible representation. 3D printers take ideas from 2D designs and create them into tangible, 3D objects.

Software

2D Graphic Design Software

Graphic design software allows students to create 2D images and a compilation of images that can be used for printing on objects like shirts, to develop apps, and many other things. There are a lot of free and easy to use graphic design software available. Some of the current free software available are: Gravit Designer, Vectr, Canva, SumoPaint. While the curriculum refers to Gravit, any software that meets the privacy and technology needs of a school or district can be used. In addition, schools that have Adobe Cloud can utilize Adobe Illustrator.

3D Graphic Design Software (Computer-Aided Design)

Creating 3D objects to be added into virtual worlds and for 3D printing is fun and exciting. The world of 3D requires objects that have 3 dimensions (height, length, width) and special types of files. Objects that are created in 3D and saved into common 3D file formats like .obj and .stl can then be exported to a 3D world like CoSpaces or for slicing and 3D printing. The Verizon Innovative Learning programs lean into free 3D design (CAD) software like TinkerCAD and OnShape. TinkerCAD is a great entry level design tool. OnShape is a professional level design tool with more advanced options.

3D Models

Online libraries of 3D models for printing and importing into virtual worlds are available. Students can access these tools to find models for CoSpaces or to modify and 3D print. Some of the common sites are SketchFab and Thingiverse.

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Smart Solutions
The Smart Solutions (SS) course guides students through a superhero themed adventure to learn about electricity, circuits, and programming. Students complete a series of hands-on "missions" and advance through four different content levels, each level culminating in a choice between various electronics projects. Will students choose to wire the lights and sounds of an electronic music benefit concert? Do they have the artistic eye to program LED jewelry? Can they wire and program a fully autonomous smart garden system?

<u>Technology</u>
Snap Circuits Electronics Kits
Snap Circuits are a great way to introduce students to the basics of electricity and circuits. Students can learn about the flow of electricity, ohms, the purpose and importance of resistors, parallel circuits, and how to troubleshoot when an electronic device is not working. A basic understanding of electronics and electrical engineering provides a strong foundation for all STEAM related careers.

BBC micro:bit
Computers and coding can be perceived by many students as difficult or boring. Micro:bit flips the script and makes it easy, cool, and fun. This pocket-sized computer has built-in sensors and Bluetooth capabilities, allowing students to create digital compasses, thermometers, and multi-player, handheld games with only a few blocks of code and a quick upload. Adding expansion packs with additional sensors, wires, breadboards, servo motors, and other cool tools allows students to imagine, design and prototype functioning solutions to the problems they identify in the world around them.

<u>Software</u>
Microsoft MakeCode
Microsoft MakeCode allows students to create games, program the micro:bit, or develop mods for Minecraft. This free and easy to use online tool allows students to use simple block coding or JavaScript to create anything they can imagine. It includes tutorials and courses that guide students through developing code step by step and includes an emulator for immediate testing of programs.

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Artificial Intelligence + Robotics

The Artificial Intelligence + Robotics (AIR) course empowers students to research and create real-life machine learning and robotics projects. Students will learn the basics of AI, programming, robotics, and electronics in this ocean-themed track. Students will design robotic solutions in both the digital and physical worlds to solve the environmental problems faced by the world's oceans. Imagine programming a video game AI villain one week and building an autonomous robot the next. Student choice is a guiding force throughout the course: there is a project for every artist, musician, athlete, and engineer.

Technology

Sphero RVR

The Sphero RVR is an easy-to-use programmable autonomous robotic vehicle with lots of options for expansion projects to teach students about robotics, coding, and circuitry. The online application Sphero EDU has hundreds of lessons that can be sorted by difficulty level and cross curricular applications in Math, Science, Social Studies and Art. Students learn the basics of robotics and programming, how to navigate an obstacle course and are challenged to create robotic solutions for real-life sustainability challenges in the AIR course.

micro:bit and littleBits Expansion Kits

Computers and coding can be perceived by many students as difficult or boring. Micro:bit and littleBits flip the script and make it easy, cool, and fun. These two kits add expanded functions to the Sphero RVR with additional sensors, wires, breadboards, servo motors, and other cool tools that allow students to imagine, design and prototype functioning solutions to the problems they identify in the world around them.

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Teachable Machine

Teachable Machine is a free online tool made by Google that makes it easy for anyone to explore a machine learning program that you code to recognize images or sounds. Students learn about a part of artificial intelligence called machine learning and can explore a machine learning model made by Google. Students can train their computer to detect the difference between two different images in the Smart Machines lesson of the AIR course.

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