Grade 6

Unit 1: Digital Journeys: The Making of A Maker	Unit 2: Brands on the Run: Companies, Products & Markets
Project output: Learners use a variety of digital tools to design customized **logos** which will be used to personalize their Design **e-portfolio websites**. **Design Challenge:** How might we meaningfully represent our designer/maker traits by creating personalized logos and portfolios? **Maker disposition(s) in focus:** multiskilled, adaptable, key players, empathetic, reflective, self-directed	**Project output:** Learners use basic graphic editing, CAD and 3D printing tools to design and create **promotional items** and **product prototypes** that showcase the branding of start-up companies. **Design Challenge:** How might we effectively showcase the identity and values of a company through versatile branding in promotional items and product prototypes? **Maker disposition(s) in focus:** key players
Unit 3: Maker Quest: Toy Craft	**Unit 4: Gamified: Play 2 Learn & Learn 2 Play**
Project output: Using a variety of materials, learners apply engineering construction concepts and skills to design and build prototypes of **mechanical toys** (cars, boats, planes, etc.) for children. **Design Challenge:** How might we encourage recycling and hands-on learning by designing and creating DIY mechanical toys for young children? **Maker disposition(s) in focus:** multiskilled	**Project output:** Learners use graphical block programming (Scratch) to design and invent **computer games** that can be manipulated/controlled using physical materials (Makey Makey). **Design Challenge**: How might we design and create interactive computer games that can serve as learning aids? **Maker disposition(s) in focus:** reflective
Unit 5: Circuits, Circuits: Designing Theme Park Rides	
Project output: Using cardboard circuits and chosen mechanisms, learners design and build functional physical models/prototypes of **theme park structures and rides.** **Design Challenge:** How might we demonstrate creative and efficient use of machines by designing and building models of theme park rides for children? **Maker disposition(s) in focus:** empathetic	

Grade 7

Unit 1: Click & Learn: Interactive Visuals & Objects	Unit 2: Design 4 Disasters: Water Towers
Project output: Learners use QR codes and Augmented Reality to create **interactive images/graphics** with multimedia content to provide information for specific users. **Design Challenge:** How might we effectively show information, instructions or directions for specific users by blending the physical and the virtual through interactive visuals or objects? **Maker disposition(s) in focus:** adaptable	**Project output:** Given disaster scenarios and cost constraints, learners design, build and test **models of buildings** that can withstand earthquakes and other natural disasters. **Design Challenge:** How might we demonstrate safe structural designs by creating and testing models of buildings for strength and resilience? **Maker disposition(s) in focus:** key players
Unit 3: Cranky Creations: Automata & Kinetic Crafts	**Unit 4: NetFlips: Interactive Digital Books**
Project output: Learners apply interactive mechanisms to design and build **automata** or similar **kinetic displays** that feature common/popular scenes in Mozambican life/culture. **Design Challenge:** How might we creatively promote Mozambican culture by designing and constructing interactive kinetic crafts that depict common/popular local scenes and traditions? **Maker disposition(s) in focus:** multiskilled	**Project output:** Using literary elements, coding tools and embedded multimedia, learners transform short fictional narratives about online safety and digital citizenship into **interactive digital non-linear stories/books.** **Design Challenge:** How might we creatively encourage responsible digital citizenship by transforming traditional stories into interactive fictional adventures? **Maker disposition(s) in focus:** multiskilled, adaptable, key players, empathetic, reflective, self-directed

Unit 5: Sumobot: Robot Wars
Project output: Learners apply coding concepts to design and build functional **robot prototypes** for a STEM competition. **Design Challenge:** How might we promote STEM-oriented careers by organizing fun and creative robotics activities? **Maker disposition(s) in focus:** self-directed

Grade 8

Unit 1: Significant Figures	Unit 2: Campfire Stories
Design Challenge: How might we creatively design interactive infographics to represent significant data and other information that will be useful for specific users? **Project output:** Based on surveys, interviews and research that they have conducted, students design and create **interactive charts, graphs and other data visualization** that creatively shows useful information for specific users. **Maker disposition(s) in focus:** adaptable	**Design Challenge:** How might we effectively convey the learning journeys and achievements of designers and makers through creative puppetry and stagecraft? **Project output:** Using a variety of materials, learners apply engineering construction concepts and skills to design and build **prototypes of puppets, and stage decor** to act out a script from a given scenario **Maker disposition(s) in focus:** multiskilled, adaptable, key players, empathetic, reflective, self-directed
Unit 3: Spaghetti Structures	**Unit 4: Fab Garb: The Buffalo Fashion Tech Catalog**
Design Challenge: How might we learn to create a lightweight bridge that will hold the most weight using Spaghetti and glue? **Project output:** Using a variety of materials, learners apply engineering construction concepts and skills to design and build **prototypes of civil or mechanical engineering objects** (cars, boats, planes, bridges.) **Maker disposition(s) in focus:** key players	**Design Challenge:** How might we showcase Mozambican culture by designing and creating innovative fashion accessories and other wearables using inexpensive recyclable materials? **Project output:** By combining fashion design concepts, 3D printed components, electronics and recyclable materials, learners create a **fashion catalog** of various **wearable fashion accessories** and other items that showcase Mozambican culture **Maker disposition(s) in focus:** reflective
Unit 5: Gamers & Coders	
Design Challenge: How might we raise awareness about responsible digital citizenship among children by designing and creating interactive **computer games and applications** using microcontrollers and microcomputers? **Project output:** Students design and code games and apps to help raise awareness about responsible digital citizenship using microcontrollers and microcomputers (examples: Arduino, Raspberry Pi). **Maker disposition(s) in focus:** self-directed	

Grade 9

Unit 1: Home 4U - Architectural Explorations	Unit 2: Makers & Movers: Global Tech Newsflash
Design Challenge: How might we demonstrate environment-friendly and adaptive architectural designs by modeling home spaces that suit the specific needs of clients/residents? **Project Output:** Using architectural concepts and CAD tools, learners design **digital house plans** in response to the environmental conditions, cost limit and specific needs of identified clients. **Maker disposition(s) in focus:** adaptable	**Design Challenge:** How might we effectively promote maker qualities/dispositions by creating informational videos that showcase innovative technological solutions/products? **Project Output:** Using multimedia tools and effects, learners create short informative **newscast videos** that showcase maker qualities/dispositions through innovative technological solutions/products. **Maker disposition(s) in focus:** multiskilled, adaptable, key players, empathetic, reflective, self-directed
Unit 3: Coders & Builders - Introduction to Vex Robotics	**Unit 4: Mechanical Wonders: Kinetic Sculpture/Art**
Design Challenge: How might we code and build a robotic device to assist in survival? **Project Output:** Learners apply coding concepts to design and build functional **robot prototypes** for a STEM competition. OR Using the Vex IQ kits the students need to build a robot that will automatically complete the challenge which is: You are living in a post-apocalyptic world, you are one of the last humans remaining on the earth, it is not safe to go outside but you need water to survive. Fortunately you have been equipped with coding and building skills required to build and code robots. Use your skills to build a robot that can help you collect the water from outside. There is also a shortage of food in your compound so the robot needs to collect food as well. You have also recently found out that there are two survivors in the outbuildings who need to be saved and brought to your compound. Your robot will need to have oxygen available for these survivors. **Maker disposition(s) in focus:** self-directed	**Design Challenge:** How might we creatively use available resources to build kinetic sculptures that aids in mental health? **Project output:** Using a variety of materials, learners apply engineering construction concepts and skills to design and build prototypes of **kinetic sculptures** **Maker disposition(s) in focus:** empathetic
Unit 5: Constructions, Conservation & Connections - Bridge Building Challenge	
Design Challenge: How might we design a system that will enhance and meet an individuals and a community's ergonomic and economic requirements by connecting them to the world? **Project Output:** Using a variety of materials, learners apply civil engineering construction concepts and skills to design and build prototypes of **civil objects (cars, boats, planes, bridges.)** **Maker disposition(s) in focus:** key players	

Grade 10

Unit 1: In Pursuit of APP-iness: Augmented Reality & App design	Unit 2: Level-Up Vex Robotics
Design Challenge: How might we meaningfully create an app or project to enhance real life experience and to reflect what augmented reality is and how it works? **Project Output:** Learners use basic graphic editing tools and techniques and a variety of digital tools to design and customize their **augmented reality project**. **Maker disposition(s) in focus:** adaptable	**Design Challenge:** How might we design and create a robot that will automatically move into an unstable environment and retrieve an object of value? **Project Output:** Learners use graphical block programming Vex Block program - **coding and robot building**, to program a Vex robot that they have to build and program to do certain tasks. **Maker disposition(s) in focus:** self-directed
Unit 3: Deep water explorations: Rigged for disaster	**Unit 4: Passion Project "Hands on"**
Design Challenge: How might we design and create a stable prototype oil rig to drill on the seabed, prevent oil spills and if a spill occurs design a collection device to gather the spilt oil? **Project Output:** Using a variety of materials, learners apply engineering construction concepts and skills to design and build prototypes of **mechanical objects (floats and oil rigs)** **Maker disposition(s) in focus:** reflective	**Design Challenge:** How might we create a marketable product or application that reflects and communicates our abilities, perspectives and dispositions as makers/designers? **Project Output:** Learners choose their topic and follow the design cycle criteria to create / present their **chosen idea/topic** **Maker disposition(s) in focus:** multiskilled, adaptable, key players, empathetic, reflective, self-directed

Unit 5: Air Force AISM - Pilot Program
Design Challenge: How might we effectively promote Scientific and technical innovation by creating 3D printed based objects that have moving parts? **Project Output:** Learners apply CAD and 3D printing tools and techniques to create **prototypes of movement based objects**. **Maker disposition(s) in focus:** key players