

# STEAM Learning Lab

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## Course Catalog

An integral part of



Digital Media Academy  
Certified Schools



Technology Education | Grades Pre K - 12 | Standards Aligned

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# Cool Computers

Learn how computers help us solve problems through games, art, music and story.



## Course Description

This course is designed to introduce young children to what computers do and how they work. Students will learn about programs, input and output and code and explore the way they work together to help us record and listen to music images, create art, take and view pictures and video.

Ages: 4-8  
Grade Level: PreK/K - 2

## Learning Outcomes

- Identify the difference between input and output devices
- Explain the general process of how a computing device works
- Give simple pseudo-code algorithms
- Understand that computers are tools that help us solve problems
- Creatively imagine the future of computers and problem solving.



SCAN ME

[dma.tech/coolcomputers](https://dma.tech/coolcomputers)



# Code, Computers and Carrots

Learn about computers and coding by solving some puzzles, playing some games and reading some stories about RABBITS!



## Course Description

Students will learn some basic coding/programming terms that are common to all computer languages through hands-on activities including drawing, puzzles and games. In the last module, students will have the skills and knowledge to engage in some basic block-based coding challenges.

Ages: 6-8  
Grade Level: 1-2

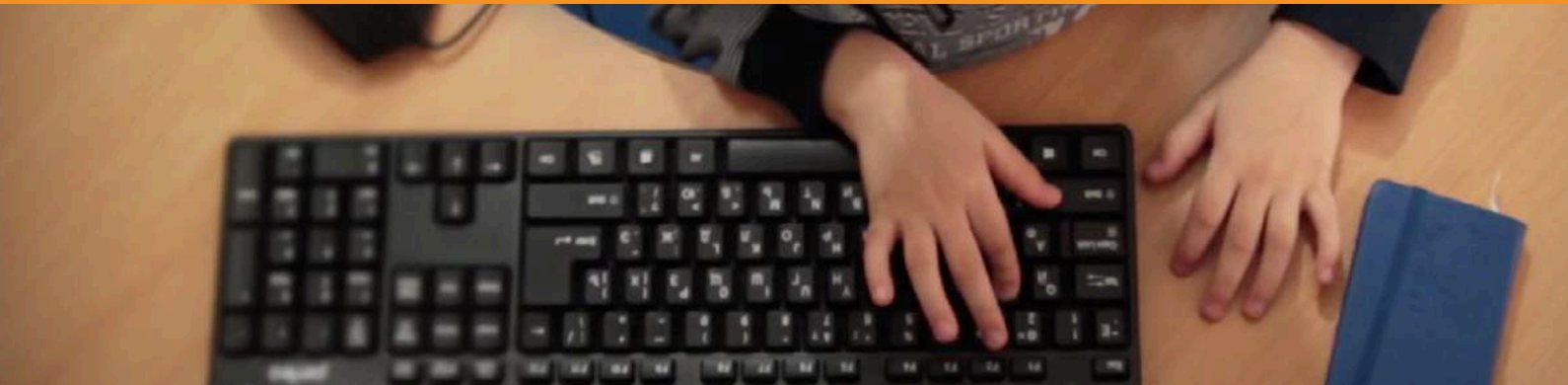
## Learning Outcomes

- Understand basic coding terms
- Identify what a computer is and what it can do
- Solve simple coding puzzles
- Write simple pseudo-code programs



SCAN ME

[dma.tech/codeandcarrots](https://dma.tech/codeandcarrots)





# Explore the Internet

Learn how the internet works by playing games, watching animations and inventing and designing your own connected device.



## Course Description

For people already used to using the internet, the way the internet works remains a complete mystery. This is particularly true for young children who have grown up with devices all around them. For them, the internet is just simply there. This course dives into the way the internet works and the technology behind it, opening students eyes to the potential of the internet as a way of sharing information, learning/teaching, and creating new things.

Ages: 6-8  
Grade Level: 1-2



SCAN ME

[dma.tech/exploreinternet](https://dma.tech/exploreinternet)

## Learning Outcomes

- Explain how the internet works (general idea)
- Decode basic binary to create a picture
- Find and use learning, play and sharing resources online
- Explain what the Internet of Things is (general idea)
- Imagine future uses for the Internet of Things in their world

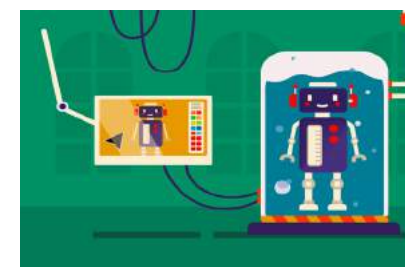


# Computer Science for Kids

It's not magic, but it seems like it. Learn all about what computers are and how they work. Read stories and then draw and build your own computer models.

## Course Description

This course is designed to reveal the mystery behind the technology so many of us interact with constantly but which few of us really understand. Students will learn about the components of a computer (and related devices like tablets and smartphones) and how they work together to allow us to do things like see images, listen to music, create documents, and play games. Through simple activities they will 'see inside' the computer to understand the technology that so many of us use each day.



Ages: 6-8  
Grade Level: 1-2



SCAN ME

[dma.tech/csforkids](https://dma.tech/csforkids)

## Learning Outcomes

- Identify the difference between hardware and software
- Identify different parts of the computer and how they work together
- Explain the general process of how a computing device works
- Give simple pseudo-code algorithms to a partner navigating through a maze





# Learn to Code with Scratch

Curious about code? This course will introduce you to Scratch, an amazing community of coders using a block-based coding language to make projects of all kinds.



Ages: 8-11  
Grade Level: 3-5



SCAN ME

## Course Description

In Learn to Code with Scratch, students will explore the creation and development of the Scratch platform as a block-based programming language and as a community of builders and remixers. Students will work on design-driven projects utilizing animation, music and sound, art, interactivity and game design as they build skills in programming Scratch and in designing media for a real-world setting.

## Learning Outcomes

- Learn essential concepts and terminology of coding
- Apply coding concepts as they learn to use a block-based coding language (Scratch)
- Create and remix simple projects with Scratch
- Develop an idea, plan/decompose essential steps, and code a Scratch project independently

[dma.tech/codingwithscratch](https://dma.tech/codingwithscratch)



# Encryption, Ciphers and Digital Detectives

Learn to decode symbols, codes and ciphers. Then learn a bit about how the internet and data encryption works before you tackle your own digital security challenge.



Ages: 8-11  
Grade Level: 3-5



SCAN ME

## Course Description

In this course, students will explore the ways in which people have historically used encryption and ciphers to share and protect information and the modern world's reliance on encryption. Looking at how encryption works through a mix of unplugged and plugged activities, students will both recognize how widespread its use is (for communication, commerce, and privacy) and come to understand how encryption systems work to protect and anonymize data.

## Learning Outcomes

- Decrypt and encrypt basic ciphers
- Use computational thinking strategies to solve problems
- Apply understanding of codes and ciphers to the concept of digital encryption
- Use strategies to design solutions to real world problems

[dma.tech/ciphers](https://dma.tech/ciphers)





# App Designer Studio

Even if you've never coded before, App Designer Studio will help you design and develop an app that you can share with others.



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/appstudio](https://dma.tech/appstudio)

## Course Description

In App Designer Studio, students will design, create, and market an app that meets the needs of a defined user group. Through this app development process, Explorers will explore the different roles of app developers, UI/UX designers, marketers, and coders while also exploring the diverse range of applications created for mobile devices including social networks, health informatics, sports science, fintech, resource sharing, and recommendation algorithms.

## Learning Outcomes

- Explore and use the design thinking process to design an app for a targeted group of users - Ideate, prototype, test, build and share
- Use App Lab to design and program an app
- Design a marketing pitch for a targeted group of users



# What Can You Do With Data?

Learn how data is used to shape the way we shop, eat, watch, listen and learn. Then come up with ideas to imagine the ways that we can use data to help solve all kinds of problems.



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/data](https://dma.tech/data)

## Course Description

Data is the lifeblood of the internet and of the modern economy, driving everything from business to health care. Students in this course will learn about how data is collected (as well as how it can be protected) and the ways in which it is used to shape: our shopping experiences, business decisions, social networks, and more. They will examine how data is used today and be asked to imagine the future possibilities offered by the intersection of data and connectivity.

## Learning Outcomes

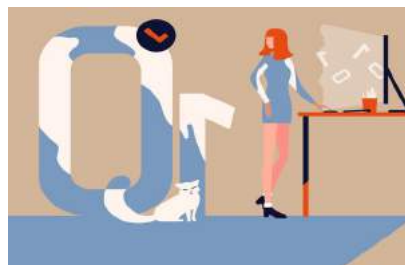
- Identify several ways in which the technology they use every day collects and uses data
- Envision ways in which data collection and use can be used to help solve problems for individuals and groups
- Make more informed and meaningful decisions about how much personal data they want to share





# Data Literacy in a Global Society

In today's Gig Economy business opportunities and careers are changing rapidly. Learn about why this is happening and how to get involved by understanding Data Literacy.



Ages: 14-18  
Grade Level: 9-12



SCAN ME

[dma.tech/dataliteracy](https://dma.tech/dataliteracy)

## Course Description

In App Designer Studio, students will design, create, and market an app that meets the needs of a defined user group. Through this app development process, Explorers will explore the different roles of app developers, UI/UX designers, marketers, and coders while also exploring the diverse range of applications created for mobile devices including social networks, health informatics, sports science, fintech, resource sharing, and recommendation algorithms.

## Learning Outcomes

- Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources
- Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning
- Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.



# Analyze Data using Python

Learn how to program in Python. This course will focus on using these programming skills to manipulate data as part of the Global Data Literacy movement.



Ages: 14-18  
Grade Level: 9-12



SCAN ME

[dma.tech/python](https://dma.tech/python)

## Course Description

Python is a language that is not only used by Computer Scientists and Software Engineer, but also in popular and new popular careers such as Data Science. Python is easy to learn compared to other beginner languages. When using Python one can build a website, develop a game, apply machine learning tasks, harvest data from websites, perform data analysis, automate a web browser, build artificial intelligence etc.

## Learning Outcomes

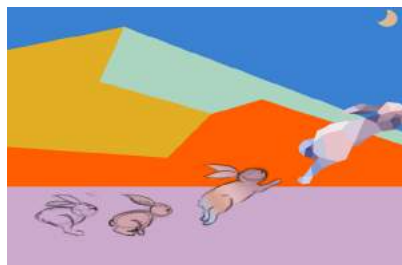
- Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes
- Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways
- Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits





# Don't Stand Still Mate... Animate

Do you like watching cartoons and animated movies and wonder how pictures can be made to come to life? Learn how some of your favorite shows are created!



Ages: 6-8  
Grade Level: 1-2



SCAN ME

[dma.tech/animate](https://dma.tech/animate)

## Course Description

In this course, students will get an introduction of what an animation is and how it can be an effective way to tell stories. Students will be exposed to three types of animations that are most commonly seen on TV and in movies today and explore how each of them are created by professionals in the field. They will then learn to create their own simple animations using the flip book method as well as using a computer program to create a digital animation.

## Learning Outcomes

- Understand how common types of animation are created
- Create a simple flip book animation using pencil and paper
- Create a digital flip animation using a web application
- Get a basic understanding of what an animation is, and some common types of animation that they see on different media



# The Power of Pictures

Learn how to draw and edit illustrations AND how to take and edit photos to use in creative projects for fun and for an audience.

## Course Description

In this course, students will learn about the ways in which images are used to tell stories. Already familiar with picture books, they will use this knowledge as a springboard to analyze how different elements of a picture convey meaning. They will then learn basic photography techniques (zoom, shadow, composition, etc) to understand some of the ways that photographers can create a narrative as well. As a final step, they will plan a story they want to tell and use a collection of images (drawings, found images, and their own photos) to tell a story.



Ages: 6-11  
Grade Level: 1-5



SCAN ME

[dma.tech/powerofpictures](https://dma.tech/powerofpictures)

## Learning Outcomes

- Edit images using online software
- Use digital art tools to create and edit illustrations
- Design and create interesting projects using text and images
- Identify images that represent specific ideas and are tailored to an audience
- Take quality photographs that demonstrate understanding of angles, framing and point of view







# The Power of Pictures: Digital Illustrations

Learn how to draw and edit illustrations to use in creative projects for fun and for an audience.



Ages: 6-11  
Grade Level: 1-5



SCAN ME

[dma.tech/illustrate](https://dma.tech/illustrate)

## Course Description

In this course, students will learn about the ways in which images are used to tell stories. Already familiar with picture books, they will use this knowledge as a springboard to analyze how different elements of a picture convey meaning. They will then learn how to use different online drawing programs to create digital illustrations for specific purposes. As a final step, they will plan a story they want to tell and use a collection of original digital illustrations to tell their story.

## Learning Outcomes

- Understand the relationships between images and text
- Use digital art tools to create and edit illustrations
- Design and create interesting projects using text and images
- Identify images that represent specific ideas and are tailored to a specific audience



# The Power of Pictures: Photography

Learn how to take and edit photos to use in creative projects for fun and for an audience.

## Course Description

In this course, students will learn about the ways in which images are used to tell stories. Already familiar with picture books, they will use this knowledge as a springboard to analyze how different elements of a picture convey meaning. They will then learn basic photography techniques (zoom, shadow, composition, etc) to understand some of the ways that photographers can create a narrative as well. As a final step, they will plan a story they want to tell and use a collection of images (drawings, found images, and their own photos) to tell a story.



Ages: 6-11  
Grade Level: 1-5



SCAN ME

[dma.tech/photography](https://dma.tech/photography)

## Learning Outcomes

- Edit images using online software
- Design and create interesting projects using text and images
- Take quality photographs that demonstrate understanding of angles, framing and point of view
- Identify images that represent specific ideas and are tailored to a specific audience





# Watch Cartoons? Create Your Own!

Watched an animation on TV or in the movies? Learn about how professionals like the ones from Pixar create storyboards to plan out their ideas.

## Course Description

In this course, students will learn about the history of animation and briefly explore the common types of animation that are featured on television and in movies. They will discover that no matter what type of animation it is, a good animation depends on good planning. Professionals use what is called storyboarding to plan out their work before creating their animation and students will have an opportunity to try it using a web-based tool called StoryboardThat.

## Learning Outcomes

- Explore a mobile app called Toontastic 3D to create simple animations
- Understand what a storyboard is and why it's important in digital storytelling
- Use a web application called StoryboardThat to create a digital storytelling



Ages: 8-11  
Grade Level: 3-5



SCAN ME

[dma.tech/createcartoons](http://dma.tech/createcartoons)



# Show and Tell: Script and Storyboard

Take this course to learn about the art of storytelling and try your hands on creating a story using helpful hints from professionals!

## Course Description

In this course, students will learn about the ways in which images are used to tell stories. Already familiar with picture books, they will use this knowledge as a springboard to analyze how different elements of a picture convey meaning. They will then learn basic photography techniques (zoom, shadow, composition, etc) to understand some of the ways that photographers can create a narrative as well. As a final step, they will plan a story they want to tell and use a collection of images (drawings, found images, and their own photos) to tell a story.

## Learning Outcomes

- Explore a mobile app called Plotagon Story an animation
- Understand what a script is and why it's important in digital storytelling
- Use a web application called StoryboardThat to create a digital storyboard
- Understand how to write simple scripts using a web-based tool called WriterDuet



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/storyboard](http://dma.tech/storyboard)





# Mobile Journalism

This course will give you the skills to find stories to tell them, and to reach an audience. It's your moment, it's your world, so help shape it.



Ages: 11-18  
Grade Level: 6-12



SCAN ME

[dma.tech/journalism](https://dma.tech/journalism)

## Course Description

In App Designer Studio, students will design, create, and market an app that meets the needs of a defined user group. Through this app development process, Explorers will explore the different roles of app developers, UI/UX designers, marketers, and coders while also exploring the diverse range of applications created for mobile devices including social networks, health informatics, sports science, fintech, resource sharing, and recommendation algorithms.

## Learning Outcomes

- Learn and practice adding sound to video stories
- Learn photo and video shooting and editing techniques
- Learn traditional journalism techniques - writing, pitching, content strategy
- Produce and shoot one or more original, researched story (video and/or photography)



# Daring Designs

Ever wonder how the objects we use every day have changed over time? Learn about the changes in the designs we use and design your own versions in the future.

## Course Description

In this course, young students will investigate the way design has changed over time by examining the objects and places that influence our day to day lives. As function, materials, technology and design ideals have evolved, these products and places have changed dramatically. Students will then take part in a challenge to imagine and redesign common objects that meet the needs of future consumers.



Ages: 6-8  
Grade Level: 1-2

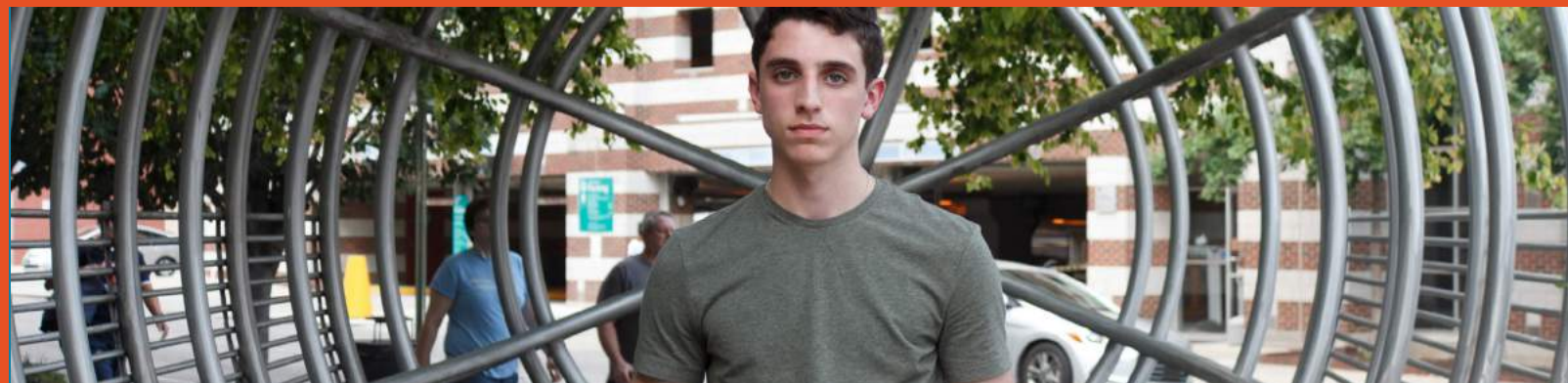
## Learning Outcomes

- Identify major design changes over time
- Understand and implement the design process
- Envision future designs based on course skills and content
- Investigate the way design has changed over time by examining the objects and places that influence our day to day lives



SCAN ME

[dma.tech/daringdesigns](https://dma.tech/daringdesigns)





# Design Challenges

Build your design skills and knowledge by tackling a series of design challenges. You can even have the opportunity to share your design solutions with others.



Ages: 8-11  
Grade Level: 3-5



SCAN ME

[dma.tech/designchallenges](https://dma.tech/designchallenges)

## Course Description

In this course, students participate in the design process through hands-on learning. Each module covers a different aspect of design thinking and learning and as students learn about each topic, they will practice their knowledge and skills with real-world design challenges. Students learn about different kinds of design careers and they can choose the design challenges that match their interests or take a chance on exploring a design project that is new to them.

## Learning Outcomes

- Identify design problems in their community
- Identify different types of design careers they might want to pursue
- Use design-thinking skills to generate solutions to real-world problems
- Define problems and implement solutions that reflect the needs of users, customers, or stakeholders



# Designing Urban Spaces

Cities are amazing, complex places. Use your talent and creativity to create unique urban spaces that make city living better for everyone.

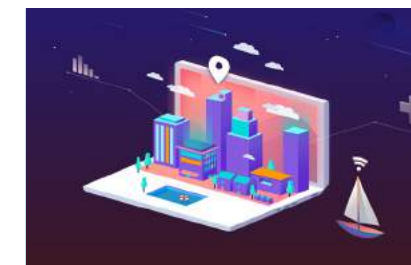
## Course Description

More than half the world's population lives in urban areas and that percentage is expected to grow in the coming decades. With more and more people living in cities, the challenges of housing, security, recreation, and healthy living (to name just a few) will be tackled by planners, designers and architects.

In this course students will explore the role of designers, architects, and urban planners in making cities better places to live. They will then use their own ideas and research to design an urban space that seeks to improve urban life by addressing specific urban issues.

## Learning Outcomes

- Use Tinkercad to create designs
- Conceive of and plan urban spaces that address urban issues
- Recognize and better understand the challenges of urban living
- Use the design process to come up with creative solutions to make urban living better



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/urbanspaces](https://dma.tech/urbanspaces)





# Graphic Designer Studio

Learn some techniques and tricks that graphic designers use. Apply your new skills and knowledge to create your own websites, book covers, logos and more.



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/graphicdesigner](https://dma.tech/graphicdesigner)

## Course Description

Participants in this course will learn about accepted principles of graphic design and their influence on media ranging from print design to app design. They will explore the ways that color scheme and layout affect the user experience (UX) and user interface (UI) in many the devices and programs we use every day. Throughout the course, participants will analyze, remix, and create original work for target audiences that reflect these essential concepts of design.

## Learning Outcomes

- Create original designs or branding for specific audiences
- Remix designs to personalize them for themselves and others
- Identify major elements of color theory and principles of design
- Select user interfaces and user experiences for specific audiences



# Introduction to 3D Modeling in Tinkercad

This course will introduce the students to how 3D Modeling has changed life and society and walk the learner through the basics of 3D modeling with Tinkercad.

## Course Description

This course will introduce students to the world of 3D modeling in our global society before creating 3D models using the polygonal method of modeling. These models can then be viewed and shared in a digital environment or printed using a 3D printer.

With the basic skills the student learns in this course, they will be able to start exploring a variety of education paths to working in the 3D modelling industry other areas of interest such as Entrepreneurship, prototyping and marketing; engineering and fabrication; art, design and sculpture; robotics and more. The course will end with an introduction to the new feature of 3D modeling with code.

## Learning Outcomes

- Understand the design elements of a good printable 3D model
- Understand how positive and negative space combine to create a 3D model
- Become familiar with how 3D modeling is used in every day in the world around us



Ages: 11-18  
Grade Level: 6-12



SCAN ME

[dma.tech/tinkercad](https://dma.tech/tinkercad)





# Entrepreneurship Bootcamp

Learn some techniques and tricks that graphic designers use. Apply your new skills and knowledge to create your own websites, book covers, logos and more.



Ages: 11-18  
Grade Level: 6-12



SCAN ME

[dma.tech/entrepreneurship](https://dma.tech/entrepreneurship)

## Course Description

Participants in this course will learn about accepted principles of graphic design and their influence on media ranging from print design to app design. They will explore the ways that color scheme and layout affect the user experience (UX) and user interface (UI) in many the devices and programs we use every day. Throughout the course, participants will analyze, remix, and create original work for target audiences that reflect these essential concepts of design.

## Learning Outcomes

- Create original designs or branding for specific audiences
- Remix designs to personalize them for themselves and others
- Identify major elements of color theory and principles of design
- Select user interfaces and user experiences for specific audiences



# Designing Play Spaces

Combine your creative genius and 3D designs to create an original play space. Start with simple structures and use the design process to envision and start building a 'world' for fun, play, and exploration.



Ages: 11-18  
Grade Level: 6-12



SCAN ME

[dma.tech/playspaces](https://dma.tech/playspaces)

## Course Description

Designing Play Spaces takes learners on a journey that begins with inspiration and ends with an exciting project-based design activity. The final project provides the opportunity for learners to combine design thinking, 3D modeling skills and creativity as they design and build (with software) a public play space of their choice.

The course begins with students discovering the different types of careers they can have as architect-designers and continues as they learn the skills that help them build virtual spaces inspired by their own ideas and of the designers who inspire them.

## Learning Outcomes

- Use Tinkercad to create floor plans
- Use Tinkercad to create 3D models of structures
- Develop a plan for a unified space that reflects a unified theme
- Use design thinking principles to design play spaces that appeal to users





# Inventing and Reinventing Machines

Learn about the machines that shape our world and start designing the next generation of machines to change the future.



Ages: 6-8  
Grade Level: 1-2



SCAN ME

[dma.tech/machines](https://dma.tech/machines)

## Course Description

Inventing and Reinventing Machines will introduce students to simple machines such as levers, pulleys, wheels/axles, pulleys, planes, and screws - tools that shaped the development of human societies. After learning about these simple machines, students will learn about some of the machines that make modern life possible (e.g., internal combustion engines and turbines for energy). With an understanding of the machines that shape our world, students will take part in creative challenges to re-imagine and redesign machines to tackle problems of modern life.

## Learning Outcomes

- Explain what simple machines are and how they work
- Solve basic problems using knowledge of simple machines
- Understand the connection between simple machines and modern innovation



# Fun With Robots

Learn about robots, play with some virtual robots online then use your creativity and skills to design a robot of the future.

## Course Description

In this course students will learn about modern uses of robots, use the design/engineering process to plan and design virtual robots, and understand the potential for robots in different fields (e.g., manufacturing, medicine, space exploration).



Ages: 8-11  
Grade Level: 3-5

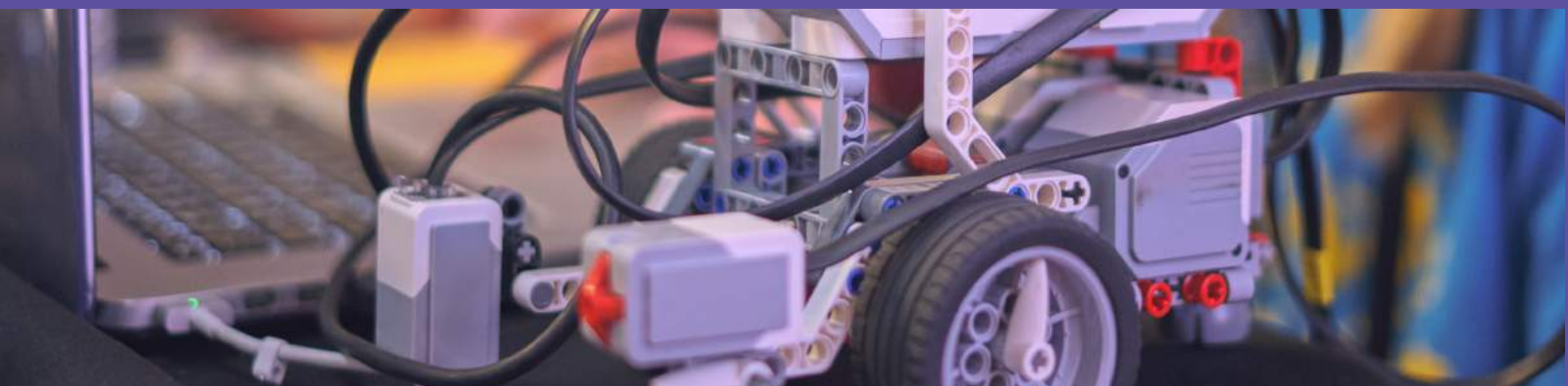


SCAN ME

[dma.tech/funwithrobots](https://dma.tech/funwithrobots)

## Learning Outcomes

- Understand and define what a robot is
- Use computational thinking to control virtual robots
- Identify different parts of a robot and how they work together
- Use design-thinking to generate ideas for robots of the future
- Use the engineering process to build machine and simple robot prototypes





# Meeting the Future: AI and Machine Learning

Build and train apps using your own data sets and cutting edge industry tools like IBM's Watson to recognize images, make decisions, and understand text.

## Course Description

This course will introduce students to the topics of artificial intelligence and machine learning by engaging them in activities that help them understand what these topics mean and how they are used in the real world. Each module will lead students through a process of discovery; exploring, building and testing different machine learning programs using Scratch and Watson. By participating in hands-on learning and reflecting on their projects, students will explore the benefits and challenges of AI and machine learning.

## Learning Outcomes

- Create simple AI programs using Scratch and Watson
- Understand what machine learning and artificial intelligence are
- Recognize and devise potential applications for artificial intelligence
- Use data sets to 'teach' and improve apps that respond to human interaction



Ages: 11-18  
Grade Level: 6-12



SCAN ME

[dma.tech/machinelearning](https://dma.tech/machinelearning)



# Crazy About Games

You'll learn how all kinds of games work and then use what you've learned to design and build your own games from scratch.

## Course Description

In this course, students will explore the key concepts of game creation using elements of computational and design thinking. Students will analyze different types of games to identify general game components, rules and features of good game design. After analyzing familiar games, students will use a design process to begin devising their own simple games using readily available materials and ending with a final game project.

## Learning Outcomes

- Apply learning to creating and testing a game
- Explain key elements and characteristics of a game
- Identify and understand important elements of game design
- Use computational thinking as a problem solving strategy
- Apply computational thinking strategies to designing games



Ages: 6-11  
Grade Level: 1-5



SCAN ME

[dma.tech/games](https://dma.tech/games)







# Game Play and Coding

Create your own board or card games and then move on to creating your own digital games that you can play on your phone or computer.



Ages: 8-11  
Grade Level: 3-5



SCAN ME

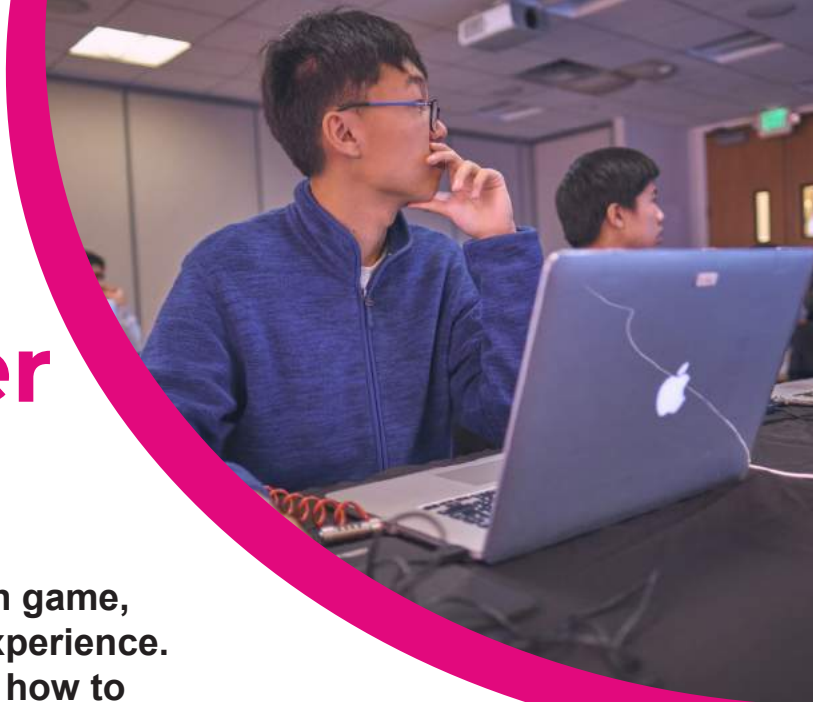
[dma.tech/gameplay](https://dma.tech/gameplay)

## Course Description

In the first phase of this course students will discover key elements of game design, create game assets (such as characters), storyboard and then create 2D games without code. From there they will apply the game development process to a block-based coding environment to plan, design, and code interactive games.

## Learning Outcomes

- Understand and apply basic elements of game theory and game design
- Design simple and challenging board/card games for different audiences
- Design and build simple digital games using block-based coding



# Game Designer Studio

Learn how to design and build your own game, even if you have no coding or design experience. Create and import your own assets and how to build games that others like to play.



Ages: 11-14  
Grade Level: 6-8



SCAN ME

[dma.tech/gamesdesigner](https://dma.tech/gamesdesigner)

## Course Description

This course will introduce students to the principles and practices of portable game design on phones, tablets, and PCs. Using the online block-based programming site, Scratch, students will build knowledge and skills in game design and development including planning, testing, level design, and basic physics. As part of the course, students will create personalized game assets (images and sounds) and learn how to import them into an original game that others can play.

## Learning Outcomes

- Identify major design changes over time
- Understand and implement the design process
- Envision future designs based on course skills and content
- Investigate the way design has changed over time by examining the objects and places that influence our day to day lives



