

# Twin Double-Winged Curriculum

At Twin Science, our quest is to create the change-makers of tomorrow through STEAM education. We believe that we can do this by raising double-winged individuals. One wing represents strong competence in different subject areas. The second wing denotes highly developed 21st century skills with a strong sense of social responsibility. By growing these two wings, kids will be empowered to fly high and have a truly positive impact on our world. We believe that to raise such individuals, we need to make learning fun, engaging and inspiring.

How do we do this through our curriculum? Under the umbrella of a meaningful social message, our lesson plans cover core scientific concepts through hands-on experiments. Learning about energy conversion while building a drawing robot and exploring the importance of teamwork is just one example of how we offer a well-integrated experience.

Twin Kits make hands-on learning fun and simple since the magnetic modules can easily be attached and detached. Kids get to tinker with the modules and see the impact of their creation right away. The kits encourage kids to question, create and problem-solve every step of the way, providing them with a medium to hone their 21st century skills.

To tackle the problems of the 21st century, we need individuals who are not just knowledgeable subject-matter experts, but also socially conscious change-makers who are willing to make meaningful changes in our world. With our double-winged curriculum, we are taking a hopeful step in that direction.

# Ages 5-7

Order	Message	Title	Experiments	Acquirements	Flow
Week 1	Being Hopeful	Discover the World of Art, Science and Colors	Code the City Lights	Learns input and output terms by coding.	Twin Robotic Art Kit and Twin Coding Kit are introduced to participants. Using Twin Coding Kit, Code the City Lights experiment is conducted and participants get introduced to concepts of "color" and "light". Using Twin Robotic Art Kit, Newton Disc experiment is conducted and participants observe the formation of white light. Using Twin Robotic Art Kit, Colors in Black experiment is conducted and participants examine the formation of the color black. Educator talks about Isaac Newton's life and tells how he explored many optic laws by "splitting the sunlight into colors of rainbow". Class has a discussion session on the relationship between art and science and further talks about technologies used in arts with a special emphasis on Spin Art as an art form. Using Twin Robotic Art Kit, Spin Art experiment is conducted and participants observe centripetal force and acceleration. Educator shares the message of the day, "being hopeful", and tells the story of how Newton led today's technologies by his discoveries at the time of lockdown during the plague pandemic. Educator summarizes the day and shares the day's Activity Homework.
			Newton Disc	Gets introduced to the concept of light.	
				Gains knowledge on the formation of white light.	
			Colors in Black	Gets introduced to the concept of color.	
				Gains knowledge on the formation of the black color.	
			Spin Art	Observes the centripetal force.	
Observes acceleration.					
Week 2	Achieving Together	Understanding Technology and Exploring Robots	Color Palette	Strengthens his/her knowledge on inputs and outputs by coding.	Twin Robotic Art Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Using Twin Coding Kit, Color Palette experiment is conducted. Class has a discussion session on "robots" and watches related videos. Using Twin Robotic Art Kit, Confetti Rain experiment is conducted. Class plays a trivia game which covers the topics they learned the previous week and includes fun facts. Everytime when someone answers a question correctly, confetti rain starts. Educator talks about energy conversions with examples from the experiment and wind turbines. Class has a discussion session on clean energy sources. Using Twin Robotic Art Kit, Vacuum Cleaner experiment is conducted. Participants compare the differences between these two experiments. Educator talks about Leonardo da Vinci's life and tells how well-rounded and versatile he was. Class examines Leonardo da Vinci's inventions and further discusses how he affected today's technologies. Using Twin Robotic Art Kit, Drawing Robot experiment is conducted. Participants gather their robots and power them altogether. In the end, they complete a drawing with everyone's contribution. Educator shares the message of the day, "achieving together". Educator summarizes the day and shares the day's Activity Homework.
				Gains knowledge about the formation of light.	
			Confetti Rain	Gets introduced to the pushing force of air.	
				Explores the different areas of usage of Twin modules.	
				Analyzes that fan modules convert electrical energy into motion energy.	
			Vacuum Cleaner	Gets introduced to pulling force of air.	
				Explores the different areas of usage of Twin modules.	
Analyzes that fan modules convert electrical energy into motion energy.					
	Observes that different ways of rotation of fan propellers might cause different outcomes by the Confetti Rain experiment.				
Drawing Robot	Gets introduced to the term "achieving together".				
Week 3	Social Innovation	Introduction to Social Innovation	Robot Hand	Explores the working principles of a robot hand.	Twin Curiosity Kit is introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Educator explains the term "social innovation" and talks about the ways technology helps humans in everyday life by showing examples. Using Twin modules, Robot Hand experiment is conducted. Educator explains how proximity sensors work with a demonstration and gives examples from nature. Using Twin Curiosity Kit, Alarm for Your Belongings experiment is conducted for participants to explore more on the subject. Using Twin modules, Explore Infrared Beams experiment is conducted and participants discuss infrared beams. Class has a discussion session on problems the visually impaired encounter in daily life and examines a social innovation example, WeWalk Smart Cane. Using Twin Curiosity Kit, Smart Cane experiment is conducted. Educator shares the message of the day, the importance of social innovation. Educator summarizes the day and shares the day's Activity Homework.
			Alarm for your Belongings	Knows infrared beams.	
			Explore Infrared Beams	Gains knowledge on visible and invisible rays.	
			Smart Cane	Knows infrared beams.	
Week 4	Developing Useful Technologies	Discovering Sound Technologies and the Science of Music	Telephone Game with Cups	Notices vibration sound vibrations.	Twin Curiosity Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Educator talks about Alexander Graham Bell's life and the invention of telephone to further emphasize the importance of social innovations. Educator explains sound vibrations and how sound travels in a wave pattern with a demonstration. Telephone Game with Cups experiment is conducted. Using Twin Curiosity Kit, Magician Hat experiment is conducted. Class plays a trivia game which covers the topics they learned the previous week and includes fun facts. Everytime when a participant has an answer to a question, the participant lights their Magician Hat's light with a tap. Educator explains the working principle of microphones and speakers. Using Twin Coding Kit, Banana Piano experiment is conducted and participants compose their own songs. Educator shares the message of the day, "wishing the same good thing for others that you wish for yourself". Educator summarizes the day and shares the day's Activity Homework.
				Realizes that sound travels in a wave pattern.	
			Magician Hat	Has an idea about energy conversions.	
			Banana Piano	Has an idea about conductors.	

# Ages 8-10

Order	Message	Title	Experiments	Acquirements	Flow
Week 1	Being Hopeful	Discover the World of Art, Science and Colors	Code the City Lights	Learns input and output terms by coding.	Twin Robotic Art Kit and Twin Coding Kit are introduced to participants. Using Twin Coding Kit, Code the City Lights experiment is conducted and participants get introduced to concepts of "color" and "light". Using Twin Robotic Art Kit, Newton Disc experiment is conducted and participants observe the formation of white light. Using Twin Robotic Art Kit, Colors in Black experiment is conducted and participants examine the formation of the color black. Formation of White Light experiment is conducted and participants observe the primary colors of light. Formation of the Color Black experiment is conducted. Educator explains additive and subtractive color combinations with a demonstration. Educator talks about Isaac Newton's life and tells how he explored many optic laws by "splitting the sunlight into colors of rainbow". Class has a discussion session on the relationship between art and science and further talks about technologies used in arts with a special emphasis on Spin Art as an art form. Using Twin Robotic Art Kit, Spin Art experiment is conducted and participants observe centripetal force and acceleration. Educator shares the message of the day, "being hopeful", and tells the story of how Newton led today's technologies by his discoveries at the time of lockdown during the plague pandemic. Educator summarizes the day and shares the day's Activity Homework.
			Newton Disc	Gets introduced to the concept of light.	
				Gains knowledge on the formation of white light.	
			Colors in Black	Gets introduced to the concept of color.	
				Gains knowledge on the formation of color black.	
			Formation of White Light	Observes white light.	
				Gains information about the properties of white light.	
			Formation of the Color Black	Observes the formation of color black.	
Spin Art	Observes the centripetal force.				
	Observes acceleration.				
Week 2	Social Innovation	Introduction to Social Innovation	Robot Hand	Explores the working principles of a robot hand.	Twin Curiosity Kit is introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Educator explains the term "social innovation" and talks about the ways technology helps humans in everyday life by showing examples. Using Twin modules, Robot Hand experiment is conducted. Educator explains how proximity sensors work with a demonstration and gives examples from nature. Using Twin Curiosity Kit, Alarm for Your Belongings experiment is conducted for participants to explore more on the subject. Using Twin modules, Explore Infrared Beams experiment is conducted and participants discuss infrared beams. Class has a discussion session on problems the visually impaired encounter in daily life and examines a social innovation example, WeWalk Smart Cane. Using Twin Curiosity Kit, Smart Cane experiment is conducted. Educator shares the message of the day, the importance of social innovation. Educator summarizes the day and shares the day's Activity Homework.
			Alarm for your Belongings	Knows infrared beams.	
			Explore Infrared Beams	Gains knowledge on visible and invisible rays.	
			Smart Cane	Knows infrared beams.	
Week 3	Developing Useful Technologies	Discovering Sound Technologies and the Science of Music	Telephone Game with Cups	Notices vibration sound vibrations.	Twin Curiosity Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Educator talks about Alexander Graham Bell's life and the invention of telephone to further emphasize the importance of social innovations. Educator explains sound vibrations and how sound travels in a wave pattern with a demonstration. Telephone Game with Cups experiment is conducted. Using Twin Curiosity Kit, Magician Hat experiment is conducted. Class plays a trivia game which covers the topics they learned the previous week and includes fun facts. Everytime when a participant has an answer to a question, the participant lights their Magician Hat's light with a tap. Educator explains the working principle of microphones and speakers, and explains how sound waves are converted to electrical signals. Using Twin Coding Kit, Banana Piano experiment is conducted and participants compose their own songs. Educator shares the message of the day, "wishing the same good thing for others that you wish for yourself". Educator summarizes the day and shares the day's Activity Homework.
				Realizes that sound travels in a wave pattern.	
			Magician Hat	Has an idea about energy conversions.	
			Banana Piano	Has an idea about conductors.	
Week 4	Confidence	Confidence and Autonomous Vehicles	Park Sensor	Knows infrared beams.	Twin Discovery Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Participants discuss the difference between "autonomous" and "autopilot" technologies. Educator gives the definition of the term "signal" and examines signals under two categories: digital and analog. Educator explains how proximity sensors work with a demonstration and gives examples from nature. Educator explains how ultrasonic sensors are used in park systems. Using Twin Discovery Kit, Park Sensor experiment is conducted. Using Twin modules, Explore Infrared Beams experiment is conducted. Participants compare these two sensors (ultrasonic, and infrared) in terms of how they work. Using Twin Discovery Kit and Twin Coding Kit, RC Car experiment is conducted. Class has a discussion session on Bluetooth technologies. Educator shows the differential system used in cars and tells the story of the first car. Using Twin Discovery Kit and Twin Coding Kit, Autonomous Car experiment is conducted. Class has a discussion session on "self-confidence". Educator talks about Thomas Alva Edison's life and how he learned from his mistakes. Educator shares the message of the day, "keeping on trying and learning". Educator summarizes the day and shares the day's Activity Homework.
				Understands the difference between infrared sensors and ultrasonic sensors.	
			Explore Infrared Beams	Gains knowledge on visible and invisible rays.	
			RC Car	Understands the Bluetooth technology.	
				Understands the remote control systems.	
				Gets introduced to differential systems used in automobiles.	
				Gets introduced to "loops" with coding.	
			Autonomous Car	Knows infrared beams.	
Observes reflection of light on both plane and curved surfaces.					
Gets introduced to "loops" with coding.					

# Ages 11-13

Order	Message	Title	Experiments	Acquirements	Flow
Week 1	Social Innovation	Introduction to Social Innovation	Robot Hand	Explores the working principles of a robot hand.	Twin Curiosity Kit is introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Educator explains the term "social innovation" and talks about the ways technology helps humans in everyday life by showing examples. Using Twin modules, Robot Hand experiment is conducted. Educator explains how proximity sensors work with a demonstration and gives examples from nature. Using Twin Curiosity Kit, Alarm for Your Belongings experiment is conducted for participants to explore more on the subject. Using Twin modules, Explore Infrared Beams experiment is conducted and participants discuss infrared beams. Class has a discussion session on problems the visually impaired encounter in daily life and examines a social innovation example, WeWalk Smart Cane. Using Twin Curiosity Kit, Smart Cane experiment is conducted. Educator shares the message of the day, the importance of social innovation. Educator summarizes the day and shares the day's Activity Homework.
			Alarm for your Belongings	Knows infrared beams.	
			Explore Infrared Beams	Gains knowledge on visible and invisible rays.	
			Smart Cane	Knows infrared beams.	
Week 2	Confidence	Confidence and Autonomous Vehicles	Park Sensor	Knows infrared beams.	Twin Discovery Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Participants discuss the difference between "autonomous" and "autopilot" technologies. Educator gives the definition of the term "signal" and examines signals under two categories: digital and analog. Educator explains how proximity sensors work with a demonstration and gives examples from nature. Educator explains how ultrasonic sensors are used in park systems. Using Twin Discovery Kit, Park Sensor experiment is conducted. Using Twin modules, Explore Infrared Beams experiment is conducted. Participants compare these two sensors (ultrasonic, and infrared) in terms of how they work. Using Twin Discovery Kit and Twin Coding Kit, RC Car experiment is conducted. Class has a discussion session on Bluetooth technologies. Educator shows the differential system used in cars and tells the story of the first car. Using Twin Discovery Kit and Twin Coding Kit, Autonomous Car experiment is conducted. Class has a discussion session on "self-confidence". Educator talks about Thomas Alva Edison's life and how he learned from his mistakes. Educator shares the message of the day, "keeping on trying and learning". Educator summarizes the day and shares the day's Activity Homework.
				Understands the difference between infrared sensors and ultrasonic sensors.	
			Explore Infrared Beams	Gains knowledge on visible and invisible rays.	
				RC Car	
			Understands the remote control systems.		
			Gets introduced to differential systems used in automobiles.		
			Autonomous Car	Gets introduced to "loops" with coding.	
				Knows infrared beams.	
Observes reflection of light on both plane and curved surfaces.					
Gets introduced to "loops" with coding.					
Week 3	Achieving Together	Smart Technologies	Smart Cooler	Knows proximity sensor.	Twin Discovery Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week and participants give presentation on the previous week's Activity Homework. Class explores different applications of smart home technologies. Educator shows related videos. Using Twin modules, Smart Cooler experiment is conducted. Participants draw a flowchart. Using Twin modules, Let's Build a Smart Home experiment is conducted. Class has a discussion session on product development and prototyping. Participants fill out their Circuit Diagram, Program Diagram and Product Worksheet. Educator shares the message of the day, "achieving together". Educator summarizes the day.
				Gains knowledge on "loops" in coding.	
				Gains knowledge on "logic gates" in coding.	
				Has an idea about "algorithms".	
				Knows "flow charts".	
			Let's Build a Smart Home	Knows all electronic Twin modules.	
				Has an idea about product development process.	
Week 4	Positive Applications of Technology	Artificial Intelligence	AI Driver's Education	Understands the concept of Artificial Intelligence.	Twin Discovery Kit and Twin Coding Kit are introduced to participants. Educator summarizes the previous week. Class has a discussion on "learned reflexes" and Artificial Intelligence. Class explores image processing technologies with demonstrations. Educator defines datasets and explains how they are built. Educator explains the term "pixel" and how these datasets are processed. Educator gives examples of simple image processing algorithms. Using Twin modules, AI Driver's Education experiment is conducted. Using Twin modules, Mission Delivery experiment is conducted. Class examines voice recognition applications. Educator gives examples of simple voice recognition algorithms. Using Twin modules, Voice Controlled Driver's Education experiment is conducted. Using Twin modules, Mission Assistant Car experiment is conducted. Educator shares the message of the day, "positive applications of technology". Educator summarizes the day.
				Gets introduced to coding Artificial Intelligence.	
				Can build datasets.	
				Has an idea about processing datasets.	
				Has an idea about image processing algorithms.	
			Mission Delivery	Gets introduced to coding Artificial Intelligence.	
				Can use a simple image processing algorithm.	
			Voice Controlled Driver's Education	Gets introduced to coding Artificial Intelligence.	
				Has an idea about voice recognition algorithms.	
			Mission Assistant Car	Gets introduced to coding Artificial Intelligence.	
Can use a simple voice recognition algorithm.					