

## Introduction to Programming in Scratch

	Activities	Assessment	Standards	Time
<b>Week 1</b>				
<b>Essential Questions: How Does a Computer and a Person Converse?</b>				
<b>Outcome/Goal: Participants will understand class procedures</b>				
Objective 1: Participants will be able to download and upload documents	Participants will demonstrate document management. They will download documents (lecture notes) about class expectations. They will add a note to indicate understanding and upload the revised document.	The uploaded document will be assessed using the participation rubric. The uploaded document must be a revised version of the original.	Standard 5 – Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Tools, Resources, and Technological Processes: Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms. PI: use appropriate graphic and electronic tools and techniques to process information.	0.25
Objective 2: Participants will be able to create a profile in Moodle	Participants will read lecture notes on creating a profile in Moodle and then create a personalized profile.	The profile made will be assessed using the participation rubric. The participant's profile must be changed.		0.25
Objective 3: Participants will be able to participate in a discussion board.	Participants will practice using a discussion board by responding to a question about their background in programming and their expectations in the course. They will respond to at least one other participant's response.	The discussion post and additional post will be assessed using the participation rubric. Participants will be expected to create a response to the activity as well as a response to another participant's post.	Standard 1 - Analysis, Inquiry, and Design: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. Scientific Inquiry: The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena. PI: share their findings with others and actively seek their interpretations and ideas	0.5
<b>Week 2</b>				
<b>Essential Questions: How Does a Computer and a Person Converse?</b>				
<b>Outcome/Goal: Participants will understand the purpose of computer languages in general and specifically Scratch.</b>				
Objective 1: Participants will be able to explain how computer languages are specific to their use.	Participants will research at least 2 computer languages other than Scratch, classifying the purpose of the language (business, gaming, internet, data, etc.) and the category of each (the basis of the language - COBOL, FORTRAN, LISP, etc.) Participants will summarize their findings in a discussion board.	The discussion board response will be assessed using the participation rubric. Participants will be expected to give a complete explanation of the two languages they researched, including both the purpose and the category.	Standard 5 - Technology History and Evolution of Technology: Technology has been the driving force in the evolution of society from an agricultural to an industrial to an information base. PI: identify technological developments that have significantly accelerated human progress.	0.75
Objective 2: Participants will be able to categorize other languages.	Participants will read their co-participants analyses and will respond to at least 2 other participants discussing how these languages relate to their researched languages.	The discussion board responses will be assessed using the participation rubric. Participants will need to compare and contrast their 2 languages with the languages of two other participants, differentiating on purpose and category.	Standard 7 - Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions. Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results. PI: Gathering and Processing Information: Accessing information from printed media, electronic data bases, and community resources and using the information to develop a definition of the problem and to research possible solutions.	0.75
<b>Week 3</b>				
<b>Essential Questions: How Does a Computer and a Person Converse?</b>				
<b>Outcome/Goal: Participants will become familiar with the Scratch interface.</b>				
Objective 1: Participants will be able to create a background in Scratch	Participants will follow Lecture notes to prepare their stage using ready-made and/or self-created backgrounds.	The uploaded stage will be assessed based on the participation rubric. The background will need color, form and details.	Standard 5 - Technology Engineering Design: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints. PI: generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices.	1.0
Objective 2: Participants will be able to differentiate the assorted categories of blocks.	Participants will explore the purposes of the movement blocks, explaining the purpose of each in a uploaded document.	The uploaded document will be assessed based on the participation rubric. The explanation will need to describe all movement blocks available.		1.0
Objective 3: Participants will be able to create a script using one category of blocks.	Participants will produce a script of their sprite using movement blocks. They will save and upload the file.	The uploaded file will be assessed based on the participation rubric. The script will need to move their sprite somewhere on their stage.		1.0
<b>Week 4</b>				
<b>Essential Questions: How Does a Computer and a Person Converse?</b>				
<b>Outcome: Participants will create a more interesting and efficient script</b>				
Objective 1: Participants will be able to use costumes and sound in their animation	Participants will design costumes and sound to transform their sprite.	The uploaded file will be assessed based on the participation rubric. The new costume must be different from their original costume and the sound must be an original composition.	Standard 5 - Technology Engineering Design: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints. PI: generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices.	1.0

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Objective 2: Participants will be able to compare the different ways the same goal can be programmed	Groups will be assigned. Each member of the group will independently produce a script for their sprite to do a specific goal (for example, bounce a ball ) and then compare their scripts with their group members. They will distinguish between the most efficient and least efficient for the goal and reflect on their experience in a discussion board.	The discussion posts will be assessed based on the participation rubric. The reflection must specify what was different in each members' script and explain why one method is more efficient than another.	Standard 7 - Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions. Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits: gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results. PI: Working Effectively: Contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identify and managing responsibilities of team members; and staying on task, whether working alone or as part of a group.	1.5
<b>Week 5</b>				
Essential Questions: How Does a Computer and a Person Converse?				
<b>Outcome: Participants will start to build an animation that reflects their interests</b>				
Objective 1: Participants will be able to integrate variables, numbers and sensing into their scripts	Participants will produce more intricate scripts using additional category blocks and incorporating numbers and variable blocks.	The uploaded file will be assessed based on the participant rubric. Their uploaded file must include at least 1 block from categories other than movement as well as incorporate variables, numbers and sensing.	Standard 5 - Technology Engineering Design: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints. PI: generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices.	1.0
Objective 2: Participants will be able to formulate a plan for creating an animation	Participants will design a plan for creating a script to accomplish at least 1 goal. They will integrate algorithmic thinking to create the script that attains that goal.	The uploaded file will be assessed based on the script rubric. The uploaded plan must include a description of the scene, what the goal is and what their plan is to attain it.	Standard 1 - Analysis, Inquiry, and Design Engineering Design: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. PI: Engineering design is an iterative process involving modeling and optimization finding the best solution within given constraints which is used to develop technological solutions to problems within given constraints.	1.25
<b>Week 6</b>				
Essential Questions: How Does a Computer and a Person Converse?				
<b>Outcome: Participants will create a multi-dimensional animation</b>				
Objective 1: Participants will be able to incorporate all their programming skills into an animation	Participants will design a plan for their final project. They will build their animation, incorporating at least 3 types of category blocks in their scripts. Participants will incorporate at least 2 sprites with at least 2 costumes each. They will upload their file when complete.	The uploaded file will be assessed using the script rubric. The project must include 2 sprites with 2 costumes each using 3 types of blocks. The script must be logical, efficient and accomplish the stated plan.	Standard 5 – Technology - Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Computer Technology: Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge. PI: control computerized devices and systems through programming.	2.5
<b>Week 7</b>				
Essential Questions: How Does a Computer and a Person Converse?				
<b>Outcome: Participants will improve their computer instruction</b>				
Objective 1: Participants will be able to describe how programming in Scratch can fit into their curriculum	Participants will analyze their programming experience in an uploaded document, focusing on what they found most difficult, what they found most rewarding and how they would help their students in a classroom setting.	The uploaded document will be assessed using the participant rubric. The uploaded document will need to describe how their successes and difficulties will impact their own teaching.	Standard 5 – Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. Impacts of Technology: Technology can have positive and negative impacts on individuals, society, and the environment and humans have the capability and responsibility to constrain or promote technological development. PI: describe how technology can have positive and negative effects on the environment and on the way people live and work.	0.5
Objective 2: Participants will get ideas from others' projects to use in their instruction	Participants will share their projects with class members. Participants will upload their finished projects onto the Scratch website. Participants will select one other animation to respond to.	The uploaded document will be assessed using the participant rubric. The uploaded document will need to describe at least 1 idea they will try from another's project.	Standard 1 - Analysis, Inquiry, and Design: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. Scientific Inquiry: The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena. PI: share their findings with others and actively seek their interpretations and ideas	0.5
Objective 3: Participants will be able to correlate learning objectives in Scratch with 21st Century skills	Participants will be referred to 21st Century skills website ( <a href="http://www.21stcenturyskills.org/">www.21stcenturyskills.org/</a> ) to analyze 21st Century skills. They will compare/contrast 21st Century skills with programming skills. They will evaluate which 21st Century skills can be incorporated when teaching Scratch in a discussion board.	The uploaded document will be assessed using the participant rubric. The discussion will need to include at least 3 skills that correlate with 21st Century skills.	Standard 6 - Interconnectedness: Common Themes: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. Systems Thinking: Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions. PI: observe and describe interactions among components of simple systems.	1.0
<b>COURSE EVALUATION</b>				
	Participants will evaluate the course			0.25