George Wythe High School Lesson Plan (Science)

Teacher: K. Allen	Content: Unit 4 Introduction to Programming.
Grade Level or Course: PLC	

STAGE 1: Desired Results ~ What will students be learning?	
Learning Objective	*The student will be able to;* • *Complete a simple Scratch Program* • *Utilize the green flag feature*
Essential Questions & Understandings/Big Ideas	What is scratch? Why should students learn scratch?
Key Vocabulary/Formulas	**Script:** the place where you put the programming blocks **Stage:** the background of your project **Block:** a puzzle piece that you fit together to command your project **Loop:** Used to repeat a script **Stamp:** Used to duplicate **Sprite:** a character that you can program and edit **Costume:** used to animate a sprite **Speech bubble:** Used to make your sprite speak **Looks category**, **motion category,** etc.: the different tabs that contain he blocks **Green flag:** the button that usually starts a project **Red Stop Sign:** the button that usually stops a project **X__Y__:** the coordinates on the stage where you want the sprite to move to

STAGE 2: Learning Plan ~ What are the strategies and activities you plan to use?	
Snapshot / Warm-up Activity	Up next • [Scratch Lesson 2 of 10Jessica Chiang67,857 views](#)

1:28

- **Scratch Tutorial 1: Make Your First ProgramKevin Briggs203,059 views**

12:52

- **Lesson 1 - Scratch BasicsWPLScratchProject546,819 views**

13:21

- **Scratch Tutorial #4: Racing GameKevin Briggs61,648 views**

20:49

- **Scratch Tutorial 2: Make a Basic GameKevin Briggs174,869 views**

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Instructional Strategies	In order to ensure optimal learning I will employ the use of • interviews; • student-centered and collaborative learning; • the use of online learning strategies; • problem based learning; and • open ended questions.

Teaching and Learning Activities	http://scratched.gse.harvard.edu/sites/default/files/scratch_activities_by_richard_wiktorowicz.pd

Scratch Activity #1 - Count Sprite
Scratch Activity #2 – Gliding Counting Ghosts and a Small Dragon
Scratch Activity #3 – Bouncing Basketballs
Scratch Activity #4 – How To Draw A Head
Scratch Activity #5 – Geometrical Patterns
Scratch Activity #6 – How To Draw Another Head And Upper Body
Scratch Activity #7 – Rockets In Space
Scratch Activity #8 – Optical Illusion
Scratch Activity #9 – Maze Game
Scratch Activity #10 – Rock, Paper and Scissors

Programming Games in Scratch
Below are some handouts for an activity that teaches how to program some simple mini-games i educational tool for teaching simple programming concepts to kids.
The first game is an introduction to Scratch. It includes step-by-step instructions on how to make familiarize you with how Scratch works.
The other games are designed as exercises with just a general description of what you need to pr game work. In the exercise handouts, the "Try It" sections are optional. If a "Try It" section is to end up with a working game at the end.

Introduction to Scratch
Avoid the monsters and get the cake.
Topics: Scratch Basics
Difficulty: Introduction

Driving Game
Drive around the track.
Topics: Movement
Difficulty: Easy

Super Fashion Dress-Up
Dress-up a doll in different clothes
Topics: Costumes
Difficulty: Easy-Medium

Room Escape
Solve puzzles to escape the room.
Topics: Messages
Difficulty: Medium

Cat and Mouse
Run through the maze to get the cheese.
Topics: Collision Detection, Artificial Intelligence |

Difficulty: Medium-Hard

Moon Landing
Land a spacecraft on the moon.
Topics: Variables
Difficulty: Hard

http://www.programmingbasics.org/en/downloads/scratchgames/teacherguide.pdf

About "Programming Games in Scratch" is a series of handouts that can be used to teach progra
thinking. The handouts guide students through the logic and algorithms underlying computer gan
different types of games and different experience levels, so it is easy to customize your lessons t
different students. All the necessary instructions are included on the handouts themselves, so stu
without guidance from a teacher. As such, teachers do not necessarily need a programming back
classrooms; nevertheless, a programming background is useful for teachers to help students cont
students when they encounter difficulties, and to direct students to supplementary material for fu
make use of the Scratch programming language from MIT. Scratch is a free programming langua
PCs without the need to install any software. It is designed to expose programming to students i
encourages creativity and independent learning. Suggested Activity The handouts contain all the
them. As such, students can follow the handouts themselves individually or in small groups. You
guidance to read through the handouts and to stay focused on the tasks.

			Connections to other subje applications X
Differentiation	**Higher Level Thinking X** Analyze data, Create diagrams and flow charts	**Resources: https://scratch.mit.edu/**	Why is it important for kids to important for our kids to learn Like Problem Solving, Modul – as more and more of this typ in areas other than Programm to have 'Digital Fluency' in th design, create and mix digital chat and interact with it. Various types of Projects can Stories, Animations, Games a Physical World (see my earlie the video here). Scratch is als allows kids to express creativ incorporating designs from ot How kids can benefit by learn projects in Scratch, kids will l

	stuff before building, will lear express the ideas that are clos collaboratively with others. K work, present their work to ot comment on others projects. T important skill sets needed for
Checking for Understanding	Question and answer Student teacher discussion Student/Group presentations Homework practice problems

<div align="center">**STAGE 3: Closure ~ What did the students master & what are they missing**</div>

Lesson Closure & Student Summarizing of their Learning	• Reviewing the key points of the lesson. • Giving students opportunities to draw conclusions from the lesson. • Describing when the students can use this new information. • Previewing future lesson. • Demonstrating student's problem-solving process.
Assessment Part 1	Scratch01_drag_and_drop.pdf Scratch02_sounds.pdf Scratch03_ways_to_run_code.pdf Scratch04_wait_and_set_instrument.pdf Scratch05_Loops.pdf Scratch06_movement_unplugged.pdf Scratch07_movement_in_Scratch.pdf Scratch08_making_shapes.pdf Scratch09_broadcast.pdf Scratch10_set_position.pdf Scratch11_If_Statements.pdf Scratch12_Pen_Exercise.pdf Scratch13_helicopter.pdf Scratch14_Electric_Keyboard.pdf Scratch15_costumes.pdf Scratch16_two_sprites_communicating.pdf Scratch17_Fading_Start_Screen.pdf Scratch18_variables.pdf Scratch19_remix_duck_hunt.pdf Scratch20_Movie.pdf Scratch21_Animating_real_photos.pdf Scratch22_remix.pdf

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| STAGE 4: Assessment Evidence ~ What is evidence of mastery?	
Assessment Part 2	The student will create and produce a storyboard for a web page that they will design individ

Possible misconceptions or learning gaps	• Read through the lesson plan you selected
	• Do the activities from the lesson. Save any artifacts you create while doing the lesson
	• While you review the lesson plan and do the activity, make sure to jot down your though
	    ○ ahha! moments during the activity . Some of the commands don't always work th
	    ○ what was difficult about this activity? Getting multiple sprites to work at the sam
	       on trying to get the sprite to hold a conversation.
	    ○ what did you enjoy about this lesson? Having the sprite to turn and move. The sc
	    ○ what additional resources might be useful for teaching this lesson? I found this w
	       activities and things I could modify: http://www.st-andrewshigh.n-
	       lanark.sch.uk/Departments_Folder/STAComputing/S2Folder/ScratchDox/Scratch
	       .pdf
	
	Prepare Responses to the Following
	
	Advice for someone who is going to teach this lesson (consider what was challenging about doin students will struggle with, etc). Just make sure you play around with the features before you ha Also put in multiple commands because I am sure the students will do the same so that you can s find an alternative assignment for kids that are more advanced.
	
	What ideas do you have about how to structure and teach this lesson? What modifications do yo am going to use some of the videos and resources that I've found online.
	
	What additional resources (if any) might be helpful in teaching this lesson? Videos and online r
	
	Extension: **Have students draw a geometrical shape using scratch.**

Polygon

A polygon is a shape with many sides which has a closed path. We can create a pattern by creating a polygon, then moving the cursor and repeating the polygon in a pattern covering 360°. This can create a shape like the ones below.
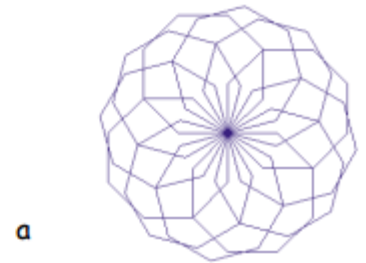
Single polygon
360°

Polygon Pattern over
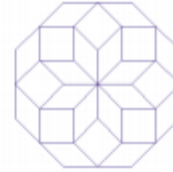
Let's look at how we do this using the steps we already used in Task 2

Notice an extra Repeat loop is added here around the first repeat loop

Also, once the first shape is drawn we turn the cursor so that the next shape is drawn at slightly different angle but
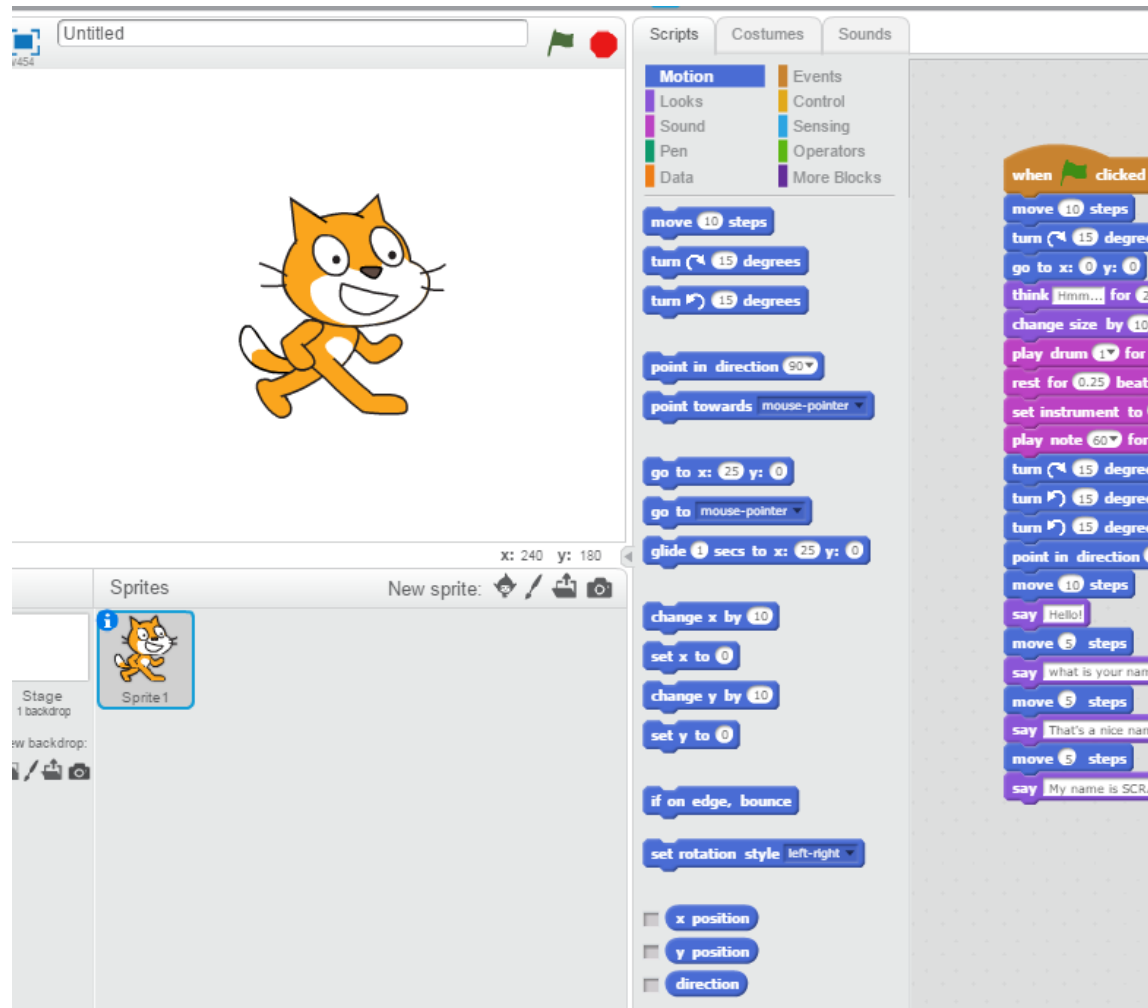
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Artifacts	

- Teacher Reflection / Effectiveness of Learning:

Create your own Extension Activity or Assessment Question that could be used with this lesson

What are some commands that you would like see integrated into the scratch program.

Create a scratch simulation that promotes learning in another subject (math, English, science, or social studies)

- Develop a short write-up explaining to another teacher how to use your Extension or Assessment item. You could use the extension as a cross curricular project with another subject teacher. Where the student receives a grade in both classes.

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