SCRATCH MIT Geometry Rubric (year 9)

Transformation geometry (reflection, rotation, translation, enlargement symmetry invariance)

Pattern design (using transformations, using tessellations)

1. Rubric for progressions in student understanding of Angle

Student exemplars for animations of avatar in Scratch (MIT Programming Language - http://scratch.mit.edu/)

GEOMETRY: ANGLE

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	Unistructural	Multistructural	Relational	Extended abstract
Prestructural	**Unistructural**	**Multistructural**	**Relational**	**Extended abstract**
I need help to identify clockwise and anticlockwise turns	**I can identify** clockwise and anticlockwise turns and a simple angle (e.g. right angle)	**I can identify** clockwise and anticlockwise turns and **angles (e.g right angle, acute, obtuse, straight angle, reflex angle, full turn – or 90, 180, 30, 45, 60)**	I can identify clockwise and anticlockwise turns and simple angles (e.g. right angle, acute, obtuse, straight angle, reflex angle, full turn – or 90, 180, 30, 45, 60) **AND measure, order and compare angles** with for example right angles to create reflection, rotation and translation.	I can identify clockwise and anticlockwise turns and simple angles (right angle, acute, obtuse, straight angle, reflex angle, full turn – or 90, 180, 30, 45, 60) measure, order and compare angles with right angles **AND estimate and predict** angles in a triangle, angles around a point, vertically opposed angles .
	I can create an animation in Scratch where the avatar turns clockwise and anticlockwise and has a motion path that makes a right angle turn.	**I can create** an animation in Scratch where the avatar turns clockwise and anticlockwise and has a motion path that makes a right angle turn, acute, obtuse, straight angle, reflex angle, and full turn – or 90, 180, 30, 45, 60.	**I can create** an animation in Scratch where the avatar turns clockwise and anticlockwise and has a motion path that makes a right angle turn, acute, obtuse, straight angle, reflex angle, and full turn – or 90, 180, 30, 45, 60. AND measure, order and or compare angles with for example right angles to create motion paths for reflection,	**I can create** an animation in Scratch where the avatar turns clockwise and anticlockwise and has a motion path that makes a right angle turn, acute, obtuse, straight angle, reflex angle, and full turn – or 90, 180, 30, 45, 60. AND measure, order and or compare angles with for example right angles to create motion paths for reflection,

			rotation and translation.	rotation and translation. AND estimate and predict angles or a sequence of angles to create animation special effects
	Student Exemplar: (insert link to student Scratch project here)	**Student Exemplar:** (insert link to student Scratch project here)	**Student Exemplar:** (insert link to student Scratch project here)	**Student Exemplar:** (insert link to student Scratch project here)
	I can identify the clockwise and anticlockwise turns and the right angle used in the Scratch animation motion path and describe the movement of the avatar in terms of rotation..	**I can identify** the angles used in the Scratch animation path and describe the movement of the avatar in terms of reflection, rotation and translation.	**I can explain** using the appropriate language of angle names, degrees, measurement, order and comparison why the angles were chosen to create the Scratch animation effect used for reflection, rotation and translation.	**I can predict** using the appropriate language of angle names, degrees, measurement, order and comparison how to use angles to create a special Scratch animation effects showing reflection, rotation, translation.
	Student Exemplar: (insert link to student Scratch project reflection here)	**Student Exemplar:** (insert link to student Scratch project reflection here)	**Student Exemplar:** (insert link to student Scratch project reflection here)	**Student Exemplar:** (insert link to student Scratch project reflection here)

(Develop SOLO Rubrics to accommodate reflection, rotation, translation, enlargement symmetry invariance)

Refer

Scratch for Educators - http://info.scratch.mit.edu/Educators

Scratch – Projects tagged with geometry angles for ideas on setting Y9 Student challenge

http://scratch.mit.edu/pages/results?cx=010101365770046705949%3Agg_q9cry0mq&cof=FORID%3A11&q=geometry+angles&safe=active&sa=search+#1155

Bill Kerr – South Australian Secondary Teacher from Adelaide billkerr@gmail.com

Bill writes the most interesting stuff about how to use Scratch in secondary schools – I know him through his comments on Artichoke - his blog is at http://billkerr2.blogspot.com/

http://cegsa.editme.com/SecondaryClassroom

http://www.users.on.net/~billkerr/a/something.htm

http://www.kidslike.info/bill_kerrs_list_of_best_resources_for_teaching_computer_programming_with_scratch/getpage.apx/pageid%3D131157104507
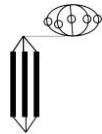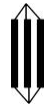

Discussion on computer lab access

Discussion on sequence of introduction

Discussion on scenario used to introduce the Scratch challenge

Geometry elements or dimensions for Scratch Animation SOLO Rubric

SOLO Taxonomy **Structured Overview of Learning Outcomes**			**Avatar Reflection**	**Avatar Rotation**	**Avatar Translation**
Extended abstract Learning Outcome	Learning outcomes go beyond subject and makes links to other concepts - generalises	E.g. all the relevant data and their interrelations are taken up and subsumed under a hypothetical abstract structure that can enable deductions to apply to data or situations not experienced.			
Relational Learning Outcome	Learning outcomes show full connections made, and synthesis of parts to the overall meaning	E.g. the integration and synthesis of information is achieved. The relational response gives an overall concept or principle that accounts for the various isolated data, but it is still tied to concrete experience.			
Multistructural	Learning outcomes	E.g. a number of			

Learning Outcome	show simple connections but importance not noted.	relevant isolated data are used, but the learner doesn't integrate them.			
Unistructural Learning Outcome	Learning outcomes show connections are made, but significance to overall meaning is missing/	E.g. one relevant datum or feature is used and focused on to link the cue and response logically.			
Pre- structural Learning Outcome	Learning outcomes show unconnected information, no organisation.				

Extended abstract	**Extended abstract:** • producing an entity (a precept) which can be used as the beginning of a higher level cycle of procedure – multiprocedure-process – concept. • all the relevant data and their interrelations are taken up and subsumed under a hypothetical abstract structure that can enable deductions to apply to data or situations not experienced. Extended abstract responses are at a level of abstraction that is extended into the next mode.
Unistructural	**Relational:** • the realisation that these several distinct procedures are essentially the same process • the integration and synthesis of information is achieved. The relational response gives an overall concept or principle that accounts for the various isolated data, but it is still tied to concrete experience.
Multistructural	**Multistructural:** • several distinct procedures having the same effect • a number of relevant isolated data are used, but the learner doesn't integrate them.
Relational	**Unistructural:** • a single procedure • one relevant datum or feature is used and focused on to link the cue and response logically. The learner closes too quickly.
·	**Prestructural:** an incorrect datum is used in order to answer a question or respond to a problem, which may lead to an irrelevant aspect belonging to a previous stage of mode. The learner may even fail to engage in the problem, so he closes (or come to a conclusion of some kind) without even seeing the problem.