STRATEGIC PARTNERSHIP
AGENTS OF CHANGE IN EDUCATION

STEAM Recipe

Theme	**Decoding DaVinci**
Target Age Group	Aged 9 - 12
Duration of Activity	(3) 60 – 90 Minutes
Resources/Materials Needed (exact details required)	Scratch website (scratch.mit.edu), DaVinci sketchets (http://www.unmuseum.org/leosketch.htm), Flying Machines sketches (http://flyingmachines.org/davi.html) pencils, pens, journals, digital cameras/phones, computers, printers
STEAM Components	Engineering, Technology, Arts (Movement)

WHY	**Goals/Objectives/Targets/Aims**	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problems. Synthesize and relate knowledge and personal experiences to make art. 21st century skills: creativity, collaboration, evaluate information, analyse media, create media product.
HOW	**Method/Activities (i.e step by step instructions for teacher)**	Pre-assessment: Ask students to find an ordinary object in the classroom environment, photograph it and sketch it in a visual journal. Pre-assess their ability to accurately depict the object with proper proportion, detail and structure. Engagement: Ask students to compare their sketch to the object. Think about ways this object could be more functional or used in a different way. Ask students to write down their ideas using question statements such as “What would happen if…” and “If I changed …… then …..?” Suggest at least one way in which the object could use motion.

		Lesson Focus: Ask students to view examples of daVinci's sketchbooks. Engage in discussions about how daVinci used the arts (including movement) as an avenue to understand and experiment with scientific principles through his sketchbooks. Compare Da Vinci's observations and questions with their own. What is the same? What is different? Focus on his sketches of Flying Machines. What questions are being explored? How did Da Vinci use traditional mathematical practices to challenge convention and create something new? What elements of motion and movement are being captured in these images? Look at the sketches of their own objects and their explorative questions. Challenge students to create a new invention using their original object as inspiration. Use the current structures and form as a framework for their new inventions, and all inventions must be able to move using the elements of space, locomotive or non-locomotive motion, and energy. Students can work in team or alone. Students will share their uncommon "common objects" inventions with the class. Explore how to create these as a prototype using the online programming tool from scratch.mit.edu
DID IT WORK	**Reflection/Evaluation (where applicable)**	Possible key questions for students: 1) What is a prototype and why is it important? 2) How do you define the invention process? Possible key questions for teachers: 1) Was there a seamless connection between the movement and technology in this lesson? 2) What pieces of this lesson were a challenge? Which pieces were most engaging for me and my students? Evaluation criteria: • Does the prototype function as described and/or intended?

		• Does the prototype utilize locomotive/non-locomotive motion, energy or space in its design? • Is the prototype a useful transformation from the original object's function?