Table 2. Steam concepts and skills explored during the Steam-Ed project

CONCEPTS	Science	Technology	Engineering	Art (Visual Arts):	Mathematics
Light	Energy, Light (sources, reflection, refraction, dispersion), Color, Wavelengths of Light, Shadows, Optics (lenses), Properties & Characteristics of Materials	Designing & Creating Prototypes, Electrical Circuits, Arduino Boards, Sensors	The Engineering Design Process Design & Engineering Challenges	Drawing, Color, Construction, Textiles (art elements and principles - shape, form, color and tone, pattern & rhythm, space, balance, unity, movement, perspective)	Shape & Space (patterns, spatial awareness, symmetry, lines & angles), Measure (length, area), Data (representing and interpreting data interpreting data)
Sound	Energy, Sound (sources of different sounds, reflection, pitch, loudness), Sound Waves, Transmission of Sound Through Materials, Muffling Sound, Properties & Characteristics of Materials	Designing & Creating Prototypes, Electrical Circuits, Makey Makey Kits, Sensors	The Engineering Design Process Design & Engineering Challenges	Drawing, Construction, Properties and character of materials, Textiles (art elements and principles shape, form, texture, pattern & rhythm, space, balance)	Shape & Space (patterns, spatial awareness), Measure (length, area), Data (representing and interpreting data interpreting data)
Movement	How different Sources of energy Move, Simple Machines, Forces, Friction & Momentum	Designing & Creating prototypes (simple machines), Electrical Circuits, Movement of Light & Sound Waves, Bee Bots	The Engineering Design Process Design & Engineering Challenges	Drawing, Color, Construction, (art elements and principals -shape, form, color and tone, texture, pattern & rhythm, space, balance, movement and how these interplay)	Shape & Space (patterns, spatial awareness, 3-d shapes, 2-d shapes, symmetry, lines & angles), Measure (length, area, capacity), Data (representing and interpreting data interpreting data)

STEAM Practices	
Asking Questions & Defining Problems	Optimizing the Design Solution
Making Observations	Developing & Using Models
Looking for Patterns	Spatial Awareness
Problem Solving	Drawing for Design
Critical Thinking	Communicating & Expression
Planning & Carrying Out Investigations	Engaging in Argument from Evidence
Constructing Explanations & Designing Solutions	Reasoning
Developing Possible Solutions	Integrating & Connecting
Data Collection	Understanding & Recalling