ADST
&
Maker Club

Cross curricular ideas, inspiration & tie ins
to Maker Club Playbook projects
Grade 6

Curriculum Mapping

Project 1: Wood Scrap Art

Maker Hero: Woodworker & Artist Brad Rhadwood

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas: *Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined (e.g., in dramatic presentations, graphic novels, films, web pages, advertisements).	***Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking** ***Synthesize ideas from a variety of sources to build understanding** ***Exchange ideas and viewpoints to build shared understanding and extend thinking** ***Select and use appropriate features, forms, and genres according to audience, purpose, and message.**	Content *Use elements of story/text, strategies and processes for writing, as well as language features, structures and conventions to have a debate about the BC forestry industry. *Ex: Is forestry sustainable in BC? How does Forestry in Canada rate in terms of sustainability compared to other resource industries in Canada (or other countries?) Use images and news articles to support your arguments. *Analyze sources of information; are they, facts or opinions? *Consider how traditional knowledge is used as testimony.  http://www.greenpeace.org/canada/en/campaigns/forests/boreal/ http://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13183 http://cbfa-efbc.ca/agreement/ http://www.vancitybuzz.com/2015/11/poetry-helped-langley-community-save-blaauw-eco-forest/ http://indigenousfoundations.arts.ubc.ca/home/culture/oral-traditions.html
Career Ed Big Ideas: *Our attitudes toward careers are influenced by our view of	***Recognize their personal preferences, skills, strengths, and abilities and connect them to possible career choices** ***Question self and others about the reciprocal relationship between self and community**	Content *Personal Development *Connections to Community *Life and Career Plan

ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options** ***Explore volunteer opportunities and other new experiences outside school and recognize their value in career development** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	*What skills can you learn from working with wood? How are these skills useful in jobs? How can working with wood be useful in a community? What is your view of the forestry and carpentry industries? What type of work environments can you work in? Are there any considerations for your health when working in forestry or carpentry? * Do you know anyone who works in carpentry? Come up with 5 questions to ask in an interview. Reflect on the information gathered and present to the class. *Research and make a list of local organizations that cater to your interests in aspects of carpentry/woodworking. Ex: artist collectives, ITA, carpentry companies, wood processing plants, maker spaces, Scouts, community gardens. 
Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Numbers describe quantities that can be represented by equivalent fractions.** ***Develop, demonstrate, and apply mathematical understanding through play, inquiry and problem solving** ***Use reasoning and logic to explore and analyze mathematical ideas** ***demonstrate and apply mental math strategies** ***Explain and justify mathematical ideas decisions** ***Reflect on mathematical thinking** ***Connect mathematical concepts to each other and other areas of personal interest**	Content *Multiplication and division facts to 100 (developing computational fluency) *Order of operations with whole numbers *Multiplication and division of decimals *Perimeter of complex shapes *Area of triangles, parallelograms, and trapezoids *Angle measurement and classification *Financial literacy *How did you decide the size and measurements of your projects(if applicable) *Research where to buy supplies new. Make cost comparisons, calculations for sale prices, breakdowns of prices per gram of wool, linear foot of wood etc. *Calculate the total cost of per project before and after taxes. Multiply by the number of people in your class. *Calculate perimeter and area of your wood before and after you cut it down to size. *Calculate how much wood is being diverted from the dump by creating your wood scrap art project. Calculate how much wood is being diverted by your class. How much wood do you have left? Record your calculations and explain how you arrived at your answer. *If a construction company had to dispose of a bin of scrap wood, how much would it cost per lb? Where does it go/get used for? *How could making projects out of scrap wood affect your community? Why? *Reflect on the aspects of this project that involved math. *How was it helpful to breakdown the cost per project? *How might an artist, teacher or shop owner use math skills on a daily basis? How would a construction site use math? How might you find math skills helpful in your daily life? 
	***Incorporate First Peoples worldviews and perspectives to**	*First Nations math resources/ lesson plans for grade 6.

	make connections in mathematical concepts	http://aboriginalperspectives.uregina.ca/workshops/workshop2011/ 
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Explore relationships between identity, place, culture, society, and belonging through the arts** ***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts.** ***Describe, interpret and respond to works of art and explore artists' intent** ***Describe, interpret and respond to works of art and explore artists' intent** ***Reflect on works of art and creative processes to understand artists' intentions** ***Interpret creative works using knowledge and skills from various areas of learning**	Content: *Purposeful application of elements and principles to create meaning in the arts, *Visual arts: elements of design: line, shape, space, texture, colour, form (visual arts),value; principles of design: pattern, repetition, balance, contrast, emphasis, rhythm (visual arts), variety, unity, harmony *Processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Symbolism and metaphor to explore ideas and perspective *Research the artist in the manual who makes Wood Scrap Art. Gather information and explain who is Brad Rhadwood? Why does Brad Rhadwood make art? Where does Brad get the ideas for his art? https://www.youtube.com/watch?time_continue=239&v=zOIpbi_2o3A 
	***Develop and refine ideas, processes, and technical skills in a variety of art forms to improve the quality of artistic creations** ***Take creative risks to express feelings, ideas, and experiences** ***Express, feelings, ideas, and experiences through the arts** ***Demonstrate increasingly sophisticated application and/or engagement of curricular content**	*Start collecting scrap wood and practice creating your own wood scrap art in order to develop your own characters as a reflection of/or inspired by people you meet and the world around you. Reflect on your project, processes, ideas techniques and skills you've learned. 
Social Studies Big Ideas: *Economic self-interest can be a significant cause of conflict among peoples and governments. *Complex global problems require international cooperation to make difficult choices for the future. *Systems of government vary in their respect for human rights and freedoms *Media sources can both positively and negatively affect our understanding of important events and issues	***Use Social Studies inquiry processes and skills to — ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions.** ***Develop a plan of action to address a selected problem or issue** ***Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media (evidence) *Differentiate between short- and long-term causes, and intended and unintended consequences, of events, decisions, or developments (cause and consequence)** ***Take stakeholders' perspectives on issues, developments, or events by making inferences about their beliefs, values, and motivations (perspective)**	Content: *How do economic policies and resource management affect indigenous people? *How should societies balance economic development with the protection of the environment? *How is forestry governed in BC? http://www.nrcan.gc.ca/forests/canada/laws/13303 *Study articles that represent different points of view. Ex case study of logging protest on Mt Elphinstone. *Using a map, locate sites of logging camps ex: Mt Elphinstone on the Sunshine Coast *Find an aerial photo of this area. *What is the latitude and longitude of this site? *Research and reflect on the local history. Cite sources in a bibliography. *Draw conclusions from information and defend your position in a format that matches(discussion, debate, presentation, essay etc) *Plan a course of action with a timeline and list of actions. (Could tie into English and Art curriculum)

	***Develop a plan of action to address a selected problem or issue** ***Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place, and assess appropriate ways to respond (ethical judgment)**	http://vancouversun.com/news/local-news/sunshine-coast-logging-protest-heats-up-with-flaming-blockade http://sierraclub.bc.ca/statement-elphinstone-logging-confrontation/ http://www.ammsa.com/publications/ravens-eye/sechelt-elder-arrested-sunshine-coast-logging-protesters http://www.theglobeandmail.com/news/national/sunshine-coast-logging-labelled-health-hazard/article691782/ https://www.bcfpb.ca/news-resources/news-releases/investigation-logging-near-sunshine-coast-trail-completed/ 
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Empathize**	*Identify a person you are making this project for(it can be yourself or someone else.) Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences.) Record your answers/ideas. 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge, money etc) How can you work within your constraints? Record your answers/ideas. 
	Ideating	*Generate and write down several ideas within these constraints, show others and exchange ideas. Let others know your criteria for success. Collect input and opinions. 
	Prototype	*Identify and use sources of information ex: a youtube video, ask a family member or teacher with experience in carpentry or art etc. Record the name of the resource and what area of knowledge it applies to. Reflect on how this resource could benefit your project.  *Explore the wood as an art medium. Explore the markers, pencils or other mark making tools on the wood using different techniques. Share your explorations. 

	Testing	*Evaluate what can be improved from your prototyping process and how you will move forward. Gather feedback on your idea. Make changes if needed. 
	Making	*If you are happy with your test samples of your project, make a plan to produce a version taking into account any advice, ideas or feedback gathered. During the course of making, write out each step as you proceed. 
	Sharing	*Decide who you will share your project with: your family, class, friends etc. Describe your process and explain tools and technology used. Evaluate and reflect on your project and your ability to work in a group. Identify any design issues you would change if you were to make another iteration. 
ADST Content	**Woodwork**	*Ways in which wood is used in local cultural and economic contexts *Characteristics of wood as a material *Woodworking techniques and basic joinery using hand tools --- *Types of wood species, availability, cost and use. *Where to source recycled/free wood *Uses for different types of wood: plywood, hardwood, softwood, mdf etc. *Storage of wood: absorbtion of moisture etc *Use of tools: sander, tape measure, hand saw etc. 
	Power Technology	*Power is the rate at which energy is transformed *Forms of energy *Energy is conserved *Devices that transform energy --- *Learn about and demonstrate how to use power tools safely. *Research and reflect on how we can store energy in batteries; battery cycling and safe storage(you can find this is your tool manual) 
	Entrepreneurship and Marketing	Content *Role of entrepreneurship in designing and making products and services *Market niche *Branding of products, services, institutions, or places *Pricing product/service, including decision to seek profit or break even

		*Role of basic financial record-keeping and budgeting --- *Create a brand name for your wood scrap art. Decide your market niche, calculate the cost of your product and the markup needed to break even. 
	Drafting	*Technical drawing, including sketching techniques and manual drafting techniques *Elements of plans and drawings *Simple computer-aided drafting programs --- *Create a draft of your wood scrap art project. Include measurements, calculations and descriptions for every project view. 

Project 2: Metal Rose

Maker Hero: Artist and Red Seal Welder Nathyn Sanche

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas: *Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined (e.g., in dramatic presentations, graphic novels, films, web pages, advertisements).	***Use and experiment with oral storytelling processes:** ***Understand how literary elements, techniques, and devices enhance and shape meaning.** ***Recognize an increasing range of text structures and how they contribute to meaning** ***Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking** ***Synthesize ideas from a variety of sources to build understanding** ***Exchange ideas and viewpoints to build shared understanding and extend thinking** ***Select and use appropriate features, forms, and genres according to audience, purpose, and message**	Content *Students explore elements of story/text, strategies and processes for writing, as well as language features, structures, and conventions to have a discussion about symbolism. --- *Read “Beauty and the Beast” and reflect on your thoughts about the symbolism of the Rose in a poem or short essay. (Tie into art curriculum.) 
Career Ed	***Recognize their personal preferences, skills, strengths, and**	Content *Personal Development *Connections to Community

Big Ideas: *Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	**abilities and connect them to possible career choices** ***Question self and others about the reciprocal relationship between self and community** ***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.**	*Life and Career Plan --- *What skills can you learn from working with metal? How are these skills useful in jobs? How can working with metal be useful in a community? What is your view of the welding, metal fabrication and/or the sheet metal working industry? *What type of work environments can you work in? Are there any considerations for your health in these jobs? *Do you know anyone who works as a welder, metal fabricator or sheet metal worker? Come up with 5 questions to ask in an interview. Reflect on the information gathered and present to the class. *Research and make a list of local organizations that cater to your interests in aspects of metal work. Ex: artists sculptors, jewelry makers, blacksmiths, art collectives, ITA, metal fabrication shops, maker spaces etc. 
	***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	*Reflect on skills learned, problems that came up between team members, resolve and take suggestions on techniques and how this project could have been done differently. 
	***Explore volunteer opportunities and other new experiences outside school and recognize their value in career development**	*What jobs exist for for your skill set? What other skills might you need to learn? Look into welding companies, artists who work with metal, blacksmiths, boat repairs(do you have a local fishing industry or yacht club?) Also look into qualifications for the film industry(special effects) 
Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Use reasoning and logic to explore, analyze, and apply mathematical ideas** ***Estimate reasonably** ***Demonstrate and apply mental math strategies** ***Use tools or technology to explore and create patterns and relationships, and test conjectures** ***Model mathematics in contextualized experiences** ***Apply multiple strategies to solve problems in both abstract and contextualized situations** ***Visualize to explore mathematical concepts** ***Use mathematical vocabulary and language to contribute to mathematical discussions** ***Explain and justify mathematical ideas and decisions**	Content *Multiplication and division facts to 100 (developing computational fluency) *Order of operations with whole numbers *Multiplication and division of decimals *Perimeter of complex shapes *Area of triangles, parallelograms, and trapezoids *Angle measurement and classification *Financial literacy --- *Estimate how many cans would be needed to create 6 roses? Or 12 roses? Or 21? *Express your calculations as an equation *Research material costs and make cost comparisons, calculations for sale prices, breakdowns of prices per foot etc. *Calculate the total cost of per project before and after taxes. Multiply by the number of people in your class. *Draw a diagram from above of your rose and label with measurements of each part (ADST Drafting curriculum tie in)

	***Communicate mathematical thinking in many ways** ***Represent mathematical ideas in concrete, pictorial, and symbolic forms**	*Calculate your startup cost for a business producing this project as a product (ADST Entrepreneurship and Marketing tie in) 
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Intentionally select, apply, combine, and arrange artistic elements, processes, materials, movements, technologies, tools, techniques, and environments in art making** ***Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play** ***Explore relationships between identity, place, culture, society, and belonging through the arts** ***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts.** ***Describe, interpret and respond to works of art and explore artists' intent** ***Reflect on works of art and creative processes to understand artists' intentions** ***Interpret creative works using knowledge and skills from various areas of learning** ***Examine relationships between the arts and the wider world** ***Adapt learned skills, understandings, and processes for use in new contexts and for different purposes and audiences** ***Interpret and communicate ideas using symbols and elements to express meaning through the arts** ***Take creative risks to express feelings, ideas, and experiences** ***Express, feelings, ideas, and experiences through the arts** ***Describe, interpret and respond to works of art and explore artists' intent** ***Experience, document and present creative works in a variety of ways** ***Demonstrate increasingly sophisticated application and/or engagement of curricular content**	Content: *Purposeful application of elements and principles to create meaning in the arts, *Dance: body, space, dynamics (dance), time, relationships, form, and movement principles Music: beat/pulse, metre, duration, rhythm (music), tempo, pitch, timbre, dynamics (music),form (music), texture *Visual arts: elements of design: line, shape, space, texture, colour, form (visual arts),value; principles of design: pattern, repetition, balance, contrast, emphasis, rhythm (visual arts), variety, unity, harmony *Processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Symbolism and metaphor to explore ideas and perspective *Traditional and contemporary Aboriginal arts and arts-making processes *Explore the symbolism of the rose in various art works/stories and films ex: Snow White, Beauty and the Beast *How do the characters relate to the rose? *How do they feel or move when they are near the rose or talking about the rose? What colors, music and/or feelings are present when the rose is in the scene? *What is the symbolism of the color red? *What is the symbolism can you create for your metal rose? *Create your own visual language with symbols from your life, culture and dreams. Case Study: Frida Kahlo https://www.khanacademy.org/humanities/art-1010/art-between-wars/latin-american-modernism1/a/kahlo-the-two-fridas-las-dos-fridas https://www.albrightknox.org/research/educator-resources/lesson-plans/lesson:symbolic-self-portrait/ 
Social Studies Big Ideas *Economic self-interest can be a significant cause of	***Use Social Studies inquiry processes and skills to — ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions.** ***Develop a plan of action to address a selected problem or issue**	Content: *How do economic policies and resource management affect indigenous people? *How should societies balance economic development with the protection of the environment?

conflict among peoples and governments. *Complex global problems require international cooperation to make difficult choices for the future. *Systems of government vary in their respect for human rights and freedoms. *Media sources can both positively and negatively affect our understanding of important events and issues	***Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media (evidence) *Differentiate between short- and long-term causes, and intended and unintended consequences, of events, decisions, or developments (cause and consequence)** ***Take stakeholders' perspectives on issues, developments, or events by making inferences about their beliefs, values, and motivations (perspective)** ***Develop a plan of action to address a selected problem or issue** ***Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place, and assess appropriate ways to respond (ethical judgment)**	*How is metal mined? Is metal renewable or nonrenewable? How many mines are in BC? How much profit does mining generate? What % of the economy does mining account for? http://www.miningassociationbc.com/ http://www.mining.bc.ca/mining-facts http://mining.ca/resources/mining-facts *What is the environmental risk for mining and how does this affect northern communities and First Nations people? How is risk assessed? http://www.afn.ca/uploads/files/env/ns_-_environmental_assessment.pdf *Case Study: Mount Polley Mine https://www.imperialmetals.com/our-operations-and-projects/operations/mount-polley-mine/overview http://globalnews.ca/news/2866143/protest-marks-mount-polley-mine-disaster-anniversary/ http://www.cbc.ca/news/canada/british-columbia/mount-polley-anniversary-1.3706850 http://www.fairmining.ca/about/ http://www.miningfacts.org/What_is_the_role_of_mining_cmpanies_in_aboriginal_consultation.aspx *Duty to Consult First Nations in Natural Resource projects: What are the possible implications of this case? What is precedence? http://legal-dictionary.thefreedictionary.com/precedent http://www.cbc.ca/news/indigenous/tsilhqot-in-land-ruling-was-a-game-changer-for-b-c-1.2875262 http://www.cbc.ca/news/canada/british-columbia/b-c-first-nations-can-sue-over-property-rights-court-rules-1.3036188 http://www.canadianminingjournal.com/features/aboriginal-rights-two-new-court-cases/1003281731/ 
Science Big Ideas: *Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. *Everyday materials are often mixtures. *Newton's three laws of motion describe the relationship between force and motion. *The solar system is part of the Milky Way, which is one of billions of galaxies	***Questioning and predicting** ***Planning and conducting** ***Processing and analyzing data and information** ***Evaluating** ***Applying and innovating** ***Communicating**	Content: *Heterogeneous mixtures *Separated using a difference in component properties *Local First Peoples knowledge of separation and extraction methods --- *Research mixtures of the most common metals and their identify their compounds. What are native element metals? What are Metal alloys? https://www.youtube.com/watch?v=9LHDSB1n11k *Research Metallurgy and experiment: http://www.juliantrubin.com/fairprojects/chemistry/metals.html *Chemical reactions with Pennies experiment: http://nobel.scas.bcit.ca/wiki/index.php/Penny_reactions

		
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Understanding Context**	*Identify a person you are making this project for (it can be yourself or someone else). Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences) 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge, money etc) How can you work within your constraints? 
	Ideating	*Generate several ideas within these constraints and show others, exchange ideas. Let others know your criteria for success and collect input and opinions. 
	Prototype	*Identify and use sources of information ex: a youtube video, ask a teacher or family member with experience in metal, welding etc. *Research and explore metal forming, bending and attaching techniques: blacksmithing, wire wrapping, welding etc. 
	Testing	*Evaluate what can be improved from your prototyping process and how you will move forward. Gather feedback on your idea from your use. Make changes if needed. 
	Making	*If you are happy with your test samples of your project, write out a plan to produce a version taking into account any advice, ideas or feedback gathered. During the course of making, write out each step as you proceed. 
	Sharing	*Decide who you will share your project with-your family, class, friends etc. Describe your process and explain tools/technology used. Evaluate and reflect on your project and your ability to work in a group.

		*Identify any design issues you would change if you were to make another iteration. 
ADST Content	**Metalwork**	*Characteristics and uses of metals *Metalworking techniques and processes using hand tools *Metals as a non-renewable resource --- *Introduce sheet metal working tools, techniques and terminology. *Social Studies tie in- resource management 
	Drafting	*Technical drawing, including sketching techniques and manual drafting techniques *Elements of plans and drawings *Simple computer-aided drafting programs --- *Create a draft of your rose project. Include measurements, calculations and descriptions for every project view. 
	Entrepreneurship and Marketing	Content *Role of entrepreneurship in designing and making products and services *Market niche *Branding of products, services, institutions, or places *Pricing product/service, including decision to seek profit or break even *Role of basic financial record-keeping and budgeting --- *Create a brand name for your metal rose. Decide you market niche and calculate the cost of your product and the markup needed to break even to cover startup costs. 

Project 3: Automatons

Maker Hero: Kinetic Sculptor & Technical Assembler Justin Miles

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas:	***Use and experiment with oral storytelling processes:** ***Understand how literary elements, techniques, and**	Content *Reflect on how elements of story/text, strategies and processes for writing, as well as language features,

*Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined (e.g., in dramatic presentations, graphic novels, films, web pages, advertisements).	**devices enhance and shape meaning.** ***Recognize an increasing range of text structures and how they contribute to meaning** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking**	structures, and conventions create mental images of how a story takes place. *What is the history of automatons and why are people compelled to make them? What do you think ancient automaton makers were trying to achieve? https://www.youtube.com/watch?v=MZMeQI1V1Ow *Reflect on an important scene in a book, podcast or audio book you've read/heard and explain why you've chosen this scene. Analyze and explain how the words the author chose contribute to the way you imagine the scene. *Animate a scene from a book or film in automaton form. Use the shape and movement of the cams and the design of the characters or objects you create to create a scene that tells a story. 
Career Ed Big Ideas: *Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	***Recognize their personal preferences, skills, strengths, and abilities and connect them to possible career choices** ***Question self and others about the reciprocal relationship between self and community** ***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	Content *Personal Development *Connections to Community *Life and Career Plan *What skills can you learn from building an automaton? How are these skills useful in jobs? How do the skills you learned from automaton building relate to automotive? http://www.explainthatstuff.com/cranks-and-cams.html *How can working in automotive be useful in a community? What is your view of the automotive industry? What type of work environments can you work in? Are there any considerations for your health when working in the auto industry? *Do you have anyone in your family or community that works on cars or has a mechanical aptitude? Come up with 5 question to ask them in an interview. Reflect on the information gathered and present to the class. 
	***Explore volunteer opportunities and other new experiences outside school and recognize their value in career development** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	*Research and make a list of local organizations that cater to your interests in aspects of automatons/automotive. Ex: artist collectives like EATart, ITA, car companies, soap box derby clubs, maker spaces, Scouts, local auto repair shop etc 
	***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking**	*Reflect on skills learned, problems that came up between team members, resolve and take suggestions on techniques and how this project could have been done differently.

	and risk taking in broadening their career options	
Science Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Questioning and predicting** ***Planning and conducting** ***Processing and analyzing data and information** ***Evaluating** ***Applying and innovating** ***Communicating**	Content *Newton's Laws of Motion *Force of gravity *How are Newton's laws of motion and gravity at play in automatons? Cams and cranks experiments http://www.technologystudent.com/cams/cam2.htm https://www.robives.com/blog/cams http://engino.com/instructions/simple_machines_quiz.pdf 
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Explore relationships between identity, place, culture, society, and belonging through the arts** ***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts.** ***Describe, interpret and respond to works of art and explore artists' intent** ***Describe, interpret and respond to works of art and explore artists' intent** ***Reflect on works of art and creative processes to understand artists' intentions** ***Interpret creative works using knowledge and skills from various areas of learning** ***Examine relationships between the arts and the wider world** ***Research, describe, interpret and evaluate how artists (dancers, actors, musicians, and visual artists) use processes, materials, movements, technologies, tools, techniques, and environments in the arts**	Content: *Purposeful application of elements and principles to create meaning in the arts, *Dance: body, space, dynamics (dance), time, relationships, form, and movement principles Music: beat/pulse, metre, duration, rhythm (music), tempo, pitch, timbre, dynamics (music),form (music), texture *Visual arts: elements of design: line, shape, space, texture, colour, form (visual arts),value; principles of design: pattern, repetition, balance, contrast, emphasis, rhythm (visual arts), variety, unity, harmony *Processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Symbolism and metaphor to explore ideas and perspective *Traditional and contemporary Aboriginal arts and arts-making processes *Research automatons from Europe and Japan. *How do automatons differ depending on which region they were made? *How does each automaton respond to the culture they are from? Europe https://www.youtube.com/watch?v=bY_wfKVjuJM Japan https://www.youtube.com/watch?v=NPm728mG67U *Reflect on the 6 basic emotions (happiness, sadness, surprise, fear, anger, and disgust.) Write examples of when you last felt each of these feelings in your life. *Consider how you could design an automaton to reflect your feelings about a situation. Ex: Consider how the shape, motion and movement of the cams would change depending on the nature of the emotion of the situation. How can other people recognize which emotion you are trying to illustrate in your automaton?

		
Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Numbers describe quantities that can be represented by equivalent fractions.** ***Estimate reasonably** **Demonstrate and apply mental math strategies** ***Use reasoning and logic to explore and analyze mathematical ideas** ***Demonstrate and apply mental math strategies** ***Explain and justify mathematical ideas decisions**	Content *Multiplication and division facts to 100 (developing computational fluency) *Order of operations with whole numbers *Multiplication and division of decimals *Perimeter of complex shapes *Area of triangles, parallelograms, and trapezoids *Angle measurement and classification *Financial literacy *Research materials and make cost comparisons, calculations for sale prices, breakdowns of prices per gram, foot etc. *Calculate the total cost of per project. Multiply by the number of people in your class. *Estimate and use angles when construction your Automaton. Follow instructions using angles. *Draft your automaton in all project views include measurements.(ADST tie in)
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Understanding context**	*Identify a person you are making this project for(it can be yourself or someone else.) Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences) 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge,not having the right thickness of cardboard,not having enough money etc.) How can you work within your constraints? 
	Ideating	*Generate several ideas within these constraints and show others, exchange ideas. Let others know your criteria for success and collect input and opinions. 
	Prototyping	*Identify and use sources of information ex: a youtube video, ask a teacher or family member who has experience with building mechanical projects etc. *Research and explore different shapes of cams, types of cranks etc. 
	Testing	*Evaluate from your prototyping process what can be improved and how you will move forward. Gather

		feedback on your idea from your use. Make changes if needed. 
	Making	*If you are happy with your test samples of your project, write out a plan to produce a version taking into account any advice, ideas or feedback gathered. During the course of making, write out each step as you proceed. 
	Sharing	*Decide who you will share your project with, your family, class, friends etc. Describe your process and explain tools/technology used. *Evaluate and reflect on your project and your ability to work in a group. *Identify any design issues you would change if you were to make another iteration. 

Project 4: Creepy Creature

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas: *Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined	***Use and experiment with oral storytelling processes:** ***Understand how literary elements, techniques, and devices enhance and shape meaning.** ***Recognize an increasing range of text structures and how they contribute to meaning** ***Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking** ***Synthesize ideas from a variety of sources to build understanding** ***Exchange ideas and viewpoints to build shared understanding and extend thinking**	Content *Students explore elements of story/text, strategies and processes for writing, as well as language features, structures, and conventions to write a poem. *Write a poem or spoken word piece about your Creepy Creature. Use expressive language and an appropriate format to paint a visual image of your creatures personality. 

	***Select and use appropriate features, forms, and genres according to audience, purpose, and message**	
Career Ed Big Ideas: *Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	***Recognize their personal preferences, skills, strengths, and abilities and connect them to possible career choices** ***Question self and others about the reciprocal relationship between self and community** ***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.**	Content *Personal Development *Connections to Community *Life and Career Plan *Reflect on the skills can you learn from working with wood and/or fibre. *What are the benefits of wool and fibre? What are the downsides? Are they sustainable materials to work with? Why/Why not?  *How are carpentry skills and textile skills useful in jobs? *What industries use these materials? How can working with wood or fibre be useful in a community? What products could you make with wood or fibre? *What is your view of the forestry and/or textile industries? Do you know anyone who works in carpentry, forestry or fibre arts? What type of work environments can you work in? *Are there any considerations for your health when working in textiles or carpentry? Come up with 5 question to ask in an interview. Reflect on the information gathered and present to the class.  *Research and reflect on the ways in which people sell their textiles online(on websites like Etsy) in physical shops, craft fairs(can tie into ADST Marketing and Entrepreneurship content) *What are the benefits/risks/downsides of being an entrepreneur? I Love my Job https://www.youtube.com/watch?v=CqjwsL8GNB4 
	***Demonstrate leadership skills through collaborative activities in the school and community** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	*During building of plaque and creature establish a group sense of responsibility for others safety. *Reflect on skills learned, problems that came up between team members, resolve and take suggestions and reflect on how your project could have been done differently. 
	***Explore volunteer opportunities and other new experiences outside school and recognize their value in career development**	*Research and document a list of local organizations that cater to your interests: artist collectives, ITA, carpentry companies, maker spaces, Scouts, the film industry.

		*For Wood Working/Carpentry: Local artists who work with wood, First Nations sculptors, carpenters, film industry set construction, home and building construction. Community Gardens(opportunities may exist for building garden boxes) *Fibre arts: Local artists who work with fibre(First Nations esp) textile companies/factories, fibre mills, knitting clubs, yarn and fabric stores. 
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Intentionally select, apply, combine, and arrange artistic elements, processes, materials, movements, technologies, tools, techniques, and environments in art making** ***Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play**	Content: *Students apply elements and principles to create meaning *Students use processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Students explore image development strategies *Create a creature from your imagination or by combining your favourite animals and characters using a range of mediums (Can be part of your ADST curriculum) *Sketch out some ideas and decide the personality of your creature by exploring different expressions, techniques,lines,textures etc. *Reflect on the choices you've made and how effective they are in communicating your idea. 
	***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts** ***Research, describe, interpret and evaluate how artists (dancers, actors, musicians, and visual artists) use processes, materials, movements, technologies, tools, techniques, and environments in the arts** ***Reflect on works of art and creative processes to understand artists' intentions** **Interpret creative works using knowledge and skills from various areas of learning** ***Examine relationships between the arts and the wider world** ***Describe, interpret and respond to works of art and explore artists' intent**	*This project is a based on the tradition of taxidermy; where does the tradition of taxidermy come from? https://www.youtube.com/watch?v=WxiCVz4F0Ho *What is the history of public display of taxidermy? *Is it ethical, why or why not? Who might find a problem with taxidermy? *Is taxidermy art? Research and explain your position.Cite your references. (Could be combined with english curriculum) *Damien Hirst's "The Physical Impossibility of Death in the Mind of Someone Living" http://www.damienhirst.com/the-physical-impossibility-of http://www.magneticstate.com/blogdept/damien-hirst-physical-impossibility-death-shark/ https://www.youtube.com/watch?v=uDuzy-t7GDA Ethical taxidermist artist http://news.nationalgeographic.com/2016/02/160217-video-taxidermy-art-animals-death-ethics/ 

	***Traditional and contemporary Aboriginal arts and arts-making processes**	*How do First Nations cultures use textiles traditionally(in the past) and today? Explain the a purpose and/or symbolism behind the design/motifs?  http://irsi.aboriginal.ubc.ca/2013/08/29/weaving-together-first-nations-traditional-knowledge-and-ubc-biology/ https://www.uvic.ca/knowledge/assets/issues/2000/v1n07_2000.pdf *What tools are used
	***Develop and refine ideas, processes, and technical skills in a variety of art forms to improve the quality of artistic creations** ***Experience, document and present creative works in a variety of ways**	*Research and experiment with different techniques that can be applied to wool Ex: Spinning, weaving, knitting, wet felting, needle felting etc. *Create your Creepy Creature using needle felting and/or a combination of other techniques and tools *Explain how might you create your project to reflect your views on taxidermy? Ie: To show beauty, opposition, raise awareness for animal rights etc 
Social Studies Big Ideas: *Economic self-interest can be a significant cause of conflict among peoples and governments. *Complex global problems require international cooperation to make difficult choices for the future. *Systems of government vary in their respect for human rights and freedoms *Media sources can both positively and negatively affect our understanding of important events and issues	***Use Social Studies inquiry processes and skills to — ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions** ***Develop a plan of action to address a selected problem or issue** ***Construct arguments defending the significance of individuals/groups, places, events, or developments (significance)** ***Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media (evidence)** ***Sequence objects, images, or events, and recognize the positive and negative aspects of continuities and changes in the past and present (continuity and change)** ***Differentiate between short- and long-term causes, and intended and unintended consequences, of events, decisions, or developments (cause and consequence)** ***Take stakeholders' perspectives on issues, developments, or events by making inferences about their beliefs, values, and motivations (perspective)** ***Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place, and assess appropriate ways to respond (ethical judgment)**	Content: *How do economic policies and resource management affect indigenous people? *How should societies balance economic development with the protection of the environment? *The urbanization and migration of people *International cooperation and responses to global issues *Roles of individuals, governmental organizations, and NGOs, including groups representing indigenous peoples --- *Research and reflect on the impact of the fashion industry on people and the environment. Why does much of our textile manufacturing happen overseas? http://www.tradeready.ca/2014/trade-takeaways/pros-cons-outsourcing-your-manufacturing-international-business/ https://www.ic.gc.ca/eic/site/026.nsf/eng/h_00070.html *What effect does overseas manufacturing have on Canada? On other countries Ex China https://china.lbl.gov/research-projects/textile-industry http://www.migrationpolicy.org/article/chinas-young-rural-urban-migrants-search-fortune-happiness-and-independence What problems exist when a company outsources their manufacturing(Specifically working conditions) http://www.ilo.org/wcmsp5/groups/public/@ed_dialogue/@sector/documents/publication/wcms_300463.pdf http://www.nytimes.com/2008/01/05/business/worldbusiness/05sweatshop.html?_r=0

		NGO's: What can be done? *Students & Scholars Against Corporate Misbehaviour. Page 8-31 http://sacom.hk/wp-content/uploads/2015/01/2014-UNIQLO-Investigative-Report_final_20150109.pdf http://www.ethicalfashionforum.com/source-directory/member/123 http://www.ethicalfashionforum.com/source-directory/member/123 http://www.ethicalfashionforum.com/source-directory/member/82 http://www.cbc.ca/news/technology/textile-recycling-1.3569138 http://www.ecouterre.com/the-renewal-workshop-wants-to-keep-repairable-garments-out-of-the-landfill/ http://www.vogue.com/13376872/how-to-fix-fashions-sustainability-problem/ https://www.indiegogo.com/projects/the-renewal-workshop-environment#/ Our Social Fabric https://oursocialfabric.wordpress.com/
Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Estimate reasonably** ***Demonstrate and apply mental math strategies** ***Use reasoning and logic to *Explore and analyze *Mathematical ideas** ***Demonstrate and apply mental math strategies** ***Explain and justify mathematical ideas decisions** ***Develop, demonstrate, and apply mathematical understanding through play, inquiry and problem solving** ***Reflect on mathematical thinking** ***Connect mathematical concepts to each other and other areas of personal interest**	Content *Multiplication and division facts to 100 (developing computational fluency) *Order of operations with whole numbers *Multiplication and division of decimals *Angle measurement and classification *Financial literacy --- *Students demonstrate and explain how to use a tape measure properly. Explain why and when this may be important when creating a project. *Research materials and make cost comparisons, calculations for sale prices, breakdowns of prices per gram, lb, foot etc. *Calculate the total cost of per project before and after taxes. Multiply by the number of people in your class. *Draft out your project and include measurements in your diagram.(Can do this through ADST tie in)  *Reflect on the aspects of this project involved math. How was it helpful to breakdown the cost per project? How might an artist, teacher or shop owner use math skill on a daily basis? How much a construction site use math? How might you find math skills helpful in your daily life? 

Science Big Ideas: *Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. *Everyday materials are often mixtures. *Newton's three laws of motion describe the relationship between force and motion. *The solar system is part of the Milky Way, which is one of billions of galaxies	***Questioning and predicting** ***Planning and conducting** ***Processing and analyzing data and information** ***Evaluating** ***Applying and innovating** ***Communicating**	Content: *Heterogeneous mixtures *Separated using a difference in component properties *Local First Peoples knowledge of separation and extraction methods *The basic structures and functions of body systems *Research and reflect on how the cellular structure of wool fibre. Is it similar to human hair? Why/Why not? Factors when dying wool: Wetting/Swelling of dye, Absorption,Diffusion, Fixation. What mixtures are best to dye wool? http://www.homeschooling-ideas.com/dyeing-yarn.html http://www.scientistinresidence.ca/pdf/life-science/Soils,%20Plants,%20and%20First%20Nations/SRP_Soil,%20Plants%20and%20First%20Nations_Lesson%205%20WF.pdf http://www.intechopen.com/books/thermodynamics-fundamentals-and-its-application-in-science/thermodynamics-of-wool-dyeing History of dye: https://zady.com/features/the-history-of-fabric-dye Experiment with natural dyes and mordants: http://www.open.edu/openlearn/science-maths-technology/science/chemistry/diy-experiments-natural-dyes
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Understanding Context**	*Identify a person you are making this project for(it can be yourself or someone else.) Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences.) 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge,not having the right color of wool, money) How can you work within your constraints? 
	Ideating	*Generate several ideas within these constraints and show others, exchange ideas. Let others know your criteria for success and collect input and opinions. 
	Prototyping	*Identify and use sources of information ex: a youtube video, ask a teacher or family member with experience with woodworking or felting etc. *Explore felting with small amounts of wool/explore tools, technique and ways each tool can be used.

		
	Testing	*Evaluate from your prototyping process what can be improved and how you will move forward. Gather feedback on your idea from your use. Make changes if needed. 
	Making	*If you are happy with your test samples of your project, write out a plan to produce a version taking into account any advice, ideas or feedback gathered. During the course of making, write out each step as you proceed. 
	Sharing	*Decide who you will share your project with-your family, class, friends etc. Describe your process and explain tools/technology used. *Evaluate and reflect on your project and your ability to work in a group. *Identify any design issues you would change if you were to make another iteration. 
ADST Content	**Power Technology**	*Power is the rate at which energy is transformed *Forms of energy *Energy is conserved *Devices that transform energy --- *Learn about and demonstrate how to use power tools safely. *Learn and demonstrate how power tools work *Learn about battery cycling and safe storage 
	Woodwork	*Ways in which wood is used in local cultural and economic contexts *Characteristics of wood as a material *Woodworking techniques and basic joinery using hand tools --- *Types of wood species, availability, cost and use. *Where to source recycled/free wood *Uses for different types of wood:plywood, hardwood, softwood etc. *Storage of wood: absorbtion of moisture etc *Use of tools: square,drill, tape measure, hand saw, router, planer etc. 

	Power Technology	*Power is the rate at which energy is transformed *Forms of energy *Energy is conserved *Devices that transform energy --- *Learn about and demonstrate how to use power tools safely. *Learn and demonstrate how power tools work *Research and reflect on how we can store energy in batteries; battery cycling and safe storage 
	Textiles	*Range of uses of textiles *Variety of textile materials *Hand construction techniques for producing and/or repairing textile items *Consumer concerns that influence textile choices, including availability, cost, function (e.g., waterproof), and textile care --- *Research:where do the best wool fibres come from? Sheep, Alpacas etc *Research special properties of wool and techniques used for wool textiles *Do we have a large textile production industry in Canada? Why/Why not? 
	Drafting	*Technical drawing, including sketching techniques and manual drafting techniques *Elements of plans and drawings *Simple computer-aided drafting programs --- *Create a draft of your project. Include measurements, calculations and descriptions for every project view. 
	Entrepreneurship and Marketing	*Role of entrepreneurship in designing and making products and services *Market niche *Branding of products, services, institutions, or places *Pricing product/service, including decision to seek profit or break even *Role of basic financial record-keeping and budgeting --- *Create a brand name for your project/company. Decide you market niche and calculate the cost of your product and the markup needed to break even. 

Project 5: Soft Circuits

Maker Hero:Emily Smith Textile Artist and Magic Trout Imagineer

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas: *Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined.	***Use and experiment with oral storytelling processes** ***Understand how literary elements, techniques, and devices enhance and shape meaning.** ***Recognize an increasing range of text structures and how they contribute to meaning** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking**	Content *Students explore elements of story/text, strategies and processes for writing, as well as language features, structures, and conventions to have a discussion/debate about cyborgs and technology. *Are humans becoming Cyborgs? *At what point to humans become cyborg? *Research and define what a cyborg is and give examples of technologies that could be seen as indications humanity is (or isn't) moving in that direction. *What are the benefits and disadvantages of becoming cyborgs? Dangers and opportunities? https://www.scientificamerican.com/article/soft-circuits-cyborg-tissues/ http://www.nytimes.com/2012/11/30/opinion/global/maria-popova-evgeny-morozov-susan-greenfield-are-we-becoming-cyborgs.html?_r=0 http://www.sciencealert.com/wealthy-humans-could-live-forever-as-cyborgs-within-200-years-expert-predicts http://qz.com/699595/scientists-believe-the-natural-next-step-in-our-evolution-is-to-become-cyborgs/ C T PS
Career Ed Big Ideas: *Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	***Recognize their personal preferences, skills, strengths, and abilities and connect them to possible career choices** ***Question self and others about the reciprocal relationship between self and community** ***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.**	Content *Personal Development *Connections to Community *Life and Career Plan *Reflect on the skills you have learned from creating a soft circuits/wearable electronics project. *How do projects involving soft circuits and wearables relate to jobs in electrical? Research and reflect. *What are some of the benefits of having electrical knowledge? What are the downsides? Is it a sustainable industry? Why/Why not? *What type of work environments do electricians work in? Are there any considerations for your health when working with electrical?

		*Using this knowledge, what could you make using electrical skills that would help people in your community or another community? *What is your view of the electrical industry? Do you know anyone who works as an electrician or manufactures electronics? Come up with 5 question to ask them in an interview. Reflect on the information gathered and present to the class. 
Science Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Questioning and Predicting** ***Demonstrate a sustained curiosity about a scientific topic or problem of personal interest** ***Make observations in familiar or unfamiliar contexts** ***Identify questions to answer or problems to solve through scientific inquiry** ***Make predictions about the findings of their inquiry** ***With support, plan appropriate investigations to answer their questions or solve problems they have identified** ***Decide which variable should be changed and measured for a fair test** ***Choose appropriate data to collect to answer their questions** ***Observe, measure, and record data, using appropriate tools, including digital technologies** ***Use equipment and materials safely, identifying potential risks** ***Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data** ***Identify patterns and connections in data** ***Compare data with predictions and develop explanations for results** ***Demonstrate an openness to new ideas and consideration of alternatives** ***Evaluate whether their investigations were fair tests** ***Identify possible sources of error** ***Suggest improvements to their investigation methods** ***Identify some of the assumptions in secondary sources** ***Demonstrate an understanding and appreciation of evidence** ***Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations**	Content *Newton's Laws *Effects of balanced and unbalanced forces in daily physical activities --- *Research and reflect on how Newton's laws of motion apply to electricity. (Ie: Electro-magnetic attraction and repulsion) *Devise an experiment ex: http://www.exploratorium.edu/snacks/subject/electricity-and-magnetism Other electricity related lesson plans: http://orgs.educ.queensu.ca/curr/ElecGames.pdf Magnets and Motors http://ambitiousscienceteaching.org/wp-content/uploads/2015/11/6th-magnets-and-motors-UNIT-GUIDE.pdf 

	***Contribute to care for self, others, and community through personal or collaborative approaches** ***Co-operatively design projects** ***Transfer and apply learning to new situations** ***Generate and introduce new or refined ideas when problem solving** ***Communicate ideas, explanations, and processes in a variety of ways**	
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Intentionally select, apply, combine, and arrange artistic elements, processes, materials, movements, technologies, tools, techniques, and environments in art making** ***Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play** ***Explore relationships between identity, place, culture, society, and belonging through the arts** ***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts.** ***Describe, interpret and respond to works of art and explore artists' intent** ***Reflect on works of art and creative processes to understand artists' intentions** ***Interpret creative works using knowledge and skills from various areas of learning** ***Examine relationships between the arts and the wider world** ***Adapt learned skills, understandings, and processes for use in new contexts and for different purposes and audiences** ***Interpret and communicate ideas using symbols and elements to express meaning through the arts** ***Take creative risks to express feelings, ideas, and experiences** ***Express, feelings, ideas, and experiences through the arts** ***Describe, interpret and respond to works of art and explore artists' intent** ***Experience, document and present creative works in a variety of ways** ***Demonstrate increasingly sophisticated application and/or engagement of curricular content**	Content *Purposeful application of elements and principles to create meaning in the arts, *Dance: body, space, dynamics (dance), time, relationships, form, and movement principles Music: beat/pulse, metre, duration, rhythm (music), tempo, pitch, timbre, dynamics (music),form (music), texture *Visual arts: elements of design: line, shape, space, texture, colour, form (visual arts),value; principles of design: pattern, repetition, balance, contrast, emphasis, rhythm (visual arts), variety, unity, harmony *Processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Symbolism and metaphor to explore ideas and perspective *Traditional and contemporary Aboriginal arts and arts-making processes --- *Research, discuss and reflect on artists who work with technology. Does technology enhance or detract from their art? *Using the design process to prototype a wearable electronics device for music, dance or visual arts. Develop your own symbols for each button or function of your device. (Can be combined with cyborg discussion in English curriculum and with ADST Curriculum) *Imogen Heap is an musician and artist who uses wearable electronics in her live performances. https://vimeo.com/90252137 https://www.youtube.com/watch?v=UYIAfiVGluk *Drawing the Movements of a Ballerina: Artist Alan Storey created a hair piece for a ballerina that captures the movements and translates them via robotic drawing machine to a canvas. https://www.erudit.org/culture/espace1041666/espace1050167/9129ac.pdf 

Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret.	***Numbers describe quantities that can be represented by equivalent fractions.** ***Estimate reasonably** **Demonstrate and apply mental math strategies** ***Use reasoning and logic to explore and analyze mathematical ideas** ***Demonstrate and apply mental math strategies** ***Explain and justify mathematical ideas decisions**	Content *Multiplication and division facts to 100 *Order of operations with whole numbers *Introduction to ratios *Financial literacy *Research materials and make cost comparisons, calculations for sale prices, breakdowns of prices per gram, lb, foot etc. *Calculate the total cost of your project before and after tax. *Calculate the total cost of per project. Multiply by the number of people in your class. *Research and reflect on the purpose of Ohms law: https://www.youtube.com/watch?v=QwNSa_8ro_Y *Use Ohm's law to calculate the number of led's you can run of of a single coin cell battery, an AA battery and an AAA battery. Figure out how many batteries you will need to operate your project. Express as an equation. http://www.ohmslawcalculator.com/led-resistor-calculator 
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Understanding context**	*Identify a person you are making this project for(it can be yourself or someone else.) Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences.) 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge, money etc) How can you work within your constraints? 
	Ideating	*Generate several ideas within these constraints and show others, exchange ideas. Let others know your criteria for success and collect input and opinions. 
	Prototyping	*Identify and use sources of information ex: a youtube video, ask a teacher or family member with experience in electrical, electronics, sewing or felting.

		*Explore soft circuits, stitching techniques and different ways to create a circuit(Ex: parallel, series etc) 
	Testing	*Evaluate from your prototyping process what can be improved and how you will move forward. Gather feedback on your idea from your use. *Make changes if needed. 
	Making	*If you are happy with your test samples of your project, write out a plan to produce a version taking into account any advice, ideas or feedback gathered. During the course of making, write out each step as you proceed. 
	Sharing	*Decide who you will share your project with-your family, class, friends etc. Describe your process and explain tools/technology used. *Evaluate and reflect on your project and your ability to work in a group. *Identify any design issues you would change if you were to make another iteration. 
ADST Content	**Drafting**	*Technical drawing, including sketching techniques and manual drafting techniques *Elements of plans and drawings *Simple computer-aided drafting programs --- *Create a draft of your project. Include measurements, calculations and descriptions for every project view. 
	Entrepreneurship and Marketing	*Role of entrepreneurship in designing and making products and services *Market niche *Branding of products, services, institutions, or places *Pricing product/service, including decision to seek profit or break even *Role of basic financial record-keeping and budgeting --- *Create a brand name for your project/company. Decide you market niche and calculate the cost of your product and the markup needed to break even.

		
	Computers and Communications Devices	*Computer system architecture, including hardware and software, network infrastructure (local), intranet/Internet, and personal communication devices *Strategies for identifying and troubleshooting simple hardware and software problems *Function of input and output devices, including 3D printing and adaptive technologies for those with special needs *Ergonomics in use of computers and computing devices *Effective and efficient keyboarding techniques *Learn about microcontrollers and electronic components that are programmed on the computer, then uploaded to devices ie:Lillipad etc.
	Media Arts	*Digital and non-digital media, and their distinguishing characteristics and uses *Techniques for using images, sounds, and text to communicate information, settings, ideas, and story structure *Media technologies and techniques to capture, edit, and manipulate images, sounds, and text for specific purposes *Influences of digital media for the purpose of communication and self-expression *Explore and reflect on how digital technology can enhance your creative projects. *Discuss relationships between humans and machines; ways they can create connection instead of disconnection
	Textiles	*Range of uses of textiles *Variety of textile materials *Hand construction techniques for producing and/or repairing textile items *Consumer concerns that influence textile choices, including availability, cost, function (e.g., waterproof), and textile care *Elaborations: construction (e.g., sails at Canada Place), automotive, apparel, function (e.g., fire blanket), ceremonial (e.g., regalia) *Elaborations: for example, leather, cedar, wool, cotton, felt, embroidery thread, yarn, grasses and reeds, pine needles, sinew, plastic, used items and fabrics (e.g., food wrappers, old clothing) *Elaborations: for example, hand sewing, knitting (needles, arm, spool), crocheting, weaving, darning, up-cycling (e.g., turning an underused item into something else), embellishing existing items *Explore and discuss how textiles can be created, altered and repaired. *Explore how textiles can be used as a creative medium.

Project 6: Skateboard Ramp

Artists, welders, carpenters, filmmakers the Zenga Bros

Subject	Curricular Competencies	Content & Lesson Ideas
English Big Ideas: *Oral texts include speeches, poems, plays, and oral stories. Written texts include novels, articles, and short stories. Visual texts include posters, photographs, and other images. *Digital texts include electronic forms of all the above. *Oral, written, and visual elements can be combined (e.g., in dramatic presentations, graphic novels, films, web pages, advertisements).	***Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking** ***Synthesize ideas from a variety of sources to build understanding** ***Exchange ideas and viewpoints to build shared understanding and extend thinking** ***Select and use appropriate features, forms, and genres according to audience, purpose, and message.**	Content *Students explore elements of story/text, strategies and processes for writing, as well as language features, structures, and conventions to have a discussion/debate about skateboarding and skate culture. *Write an essay or spoken word piece about skateboarding, express your feelings around skate culture or a talk about a skate hero you have. *How can the structure of your talk or poem better express your feelings? *Ex of poetry about skateboarding: http://www.poetrysoup.com/poems/short/skateboard http://www.teenink.com/poetry/free_verse/article/212263/Ode-to-Skateboarding/ *Ex essay on skateboarding: https://johnnyidol.wordpress.com/essays/essay-1/ *Write an essay on your subject for social studies (See social curriculum below)
	***Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability** ***Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking** ***Synthesize ideas from a variety of sources to build understanding** ***Exchange ideas and viewpoints to build shared understanding and extend thinking** ***Select and use appropriate features, forms, and genres according to audience, purpose, and message.**	*Write an essay/host a debate for and against skateparks. Use images and news articles to support your arguments. https://www.skatepark.org/park-development/vision/2010/12/how-skateparks-fail/ http://publicskateparkguide.org/advocacy/common-issues-and-answers/ http://publicskateparkguide.org/advocacy/meet-the-opposition/ http://www.durhamregion.com/news-story/3468523-neighbours-say-courtice-skatepark-causing-them-grief/ **Link to an amazing and inspiring Zenga brothers documentary about how they learned to build ramps:** DIY Ramp History: http://www.zengabros.com/diy-ramp-history/
Career Ed Big Ideas:	***Recognize their personal preferences, skills, strengths, and abilities and connect them to possible career choices**	Content *Personal Development *Connections to Community

*Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community. *Our personal digital identity forms part of our public identity. *Practising respectful, ethical, inclusive behaviour prepares us for the expectations of the workplace. *Leadership represents good planning, goal-setting, and collaboration. *Safe environments depend on everyone following safety rules. *New experiences, both within and outside of school, expand our career skill set and options.	***Question self and others about the reciprocal relationship between self and community** ***Use entrepreneurial and innovative thinking to solve problems** ***Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community.**	*Life and Career Plan --- *Reflect on the skills can you learn from working with wood. What are the benefits of using wood vs. other materials? What are the downsides? Is wood a sustainable materials to work with? Why/Why not? What skills can you learn from skateboarding and building physical structures like ramps? How are these skill useful in jobs? How can these skills be useful in the community? What is your view of carpentry? What type of work environments can you work in as a carpenter? Are there any considerations for your health when working in carpentry? *How are carpentry skills useful in jobs? What industries need carpenters? How can working with wood be useful in a community? What products could you make with wood? *What is your view of the carpentry industry? Do you know anyone who works in carpentry? Come up with 5 question to ask in an interview. Reflect on the information gathered and present to the class. Video about skateboarders whose passion for skating led them to jobs in trades: Skate trades video:https://vimeo.com/138236608
	***Demonstrate leadership skills through collaborative activities in the school and community** ***Demonstrate safety skills in an experiential learning environment** ***Appreciate the value of new experiences, innovative thinking and risk taking in broadening their career options**	*During building of ramp, establish roles, delegate tasks *Establish a group sense of responsibility for others safety. *Reflect on skills learned, problems that came up between team members, resolve and take suggestions on how it could have been done differently.
	***Explore volunteer opportunities and other new experiences outside school and recognize their value in career development**	*Research local organizations that cater to your interests. *What jobs exist for for your skill set? What other skills might you need to learn? *For Skateboarding/carpentry: Explore CAD software, create miniature models and mock ups. Learn about drafting, scale drawings and blueprints(ADST tie in)
Math Big Ideas: *Linear relations can be identified and represented using expressions with variables and line graphs and can be used to	***Numbers describe quantities that can be represented by equivalent fractions.** ***Closed shapes have area and perimeter that can be described, measured, and compared.** ***Relationships between area and perimeter** ***Use reasoning and logic to explore, analyze, and apply mathematical ideas**	Content *Multiplication and division facts to 100 (developing computational fluency) *Perimeter of complex shapes *Angle measurement and classification *Financial literacy --- *Learn to use/properly read a measuring tape: What do all the lines mean?

form generalizations *Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles. *Data from the results of an experiment can be used to predict the theoretical probability of an event and to compare and interpret	***Estimate reasonably** ***Demonstrate and apply mental math strategies** ***Use tools or technology to explore and create patterns and relationships, and test conjectures** ***Model mathematics in contextualized experiences** ***Apply multiple strategies to solve problems in both abstract and contextualized situations** ***Visualize to explore mathematical concepts** ***Use mathematical vocabulary and language to contribute to mathematical discussions** ***Explain and justify mathematical ideas and decisions** ***Communicate mathematical thinking in many ways** ***Represent mathematical ideas in concrete, pictorial, and symbolic forms**	*Give the class a budget and let them calculate what size of ramp they can build with their budget (more 2x4's are needed depending on the width) *How did you decide the size and measurements of your projects *Research where to buy supplies new. Make cost comparisons, calculations for sale prices, breakdowns of prices per, gram, lb or linear foot etc. *Calculate the total cost of per project before and after taxes. *Calculate perimeter and area of your wood before and after you cut it down to size. *Calculate how much wood is being diverted from the dump by creating your wood scrap art project. Calculate how much wood is being diverted by your class. How much wood do you have left? *Record your calculations and explain how you arrived at your answer. *In your design,calculate the number length of ribs required if you were to create different widths of ramps(Up to 8 ft width total including transitions) *Write out the mathematical equation needed to determine the length of ribs. *What size of ramp will your group build and why? Show your calculations *Draft and label a diagram of your ramp design with measurements of each part and explain how you came to this conclusion. (ADST tie in)
Art Big Ideas: *Engaging in creative expression and experiences expands people's sense of identity and community. *Artistic expressions differ across time and place. *Dance, drama, music, and visual arts are each unique languages for creating and communicating. *Experiencing art is a means to develop empathy for others' perspectives and experiences.	***Explore relationships between identity, place, culture, society, and belonging through the arts** ***Demonstrate an understanding and appreciation of personal, social, cultural, historical, and environmental contexts in relation to the arts.** ***Describe, interpret and respond to works of art and explore artists' intent** ***Describe, interpret and respond to works of art and explore artists' intent** ***Experience, document and present creative works in a variety of ways** ***Reflect on works of art and creative processes to understand artists' intentions** ***Interpret creative works using knowledge and skills from various areas of learning** ***Examine relationships between the arts and the wider world** ***Research, describe, interpret and evaluate how artists (dancers, actors, musicians, and visual artists) use processes, materials, movements, technologies, tools, techniques, and environments in the arts** **(Could cross over into social issues-see Social Studies)**	Content: *Purposeful application of elements and principles to create meaning in the arts, *Visual arts: elements of design: line, shape, space, texture, colour, form (visual arts),value; principles of design: pattern, repetition, balance, contrast, emphasis, rhythm (visual arts), variety, unity, harmony *Processes, materials, movements, technologies, tools, strategies, and techniques to support creative works *Symbolism and metaphor to explore ideas and perspective *Explore street culture, graffiti and street art. Book: In Graffiti World: Street Art from Five Continents (or similar) *Why do you think people do graffiti/street art? Is it illegal? *Compare and contrast 2 artists to in a presentation(could be multi-media) or an essay. Describe the following: *What are the artists trying to say with their art a) about themselves, b) about the world around them *How does graffitti/street art differ from traditional styles of art? *How does graffitti/street art differ from country to country in style, subject matter and message? *How does the medium, location or style of their art reflect the message of their art? (Check list of artists in Social Studies tie in)
	***Develop and refine ideas, processes, and technical skills in a variety of art forms to improve the quality of artistic creations**	*Start a sketchbook and explore and develop your own "tag" *Consider parts of your personality you show, which you hide. *Integrate these aspects of yourself into a tag design. Explore symbolism while using the elements and principles

	***Take creative risks to express feelings, ideas, and experiences** ***Express, feelings, ideas, and experiences through the arts** ***Demonstrate increasingly sophisticated application and/or engagement of curricular content**	*Create your own visual language with symbols from your life, culture and dreams.Incorporate into your tag. Case Study: Frida Kahlo https://www.khanacademy.org/humanities/art-1010/art-between-wars/latin-american-modernism1/a/kahlo-the-two-fridas-las-dos-fridas https://www.albrightknox.org/research/educator-resources/lesson-plans/lesson:symbolic-self-portrait/ *Reflect on the elements and principles you chose and why.
Social Studies Big Ideas: *Economic self-interest can be a significant cause of conflict among peoples and governments. *Complex global problems require international cooperation to make difficult choices for the future. *Systems of government vary in their respect for human rights and freedoms *Media sources can both positively and negatively affect our understanding of important events and issues	***Use Social Studies inquiry processes and skills to — ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions** ***Develop a plan of action to address a selected problem or issue** ***Construct arguments defending the significance of individuals/groups, places, events, or developments (significance)** ***Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media (evidence)** ***Sequence objects, images, or events, and recognize the positive and negative aspects of continuities and changes in the past and present (continuity and change)** ***Differentiate between short- and long-term causes, and intended and unintended consequences, of events, decisions, or developments (cause and consequence)** ***Take stakeholders' perspectives on issues, developments, or events by making inferences about their beliefs, values, and motivations (perspective)** ***Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place, and assess appropriate ways to respond (ethical judgment)**	Content: *Global poverty and inequality issues, including class structure and gender : *Treatment of minority populations in Canada and in other cultures and societies you have studied *Unequal distribution of wealth *Corruption *Lack of judicial process *Women's rights *Social justice *Treatment of indigenous people *The urbanization and migration of people *International cooperation and responses to global issues: *Regional and international conflict *War *Boundary disputes *Religious and ethnic violence --- *Investigate the role of art in improving raising awareness of social conditions across the world. *Watch films/read about artists who address issues and engage citizens in art for social change. Choose an artist and issue and research that same issue in your town as well. *Draw a map and document bordering countries, seas, capital cities, the latitude and longitude of the location. *What time zones are they in, what time is it there if you were to call them when you arrive home from school? Artist "JR" Women Are Heroes: Issue Violence in Rio De Janeiro http://www.jr-art.net/projects/women-are-heroes-brazil Face2 Face Israel/ Palestine http://www.jr-art.net/projects/face-2-face Ted Talk http://www.jr-art.net/videos/ted-talk-2012 Artist Vik Muniz http://www.wastelandmovie.com/ *Find information and statistics on the issue the artist's project is trying to address and display through a graph, chart etc *Compare statistics to your own city or town and document in a graph, chart, etc. *If the problem exists in your community, what can you help or raise awareness? Host a discussion and reflect on what can be done. *Make a plan and choose a course of action *A great collection of videos on how art creates social change: http://cloudhead.org/2013/09/03/the-power-of-art-to-affect-social-change-shown-in-5-ted-talks/

Science Big Ideas *Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. *Everyday materials are often mixtures. *Newton's three laws of motion describe the relationship between force and motion.	***Questioning and predicting** ***Planning and conducting** ***Processing and analyzing data and information** ***Evaluating** ***Applying and innovating** ***Communicating**	Content: *Newton's three laws of motion *effects of balanced and unbalanced forces in daily physical activities *force of gravity How is gravity important in skateboard tricks? http://www.exploratorium.edu/skateboarding/ How do Newton's Laws of Motion relate to your ramp? http://www.wired.com/2014/10/skateboard-physics-empzeal/ Ollie Experiment: http://www.sciencebuddies.org/science-fair-projects/project_ideas/Sports_p055.shtml#summary Force and Friction: Which wheels are best? http://www.sciencebuddies.org/science-fair-projects/project_ideas/Sports_p018.shtml#background http://pbskids.org/dragonflytv/show/skateboarding.html
ADST Big Ideas: *Design can be responsive to identified needs. *Complex tasks require the acquisition of additional skills. *Complex tasks may require multiple tools and technologies.	**Understanding Context**	*Identify a person you are making this project for(it can be yourself or someone else.) Empathize and understand the purpose for your project. (Personal preference, environmental impact, design/artistic influences.) 
	Defining	*Choose a project that works with the information you have gathered. What are your constraints(could be lack of knowledge,not having the right wood, money etc) How can you work within your constraints? 
	Ideating	*Generate several ideas within these constraints and show others, exchange ideas. Let others know your criteria for success and collect input and opinions. 
	Prototype	*Identify and use sources of information ex: a youtube video, ask a friend, family member or a teacher with experience in carpentry *Explore attaching wood with screws, drilling techniques etc. 
	Testing	*If you are happy with your test samples of your project, make a plan to produce a version taking into account any advice, ideas or

		feedback gathered. During the course of making, write out each step as you proceed. 
	Making	*Decide who you will share your project with-your family, class, friends etc. Describe your process and explain tools and technology used. *Evaluate and reflect on your project and your ability to work in a group. Identify any design issues you would change if you were to make another iteration. 
ADST Content	**Woodwork**	*Ways in which wood is used in local cultural and economic contexts *Characteristics of wood as a material *Woodworking techniques and basic joinery using hand tools --- *Types of wood species, availability, cost and use. *Where to source recycled/free wood, *Uses for different types of wood:plywood, hardwood, softwood etc. *Storage of wood: absorbtion of moisture etc *Use of tools: square,drill, chalk line, skillsaw etc.
	Power Technology	*Power is the rate at which energy is transformed *Forms of energy *Energy is conserved *Devices that transform energy --- *Learn about and demonstrate how to use power tools safely. *Research and reflect on how we can store energy in batteries; battery cycling and safe storage 
	Entrepreneurship and Marketing	*Role of entrepreneurship in designing and making products and services *Market niche *Branding of products, services, institutions, or places *Pricing product/service, including decision to seek profit or break even *Role of basic financial record-keeping and budgeting --- *Create a brand name for a line of skateboard products *Decide you market niche and calculate the cost of your product and the markup needed to break even. 
	Drafting	*Technical drawing, including sketching techniques and manual drafting techniques *Elements of plans and drawings *Simple computer-aided drafting programs --- *Draft a preliminary sketch of your program according to your budget and measurements. Label your calculations and measurements. Explain how you came to your conclusions. *Include measurements, calculations and descriptions for each project view.

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