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| **APPLIED DESIGN, SKILLS and TECHNOLOGIES 8 - Planning KDU** |
| **CORE COMPETENCIES** **COMMUNICATION**  | **CORE COMPETENCIES** **THINKING (CRITICAL/CREATIVE)** | **CORE COMPETENCIES****(PERSONAL/SOCIAL)** |
| **CURRICULAR COMPETENCIES** | **BIG IDEA (Understand…)** | **What do we want students to DO? (Activities, lessons…)**  | **Content (& Elaborations)****(Know)** |
| **Applied Design*****Understanding context**** Empathize *(share the feelings and understand the needs of others to inform design)* with potential users to find issues and uncover needs

***Defining*** *(setting parameters)** Choose a design opportunity
* Identify key features or potential users and their requirements
* Identify criteria for success and any constraints *(limiting factors such as task or user requirements, materials, expense, environmental impact, issues of appropriation, and knowledge that is considered sacred)*

***Ideating*** *(forming ideas or concepts)** Generate potential ideas and add to others’ ideas
* Screen ideas against criteria and constraints
* Evaluate personal, social, and environmental impacts and ethical considerations
* Choose an idea to pursue

***Prototyping**** Identify and use sources of information *(including seeking knowledge from other people as experts First Peoples Elders) secondary sources, and collective pools of knowledge in communities and collaborative atmospheres)*
* Develop a plan that identifies key stages and resources
* Explore and test a variety of materials for effective use
* Construct a first version of the product *(physical product, a process, a system, a service, or a designed environment)* or a prototype, as appropriate, making changes to tools, materials, and procedures as needed
* Record iterations *(repetitions of a process with the aim of approaching a desired result)* of prototyping

***Testing**** Test the first version of the product or the prototype
* Gather peer and/or user and/or expert feedback and inspiration
* Make changes, troubleshoot, and test again

***Making**** Identify and use appropriate tools, technologies, and materials for production
* Make a plan for production that includes key stages, and carry it out, making changes as needed
* Use materials in ways that minimize waste

***Sharing**** Decide on how and with whom to share *(may include showing to others, use by others, giving away, or marketing and selling)* their product
* Demonstrate their product
* Explain their process, using appropriate terminology, and provide reasons for their selected solution and modifications
* Reflect on their design thinking and processes
* Evaluate their product against criteria
* Identify how their product contributes to the individual, family, community, and/or environment
* Identify new design issues
* Evaluate their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain an efficient co-operative work space

**Applied Skills*** Demonstrate an awareness of precautionary and emergency safety procedures in both physical and digital environments
* Identify and evaluate the skills and skill levels needed, individually or as a group, in relation to a specific task, and develop them as needed

**Applied Technologies*** Select, and as needed learn about, appropriate tools and technologies to extend their capability to complete a task
* Identify the personal, social, and environmental impacts, including unintended negative consequences, of the choices they make about technology use
* Identify how the land, natural resources, and culture influence the development and use of tools and technologies
 | Design can be responsive to identified needs.Complex tasks require the acquisition of additional skills.Complex tasks may require multiple tools and technologies. | *Questions to support inquiry with students:* * What makes good design?

  | *The curriculum is designed to be offered in modules or courses of various lengths. The requirement will be that students take a yearlong “course” in ADST. This “course” can be made up of one or more modules. Schools may choose from among the modules listed below or develop new modules that use the Curricular Competencies of ADST 8 with locally developed content. Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum.***Computational Thinking*** software programs as specific and sequential instructions with algorithms that can be reliably repeated by others
* debugging algorithms and programs by breaking problems down into a series of sub-problems
* binary number system (1s and 0s) to represent data
* Programming languages, including visual programming *(Scratch, Alice, Greenfoot, BlueJ] in relation to text-based programming [HTML])* and programming modular components *(Arduino, LEGO Mindstorms)*

**Computers and Communications Devices*** design and function of digital infrastructures, including personal communication systems to wide area networks *(global, satellite)* and the Internet of Things *(internet access across all technologies)*
* social, cultural, and economic impact of mobile devices
* systems for information transfer and communication, including videos, blogs, podcasts, and social media
* keyboarding techniques *(physical hand and foot placement, posture, development of touch typing skills, use of “home row” ASDFJKL techniques)*

**Digital Literacy*** elements of digital citizenship *(digital self-image, creative credit and copyright, relationships and communication, cyberbullying, legal and ethical issues)*
* ethical and legal implications of current and future technologies *(hacking (white hat and black hat), P2P Sharing, Torrents, VPNs, tracking, data collection, anonymity; automation, artificial intelligence, mobile devices, data collection, robotics, digital currencies (e.g., Bitcoin))*
* strategies for curating personal digital content, including management, personalization, organization, and maintenance of digital content; e-mail management; and workflow
* search techniques, how search results are selected and ranked, and criteria *(accuracy, timeliness, appropriateness, credibility, and bias)*  for evaluating search results
* strategies to engage with personal learning networks *(personalized digital instructional tools to support learning (web forums, tutorials, videos, digital resources, global communities, group communication and etiquette, online learning))*

**Drafting*** manual and computer-aided drafting techniques *(isometric, orthographic, oblique, scale, 2D and 3D drawings)*
* elements of technical plans and drawings
* Advantages of using *(converting raster to vector in order to use plotters and vinyl cutters)* vector files
* virtual creation *(layout, planning project, creating plans for model)* using CAD

**Entrepreneurship and Marketing*** characteristics *(goal, element of risk, personal commitment, planning and preparation, commitment of resources)* of entrepreneurial activity
* characteristics of social entrepreneurship in First Nations communities
* recognition of a market need and identification of target market
* development of a product or service, including its features and benefits
* forms *(print, social media, web, digital)* of advertising and marketing that can influence a potential customer or buyer
* differences between consumer wants *(what one would like to have; what one can do without)* and needs *(what one must have; what one cannot do without)*
* role of money management in financing an idea or developing a product

**Food Studies*** cross-contamination, including prevention and management
* food preparation practices, including elements of a recipe, techniques, and equipment
* effects of removing or substituting ingredients, including nutritional profile, food quality, taste
* social factors that affect food choices, including eating practices
* variety of eating practices *(with whom, what, when, how, why, where food is consumed in a variety of settings (e.g., informal, formal, special, and/or ceremonial occasions))*
* local food systems *(growing, harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food and food-related items)*
* First Peoples’ traditional food use

**Media Arts*** Digital and non-digital media technologies *(video production, layout and design, graphics and images, photography (digital and traditional), emerging media processes (performance art, collaborative work, sound art, network art, kinetic art, biotechnical art, robotic art, space art))*, their distinguishing characteristics and uses, including layout and design, graphics and images, and video production techniques for using images, sounds, and text to represent characterizations and points of view of people including themselves, as well as settings and ideas
* story principles *(electing and organizing the elements of structure, intent, characters, settings and points of view within the conventions of a genre)* and genre conventions *(traditional or culturally accepted ways of doing things based on audience expectations)*
* media technologies and techniques *(preparing rough lumber, choosing appropriate tool sizes, cutting, drilling, painting, using simple hardware and fasteners)*  to shape space, time, movement, and lighting within images, sounds, and text for specific purposes
* processes for manipulating and testing digital media data
* issues in ethical media practices, including cultural appropriation, moral copyright, reproduction, and privacy
* elements *(composition, time, space, sound, movement, lighting)* of media arts used to communicate meaning
* influences of digital media, including on communication and self-expression

**Metalwork*** characteristics and uses of ferrous and non-ferrous metals
* metal fastening techniques, including basic welding and fabrication practices
* metalworking techniques and processes *(brazing, turning, machining, drilling, cutting, sanding, grinding, polishing)* using hand tools *(cordless and corded drills, rotary tool, hammer, screwdriver, backsaw, ripsaw, coping saw, nail set, square, clamp and vise, chisel, marking gauge, carpenter square, jig saw)*  and power equipment *(band saw, scroll saw, drill press)*
* elements of plans and drawings
* reclamation and repurposing of metals

**Power Technology*** uses of power technology
* renewable and non-renewable sources of energy
* conversion and transmission of energy
* kinetic *(energy of motion)* and potential *(stored energy of position)* energy
* effect of mass and inertia on speed and distance
* role of aerodynamics
* effects of forces *(tension, torsion, compression, shear, friction)* on devices

**Robotics*** uses of robotics in local contexts
* types of sensors *(bump, motion, sound, light, infrared)*
* user and autonomous control systems
* uses and applications of end effectors
* movement- and sensor-based responses
* program flow
* interpretation and use of schematics for assembling *(soldering (with fume extraction), breadboarding)* circuits
* identification and applications of components *(diodes, LEDs, resistors, capacitors, transistors)*
* various platforms *(VEX, VEX IQ, LEGO Mindstorms/NXT)* for robotics programming

**Textiles*** sources of textile materials *(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))*
* hand and machine construction techniques for producing and/or repairing textile items
* basic components of patterns and instructions
* colour as an element of design
* personal factors that influence textile choices, including culture and self-expression, and the impact of those choices on individual and cultural identity

**Woodwork*** historical and current contexts of woodworking
* identification, characteristics, and properties of a variety of woods, both manufactured and natural
* elements of plans and drawings
* woodworking techniques *(preparing rough lumber, choosing appropriate tool sizes, cutting, drilling, painting, using simple hardware and fasteners)*
* traditional *(mitre joint, rabbet joint, dado joint, dowelling)* and non-traditional *(metal connectors, screws and fasteners, biscuits)* joinery using hand tools *(cordless and corded drills, rotary tool, hammer, screwdriver, backsaw, ripsaw, coping saw, nail set, square, clamp and vise, chisel, marking gauge, carpenter square, jig saw)* and power equipment *(band saw, scroll saw, drill press)*
* options for reuse *(recycling and reclamation)* of wood and wood products
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| **BIG IDEA (Understand…)** | **What do we want students to DO? (Activities, lessons…)**  | **Content (& Elaborations)****(Know)** |
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