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| **APPLIED DESIGN, SKILLS and TECHNOLOGIES 6 - 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 and potential design opportunities

***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 (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 *(* *a 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?
* How does design change with availability of different materials?

  | *Students will experience a minimum of three modules of ADST in each of Grades 6 and 7. Schools may choose from among the modules listed below or develop new modules that use the Curricular Competencies of ADST 6–7 with locally developed content. Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum*.**Computational Thinking*** simple algorithms *(for sorting, searching, sequence, selection, and repetition; specific statements to complete a simple task; cryptography and code breaking (cyphers))* that reflect computational thinking
* visual representations *(graphs, charts, network diagrams, info graphics, flow charts, lists, tables, or arrays)* of problems and data
* evolution of programming languages *(historical perspectives, evolution (Ada Lovelace, punch cards, Hollerith, Grace Hopper, Alan Turing, Enigma, cyphers))*
* Visual programming*(Kodu, Scratch)*

**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

**Digital Literacy*** Internet safety*(privacy and security (secured connections, passwords, personal information), digital footprint and dossier, cyberbullying, online scams, and cybercrimes))*
* digital self-image, citizenship, relationships, and communication
* legal and ethical considerations, including creative credit and copyright, and cyberbullying
* Methods for personal media management*(personalization and organization, bookmarks, content management)*
* search techniques, how search results are selected and ranked, and criteria *(accuracy, timeliness, appropriateness, credibility, and bias)* for evaluating search results
* strategies to identify personal learning networks *(personalized digital instructional tools to enhance learning and engagement (apps, websites, videos, tutorials, games))*

**Drafting*** technical drawing, including sketching techniques and manual drafting techniques *(geometric concepts and scale, isometric, orthographic, and oblique drawings)*
* elements of plans and drawings
* Simple computer-aided drafting programs *(eg. SketchUp, 123Design)*

**Entrepreneurship and Marketing*** role of entrepreneurship in designing and making products and services
* market niche*(subset of the market on which a specific product is focused, created by identifying needs or wants not provided by competitors)*
* 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

**Food Studies*** basic food handling and simple preparation techniques *(cutting, blending, heating, and chilling foods; storing foods; clean hands and food preparation surfaces)* and equipment *(eg. blender, utensils, knife, scissors, hot plate, stove, solar oven, ice bath, wooden skewers, steam basket, microwave, birch bark container, tagine, wok)*
* factors in ingredient use, including balanced eating/nutrition, function, and dietary restrictions*((eg., dairy, nuts), sensitivities/intolerances (eg., gluten))*
* factors that influence food choices, including cost, availability, and family and cultural influences

**Media Arts*** digital and non-digital media *(video production, layout and design, graphics and images, photography (digital and traditional), emerging media processes (performance art, collaborative work, sound art, network art)*, and their distinguishing characteristics and uses
* techniques *(crop, print, record/capture, sequence)*  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

**Metalwork*** characteristics and uses of metals
* metalworking techniques and processes*(bending****,*** *cutting, filing, drilling, soldering (with fume extractor))*and processes using hand tools*(eg. cordless and corded drills, rotary tool, hammer, screwdriver, hacksaw, jeweller’s saw, scribe, square, punch, clamp and vise, files)*
* metals as a non-renewable resource

**Power Technology*** power is the rate at which energy is transformed
* forms of energy*(sound, thermal, elastic, nuclear, chemical, magnetic, mechanical, gravitational, and electrical)*
* energy is conserved*(law of conservation of energy — energy cannot be created or destroyed but can be changed)*
* devices that transform energy*(electrical to mechanical, elastic to mechanical, chemical to electrical, electrical to light)*

**Robotics*** a robot is a machine capable of carrying out a complex series of actions automatically
* uses of robotics
* main components of robots: sensors*(“sense” — the parts of the robot that allow it to gather information about its environment that guides its behaviour)*, control systems*(“think” — the part of the robot that determines the robot’s behaviour)*, and effectors *(“act” — the parts of the robot that do the work)*
* various ways *(straight line, back-and-forth, round-and-round, zigzag, fast and slow, fixed distances in set patterns)* that objects can move
* programming and logic for robotics components
* various platforms *(VEX IQ, LEGO Mindstorms/NXT, Cubelets)* for robotics

**Textiles*** range of uses *(construction ( sails at Canada Place), automotive, apparel, function (fire blanket), ceremonial (regalia))* of textiles
* variety of textile materials*[leather, cedar, wool, cotton, felt, embroidery thread, yarn, grasses and reeds, pine needles, sinew, plastic, used items and fabrics (food wrappers, old clothing))*
* hand construction techniques*(hand sewing, knitting (needles, arm, spool), crocheting, weaving, darning, up-cycling (turning an underused item into something else), embellishing existing items)*  for producing and/or repairing textile items
* consumer concerns that influence textile choices, including availability, cost, function (e.g. waterproof), and textile care

**Woodwork*** ways in which wood is used in local cultural and economic contexts
* characteristics of wood as a material
* woodworking techniques*(cutting materials according to plan, layout, sanding methods, abrasive applications]* and basic joinery*(butt joints (with and without dowel), rabbit joints, gluing, nails and screws]* using hand tools *(cordless and corded drills, rotary tool, hammer, screwdriver, backsaw, coping saw, nail set, square, clamp and vise)*
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