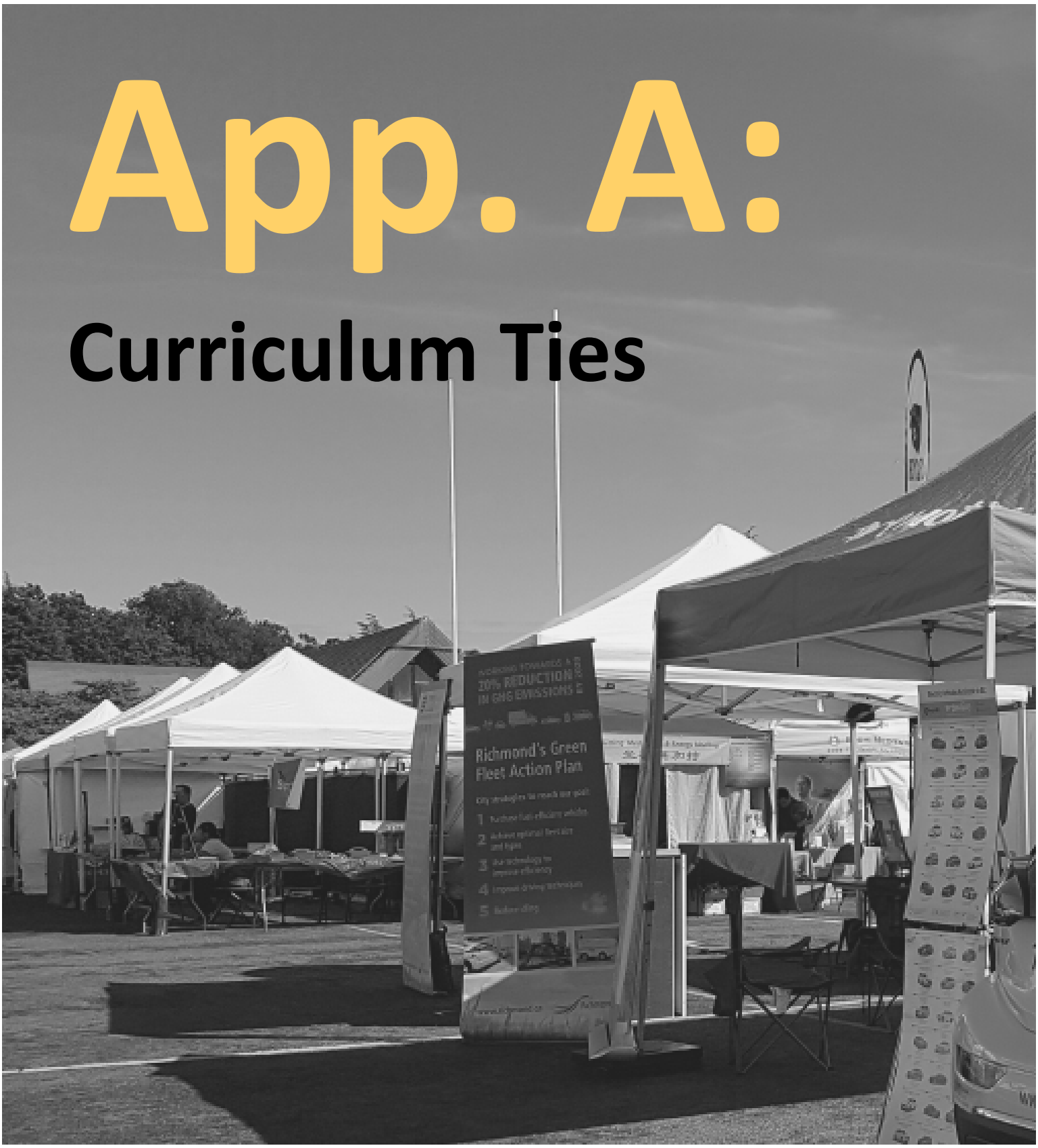
App. A:

Curriculum Ties



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Subject	Course	Course Content	Ideas for Coursework Application
Applied Design, Skills and Technologies	Entrepreneurship + Marketing 9	Ways of decreasing production costs through training and technological advancement.	Students could look at the current automotive industry and think of new ways to improve the efficiency of manufacturing cars while keeping production costs low.
	Entrepreneurship + Marketing 10	Social, ethical and sustainability considerations impact design and decision making. • Customer needs, wants and demands.	Students can practice linking mitigation strategies (supply and demand) to changes that have occurred within the commercialized industry, e.g. the decreased sales of aerosol hair spray.
	Drafting 10/11/12	User needs and interests drive the design process. • Identify potential users and relevant contextual factors for a chosen design opportunity. • Identify criteria for success, intended impact and any constraints. • Take creative risks in generating ideas and add to others' ideas in ways that enhance them. • Critically analyze and prioritize competing factors to meet community needs for preferred futures. Social, ethical and sustainability considerations impact design. • Evaluate a variety of materials for effective use and potential for reuse, recycling and biodegradability. • Use materials in ways that minimize waste.	Students can participate in the "What will transportation look like in 2050" challenge through engaging and researching concepts and innovations to add to their cars. Students can use the skills they have learned in class to create and model their designs. From using sustainable materials, students use their critical thinking and creativity skills to evaluate and analyze various factors that make a certain material better than others. This experience allows them to gain a better understanding of social, economical and environmental sustainability.
	Electronics + Robotics 10 Electronics 11/12 Robotics 11/12	User needs and interests drive the design process. • Identify potential users and relevant contextual factors for a chosen design opportunity. • Identify criteria for success, intended impact and any constraints. • Take creative risks in generating ideas and add to others' ideas in ways that enhance them. • Critically analyze and prioritize competing factors to meet community needs for preferred futures. Social ethical, and sustainability considerations impact design. • Evaluate a variety of materials for effective use and potential for reuse, recycling and biodegradability. • Use materials in ways that minimize waste. • Electrical theory using parallel and series circuits.	Create a small battery-powered car that is made from items that are not brand new. Get students to focus on using items that can be upcycled to identify potential uses in atypical items. This allows students to engage in research and learn to take creative risks in generating ideas.

Subject	Course	Course Content	Ideas for Coursework Application
Career Education	Career-Life Education	Explore factors that both inform career-life choices and are influenced by them. These may include personal, environmental and land-use decisions. Introduction to financial planning.	Budgeting challenge—Each student in the class is given a different electric vehicle to save up for. Each student is also given the same starting amount of money and has the same bills to pay for. Have students use information from the lesson to help them budget for the car. This can allow students to learn about loans, leases and interest rates.
	Career-Life Connections	Post-graduation budget planning, labour market trends and local and global influences on career-life choices.	Students can learn how to budget for post-graduation learning about leases, market trends, and local and global influences on career-life choices.
English Language Arts	English Language Arts 8/9 Literary Studies 10/11/12 Composition 11/12 English Studies 12	Questioning what we hear, read and view contributes to our ability to be educated and engaged citizens.	The discussion topics provided will help students create a conversation where they discuss and challenge existing ideas. Classroom Assessment Resource for English Language Arts (K-9) Classroom Assessment Resource for English Language Arts (10-12)
	New Media 10/11/12	Digital citizens have rights and responsibilities in an increasingly globalized society.	Get students to join the short video challenge, and/or make an infographic regarding topics discussed, e.g. climate change and BC's ZEV Act.
Mathematics	Foundations of Mathematics 11	Optimization informs the decision-making process in situations involving extreme values.	Maximizing range while minimizing cost. Ask students which car they think is the most reasonable for its range and cost. Relevant topics: linear inequalities, systems of equations, optimization, financial literacy (investments, loans, buy/lease).
	Workplace Mathematics 11	Rate of change.	Provide students with information to plot a graph regarding the cost of a car, gasoline cost and electricity cost. Then get students to calculate the rate of change and find the line of best fit. Relevant topics: financial literacy (investments, loans, budgeting), rate of change (finding slope by rise/run).

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Mathematics (cont'd)	Calculus 12	Differential calculus develops the concept of instantaneous rate of change.	Provide students with information to plot a graph regarding the cost of a car, gasoline and electricity over time so they can calculate the instantaneous rate of change using derivatives. Relevant topics: rate of change (average vs instantaneous), applications of differentiation (related rates, optimization)
	Pre-calculus 12	Exponential functions and equations.	The price of maintaining gas cars increases exponentially as time goes on because more parts need to get repaired.
	Statistics 12	Statistics plays an integral role in research, decision making, and policy in society.	Look at statistics about climate change and how policies have been implemented as a result.
Science	Science 8	Energy can be transferred as both a particle and a wave.	Focus on the idea of electricity and how through the use of electrons, we are able to create electricity. Classroom Assessment Resource for Science (K-9)
	Science 9	An electric current is the flow of an electric charge. • Circuits – must be complete for electrons to flow. • Voltage, current and resistance.	Focus on different types of charging and how it works, and how the different types of charging allow different currents to flow. Classroom Assessment Resource for Science (K-9)
	Science 10	Local and global impacts of energy transformations from technologies.	Discuss the use of technological advancements in creating a more environmentally conscious world. Classroom Assessment Resource for Science (10-12)
	Earth Sciences 11	The transfer of energy through the atmosphere creates weather, and this transfer is affected by climate change. • Changes in the composition of the atmosphere due to natural and human causes. • Solar radiation interactions and impacts on the energy budget.	We suggest creating a project that focuses on emerging technologies targeted at reducing GHG pollution in the atmosphere. Classroom Assessment Resource for Science (10-12)
	Environmental Science 11	Human practices affect the sustainability of ecosystems. • Human actions and their impact on ecosystem integrity.	We suggest creating a project that focuses on emerging technologies targeted at reducing GHG pollution in the atmosphere. Classroom Assessment Resource for Science (10-12)

Subject	Course	Course Content	Ideas for Coursework Application
Science (cont'd)	Physics 11	Energy is found in different forms, is conserved, and has the ability to do work. Mechanical waves transfer energy but not matter. • Electric circuits (DC), Ohm's law and Kirchhoff's laws. • Power and efficiency.	Explore how regenerative braking works. Also look into how parallel/series hybrid configurations change the range of a PHEV. Classroom Assessment Resource for Science (10-12)
	Science for Citizens 11	Human impact on Earth's systems: • Natural resources. • Effects of climate change.	We suggest creating a project that focuses on emerging technologies targeted at reducing GHG pollution in the atmosphere. Classroom Assessment Resource for Science (10-12)
	Chemistry 12	Electrochemical cells.	How FCEVs work by reverse electrolysis—converting hydrogen into electricity. Classroom Assessment Resource for Science (10-12)
	Environmental Science 12	Human activities cause changes in the global climate system. • Global environmental ethics, policy and law. Living sustainably supports the well-being of self, community and Earth.	We suggest creating a project that focuses on emerging technologies targeted at reducing GHG pollution in the atmosphere. Explore what legislation is being enacted to help us reach the goal of net-zero emissions by 2050. Classroom Assessment Resource for Science (10-12)
	Physics 12	Forces and energy interactions occur within fields. • Applications of electromagnetic induction. • Electric potential energy, electric potential and electric potential difference. • Electric field and Coulomb's law. Momentum is conserved within a closed and isolated system.	Integrate practice questions/homework with applications to EVs. Classroom Assessment Resource for Science (10-12)
Social Studies	Social Studies 8	Human and environmental factors shape changes in population and living standards. • Urbanization and the effect of expanding communities. • Environmental impact (e.g. resource and land use).	Discuss topics regarding climate mitigation to help correlate the link between human and environmental impacts, as both strategies have different environmental impacts and effects on the expansion of communities. Classroom Assessment Resource for Social Studies (K-9)

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Subject	Course	Course Content	Ideas for Coursework Application
Social Studies (cont'd)	Social Studies 10	Environmental, political and economic policies.	Debate about BC ZEV Act. Classroom Assessment Resource for Social Studies (K-9)
	Law Studies 12	Explain and infer multiple perspectives on legal systems or codes.	Debate about BC ZEV Act and look at it from different perspectives.
	Physical Geography 12	Interactions between human activities and the atmosphere affect local and global weather and climate. • Climate, weather and interactions between humans and the atmosphere. • Natural resources and sustainability. • Features and processes of the anthroposphere and their effects on natural systems.	The increase in GHGs causes shifts in weather patterns and causes extreme events to occur more frequently. From the EV lesson, you can highlight how the shift towards ZEVs helps promote lower emissions, which is vital to help stop climate change. The interactions that cause the increase in GHGs can be attributed to the use of gasoline-powered vehicles and fossil-fuel generated electricity. We suggest focusing the debate on whether or not BC's electricity should be considered clean.
	Political Studies 12	Current and future public policy issues in local, regional, national and international politics.	Explore policymaking that has occurred for EVs and explore the idea of what policies and legislation should be enacted to help Canada reach the goal of being net-zero by 2050.
	Urban Studies 12	Urban planning decisions and other government policies can dramatically affect the overall quality of life in cities. • Local and regional governance in BC and relationships with other levels of government. • Urban planning and urban design. • Decision making in the planning of cities and regions. • Contemporary issues in urban studies.	Focus on the topic of policies that may help reduce the need for overall transportation. As mentioned in the video called Transportation 101, we learn about circular economies, which can be applicable in the new developments of major cities. By creating areas within cities that are pedestrian-friendly (walking distance), it helps promote a healthier lifestyle.

❖ For more assistance, please review the BC Ministry of Education's guide to Developing and Supporting K-12 Student Reflection and Self-Assessment of Core Competencies.