**Part 1: Unit Overview**

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| **Title/Theme of Unit** | How we use data | **Grade Level** | Level 10 |
| **Subjects** | Social, math, science | **Time Frame** | 6 periods (1-2 for each lesson plan, and 2 for the culminating activity) |
| **Developed By** | Kara M., Isabel W., Chandra W. | | |
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| **Stage 1 - Identify Desired Results** | | | |
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| **Learning Outcomes**  Should be identified by designation (e.g., USC 9.1) and written in student friendly language – words that you can share with the students so they know what it is they are trying to achieve.  Suggestion: Choose ONE treaty ed outcome (total), plus one outcome for each of the three or four subject areas. | | | |
| **FP10.6:** *Apply your understanding of relations and functions by relating data, graphs, and situations. Apply and expand your understanding by analyzing, interpreting, and distinguishing relations and functions.*  **FP10.7:** *Show an understanding of slope concretely, pictorially, and graphically in relation to line segments and lines, rate of change, ratio of rise to run, parallel lines, perpendicular lines. Show your understanding with and without the use of technology.*  **SCI10-CD3:** *Look at different ecosystems and their interactions throughout the species in the ecosystems. Specifically, the populations.*  **SCI10-CD1:** *Look at how human actions affect climate change locally, globally, and within ecosystems.*  **Page 93** - *CONCEPT: Economic Decision making - Students understand the study of economics. Economics is the study of how societies make decisions about goods and services provided to meet the wants of its citizens.*  **Page 96 of PDF -** *Understanding that goods and services determine economic wealth. Understand that goods and services come from resources, which are limited and affected supply and demand.*  **TR10:** *Examine contemporary economic implications of Treaties for all the people of Saskatchewan and other Canadian jurisdictions.*  **HC10:** *Investigate opportunities and challenges faced by First Nations and the Government of Canada in relation to governance issues.*  **SI10:** *Analyze the spirit and intent of Treaties and investigate the extent to which they have been fulfilled.* | | | |
| **Enduring Understandings**  What understandings about the big ideas are desired?(what you want students to understand & be able to use several years from now)  What misunderstandings are predictable? | | **Essential Questions/Questions for Deep Understanding**  *What provocative questions will foster inquiry into the content?**(open-ended questions that stimulate thought and inquiry linked to the content of the enduring understanding)*  *These questions should guide all of your lessons.* | |
| *Students will understand that...*   * How data is calculated and interpreted and the different ways it can be presented. * How data influences understandings of science and society. * Data can be manipulated to show different perspectives. * Data based analysis does not always show reality/what will happen, based on hypothetical. | | *Content specific….*  How can we use data gathered to further our knowledge about our society today?  How do you translate words into graphable data?  How do we track changes in populations and biodiversity?  What does the data tell us about the situation?  *FNMI, multicultural, cross-curricular…*  What would society look like, how would Data change (population, animal population, etc) if treaties were upheld?  How has Saskatchewan’s biodiversity changed since colonization and Treaties? | |
| **Culminating Activity for the Mini-Unit**  What which assessment task will learners complete to demonstrate their learning | | | |
| For this culminating activity students will be split into groups and required to go out into the schools environment in order to collect data. There would be different coloured squares marked out for each group in different areas of the school grounds. Each square would be divided into a smaller grid section.  Each of the groups would be responsible for a different kind of sampling technique and a specific timeframe for the dandelion growth (April A.-May A., June A.-July A., August A.-September A., April B.-May B., etc.).  As a class we would be collecting data on the dandelion population in the school grounds. With students using data collected in their square of land they can calculate the population density in their square.  All the students who collected data in the A months will come together to graph the change in population over time, and the B group will do the same. Once they have graphed all their data, the groups will present their findings to each other, and their analysis of what the graph means.  The class will compare and contrast all the graphs (density and population over time) graphs and analysis why differences may occur.  The students will also discuss or research the different views upon dandelions in the environment (EX. viewed as a weed vs. viewed as a tool or something of purpose/use) and how/ why this has changed over time. Some more questions the students will be asked to think about would be: who had what view and why?What caused this view?, What view became more accepted and why?.  At the end of the class and activity the students will be required to hand in the data and research they collected as well as any calculations and graphs they constructed. We will use the data they collected and their ability to participate in the activity to gauge their understanding of all the learning in the unit. | | | |

**Part 2: Lesson Plans**

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| Subject/Grade: Science/Grade 10 Lesson Title: Date Identification and Analysis Teacher: Isabel Wilson | | |
| Stage 1: Identify Desired Results | | |
| **Outcome(s)/Indicator(s):**  **SCI10-CD1:** *Assess the implications of human actions on the local and global climate and the sustainability of ecosystems.*  a. Pose questions or problems relating to the effects of human actions on global climate change and the sustainability of ecosystems that arise from personal research.  c. Research how people from Aboriginal and other cultures view relationships between living organisms and their ecosystems, and the role of humans in those relationships.  i. Research how scientists examine changes to the key indicators of climate change.  **SCI10-CD3:** *Examine biodiversity through the analysis of interactions among populations within communities.*  b.Estimate the abundance of organisms in a local ecosystem using random (e.g., quadrat), systematic (e.g., line transect and belt transect) and/or stratified sampling techniques.  e. Determine the population density, percentage frequency and/or percentage cover of one or more organisms in an ecosystem using primary or secondary population data.  f. Discuss ethical and cultural perspectives related to studying biotic components of ecosystems, including the potential benefits and consequences of technologies (e.g., radio collar) and techniques (e.g., mark and recapture) used to collect data.  i. Investigate various ways in which natural populations attempt to maintain equilibrium, and relate this equilibrium to the resource limits of an ecosystem with reference to concepts such as carrying capacity, natality, mortality, immigration and emigration.  k. Examine how factors such as invasive species, habitat loss and climate change affect biodiversity within an ecosystem, and can result in species becoming at-risk (i.e., vulnerable, threatened and extirpated).  **TR10:** *Examine contemporary economic implications of Treaties for all the people of Saskatchewan and other Canadian jurisdictions.*   * Investigate the economic impact that First Nations have on the provincial and territorial economies and the resulting benefits for all people (e.g. natural resources; hunting, fishing and gathering; tourism; hospitality; gaming). | | |
| **Key Understandings: (‘I Can’ statements)**  **I Can** recognise different sampling techniques and understand how they work.  **I Can** understand the different factors that affect the population and predict how big of an impact they pose.  **I Can** interpret the pros/cons of collected data.  **I Can** draw conclusions about the population based upon collected data. | **Essential or Key Questions:**   * How can we use data gathered to further our knowledge about our society today? * How do we track changes in populations and biodiversity? * What does the data tell us about the situation? * What would society look like, how would data change (population, animal population, etc) if treaties were upheld? * Are some sampling techniques more ethical for the environment and animals than others? | |
| Prerequisite Learning:Students should have an understanding of how to use technology and utilize basic researching skills. CR9.1a/CR9.1b - outcome c. Students should have an understanding of ecosystems and how they function and survive. **IE7.2**  Students should have a basic understanding of cause/effect circumstances. (learned throughout other curriculum studies)  Students should be able to complete basic division. **N4.5, N5.3** | | |
| Instructional Strategy(ies) The best instructional strategy for this lesson would be to provide lots of explanation, as well as thinking ahead for multiple ways to explain the various situations. This lesson relies heavily on verbal instruction and communication so I will need to be prepared to explain everything as it happens in depth to support the student’s learning. The research is student led and inquiry based so there is no wrong direction the students can take as long as it is within the topic. This gives students a sense of confidence and independence with it being student led. It also sparks curiosity within the students and helps me to narrow what kind of learning pathway they want to pursue in upcoming lessons. This lesson incorporates all seven of the different learning styles in some way (visual, aural, verbal, physical, logical, social, and solitary).During the lesson activity the students are using visual, physical, verbal, social, and aural learning styles. The research section in the beginning of the lesson uses logical, and solitary learning styles. The class discussion and calculations at the end of the lesson utilizes verbal, social, and logical learning styles. | | |
| Stage 2: Determine Evidence for Assessing Learning | | |
| The participation in the activity, the discussions, and the questions going on throughout the lesson would act as both the formative and summative assessments. As the lesson is happening there would be a continual flow of questions being asked to check the students comprehension of the activity. These questions would include the hows and whys of what is currently happening in the activity. This kind of connection to the students would allow me to get a better understanding of their learning and would act as the formative assessment piece. The brief research paper questions as well as the exit slip would be taken in at the end of class and marked for completion and participation. These would act as the summative assessment pieces. I can then use the summative assessment pieces to make sure they are getting a grasp of the “I Can…” statements and the Key Questions. | | |
| Stage 3: Build Learning Plan | | |
| **Set (Engagement): Length of Time: 10 minutes**  To introduce and set up the lessonI would provide the students with some sort of technology where they could research on their own (laptops, or iPads). The research would be led by a series of questions/prompts given to these students. It would not be required of the students to answer every question. This worksheet just acts as a base or step one to get the students thinking critically of the topics and for me, as the teacher, to see what area they might be more interested to learn about. They will be required however, to create a list of questions that they have based upon the questions/prompts given as well as their research. These questions/ prompts are attached in the materials/resources section. After about 8 minutes of quick research and question building we will have a class discussion about findings and some questions that they asked to lead us into the bulk of the lesson. Their research will be handed in at the end of class for completion marks.  **Development: Length of Time: 40 minutes**  This activity is dependent on class size. This will be described for a class of 30 students but can be adapted to any size classroom. Every student in the class will be given a poster with a name or word on it. These names or words would describe the “job” the students are meant to do. Desks and chairs would be cleared to the sides of the room and I (the teacher) would act as a narrator and guide. Once the desks and chairs are moved away the students would see a pre-taped grid on the floor with each square representing a square mile. For the first part of the activity 27 of the students would be divided into 3 groups of 9, each group getting different animal names being “whitetail deer”, “moose”, and “buffalo”. The remaining 3 students would each get different cards stating different sampling techniques: “random”, “systematic”, and “stratified”. The students representing different animals would then walk around the classroom and the student representing the different kinds of sampling would take turns acting out the sampling, led by the teacher to explain what each sampling looks like. This process will be repeated but with different circumstances each time. The different circumstances would include things like natality/mortality, immigration/emigration, invasive species, loss of habitat, and climate change represented with different coloured stickers placed on their posters. As the teacher and leader of the activity they get the job of implementing these changes as well as recording the data collected by the “sampling” students throughout each trial. This data is to be shown on a whiteboard/ smartboard for the students to all see as each trial happens.  **Learning Closure: Length of Time: 10 minutes**  After this activity the students should have a lot of data that they have collected. With this data we can start a small class discussion about what they experienced during the activity. This would be led by questions like: “What sampling methods did you think worked better and treated the animals best?”, “Was there anything that happened in the activity that was a red flag for you?”, “What are the benefits of collecting these samples?”, “What might be the cons of collecting these samples?”. After this brief class discussion we would work through calculations for population density together for each of the species in the activity. At the very end of this lesson the students will be required to complete an exit slip. This exit slip will be used to check their comprehension of the activity and lesson. It will ask a question about which sampling technique works the best in their opinion and the students will be expected to provide a brief description as to why. There is no right or wrong answer with the exit slip, just a completion mark given. The exit slip to be used is attached in the materials section. | | **Instructional Strategies:**  -In-depth and clear explanation through instructions and concepts as they are happening.  -Be open and adaptable throughout the lesson as it has aspects of inquiry based learning and curiosity.  **Materials/Resources:**  -Technology source (iPads, laptops, desktops, etc.)  -Research questions: [Questions](https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:83caeacf-6d38-4992-bddb-445adcaa66a2)  -Exit slip: [Questions](https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:f804b632-bf1f-4a15-a9c7-0cfbe53e4086)  -Signage to represent the different animals, and different sampling strategies  -Different coloured stickers to represent the different factors that affect population.  -Whiteboard/SmartBoard to record data findings, and calculations  -Pre-taped grid on the floor  **Possible Adaptations/**  **Differentiation:**  -If technology is not available we can look at examples we might see in our community as a discussion.  -Class size being less than thirty students (attendance) so there would have to be some shuffling of roles. Perhaps one animal group would have less because of pre-existing complications in the environment (buffalo).  -If movement around the classroom is challenging or overwhelming for some students, they can take the role of implementing the factors affecting the different trials or recording the data collected.  -This activity can also be taken outside for more of an Environmental Education approach and add that connection to place.  -If in-person learning is not possible, this activity can be done via zoom with the students adding their role to their name on zoom. We can use the zoom grid on the screen as the area.  **Management Strategies:**  -Be clear that the research section does not have to be in depth and should be nice and quick.  -Moving around the classroom does not mean running full speed like it is a chase. Promote walking calmly about the classroom.  -Be clear and sure when delivering instruction so there is less lag between trials and more flow.  -Find the quickest and most efficient way of moving the furniture before the lesson begins.  **Safety Considerations:**  -The teacher should be aware of proper technology use in the classroom and be monitoring the students while they use the internet.  -Be sure tape is placed flat on the floor and the classroom furniture is moved adequately away to prevent tripping hazards.  -Students are to be moving around the classroom in a calm way (no running).  -Other options for “jobs” immediately if a student gets overwhelmed. |
| **Stage 4: Reflection** | | |
| *(This part of the lesson is completed after the lesson has been delivered; this is where you can record how it went, what you would keep, and what would you change for next time) For the purposes of this assignment, you do not need to complete this section.* | | |

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| Subject/Grade: Social Studies 10 (2 class periods) Lesson Title: Cause and effect In the World Teacher: Kara Miskolczi | | |
| Stage 1: Identify Desired Results | | |
| **Outcome(s)/Indicator(s):**  **Social Studies 10 Outcomes:**  **Major concept: Economic Decision Making: Page 93 of PDF - Knowledge point 1 (Outcome)**: *Know that economics is a study of the way in which societies make decisions about the goods and services they will produce to meet the wants of its citizens.*  **Page 96 of PDF -** *Goods and services which constitute the wealth of a society can only be generated by combining resources in various ways. The amount of resources available in any situation is always limited (finite) and with very few exceptions is always less than the demand for those resources*.  **Social Studies 10 Indicators:**  **Skills/Abilities (indicators) Page 93 of PDF:** learn to use the following analytical skills: defining the main parts; describing cause-effect relationships; describing how the parts of a whole are related to each other; Learn to make hypotheses based on reasonable assumptions and inferences; Practise stating how the parts are related to each other and to the whole; Practise constructing concept maps as a means of analyzing data  **Page 96 of PDF** **-**  Resources - Know that resources are those things which are used to produce goods and services (wealth) individuals within a society need or want. Scarcity - Know that scarcity is the relationship that occurs when needs and wants exceed the limited resources available to meet those wants.  **Treaty Ed outcomes:** **TR101 :** Examine contemporary economic implications of Treaties for all the people of Saskatchewan and other Canadian jurisdictions.  **Treaty Ed Indicators:** Investigate the economic impact that First Nations have on the provincial and territorial economies and the resulting benefits for all people (e.g. natural resources; hunting, fishing and gathering; tourism; hospitality; gaming).  Evaluate the impact that First Nations have on local economies. | | |
| **Key Understandings: (‘I Can’ statements)**  **I Can** identify possible cause and effect relationships in a situation.  **I Can** understand how supply and demand affects an economy in a society.  **I Can** make inferences based on comprehending given information.  **I Can** hypothesize possible causes and effects given a situation, and back up my answers. | **Essential or Key Questions:**   * How can we use data gathered to further our knowledge about our society today? * What does the data tell us about the situation? * How can we interpret graphable data? * How do we track changes in populations and biodiversity? * How does the demand for a service affect the supply of resources? | |
| Prerequisite Learning: Cause and Effect- Students should have a basic understanding of cause and effect (learned throughout other curriculum studies and in everyday experience)  The Fur Trade - **IN4.1**, **DR5.3**  Skill: Researching using technology | | |
| Instructional Strategy(ies) For this lesson, be sure that all students are being active participants. This lesson is very much a discussion lesson that is being led by the teacher. Student participation is key in the students' understanding.  Make sure to guide the discussion by using leading questions. Sometimes students will get off track, and the leading questions can bring the discussion back to where it needs to be.  Students all learn differently. (visual, verbal, hands on, etc). The discussion aspect is fully verbal. Any ideas should be written down on the board to ensure that the visual learners are able to see and understand better. Organizing the information into tables is also good for the visual learners.  For students who are unable to speak or have trouble speaking, they can always come up and write it themselves.  Make sure students feel like they are contributing without fear of making mistakes. | | |
| Stage 2: Determine Evidence for Assessing Learning | | |
| **Formative assessment -** beginning concept review   * In groups, students will be given simple situations to identify cause and effect or supply and demand. * the list is meant to give a quick overview of the concept and get students into the mindset * it will give the teacher a good view of where the students are starting   **Summative assessment** - full class period  Students will be given a topic (case) and explore the situation.   * In groups of 5, they will brainstorm, research, and decide cause and effects related to the topics. * Students infer things that could happen if the situation was changed. * All effects or causes should be backed up by research. Everything should be given a reason. | | |
| Stage 3: Build Learning Plan | | |
| **Set (Engagement): Length of Time: 10 min**  Concept review: What is cause and effect? supply and demand?  To introduce the lesson, I would start with a review of the concepts of cause and effect and supply and demand. Go over the meanings and make them clear.  Next provide the students with small and general situations and have them identify possible causes and effects. (table) These situations should also include the ideas of supply and demand and get students thinking about how supply and demand can affect price and buying trends. (more supply can mean reduced price which can cause an increase in consumer buying). This is meant to get the students thinking in the right mindset. I suggest putting the students in groups of 5 to allow discussion. This will give me a good understanding of the students abilities for the project I have planned.  **Development: Length of Time: 40 min**  We are going to look closely at a situation that we have learned a lot about throughout the years. The fur trade. (If students have never learned about the Fur Trade, I suggest taking 2 class periods to teach a lesson on it, and let students research it). Students will go through this complex situation guided by the teacher.  First, start with a brainstorm of what happened in the fur trade. Any information students can provide should be written down. Use leading questions to direct students towards giving more cause and effect related answers. Some questions to get the discussion started:   * What was it? Who was involved? * Why did they start trading fur? * How long did it last? * What did they trade? why? * How is this related to the idea of supply and demand? * What happened to the animals? their population?   For example students might say “the Indigenous people traded beaver fur for supplies at the Hudson’s Bay Company”. Next ask students whether they think each idea is a cause or effect.  Then ask if each effect could also be a cause (this might already come up in discussion - some students might think one thing is a cause and another might think it is an effect. Both could be correct so discussing not only is it a cause or an effect, but also thinking what caused each idea and how did each effect cause something else - like a chain). You can also provide students with your own ideas during the brainstorm. Make sure to include that the european people wanted beaver hats and furs for fashion purposes. This demand was a major cause of the fur trade. This discussion will help students fully understand cause and effect and how supply and demand is just an extension of it.  Take the discussion one step further. Using their knowledge of the causes and effects of the Fur Trade, they will be able to infer what could have happened if the situation were different.  Discussion topics: What if the Fur trade was focused on a different animal, how would that change the effect it had on Canada?  What if the fur trade began when today's technology is available? What would change? (get them to think what would happen to animal populations)  **Learning Closure: Length of Time: 10 MIn**  **Given a class period to actually do the assignment**  Quick review: Cause and effect - understanding that it is a chain effect can also be a cause. supply and demand can also be causes or effects. These 2 ideas are closely linked. Also review how we can base possible cause and effects on research. After understanding how the Fur trade happened (research is done), changing the situation and letting students hypothesize how it would change.  This will ensure that students understand. The beginning activity provides everyday life examples, not just a historical context. We can think about this going into the future.  Next class period, students will work in groups to explore the possible causes and effects of a given situation. They can use research tools to help them understand then change the situation and think about how it would affect the future. If there is time, you can explain the project now.  If not, the first 10 min of the next period should be spent explaining the project.   * students will be in groups of 5 (30 students, so 6 groups) * each group will be given a situation or topic to investigate * The list of leading questions should be provided to guide them * the students will be given a fairly open ended task. The will investigate the topic and provide possible cause and effects that are involved. They should be sure to provide reasons for their cause and effects * Then provide extension questions - changing the situation.   This is a summative assessment so make sure to go over marking criteria for the groups. They will be given this class period to work and create their lists. | | **Instructional Strategies:**  Let the students tell you their thoughts and explore the connections with you. The lesson is basically a guided discussion about cause and effect.  **Materials/Resources:**  - situation list → [General review assignment format and suggestion](https://docs.google.com/document/d/1_JCIyWCYvEHIKKPSExKQCl9M-ZU81iJL8sAb8DqzxIc/edit?usp=sharing)  - smart board/whiteboard  - 6 topics or situations for summative assessment [Group topics](https://docs.google.com/document/d/1THHN2JAQq_bM5VDprwREpqCAT7Ta6xKnSsvOuhgctLE/edit?usp=sharing)  - technology source (laptops, tablets, ipad, etc) ideally one for each student, but one or two per group will work too.  **Possible Adaptations/**  **Differentiation:**  -Individual or group work  -Submit a video response, brainstorm clouds, table of ideas, written response (paragraphs), as long as they can share ideas effectively and provide reasons in an organized manner, students can choose how they want to hand in their project. Because they only have one class period I suggest written or table responses like we did in class.  -if technology is unavailable, students can use what they know of a situation or what they believe to be true about it to suggest their answers. Students may also be permitted to use cell phones if school policy allows.  -if school is not in person, it can still work the same way, using breakout rooms, everything should be on google docs so each student can edit.  **Management Strategies:**  -Patrolling groups to keep students on track  -keep asking leading questions and giving research resources  -be clear with instructions  -ask if there are any questions before moving on  -when students are using technology, ensure that they are using it for the intended purpose  -if students are permitted to use cell phones ensure that they understand it is for research only, not using other apps  **Safety Considerations:**  **-**teacher needs to be aware of technology usage, and monitoring the sites used during class time.  -ensure that the classroom discussion is a welcoming discussion. Students should be accepting and polite during the discussion. Disagreements should not be hostile, but constructive and productive.  -same goes for group work, students could be constructive in their discussion and come to decisions without putting each other down. |
| **Stage 4: Reflection** | | |
| *(This part of the lesson is completed after the lesson has been delivered; this is where you can record how it went, what you would keep, and what would you change for next time) For the purposes of this assignment, you do not need to complete this section.* | | |

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| Subject/Grade: Foundations of Mathematics & Pre-Calculus 10 Lesson Title: How to graph situations Teacher: Chandra Wassill | | |
| Stage 1: Identify Desired Results | | |
| **Outcome(s)/Indicator(s):**  **FP10.6:** *Expand and apply understanding of relations and functions including: relating data, graphs, and situations; analyzing and interpreting; distinguishing between relations and functions.*  a. Provide and discuss examples of different types of relations relevant to one’s life, family, or community (e.g., person A is the mother of person B, or person A is a brother of person B.). Note: For some First Nations and Métis, the way relations are defined might be at a more specific level. For example, for some Ojibway a word for “brother” does not exist, only “older brother” and “younger brother”.  f. Provide and explain examples of situations that could be represented by a given graph.  g. Sketch a graph to represent a situation presented orally or in writing.  h. Determine, and express in a variety of ways, the domain and range of a graph, a set of ordered pairs, or a table of values.  **FP10.7:** *Demonstrate, with and without the use of technology, understanding of slope (concretely, pictorially, and symbolically) with respect to: line segments and lines; rate of change; ratio of rise to run; parallel lines; perpendicular lines.*  a. Provide examples, relevant to self, family, or community, to explain the importance of slope.  b. Illustrate and explain, using examples relevant to self, family, or community, how slope is rate of change.  c. Determine the slope of a line segment by using the measurement or calculation of the rise and run.  d. Classify lines in a given set as having positive or negative slopes, and explain how the sign of the slope affects the interpretation or meaning of the slope.  j. Apply knowledge and skills related to slope to solve situational questions relevant to self, family, and community (e.g., determine the slopes of the poles in a tepee and the impact of changing the slopes on the dimensions and strength of the tepee)  **HC10:** *Investigate opportunities and challenges faced by First Nations and the Government of Canada in relation to governance issues.*   * Examine the impact of federal,provincial, and municipal government policies on the fulfillment of Treaties. * Research public policy as it relates to self-government.   **SI10:** *Analyze the spirit and intent of Treaties and investigate the extent to which they have been fulfilled.*   * Identify spirit and intent of the terms of treaty. * Imagine and describe what our society would look like today if all treaty obligations had been completely fulfilled and what it could look like into the future (e.g., Maori influence on New Zealand institutions). | | |
| **Key Understandings: (‘I Can’ statements)**  **I Can** create examples of different types of relations that are relevant to me.  **I Can** identify types of situations that can be represented by a graph.  **I Can** understand relationships by analyzing a graph.  **I Can** create graphs to represent various situations.  **I Can** look at graphs and data to make conclusions about situations and societal impacts. | **Essential or Key Questions:**   * Do graphs always accurately represent data? * How can you manipulate graphs and data to present a point of view? * What is the relationship between a table of values, ordered pairs, and graphs? * What is the relationship between words, written and oral, and graphs? * What types of relationships can be depicted graphically? What types cannot be? | |
| Prerequisite Learning: Linear relations and how they are graphed and analyzed **P9.1**  How to modeling situational questions **P9.2**  Understand factors that affect data collection, such as bias, privacy, timing, and culture. **SP9.1**  How to place coordinate points on a cartesian plane  The elements of a cartesian plane | | |
| Instructional Strategy(ies) In the lesson plan, students will be encouraged to participate in class discussion and student-led inquiry during group discussion. There will also be some lecture-style explanation, where students will be encouraged to ask questions and join discussion. To reduce the pressure to take notes, and ensure that students that be fully engaged with the discussion, at the beginning of the development stage, I will provide a notes booklet with all the relevant information, so students can follow along and add notes if they want to, this will also serve as a summary to look back on. | | |
| Stage 2: Determine Evidence for Assessing Learning | | |
| **Formative:** At the end of class, a formative exit slip will be given. The students will be presented with a graph and asked to identify the approximate slope, what is represented by the domain and range and x and y values, and a brief analysis of what the graph represents.  **Summative:** During the cumulative activity, students will be assessed on the ability to correctly transfer known information to a graph, and interpret the graph. Students will create a table of values from their collected data, and sketch a graph with accurate labels. By analyzing and comparing graphs, students will demonstrate an understanding of elements of graphs such as slope, domain and range, and interpret the graph and its relation to their environment. | | |
| Stage 3: Build Learning Plan | | |
| **Set (Engagement): Length of Time: 10 Minutes**  **PADLET Minute Entry: What are different types of relations in your life? Could you graph them?**  Students will be prompted to respond to these two questions when the lesson begins, this will be a quick mini-entry to begin thinking. (2-3 minutes)  **Let’s Discuss: What do you notice about this graph?**  The class will be presented with a graph (I have chosen a graph related to resource challenges within First Nations communities), and together create a brainmap of all the elements they notice as well as what meanings they find. This discussion will lead into the development. (8-7 minutes)  **Development: Length of Time: 45 minutes**  From the Let’s Discuss mind map, I will go over a brief summary of the prerequisite information (linear relations, cartesian plans, understanding data) and confirm and expand on the student’s thoughts in the mind map.  In a lecture-style instruction, I will introduce how to sketch graphs from a table of values, and have the class all work together on an example. Instruction will continue by introducing the idea of slope as rise over run, and asking for students to brainstorm what a positive and negative slope would mean.  Once these key ideas are understood, I will present a situation orally and have students pair up to quickly sketch a graph that could represent the situation. I will ask a few students to share their graphs and the ideas they had, and have a class discussion to all agree on the elements of the graph.  Now that the students are familiar with some elements of graphing and graphing a situation, I will divide the class into two groups and have one group discuss what domain represents in different situations and the other what range might suggest. I will ask each group to share the ideas they came up with, what their conjectures about domain and range are, and how they may be used situationally. If needed, I will provide a brief lecture-style explanation to summarize domain and range, building off the discussion.  **Learning Closure: Length of Time: 5 minutes**  **Exit Slip:** Present the class with a graph, and an exit slip. The exit slip will ask students to demonstrate their understanding of the lesson by identifying the approximate slope, explaining what is represented by the domain and range and x and y values, and providing a brief analysis of what the graph represents. This will involve students analyzing and discussing the difference between Indingenous and non-diengious education scores, and exploring what this may mean and why. Exit slip will provide a brief background on Treaty promises related to education and resources. (Exit slip will introduce a graph showing two relations, students will apply their knowledge from the lesson to respond) | | **Instructional Strategies:**  -Classroom discussion  -Group and pair work  -Lecture-style instruction  -Working through examples  -Making connections through mind mapping and brainstorming  **Materials/Resources:**  -Padlet  -Technology (student’s own devices or school provided)  -“Let’s Discuss” [graph](https://www.budget.gc.ca/2019/docs/plan/img/chap3.2-eng.png)  -Exit Slip [graph](https://www.sac-isc.gc.ca/DAM/DAM-ISC-SAC/DAM-STSCRD/STAGING/images-images/cwb_report_trends_first_nations_1981-2016_fig4_1557791092283_eng.jpg)  **Possible Adaptations/**  **Differentiation:**  -Present the situation in writing instead of orally, or offer both options to support the needs of all students  -Create larger groups to sketch the graph  -If technology is unavailable, minute entry could be on paper, or be presented as questions on the board to just consider  **-**exit slip could be changed to a whole class discussion instead of individual assessment  -introduce roles into the group discussions (recorder, presenter, moderator, calculator, etc)  -The graphs used as examples and for entrance/exit activities can be adjusted to be more relevant to the area/time; I chose graphs that related to present issues and Treaty Ed indicators; graphs can be used to make a variety of cross-curricular connections  -If in person learning cannot happen, the lesson plan can be adapted to zoom, utilizing breakout rooms for the group/pair work, using the whiteboard feature and screen sharing, as well as digital versions of handouts  **Management Strategies:**  -Observing the discussions in order to ensure students are on topic  -Ask open-ended questions to promote students to continue thinking on the concepts  -When dividing groups or pairs, being mindful of student relationships  -Present clear expectations of group work and discussion that involves participation  -Maintain expectations and norms throughout all lessons, building a stable classroom atmosphere  -No tolerance towards negativity to other students idea, promote and model only positive discussion  **Safety Considerations:**  -Ensure technology is being used safely, monitoring activity and usage  -Promote only constructive and positive classroom discussion and group/pair work, all ideas are to be respected  -Create groups and pairs that can easily work together without much reaganment of furniture |
| **Stage 4: Reflection** | | |
| *(This part of the lesson is completed after the lesson has been delivered; this is where you can record how it went, what you would keep, and what would you change for next time) For the purposes of this assignment, you do not need to complete this section.* | | |