

**Inquiry Project Plan**

**Inquiry Title:**

What measures can reduce air pollution?

**Time**

**Frame** 4 days

**Inquiry Approach :**

Structured Inquiry

**Name:** Vani Dewan (T00664901) **Subject(s):** Environmental

Education

**Inquiry Project Rationale & Overview**

**Grade(s):** 7th

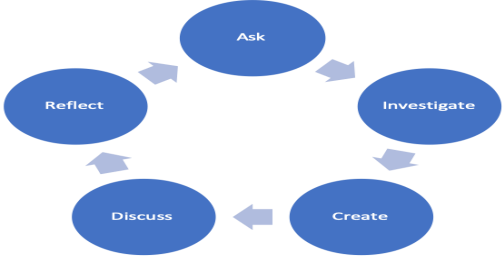
|  |
| --- |
| Why does this topic matter to students?  Air pollution is an important topic that everyone has to be well aware. A number of literature pieces have shown that air pollution can cause harm to human health (Zhang, Chen & Zhang, 2018). Students are required to know about the processes of controlling air pollution so that they can imply these processes in their daily lives and can ensure a better environment in the future. This is the reason why it can be stated that this topic matters to students.  How does this project incorporate the inquiry cycle?  The project would definitely follow the inquiry cycle. On the first day, students would be asked regarding their viewpoint of air pollution. Based on it, investigation would be made on day 2 and day 3. On day 3 and day 4, students will be instructed to create project copies. On day 4, discussion session would be conducted and students would be asked reflecting their learning journey. Inquiry based learning approach has the potential to provide a new learning approach to students as it provides them with the chance to share their ideas (Rijal, 2020). |

**Key Questions For Inquiry About the Topic of Study**

|  |  |
| --- | --- |
| **Core Question** | **Supporting Questions** |

TRU B.Ed. Template. Adapted by Jodi Latremouille Page 1

|  |  |
| --- | --- |
| ∙ What is the key impact of air pollution? ∙ What are the key measures that can be adopted for controlling air pollutions? | ∙ What is air pollution?  ∙ What are the causes of air pollution?  ∙ Why is it important to control air pollution immediately? |

**Inquiry Approach/Style and Rationale**

Page 2

|  |
| --- |
| Structured inquiry approach has been found to be effective in this regard. If this inquiry approach would be used, the overall learning journey would be smoother for both the students and the teachers. |

**Core Principles of Effective Teaching (Sharon Friesen)**

|  |  |
| --- | --- |
| **Core Principle 1:** Effective teaching practice begins with the thoughtful and intentional design of learning that engages students intellectually and academically. | The Inquiry cycle would pay adequate attention to the level of understanding to each student and adequate resources would be used for ensuring the development of disciplinary knowledge and understanding. |
| *\*\*How is the inquiry focused on building disciplinary knowledge and understandings?* |
| **Core Principle 2:** The work that students are asked to undertake is worthy of their time and attention, is personally relevant, and deeply connected to the world in which they live.  *\*What makes this inquiry valuable, meaningful, and “alive” for the students and teachers?* | The inquiry will make students and teachers engaged effectively in the overall learning journey and help both of them to get the expected learning outcome from the workshop. |
| **Core Principle 3:** Assessment practices are clearly focused on improving student learning and guiding teaching decisions and actions.  *\*How do I define learning and success in this inquiry? How is learning expressed and articulated in peer, self and teacher assessments?* | In this inquiry cycle, essential questions would be asked. The overall learning would be defined here based on the topic and the relevance of it for the students of standard seven. The success would be assessed here by considering the overall learning outcome of each student.  The learning would be articulated with others through group conversation. |
| **Core Principle 4:** Teachers foster a variety of interdependent relationships in classrooms that promote learning and create a strong culture around learning.  *\*How do I connect students with each other, with experts in the field, with larger communities and nature, and across disciplines?* | I would connect to everyone while being an assertive communicator. In the case of  communicating with larger communities, formalities would definitely be maintained. |

Page 3

|  |  |
| --- | --- |
| **Core Principle 5:** Teachers improve their practice in the company of peers.  *\*How do I reflect on the inquiry together, and/or collaborate with others?* | Here, collaboration would be developed through adequate communication. |

**BC Curriculum Core Competencies**

|  |  |  |
| --- | --- | --- |
| **Communication** | **Thinking** | **Personal & Social** |
| Assertive communication  approach would be followed.  **Contributing to community and caring for environment-**  Students will develop awareness of and take responsibility for their social , physical and natural environments by working independently and collaboratively for the benefit of others, communities and the environment. | Critical and design thinking would be used.  **Building Relationships-**   * Students will build and maintain diverse, positive peer and intergenerational relationships.   Adjust their words and actions to care for their relationships. | The personal and social  impacts of the lesson would definitely be assessed after project accomplishment. |

**BC Curriculum Big Ideas (STUDENTS UNDERSTAND)**

|  |
| --- |
| Air pollution is a great concern that is required to be controlled through the adoption of best measures.   * How and why have Earth and its climate changed over time? * How do people and their practices impact Earth and its climate? |

**BC Curriculum Learning Standards**

**(STUDENTS DO) (STUDENTS KNOW)**

|  |  |
| --- | --- |
| **Learning Standards - Curricular Competencies** | **Learning Standards - Content** |
| It is a fact that knowledge acquisition process is carried out by a particular method that is called learning (Khalaf, 2018). Here, students are required to participate in all classes attentively and have to follow all instructions that are being provided by the teacher. [Questioning and predicting](https://curriculum.gov.bc.ca/curriculum/science/7/core) Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest  Make observations aimed at identifying their own questions about the natural world  Identify a question to answer or a problem to solve through scientific inquiry  Formulate alternative “If…then…” hypotheses based on their questions  Make predictions about the findings of their inquiry Planning and conducting Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified  Measure and control variables (dependent and independent) through fair tests  Observe, measure, and record data ([qualitative](https://curriculum.gov.bc.ca/curriculum/science/7/core#;) and [quantitative](https://curriculum.gov.bc.ca/curriculum/science/7/core#;)), using equipment, including digital technologies, with [accuracy](https://curriculum.gov.bc.ca/curriculum/science/7/core#;) and [precision](https://curriculum.gov.bc.ca/curriculum/science/7/core#;)  Use appropriate SI units and perform simple unit conversions  Ensure that safety and ethical guidelines are followed in their investigations Processing and analyzing data and information Experience and interpret the local environment  Apply First Peoples perspectives and knowledge, other [ways of knowing](https://curriculum.gov.bc.ca/curriculum/science/7/core), and local knowledge as sources of information  Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate  Seek patterns and connections in data from their own investigations and secondary sources  Use scientific understandings to identify relationships and draw conclusions Evaluating Reflect on their investigation methods, including the adequacy of controls on variables (dependent and independent) and the quality of the data collected  Identify possible sources of error and suggest improvements to their investigation methods  Demonstrate an awareness of assumptions and bias in their own work and secondary sources  Demonstrate an understanding and appreciation of evidence (qualitative and quantitative)  Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources  Consider social, ethical, and environmental implications of the findings from their own and others’ investigations Applying and innovating Contribute to care for self, others, community, and world 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 Communicating Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate  Express and reflect on a variety of experiences and perspectives of [place](https://curriculum.gov.bc.ca/curriculum/science/7/core) | Here, some books would be used as resources, Video content would be used and everything would be used by considering that the workshop has been designed for seven standard students.  change in climate affects:  the interconnectedness of plants and animals, and their local environment  e.g., changes to harvesting dates, changes to schedules due to early/later ripening and runs, lowered water levels in creeks, rivers and lakes, change in humidity impacts the ability to preserve salmon, etc. |

**Indigenous Connections/ First Peoples Principles of Learning**

|  |
| --- |
| *How will I incorporate Indigenous knowledge and principles of learning?*  The inquiry project aims to apply First People’s perspectives and knowledge, other ways of knowing and local knowledge as sources of information. It will help students to express and reflect on a variety of experiences, perspectives and worldviews through the place, the place is any environment, locality, or context with which people interact to learn, create a memory, reflect on history, connect with culture and establish identity. The connection between people and place is foundational to First People’s perspectives. The inquiry project will also help students to understand that how air pollution affected people and environment?  Following are the relevant first People’s principles of learning related to this project-   * Learning involves patience and time. * Learning requires exploration of one’s identity. * Learning involves generational roles and responsibilities.   Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits. |

**Respectful Relations**

|  |
| --- |
| *How will I invite students of all backgrounds, interests and skills into the inquiry?* |

Page 4

|  |
| --- |
| Here, discrimination against anyone would take place, no matter what the background and culture of the student is and the best effort would be provided to engage all students in the learning journey. |

**Project Overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time Estimate** | | **Teacher and Student Activities** | **Assessment**  **Activities** |
| Ask | Day 1  Day 2 | On the first day of the workshop, students are required to be asked to share their thoughts about air pollution. They are required to be asked why they think it is an important topic for them.  Using a chart that depicted the causes and impacts of air pollution, the students were first introduced to the topic and later questioned regarding their viewpoint on the topic.  On the second day of the workshop, students are required to be asked regarding the measures that they think might be helpful for controlling air pollution and some questions regarding the first day activities should be asked.  Students will be asked regarding the second day’s activities and the overall learning outcome.  Sharing a short story about human activities that contribute to air pollution, the students were asked about what they think would be the best methods to control air pollution. This is a fun activity where attempts will be made to create a discussion among the students. | In order to develop an effective learning journey, it is  important to develop an effective  relationship with  students and that is why teachers have to make students face the requirement of answering some  questions relevant to the topic so that  students would think that their overall  learning is being  assessed here. |
| Investigate | Day 2  Day 3 | The flowchart that is related to air pollution would be investigated by students so that students can obtain a clear idea regarding the research topic before the actual learning journey starts.  The flowchart depicts the factors contributing to air pollution and the measures that control air pollution. This flowchart will be presented after the students have discussed their opinions so that they would have a chance to present their views and then learn about the actual measures. This learning process will bridge the gap in their knowledge and enhance their learning abilities.  The causes and impact of air pollution would be investigated on day 2 by students and teachers. The measures for controlling air pollution would be investigated by students and teachers would help them in this investigation. | Each day, the  investigation would be made in an  effective way. After the investigation,  teachers would ask some questions to students in order to understand whether they have |

Page 5

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | investigated in the proper manner. |
| Create | Day 3  Day 4 | At the end of day 3, students will be asked to develop a project copy where they will write about the causes and impact of air pollution.  With a help of a video the students will be taught about the concept of air pollution, the factors influencing the causes of air pollution and the necessary measures to control air pollution. This activity will help the students in revising the entire topic on Day 3. This will help the students in recapitulating the lessons taught in Day 1 and Day 2. This will help the students to prepare the project copy with the causes and impact of air pollution.  The students will take part in a short presentation session where a presentation with important measures that control air pollution will be provided for the students so that they can revise the lessons of the previous days and effectively write the measures in the project copy. The presentation will engage the students and learn about the topic ensuring that they remember these lessons for a longer period of time.  At the end of day 4, students will be asked to develop a project copy where they will write down all of the important measures of controlling air pollution. They will also be asked to create a reflection piece where they will write about their overall learning journey. In all of these activities of the students, teachers are required to help them. If they face any issue while developing these project copies, teachers have to help them to get the problem solved. | Here, the assessment would be done by considering the  information that  students have put in their project copies and how nicely they  have developed their project copies. |
| Discuss | Day 4 | Discussion regarding the air pollution-related flow chart will be made. Air pollution can be regarded as a major planetary health risk (Balakrishnan *et al.* 2019) and a discussion regarding it has to be made here.  The students will be educated about how air pollution has been increasing across the world through the flowchart. Studies have shown that using a flowchart is advantageous as it has the ability to provide visual representation of the complex processes helping to understand the flow of work leading to identification of non-value added activities and concerned areas which in turn leads to improved solving of problems and making informed decisions (McGowan & Boscia, 2016). After the lesson with the help of a flowchart the following discussions will be conducted.  Discussion regarding the causes and impact of air pollution would be made.  Discussion regarding the measures of controlling air pollution would be made.  Discussion regarding the same factor would be made.  All students and teachers would participate in the discussion in an effective way, | The assessment  would be done here by considering how actively students are  participating in the discussion sessions. |
| Reflect | Day 4 | Day 4 will be focused on generating a reflective report from the students which will showcase their understanding regarding the topic learned through the previous days and will also help the students to remember the lessons that they have learned on the topic of air pollution. Before the students write the reflective piece, they will be provided with a questionnaire that will have 20 questions regarding air pollution and the measures used for controlling air pollution. The students will be asked to answer the questions as per their knowledge and based on the lessons learnt during the previous days of the workshop. Unlike previous days there will be no recapitulation activity by the teachers and this questionnaire activity will act as a revision for the students helping them further to write the reflective piece effectively.  After the accomplishment of the workshop, students would be asked to write a reflection piece based on their overall experience. Teachers have to | How effectively  students have written the reflection piece |

Page 6

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | guide them regarding the process of writing a reflection. | would be the m |

**Materials and Resources (use APA citation format)**

|  |
| --- |
| Books, articles, flowcharts, educational charts, short stories, questionnaire, presentation and video resources would be used here. |

**Organizational Strategies (Optional)**

|  |
| --- |
| Proper communication styles would be used throughout the learning journey and the learning journey would be handled by considering the strengths, weaknesses and competencies of all students. |

**Proactive, Positive Classroom Learning Environment Strategies (Optional)**

|  |
| --- |
| The teacher would try the level best to keep the classroom environment calm. However, an engaging atmosphere should be developed so that students show interest in being a part of the journey. |

**Extensions**

|  |
| --- |
| Extension-related decision would be made by considering the learning outcome after day 4. If it would be found that students require more time to reach the expected outcome, extension-related thoughts would be made. |

**Reflections (to be completed after Project Completion)**

|  |
| --- |
| What did I learn about Inquiry Based Pedagogy?  I have learned the effectiveness and the way of Inquiry Based Pedagogy.  What challenges and successes did I experience?  I face a challenge to handle different kinds of needs of different students at a time. However, I have handled it effectively.  What would I adapt for next time?  Next time, I would try to pay more attention to the communication process and the process of student engagement.  What questions do I still have about Inquiry Based Pedagogy? |

Page 7

|  |
| --- |
| The Inquiry Based Pedagogy is clear to me. However, I have an intention to be involved in this practice more intensively in the future. |

Page 8

**References**

Balakrishnan, K., Dey, S., Gupta, T., Dhaliwal, R. S., Brauer, M., Cohen, A. J., ... & Dandona, L. (2019). The impact of air pollution on deaths, disease burden, and life expectancy across the states of India: the Global Burden of Disease Study 2017. *The Lancet Planetary Health*, *3*(1), e26-e39.

Khalaf, B. K. (2018). Traditional and Inquiry-Based Learning Pedagogy: A Systematic Critical Review. *International Journal of Instruction*, *11*(4), 545-564.

McGowan, M. M., & Boscia, M. W. (2016). Opening more than just a bag: Unlocking the flowchart as an effective problem-solving tool. The Journal of Health Administration Education, 33(1), 211.

Rijal, M. (2020). *INQUIRY BASED PEDAGOGY FOR TEACHING AND LEARNING SCHOOL MATHEMATICS: AN ACTION RESEARCH* (Doctoral dissertation, Kathmandu University). Zhang, X., Chen, X., & Zhang, X. (2018). The impact of exposure to air pollution on cognitive performance. *Proceedings of the National Academy of Sciences*, *115*(37), 9193-9197.

Page 9