



LEARNING ALLIANCE INTERNATIONAL

IB WORLD SCHOOL



A Journal for Research in the International Baccalaureate

# PYP III

## STATEMENT OF INQUIRY

'Biodiversity relies on maintaining the interdependent balance of organisms within systems'.

## RESEARCH RATIONALE

### Lines of Inquiry

Ways in which living organisms are interdependent within an ecosystem

The consequences of imbalance within ecosystems

Human actions and their consequences on ecosystem

**Connection:** How are the organisms in the ecosystem connected?

**Causation:** What happened when there was an increase or a decrease of a specific species in the ecosystem? So What?

**Impact:** What were some of the effects of a change in the population of a species within the ecosystem?

**Responsibility:** What steps can be taken to save their habitats?

**Global Context:** Globalization & Sustainability - Environment

**Focus:** Endangered Species in Pakistan (IBEX, Indus River Dolphin etc)



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## METHODOLOGY:

Secondary research, Interview, Photo statics

# PYP IV

## STATEMENT OF INQUIRY

“Our systems of food resources and waste management can have a great impact on sustainability.”

## RESEARCH RATIONALE

### Lines of Inquiry

- Where does our food come from? Can we have an unlimited supply of food? What are the alternate food resources?
- Our current system of waste management impact the environment, and what strategies can we use to reduce waste and improve sustainability?

**Connection:** How do our current systems of food production and distribution affect the environment, and what steps can we take to make them more sustainable?

**Causation:** What are some of the most significant sources of food waste in our society, and how can we reduce or eliminate them?

**Impact:** What are some of the negative consequences of food waste, both for the environment and for society as a whole?

**Responsibility:** How can we encourage individuals, businesses, and governments to prioritize sustainability in their food-related decision making, and what barriers must be overcome to achieve this goal?

**Global Context:** Globalization & Sustainability - Culture

**Focus:** Alternate Food supply systems & significant sources of food wastage



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## METHODOLOGY:

Secondary research - Articles, Interview, Case Study, Photo statics



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# PYP V

## STATEMENT OF RESEARCH

The PYPX 2023 aimed at exploring the UNSDGs at a global level while taking action to support these goals at a personal, local or a global scale. The students explored a wide array of statements of inquiry to delve into a wide array of global issues.

### Areas of Exploration:

Different problems within a country may lead to civil wars

Finding solutions to decrease climate change may lead to peace for the living

Saving energy may be a necessity of time

Child labor may lead to mental and physical trauma

Lack of education may affect a child's future and well-being Animals have the right to be treated fairly and without cruelty

Knowing and learning more about earthquakes may help us prevent loss of lives and infrastructure

### Global Context: Globalization & Sustainability



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### METHODOLOGY:

**Community Walk** to identify issues/problems that learners feel passionate about.

Walk starts with looking into personal communities first and then expanding onto local and global communities.

**Connecting to UNSDGs:** Learners connect their issues to UNSDGs and form the Central Ideas and Lines of Inquiry.

**Secondary research** starts with asking the 5Ws and H questions as well as using the PYP Key Concepts to generate questions. Research is done using online resources and print media. **Primary research** was done through interviews and visitations.



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# PYP V

## STATEMENT OF RESEARCH

The PYPX 2023 aimed at exploring the UNSDGs at a global level while taking action to support these goals at a personal, local or a global scale. The students explored a wide array of statements of inquiry to delve into a wide array of global issues.

### Areas of Exploration:

Human activity can impact the world around us.

Safety and dignity at work plays a central role in the lives of people all across the world

Eco-friendly fashion may help the environment

Discrimination against minorities in Pakistan may increase wars or conflicts

Conflicts between two or more countries may affect the whole world

Children may have lost creativity due to technology

Inequality in distribution of resources may cause hunger

Asteroid mining may lead to economic benefits and lead to better development

### Global Context: Globalization & Sustainability



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## METHODOLOGY:

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# MYP I

## STATEMENT OF INQUIRY

“Technology affects human values in this day and age.”

## RESEARCH RATIONALE

### Lines of Inquiry

Technology today is affecting human values.

- ChatGPT has revolutionized human focus.
- Instagram has shaped human values.
- Tik Tok has opened new avenues of communication.

**Global Context: Globalization & Sustainability - Morality**



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## METHODOLOGY:

Primary research: Survey (quantitative research)

Secondary research: Research articles, newspapers, encyclopedias, review articles, and meta analysis.

<p>SURVEY (MYP 1) – How has Chat GPT technology affected human values? Participants- 9 DP students Age: 15-17 I understand that this survey is part of a research study by students of Learning Alliance International (LAI). The purpose of this research is to get insight from the stakeholders on their perceptions of technology and social media handles. I understand that my participation is voluntary and that I am free to withdraw at any time. I agree to provide information to the researchers on the understanding that this information will only be used for this research and that my name will not be disclosed in any publications arising from this research project without prior consent.</p> <p>1. How often do you use technology? All the time Most of the time during a day Sometimes Never</p> <p>5 students selected all the time 4 said most of the time</p>	<p>2. Does technology help in making your life easier? Yes No</p> <p>All 9 selected Yes</p> <p>3. Do you use social media? Yes No</p> <p>All 9 selected yes</p> <p>4. Which of the following social media websites do you currently have an account with? Instagram TIK TOK Chat GPT</p> <p>7 have accounts of Instagram 4 have accounts on TIK TOK 6 have accounts on Chat GPT</p> <p>5. Have you ever used it for educational purposes? Yes No</p> <p>8 selected yes 1 selected No</p>	<p>6. How is Chat GPT affecting the masses? Positively Negatively Both Not effecting at all</p> <p>2 selected negatively 7 selected both</p> <p>7. Do you think it plays a role in affecting human values (social, moral, or ethical- For example respect, peace, non-violence, acceptance, consideration, appreciation, listening, openness, affection, empathy, and love towards other human beings)? Yes No</p> <p>6 selected yes 3 selected no</p> <p>8. If yes, what kind of effects does it have on human values? Positive Negative Both</p> <p>All 9 selected both</p>	<p>9. Do you think it can be used to develop cultures of empathy? Yes No</p> <p>3 selected yes 6 selected No</p> <p>10. Considering your <i>complete</i> experience with Chat GPT how likely are you to recommend it to your family and friends? 0 Very Unlikely to 10 Very Likely</p> <p>1: 4 2: 5 3: 7 4: 9 5: 10</p>
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# MYP II

## STATEMENT OF INQUIRY

“Pakistan Super League as an engagement renders massive impacts on the economy of Pakistan”

## RESEARCH RATIONALE

### Lines of Inquiry

PSL is affecting the economy of Pakistan through public engagement.

**Global Context: Globalization and Sustainability - Economics**

**Focus: Sports and Economy**



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## METHODOLOGY:

Primary research: Semi-structured interviews (qualitative research)

Secondary research: Research articles, newspapers, review articles, and meta analysis.

<p><b>Interview- PSL</b></p> <p>I understand that this interview is part of a research study by students of Learning Alliance International (LAI). The purpose of this research is to get insight from the stakeholders on their perceptions of town planning for sustainable societies.</p> <p>I understand that my participation is voluntary and that I am free to withdraw at any time. I also agree to the transcription and recording of this interview.</p> <p>I agree to provide information to the researchers on the understanding that this information will only be used for this research and that my name will not be disclosed in any publications arising from this research project without prior consent.</p> <p>Name: <b>Imran Ahmad Khan</b>  Designation: <b>Senior Vice President A Sports</b>  Previously: <b>Member Governing Council, PSL, GM Commercial, PCB Head Player Acquisition &amp; Management PSL, Manager Marketing &amp; Comms, PCB &amp; PSL.</b>  Organization: <b>A Sports</b></p>	<p>Q1) Can cricket help in the economic growth of a country? If yes, how?</p> <p><b>Yes, cricket can help in the economic growth of a country.</b></p> <p>When you organize a cricket tournament, it generates a number of opportunities across various industries. You can take the hotel, catering and transport industries as examples of this. A number of individuals including players, technical staff, and fans travel with their teams and spend in these sectors which, in turn, helps a country's economy positively.</p> <p>In Pakistan's context, cricket also massively helps in promoting a positive image of the country across the globe. Given our history of turmoil and domestic violence, Pakistan does not inspire great confidence as a destination and cricket is one of the pillars through which Pakistan is able to promote a positive image.</p> <p>According to the ICC, the 2019 Men's Cricket World Cup in the United Kingdom had an impact of around GBP 350 million on the country's GDP. The event created more than 500,000 room nights for hotels, generating GBP 46.5 million in the hotel sector alone. While Pakistan cannot compare with this impact just yet, this example highlights why organizing lucrative international sports events is important.</p>
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<p>Q2) Do you think officially sanctioned domestic cricket like PSL has begun to challenge the dominance of international cricket?</p> <p><b>Yes. League cricket provides cricketers with an opportunity to earn significantly more with a considerably less workload.</b></p> <p>Cricket boards like New Zealand, Australia, Sri Lanka, England and Pakistan are already beginning to face the heat with players wanting to get go of less significant bilateral cricket events in favour of league cricket opportunities.</p> <p>Q3) Who governs all official domestic tournaments of PSL?</p> <p><b>The PSL is owned and operated by the Pakistan Cricket Board. There is a PSL Governing Council with representation from all six franchises but this council is advisory in nature.</b></p> <p>Q4) Do you think PSL matches affect the economy of Pakistan in any way? Please elaborate.</p> <p>Circling back to the first query, the answer is yes.</p> <p>The PSL creates economic opportunities for a greater pool of local players. It creates opportunities for a number of industries including but not limited to advertising, creative, ticketing, hotel, broadcast production, travel, apparel, sports equipment retail, etc.</p> <p>To give you a small example, the PSL commissioned Swarovski and Ottewill to make their event trophies in the first few years. The same trophies are now made in Pakistan by a Pakistani jewelry maker.</p> <p>The League itself generates close to 2 Billion Rupees in taxes for the government.</p> <p>In addition, international broadcast partners and foreign entities pay in US dollars to acquire rights from the PCB, resulting in foreign currency inflow for Pakistan.</p>
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<p>Q5) What are some of the positive effects of PSL matches on the economy of Pakistan?</p> <p><b>Explained above.</b></p> <p>Q6) Please shed light on some of the negative effects of PSL, if any.</p> <p><b>People generally complain about the traffic blocks due to cricket matches that come into effect due to excessive security measures. The security measures are mandated because of Pakistan's past history when it comes to organising cricket - it's a risk no st. ate authority would be willing to take.</b></p> <p><b>The public is inconvenienced due to this and one would hope that this security landscape changes at some stage in our lives.</b></p> <p>Q7) Do you think civilians are affected by the PSL matches in any capacity?</p> <p><b>As explained above.</b></p>
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# MYP III

## STATEMENT OF INQUIRY

“Urban planning with environment as a focus can help achieve sustainable development goals”

## RESEARCH RATIONALE

### Lines of Inquiry

Planned cities are a great tool for enforcing sustainable development.

Urban planning helps with SDGs.

**Global Context:** Globalization and Sustainability - Environment

**Focus:** Planned cities, their examples from all around the world and suggestions for Pakistan and case studies to support the essay.



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## METHODOLOGY:

Primary research: Semi-structured interviews (qualitative research)

Secondary research: Research articles, newspapers, review articles, encyclopedias, and meta analysis.

**Interview Questions- Assistant Commissioner**

I understand that this interview is part of a research study by students of Learning Alliance International (LAI). The purpose of this research is to get insight from the stakeholders on their perceptions of town planning for sustainable societies.

I understand that my participation is voluntary and that I am free to withdraw at any time. I also agree to the transcription and recording of this interview.

I agree to provide information to the researchers on the understanding that this information will only be used for this research and that my name will not be disclosed in any publications arising from this research project without prior consent.

**Name:** Waqas Sufdar Sikandari  
**Designation:** Assistant Commissioner Gujranwala  
**Organization:** Pakistan Administrative Service (PAS)

**Question 1:** How do you define a planned city? / What is your understanding of a planned city?  
A city that is designed keeping in mind a pattern and vision for future additions.

**Question 2:** What are some of the key features that distinguish it from an unplanned one?  
1. Planning  
2. Geometrical  
3. Provides access to all essential services and amenities for people residing in it.  
4. Able to accommodate increase in population.

**Question 3:** What are some of the key strategies that are taken into account while planning a city?  
1. Action-oriented process  
2. Developed and sustained through participation of all stakeholders  
3. Hire consultants who have knowledge about how to promote equitable growth in cities and their surrounding regions to improve the quality of life for all citizens.

**Question 4:** In what ways can planned cities contribute to sustainable development?

- Nature based solutions.
- Sustainable urban transport
- Smart solutions can improve urban livelihoods.
- Industrial areas far from the population leading to healthy environment.

**Question 5:** In your opinion, how can planned cities incorporate sustainable development?  
1. Nature based solutions. For example, New York City's greened rooftops and streets and China's concept of 'sponge cities', cities with open spaces that can soak up floodwater and prevent disaster in ecologically friendly ways.  
2. Sustainable urban transport can include giving priority to bicycles over cars in Copenhagen.  
3. Smart solutions can improve urban livelihoods. Living in a formal settlement means having a proper address and a bank account, making it easier to sign up for basic necessities such as water and energy services.  
4. Collaboration of cities, countries and international bodies. For example, Brazil enacted a City Statute and implemented a Ministry of Cities in 2003 to direct urban planning and to make it more sustainable and inclusive. Countries are also coming together on an international level, for example at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in which 167 countries participated to focus on sustainable urban development and adopted the "New Urban Agenda".

**Question 6:** What role can an Assistant Commissioner play in planning a sustainable city?  
1. Act as a representative of the Government at Sub-Division Level.  
2. Supervise and coordinate with the line departments in implementation Government Policies.  
3. Oversee law and order of the Sub-Division and keep posted the Deputy Commissioner.  
4. Supervise duties pertaining to Police, encroachment removal, Civic Services, Traffic plans, Addas/ Bus Stands related issues etc.  
5. As Assistant Commissioner, you can ensure improvements in quality of Public Places like parks, roads, hospitals, schools, sports ground, government offices and ensure equitable and sustainability of these places.  
6. As Assistant can improve public spaces by making it more green and also controlling emissions from factories and vehicles.  
7. Ensure equitable land zoning between commercial residential and agricultural for sustainable living and consumption patterns.

- Implement Green infrastructure by making sustainable building by laws.
- Support Urban Farming
- Ensure sustainable urban transport and improving food quality and nutrition of public by implementing Food quality /hygiene laws.

**Question 7:** What is the biggest problem that a developing nation like Pakistan faces in planning sustainable cities today?  
Mismanagement and misuse of resources because of varying vested interests and priorities.

**Question 8:** Can you name any three cities across the world that are well-planned?  
1. Copenhagen  
2. Vienna  
3. New York

**Question 9:** What technologies and software systems are being used in urban planning in Pakistan?  
1. Geographic Information System (GIS)  
2. Information and communication technology (ICT)  
3. Sensors

**Question 10:** Are you aware of any town planning projects currently initiated in Pakistan-to promote sustainable development?  
Yes I am but can't disclose.

**Interview Questions for Architect**

I understand that this interview is part of a research study by students of Learning Alliance International (LAI). The purpose of this research is to get insight from the stakeholders on their perceptions of town planning for sustainable societies.

I understand that my participation is voluntary and that I am free to withdraw at any time. I also agree to the transcription and recording of this interview.

I agree to provide information to the researchers on the understanding that this information will only be used for this research and that my name will not be disclosed in any publications arising from this research project without prior consent.

**Name:** Isfandyar Khan  
**Designation:** Founder/Principal Architect  
**Organization:** Spacemen Architecture Design

**Question 1:** How do you define a planned city? / What is your understanding of a planned city?  
A planned city integrates building resources, building techniques, building health, community needs, and community health together to form a self-regulating system.

**Question 2:** What are some of the key features that distinguish it from an unplanned one?  
An unplanned city is sporadic in its growth and haphazard in implementing its constitution.

**Question 3:** What are some of the key strategies that are taken into account while planning a city?  
Tending to the people at first; the social classes that exist and how they are supposed to co-exist. The rate of growth of the population.

**Question 4:** In what ways can planned cities contribute to sustainable development?  
The linkages with the political and economic system must be identified first. With the continuation of neoliberal capitalism, planning a city would not bear any fruit as the rules of the game would have to be changed with the demands of capitalism constantly. Only a planned economy can produce a planned city.

**Question 5:** In your opinion, how can planned cities incorporate sustainable development?  
We must first understand what sustainable development actually is. Architects and urban planners take it upon themselves to design 'sustainable' housing and communities with the inclusion of green infrastructure but these are temporary solutions to a larger problem. I have talked about this in my paper:  
[https://scholar.google.com/scholar?hl=en&as\\_sdl=052C584-the-incentivization-of-freedom-and-risks-finance&btnq=city-planning-urban-planning-for-sustainable-societies](https://scholar.google.com/scholar?hl=en&as_sdl=052C584-the-incentivization-of-freedom-and-risks-finance&btnq=city-planning-urban-planning-for-sustainable-societies)

**Question 6:** What role can an architect play in planning a sustainable city?  
The architect must at first resist the temptation to buckle down to the client's demands and wishes. But to do that they must be aware of building techniques and materials that contribute toward green living no matter how temporary that idea is.



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# MYP IV

## STATEMENT OF INQUIRY

“Social entrepreneurship can lead to societal transformation and help in creating sustainable societies, especially in developing nations like Pakistan. Discuss”

## RESEARCH RATIONALE

### Lines of Inquiry

- Social entrepreneurship and its effect on society as a whole.
- Challenges faced by social entrepreneurs.
- Creating sustainable societies.

**Global Context:** Globalization and Sustainability - Society & Economy

**Focus:** Interviewing social entrepreneurs as cases and their examples from all around the world, and from Pakistan. Case Studies to support the essay.



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## METHODOLOGY:

Primary research: Semi-structured interviews (qualitative research)

Secondary research: Research articles, newspapers, review articles, encyclopedias, and meta analysis.

<p><b>MYP IV- Survey- Social Entrepreneurship</b></p> <p>I understand that this interview is part of a research study by students of Learning Alliance International (LAI). The purpose of this research is to get insight from the stakeholders on their perceptions of town planning for sustainable societies.</p> <p>I understand that my participation is voluntary and that I am free to withdraw at any time. I also agree to the transcription and recording of this interview.</p> <p>I agree to provide information to the researchers on the understanding that this information will only be used for this research and that my name will not be disclosed in any publications arising from this research project without prior consent.</p> <p>Name: Huzefa Ahmad Designation: Co-founder Rizq Organization: Rizq</p> <p>1. What is social entrepreneurship according to you?</p> <p>For me, a Social enterprise is an organization that works largely on social problems and challenges and solves them through a sustainable business approach.</p> <p>2. What is the significance of social entrepreneurship in today's world?</p>	<p>2. What is the significance of social entrepreneurship in today's world?</p> <p>In recent times we have seen that the global world is facing severe challenges especially due to climate change. Our ecosystem is changing rapidly and it requires us to create solutions that are sustainable and overcome the challenges that we all will have to face. Young minds need to think in a solution-oriented approach and come up with social enterprises that solve our modern-day problems with modern-day solutions involving technology.</p> <p>3. Do you think social entrepreneurship can aid in creating sustainable societies?</p> <p>Yes, it definitely can be a strong means to create sustainable societies. However, it must solve challenges and its foundations and values are in the right place.</p> <p>4. If yes, what is the role of social entrepreneurship in creating sustainable societies?</p> <p>Every society needs localized solutions that sustainably solve its unique challenges. Social entrepreneurs have the mandate to create such solutions which will lay the foundations of such societies and ecosystems.</p>	<p>5. Do you consider yourself as a social entrepreneur? If yes, why?</p> <p>Yes, because I am part of the ecosystem that is trying to solve the food waste and food security problems in my country.</p> <p>6. What are the challenges of social entrepreneurs in Pakistan?</p> <p>Social enterprises have legal and compliance issues when it comes to registration. They do not have any separate classification for registration. Not many people are willing to invest in such ideas because they do not reap high profits. Incentives are low for leaders. The ecosystem is still in its early stages.</p> <p>7. Do you think social entrepreneurship can lead to societal transformation in Pakistan?</p> <p>Yes, this is a way of thinking. This is a different approach altogether. This demands us to think about not only our profits but to strike a balance and care about our society and the planet at large. If done rightly we can witness a significant change in the Pakistani ecosystem.</p> <p>8. Why is social entrepreneurship needed in developing nations like Pakistan?</p>	<p>8. Why is social entrepreneurship needed in developing nations like Pakistan?</p> <p>Like the global world, Pakistan is also facing the consequences of all the problems the world has created in the last century. We are facing water scarcity, climate change crises, environmental and air quality problems, and food security challenges. We need to think about how we need to evolve in the future and what the right approach is.</p> <p>9. What is its impact on the global world? Please provide examples, if any.</p> <p>Problems are the same across the globe due to high globalization. If we develop a solution for a certain problem in Pakistan, the same solution can likely work for India or regions with similar demographics. Our solutions can have a huge impact. We have seen in the recent past how certain ride-sharing platforms such as Uber and Careem were able to rapidly scale their solutions in different countries and solve a major transport problem.</p> <p>10. What message would you want to give to budding social entrepreneurs?</p> <p>We all must develop a solution-oriented approach toward our challenges. We must think about how we can develop solutions using modern-day techniques and technology to solve these problems.</p>
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# MYP V

## STATEMENT OF RESEARCH

Research in the IB MYP V is carried out through a multi-faceted approach including MYP V Interdisciplinary Unit, Personal Project and the E-portfolios being at the core of it. It covers a broad spectrum of global issues. For each year, a Global Context is announced for the MYP E-assessments around which inquiries are designed.

## Area of Inquiry

This year, our MYP V students carried out explorations around the following overarching avenues:

- Environmental Sustainability
  - Economic Sustainability
  - Societal Sustainability
- Sustainability via Visual Arts  
Global Sustainability in Design

## Global Context: Globalization & Sustainability



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## METHODOLOGY:

Primary research - Survey Questionnaire, interviews, Museum Visits, Lab experiments  
 Secondary research - Research Articles, Periodicals, Published Digital Media



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# DPI

## STATEMENT OF INQUIRY

“Investigating the presence of heavy metals in water and its impact on health.”

## RESEARCH RATIONALE

### Lines of Inquiry

Detecting the presence of heavy metals in water.

The effect of consuming metals on health.

Methods by which heavy metals can be removed from drinking water.

### Global Context: Globalization and Sustainability - Environment




**Focus:** Detecting the presence of heavy metals in water and the impact of consuming metals on health. Research on methods by which heavy metals can be removed from drinking water through experimentation.



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## METHODOLOGY:

Secondary research: Research articles, newspapers, books, documentaries and meta analysis.

<p><b>Introduction</b></p> <p>Heavy metals are a group of metallic elements that have a high density, atomic weight, and toxicity. The term "heavy metals" is not precisely defined, but generally includes elements with an atomic number greater than 20, such as lead, mercury, cadmium, arsenic, chromium, and nickel.</p> <p>Heavy metals are found naturally in the environment, but human activities such as mining, manufacturing, and agriculture can increase their concentration in the soil, water, and air. Exposure to heavy metals can be harmful to human health, particularly to the nervous system, kidneys, and liver. Heavy metals can also be toxic to plants and animals.</p> <p>Heavy metals in drinking water have exceeded recommended limits as technology continues to advance. Heavy metals are most commonly ingested by humans through contaminated drinking water. The effects of drinking water contaminated with heavy metals like arsenic, lead, nickel, cadmium, and mercury have slowly gotten the attention of the right departments and people.</p> <p>It is generally recognized that employing heavy metals in a number of industrial processes and/or a variety of materials, such as coloring agents and alloys, results in occupational exposure to these metals. Drinking water polluted with heavy metals has been linked to a number of harmful consequences on human metabolism that have been documented globally. The generation of reactive oxygen species, the emergence of oxidative damage, and consequent negative consequences on health are the main mechanisms by which heavy metal poisoning manifests. As a result, heavy metal contamination of water leads to high rates of sickness and mortality all across the world.</p> <p><b>Effects of Heavy Metals on Metabolic Functions</b></p> <p>Metabolism in living things can be negatively impacted by heavy metals. Heavy metals are components that have a high nuclear weight and thickness, like lead, mercury, cadmium, arsenic, and chromium. These metals can collect in the body over time and disturb different metabolic cycles, prompting an assortment of medical conditions.</p> <p>By interfering with the activity of enzymes, heavy metals can affect metabolic functions in one way. Heavy metals can bind to these metal ions and prevent enzymes from functioning properly, as many enzymes require metal ions as cofactors to function properly. Problems with energy metabolism, protein synthesis, and other cellular processes may result from disruptions in metabolic pathways that are dependent on these enzymes.</p> <p>Weighty metals can likewise disturb cell flagging pathways, which can influence metabolic capabilities. For instance, heavy metals can disrupt the insulin-flagging pathway, which directs glucose digestion. Heavy metals have the potential to disrupt this pathway, resulting in insulin resistance and impaired glucose tolerance, both of which can contribute to the onset of type 2 diabetes.</p>	<p>Additionally, heavy metals may contribute to oxidative stress, which is characterized by an imbalance between the body's capacity to neutralize reactive oxygen species (ROS) and its capacity to produce ROS. This can cause a variety of health issues, including inflammation, cardiovascular disease, and cancer, as well as damage to cells and tissues, including those involved in metabolic functions.</p> <p>In general, the impacts of heavy metals on metabolic capabilities can be colossal and complex and can add to an assortment of medical issues. To limit the dangers related to heavy metals, it is critical to limit the utilization of these components and to do whatever it may take to help metabolic well-being, like eating a decent eating routine, practicing consistently, and overseeing feelings of anxiety.</p> <p><b>Effects of Heavy Metals on the Human Body</b></p> <p>Elements with a high atomic weight and density are known as heavy metals. While some of these metals, like iron, zinc, and copper, are necessary for human health in trace amounts, others, like lead, mercury, cadmium, and arsenic, are toxic and can harm human health. The effects of heavy metals on the human body include the following:</p> <p><b>Effects on the brain:</b> Arsenic, lead, and other heavy metals can accumulate in the brain and harm the nervous system. Neurological conditions like tremors, memory loss, and cognitive impairment may result from this.</p> <p><b>Effects on the heart:</b> Exposure to heavy metals like lead and cadmium can prompt hypertension, coronary illness, and other cardiovascular issues.</p> <p><b>Kidney harm:</b> The renal system can be damaged by heavy metals that build up in the kidneys. This can prompt kidney disappointment, ongoing kidney illness, and other related problems.</p> <p><b>Problems with reproduction:</b> Reproductive issues such as infertility, miscarriage, and birth defects can result from exposure to heavy metals like lead, mercury, and cadmium.</p> <p><b>Gastrointestinal issues:</b> Heavy metal poisoniveness can create gastrointestinal issues like stomach torment, loose bowels, and spewing.</p> <p><b>Problems with the airways:</b> Coughing, wheezing, and shortness of breath can be symptoms of respiratory problems brought on by heavy metals like lead, cadmium, and arsenic.</p> <p><b>Skin issues:</b> Dermatitis, rashes, and irritation of the skin can be caused by heavy metals.</p> <p><b>Cancer:</b> Cancer risk has been linked to exposure to heavy metals like arsenic, lead, and cadmium.</p>	<p><b>Detection of Metals in H<sub>2</sub>O</b></p> <p>Data obtained from electrochemical measurements can be analyzed using various techniques such as cyclic voltammetry, square wave voltammetry, and stripping voltammetry to determine the identity and concentration of metal ions present in water.</p> <p>In addition to this, a simple method that can be performed in any laboratory is the addition of nitric acid into water to detect the presence of metals. Nitric acid is a commonly used reagent for the detection and quantification of metals in water samples. The acid is a strong oxidizing agent that can dissolve many metals and form metal ions, which can be detected using various analytical techniques.</p> <p>Here are the general steps for detecting metals in water using nitric acid:</p> <ol style="list-style-type: none"> <li>1. Collect the water sample: Collect a representative water sample from the source of interest, taking care to avoid contamination.</li> </ol>  <ol style="list-style-type: none"> <li>2. Acidify the water sample: Add a small amount of nitric acid to the water sample to acidify it. This helps to dissolve any metals that may be present in the water and prevents them from precipitating out of solution.</li> </ol> 	<ol style="list-style-type: none"> <li>3. Observe the sample as brown NO<sub>2</sub> gas will be released if a metal is present in the water (be careful as the brown gas is toxic to one's eyes)</li> </ol>  <p><b>Results + Conclusion</b></p> <p>Judging from the fact that this particular water sample that was used did end up releasing brown NO<sub>2</sub> gas, we can conclude that the village from where this sample was collected was just one of the many villages in Pakistan that have unhealthy water running through them. This water is most likely consumed by the wildlife and the locals of that village which can result in disastrous consequences.</p> <p>For this reason, by filtering water, you can remove or reduce these contaminants, making the water safe to drink. This is particularly important in areas where access to clean water is limited, or where natural water sources may be contaminated by human or industrial activities. Filtering water can also improve its taste and smell, making it more pleasant to drink.</p> <p>Overall, filtering water is a simple and effective way to ensure that the water you drink is clean, safe, and healthy.</p>
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# DP II

## STATEMENT OF RESEARCH

Research in the IBDP covers a broad spectrum of areas including internal assessments being conducted for each subject group of the IBDP. However, IBDP Core including Theory of Knowledge serves as an in-depth inquiry while Extended Essay being the pinnacle of it with a 4,000 Words long academic research paper as the product.

## Lines of Inquiry

This year, our DP-II students investigated the following major areas:

An Inquiry of Hyper Nationalism and Indo-Pak Conflict 2010-2022

A Comparative Study of Population Growth Models for Pakistan for Future Predictions

A Novel Investigation into the stylistic elements of Indo-Saracenic Architecture

An Exploration of the Significance of Sega in Console Market

Role of Adverse Childhood Experiences in the Development of Bipolar Disorder

A Comparative Study of the Evolution of the Hero Archetype

Evaluation and Analysis of the Market Positioning of Toyota's Electrical Vehicles

An Analysis of the Link between Childhood Attachment and Future Romantic Relationships

An Exploration of Conformity in Social Groups



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## METHODOLOGY:

Primary research - Survey Questionnaire, interviews, Museum Visits, Lab experiments

Secondary research - Research Articles, Periodicals, Published Digital Media