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# **Relating Science to Our Changing World**

### **🌎 Engage: Unveiling Climate Change**

#### **📚 Introduction to Climate Change**

Climate change refers to significant, long-term changes in the Earth's climate patterns, predominantly caused by increasing levels of greenhouse gases in the atmosphere due to human activities such as deforestation and burning fossil fuels. This global phenomenon affects temperature, precipitation, and sea levels, impacting all forms of life.

**Discussion Prompt:**

* **Reflect Individually:** Think about the weather patterns over the last few years. Have you noticed any unusual changes in your local environment? Write a brief reflection on these changes and how they might relate to climate change.

### **🌿 Explore: Impact on Canadian Communities**

#### **🕵️‍♂️ Solo Research Activity: Impact Analysis**

* **Activity Description:** Individually, students will research how climate change has impacted various communities across Canada, with a special focus on First Nations, Métis, and Inuit communities. Students will prepare a short presentation based on their findings.

**Guided Questions:**

1. What effects does climate change have on the natural resources that these communities depend on?
2. How are the lifestyles of these communities being altered by climate changes?

### **📖 Explain: Impacts on Indigenous Communities**

#### **🌐 Understanding the Extent**

First Nations, Métis, and Inuit communities have deep connections with nature, making them particularly vulnerable to the changes brought by climate change. These alterations threaten their traditional ways of life, such as hunting, fishing, and gathering.

* **Example:** In northern Canada, warmer temperatures have led to less predictable ice conditions, affecting the safety and efficacy of traditional ice fishing and hunting practices.
* **Direct Instruction:** Discuss the direct link between these environmental changes and the socio-economic implications for indigenous communities.

### **🚀 Elaborate: Critical Thinking and Application**

#### **🌱 Individual Project: Sustainable Solutions**

* **Task Description:** Each student will devise a personal project that outlines sustainable practices to help a specific community combat the challenges posed by climate change. This could include innovative approaches to housing, food security, or community planning.

**Application Exercise:**

* Propose a plan that integrates modern technology with traditional knowledge to create climate-resilient infrastructures.
* Develop a year-round food security plan that considers the potential impacts of climate variability.

### **✅ Evaluate: Reflect and Assess**

#### **📝 Quiz and Reflection**

* **Quiz:** Students will complete a quiz to assess their understanding of how climate change affects Canadian indigenous communities.
* **Self-Assessment Prompt:** Write a reflection on what you have learned about climate change's impact on communities and how you might apply this knowledge to help your local community or beyond.

### **🔚 Conclusion**

This lesson has provided an in-depth exploration into the impacts of climate change on Canadian communities, emphasizing the unique challenges faced by First Nations, Métis, and Inuit peoples. Through individual research, critical thinking, and application projects, students gain a comprehensive understanding of climate change's real-world effects and the importance of sustainable practices.

## **📝 Climate Change Impacts on Canadian Communities Quiz**

### **🌱 Easy Level**

1. **What is climate change primarily caused by?**
   * A) Lunar cycles
   * B) Human activities
   * C) Continental drift
   * D) Solar flares
   * **Answer: B**
2. **Which of the following is a greenhouse gas?**
   * A) Oxygen
   * B) Nitrogen
   * C) Carbon dioxide
   * D) Hydrogen
   * **Answer: C**
3. **What effect does climate change have on ice conditions in northern Canada?**
   * A) Makes the ice thicker
   * B) Has no effect
   * C) Makes the ice thinner
   * D) Turns ice to snow
   * **Answer: C**
4. **Which community is known for using ice roads?**
   * A) Urban communities
   * B) Coastal communities
   * C) Northern communities
   * D) Southern communities
   * **Answer: C**
5. **What is one traditional activity of First Nations affected by climate change?**
   * A) Video gaming
   * B) Ice fishing
   * C) Desert farming
   * D) Mountain climbing
   * **Answer: B**
6. **Rising temperatures can disrupt which of the following?**
   * A) Snowfall in the Sahara
   * B) Ocean currents in the Atlantic
   * C) Animal migration patterns
   * D) Volcanic activity
   * **Answer: C**
7. **Who are most affected by the changes in the environment due to climate change?**
   * A) City dwellers
   * B) First Nations, Métis, and Inuit communities
   * C) Europeans
   * D) Astronauts
   * **Answer: B**
8. **What is a major consequence of melting ice in Arctic regions?**
   * A) Increased land for agriculture
   * B) Decreased hunting territories
   * C) More space for urban development
   * D) Enhanced transportation networks
   * **Answer: B**
9. **Which activity relies heavily on stable weather conditions?**
   * A) Indoor swimming
   * B) Online shopping
   * C) Traditional hunting
   * D) Library visits
   * **Answer: C**
10. **What is an effect of climate change on water bodies used by indigenous communities?**
    * A) Increased ice thickness
    * B) Decreased fish populations
    * C) More predictable water currents
    * D) Less pollution
    * **Answer: B**

### **🌳 Moderate Level**

1. **How does climate change affect traditional plant gathering practices?**
   * A) Plants grow larger
   * B) Alters plant flowering times
   * C) Plants require less water
   * D) Makes plants more colorful
   * **Answer: B**
2. **Which initiative could mitigate climate change effects on local ecosystems?**
   * A) Building more shopping malls
   * B) Increased fossil fuel consumption
   * C) Afforestation projects
   * D) Expanding urban areas
   * **Answer: C**
3. **What is a direct impact of thinner ice in northern regions?**
   * A) Easier transportation by car
   * B) Safer hunting conditions
   * C) More robust ice fishing techniques
   * D) Increased risks during traditional ice-based activities
   * **Answer: D**
4. **How might rising temperatures affect fishing communities?**
   * A) Fish species migrate to cooler waters
   * B) Fish grow larger and faster
   * C) Less competition for fishing spots
   * D) Increased availability of tropical fish
   * **Answer: A**
5. **What sustainable practice can help combat climate change impacts?**
   * A) Increase in plastic usage
   * B) Reduction in recycling efforts
   * C) Building energy-efficient homes
   * D) Decreasing green spaces
   * **Answer: C**
6. **What role do local initiatives play in combatting climate change?**
   * A) They provide immediate global solutions
   * B) They increase public awareness and local resilience
   * C) They are generally ineffective
   * D) They prevent any future climate change
   * **Answer: B**
7. **Which technology could assist communities in adapting to climate change?**
   * A) Coal-fired power plants
   * B) Water purification systems
   * C) Oil drilling equipment
   * D) None of the above
   * **Answer: B**
8. **Which strategy could mitigate the impact of climate change on traditional farming practices?**
   * A) Continuing traditional practices without changes
   * B) Introducing drought-resistant crops

* C) Reducing the amount of land farmed
  + D) Increasing pesticide use
  + **Answer: B**

1. **What effect does reduced ice cover have on marine life?**
   * A) Increases the ice-dependent species population
   * B) Decreases biodiversity in polar regions
   * C) Makes marine life less vulnerable
   * D) No effect
   * **Answer: B**
2. **How does climate change affect the cultural practices of Indigenous communities?**
   * A) Enhances traditional celebrations
   * B) Has no effect
   * C) Forces changes or adaptations in traditional celebrations
   * D) Leads to more frequent cultural festivals
   * **Answer: C**

### **🏔 Hard Level**

1. **What is the impact of permafrost thaw on northern communities?**
   * A) Improves agricultural prospects
   * B) Destabilizes buildings and roads
   * C) Enhances local flora and fauna
   * D) Increases land availability for construction
   * **Answer: B**
2. **Which adaptation strategy is most effective for coastal communities facing rising sea levels?**
   * A) Ignoring the changes
   * B) Building sea walls and improving drainage
   * C) Reducing water usage
   * D) Increasing fishing activities
   * **Answer: B**
3. **What long-term effect might climate change have on traditional knowledge?**
   * A) It becomes more widely known
   * B) It may be lost or require significant alteration
   * C) It becomes less relevant
   * D) It is unaffected by climate conditions
   * **Answer: B**
4. **Which of the following is a potential impact of climate change on health in Indigenous communities?**
   * A) Improved health due to warmer temperatures
   * B) Increased respiratory diseases from poorer air quality
   * C) Decreased incidence of diseases
   * D) No impact on health
   * **Answer: B**
5. **How could climate change potentially affect water security for Indigenous communities?**
   * A) Leads to more stable water supplies
   * B) May result in more frequent and severe droughts
   * C) Increases water quality
   * D) No impact
   * **Answer: B**
6. **Which educational approach helps communities understand and adapt to climate change?**
   * A) Avoiding discussion of climate issues
   * B) Promoting traditional-only knowledge without modern science
   * C) Integrating climate science into community learning
   * D) Focusing solely on historical data
   * **Answer: C**
7. **What is the role of Indigenous knowledge in combating climate change?**
   * A) It is outdated and irrelevant
   * B) It can provide sustainable solutions and adaptation strategies
   * C) It has no role
   * D) It complicates scientific understanding
   * **Answer: B**
8. **How do changing seasonal patterns affect traditional activities in Indigenous communities?**
   * A) They have no impact
   * B) They force changes in the timing and methods of these activities
   * C) They make these activities easier
   * D) They reduce the number of activities
   * **Answer: B**
9. **What is a critical factor in ensuring the sustainability of hunting and fishing practices amidst climate change?**
   * A) Ignoring climate predictions
   * B) Increasing the number of animals hunted
   * C) Adapting practices to changing environmental conditions
   * D) Reducing the local population
   * **Answer: C**
10. **How might climate change influence the transmission of diseases in northern communities?**
    * A) It reduces disease transmission
    * B) It could increase the spread of vector-borne diseases
    * C) It has no effect on diseases
    * D) It eliminates most common diseases
    * **Answer: B**