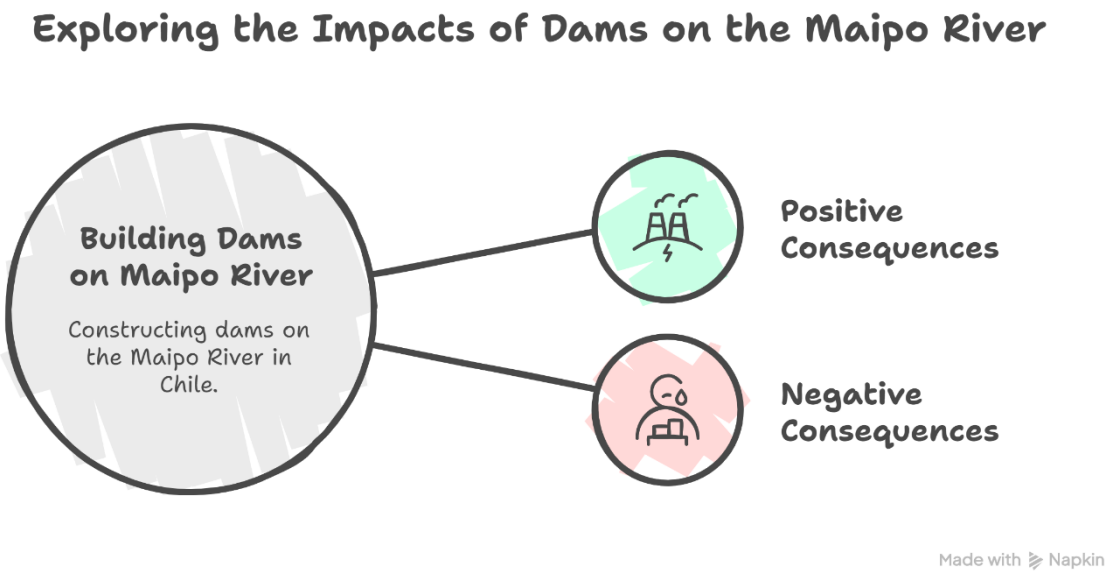
Rivers and Dams: Getting Power and Water

Overall Unit Goal: To understand the positive and negative consequences of building dams, using Maipo River in Chile as a case study.



Lesson 1: Thinking About Building Dams the Maipo River in Chile

Content Objectives:	Students will discuss the potential positive and negative results of building a dam on a different river.
Language Objectives:	Students will be able to ask and answer basic questions about a new location. (e.g., "Where is the Maipo River?", What might happen if a dam is built there?", "Can you name one positive result of building a dam?")
Vocabulary	**Mandatory:** Chile, Maipo River, dam, positive results, negative results. **Compatible:** observe, area, similar, happen, prompts, discussion.

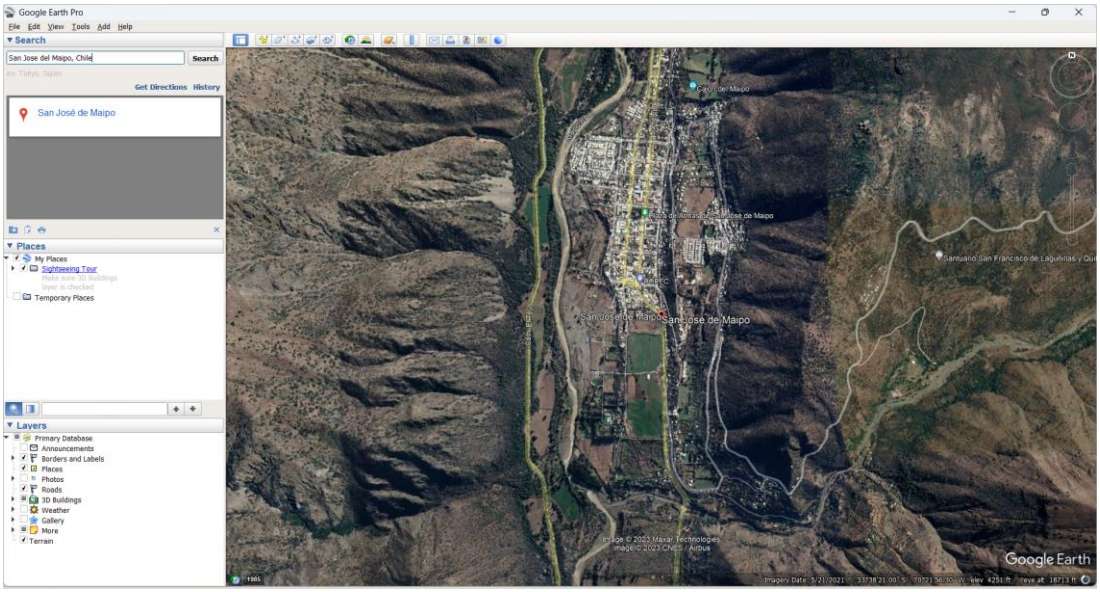
Activities:

Introduction to Chile and the Maipo River: Locate Chile on a map. Use the information to find the Maipo River on Google Earth Pro

1.What do you know about Chile?

2. Where is it on this map?

1. Imagine that you work for the government of Chile. You are going to help your leaders decide whether to build a new dam or not.
2. Find the Maipo River on **Google Earth Pro**
3. In "Search" on the top, left, put in a place: San Jose del Maipo, Chile



4. zoom out (far left, click - on the bottom)
5. Zoom in again (click + on top)

4. Answer questions

    1. What is this place?
    2. Where is the Maipo River?
    3. What do people do beside the river?
    4. What do you think will happen if we put a dam near there?

5. Places to find along the Maipo River, Chile:

    1.Embalse del Yeso, Chile

    2.Puente, Alto, Chile

    3.Isla del Pirique, Chile

    4.Casona Viña Maipo, Buin, Chile

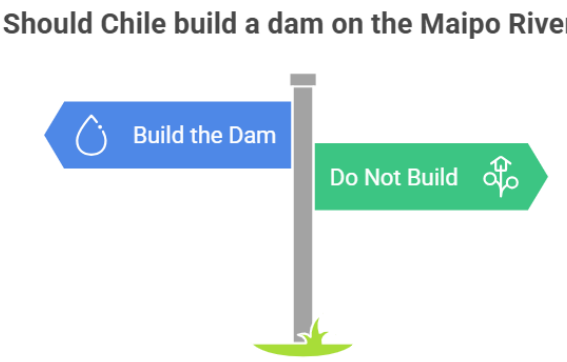
    5.Maria Olga Cabrera Albornoz, chile

    6.Escuela Poeta Huidobro - San Juan, Lo Gallardo, San Antonio, Chile

    7. Puente Lo Gallardo, San Antonio, Chile

        1. **Brainstorming:** Ask students what they observe about the area around the Maipo River and what people might do there.

Lesson 2: The Proposed Dam on the Maipo River - Should Chile Build a Dam?



Content Objectives:	Students will be able to present arguments for and against building a dam on the Maipo River
Language Objectives:	**Language Objective:** Students will be able to use persuasive language and supporting details to present their arguments in a structured way.
Vocabulary	**Mandatory:** argument, rebuttal, economic growth, recreational opportunities, water supply (urban), over-irrigation **Compatible:** reliance on fossil fuels, degradation, manage, artificial flood conditions, instability, conflicts, stance

The Maipo River. Wikipedia. https://en.wikipedia.org/wiki/Maipo_River#/media/File:R%C3%ADo_Maipo.jpg

 **Activities:**

Arguments and Rebuttals for the Debate on Dams (in general)

SEE SAMPLE SENTENCES

- ✓ "One reason for building the dam is that it supports economic growth."
- ✓ "This project is important because it provides a steady urban water supply."
- ✓ "Opponents argue that the dam could cause environmental degradation."
- ✓ "Another argument against the dam is the risk of artificial flood conditions."
- ✓ "In my opinion, the benefits outweigh the drawbacks because…"

Argument 1: Dams Provide Reliable Hydroelectric Power

- **Claim:** Dams generate significant amounts of hydroelectric power, which is a renewable energy source that helps reduce reliance on fossil fuels.
- **Rebuttal:** While dams provide renewable energy, they can also lead to environmental degradation and displacement of communities. The ecological impact of altering river ecosystems can outweigh the benefits of renewable energy.

Argument 2: Dams Aid in Flood Control

- **Claim:** Dams help manage and control floods, protecting communities and agricultural land from seasonal flooding.
- **Rebuttal:** Although dams can control flooding, they can also create artificial flood conditions downstream, disrupting local ecosystems and potentially causing harm to communities that rely on natural flood cycles for agriculture.

Argument 3: Dams Support Economic Growth

- **Claim:** Dams can boost local economies by providing water for irrigation, improving agricultural productivity, and creating jobs in construction and maintenance.
- **Rebuttal:** The economic benefits are often short-term and may not account for the long-term negative impacts, such as loss of fisheries and tourism. Additionally, the displaced communities may lose their livelihoods, leading to social and economic instability.

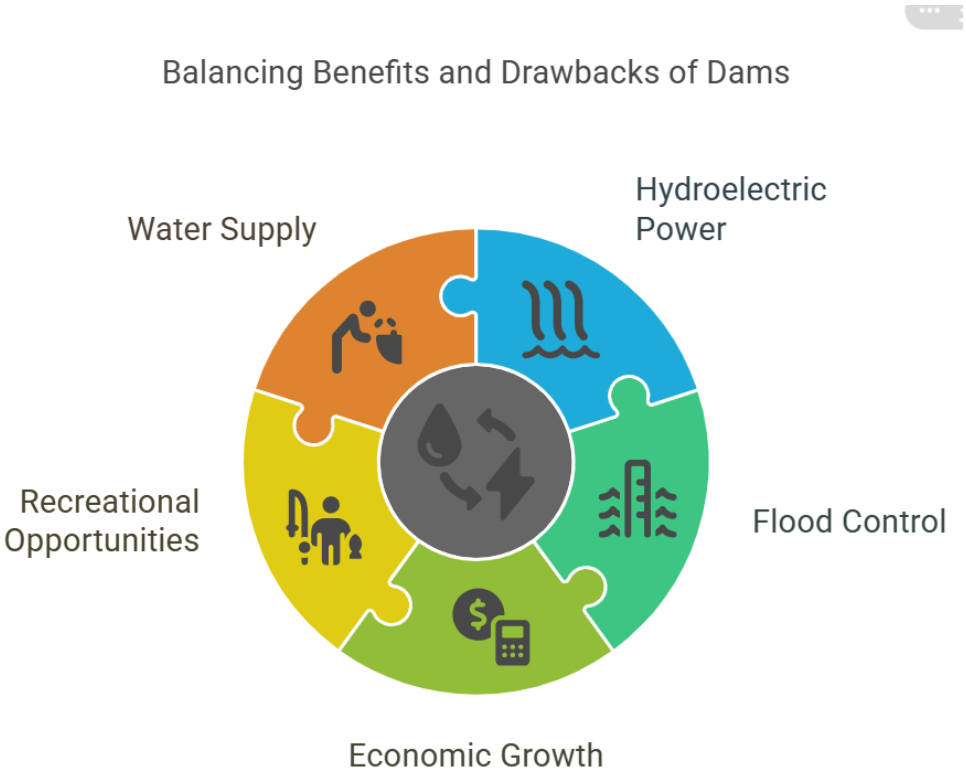
Argument 4: Dams Create Recreational Opportunities

- **Claim:** Reservoirs created by dams provide recreational opportunities such as boating, fishing, and tourism, which can benefit local economies.
- **Rebuttal:** The creation of reservoirs can lead to loss of natural habitats and biodiversity, diminishing the outdoor experiences that people value. Furthermore, these recreational activities may not compensate for the loss of natural ecosystems and cultural sites.

Argument 5: Dams Improve Water Supply for Urban Areas

- **Claim:** Dams can ensure a steady water supply for growing urban populations, helping to meet the increasing demand for water in cities.
- **Rebuttal:** Over-reliance on dams for water supply can lead to conflicts over water rights and may negatively impact rural areas that depend on the same water sources. Additionally, drought conditions can reduce the effectiveness of dams in providing water during critical times.

These arguments and rebuttals can help students prepare for their debate by enabling them to understand both sides of the issue regarding dams.



Classroom Discussion/Debate

Activities:

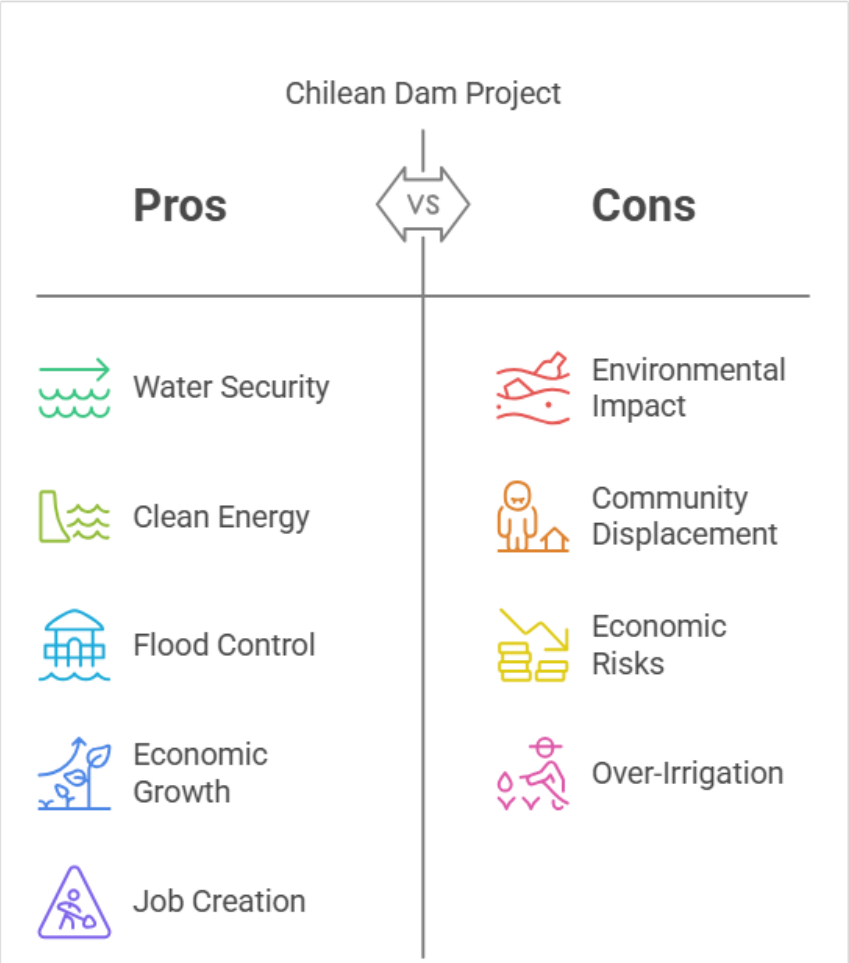
1. **Introduce the Debate Question:** Clearly state the question: "Should the Government of Chile build a dam on the Maipo River? Why or why not?".
2. **Argument Brainstorming:** Divide the class into two sides (for and against). Use the "Arguments and Rebuttals for the Debate on Dams" section to help each side develop their arguments.
3. **Structured Discussion/Debate:** Facilitate a discussion or a more formal debate where students present their arguments for and against building the dam on the Maipo River.

 **Affirmative Side (In Favor of Building the Dam)**

1. **Water Security & Hydroelectric Power**
   *A new dam in Chile could provide a stable water supply for agriculture and human consumption, reducing dependence on seasonal rainfall.
   *Hydroelectric power from the dam could supply clean, renewable energy, reducing reliance on fossil fuels.
2. **Flood Control**
   *A dam in Chile could help prevent destructive flooding, especially in regions prone to extreme weather events.
3. **Economic & Agricultural Benefits**
   *By regulating water flow, the dam could expand irrigation opportunities for farmers, increasing food production.
   *Tourism and recreational activities around the reservoir could provide economic benefits.
4. **Job Creation & Infrastructure Development**
   *Construction and maintenance of the dam would create thousands of jobs, boosting local economies.
   *Improved roads, power lines, and water systems could emerge as part of the project's development.

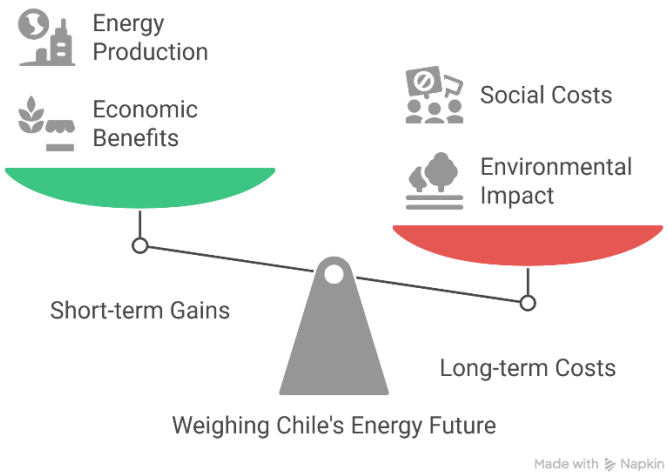
 **Opposition Side (Against Building the Dam)**

1. **Environmental Consequences**
   *A Chilean dam could disrupt natural sediment flow, affecting ecosystems downstream.
   *Loss of biodiversity could occur due to habitat destruction and altered river conditions.
2. **Displacement of Communities**
   *A new dam in Chile could force communities to relocate, leading to loss of homes, cultural heritage, and livelihoods.
3. **Long-Term Economic Costs**
   *While the dam may generate revenue, its maintenance costs, silt buildup, and potential inefficiencies could lead to financial burdens.
   *If climate change reduces water levels, the dam's effectiveness could diminish over time, making the investment risky.
4. **Risk of Dependence & Over-Irrigation**
   *Over-irrigation could damage long-term agricultural sustainability.



Conclusion:

The decision depends on weighing these benefits and risks carefully. Should Chile prioritize short-term economic and energy gains, or consider long-term environmental and social costs? Would alternative renewable energy sources (such as wind or solar) be a better investment?
What's your stance—should Chile build the dam or not?


Energy Production
Economic Benefits
Social Costs
Environmental Impact
Short-term Gains
Long-term Costs
Weighing Chile's Energy Future
Made with Napkin