⏳ Timing Breakdown

1️⃣ (5 min) Initial group discussion (before they know the pathogen)
2️⃣ (10 min) Diagnostic results revealed one by one
3️⃣ (5 min) Groups finalize their response plans
4️⃣ (5 min) Groups present their findings
5️⃣ (Optional, 5 min) Instructor-led wrap-up on real-world Red Tide events

🌊 **Mystery Outbreak: Coastal Illnesses & Wildlife Die-Off: Handout**

💡 **Objective:**
Students will work as **public health officials** investigating an **unknown outbreak**.

They will analyze symptoms, environmental clues, and diagnostic test results before **identifying the pathogen** and proposing solutions.

📍 **Case Scenario: Unexplained Illness Along Gulf Coast**

📅 **Timeline:** Over the past two weeks
🌊 **Location:** A small coastal town in Florida
🏥 **Hospitals Report:**

- Dozens of **beachgoers** complaining of **coughing, wheezing, and itchy eyes**
- Several cases of **nausea and vomiting** in seafood consumers
- Two individuals with **neurological symptoms (dizziness, tingling in fingers, slurred speech)**

🦀 **Local Wildlife Reports:**

- **Massive fish kills** observed along the shore
- Sick and disoriented **sea turtles**
- Dead manatees found in coastal waters

🚨 **Local Concerns:**

- Residents **worry it's chemical pollution or a new viral outbreak**
- Restaurants fear a **decline in seafood sales**
- Tourism industry **demands an explanation**

👥 **Student Roles & Instructions**

🔹 **Divide students into 4 groups**
🔹 **Each group will analyze the case** and propose a response

1 Epidemiologists

- Identify **patterns** in who is getting sick and when
- Consider **possible sources** (air, water, food?)
- Suggest preliminary **public health guidelines**

2 Hospital & Clinical Team

- Assess **symptoms** and suspect possible **types of pathogens (bacteria, virus, fungus, protist, toxin?)**
- Suggest **diagnostic tests** (e.g., blood tests, water samples, imaging)
- Decide if **treatments** should be supportive or targeted

3 Environmental Scientists

- Investigate **water quality & marine life**
- Identify possible **toxic substances**
- Determine if **climate factors (temperature, storm runoff, algae blooms?)** are involved

4 Local Government & Business Leaders

- Balance **public health safety vs. economic impact**
- Decide if **beaches should be closed**
- Communicate risks to the public **without causing panic**

🧪 **Diagnostic Clues**

After 5-10 minutes of discussion, give students **diagnostic test results** one by one to see if they adjust their conclusions.

🔬 **Lab Tests & Findings:**
1 **Tissue samples from dead fish:** Show **paralysis but no bacterial infection**
2 **Water sample from the beach:** Identifies **high levels of brevetoxins**

3 **Nasal swabs from sick patients:** No bacteria or viruses detected
4 **Aerial satellite images:** Reveal a **large red-colored bloom in coastal waters**

💡 **Wrap-Up Questions & Actions**

Once students **identify *Karenia brevis***, they must decide:

✔️ **Immediate Actions:**

- Should the beaches be **closed**?
- Should seafood sales be **restricted**?

- How should residents **reduce exposure**?

✔️ **Long-Term Solutions:**

- What **factors increase harmful algal blooms**?
- How can local policies **reduce nutrient pollution**?
- What **monitoring systems** should be implemented?

✔️ **Press Release Drafting (for Public Officials)**
Example:
🚨 **"Health Officials Warn of Red Tide Blooms on Florida Coast"** 🚨
"High levels of toxic algae have been detected along the coastline, causing respiratory symptoms and marine life die-offs. Beachgoers are advised to avoid water exposure, and seafood consumers should check for health advisories before eating shellfish. Officials are monitoring the bloom and will update the public regularly."