

Name _____ Date _____

Human Accelerated Environmental Change

In your jigsaw group, discuss change globally and locally. Then, using the information provided, answer the questions in expert groups. Finally, meet with your jigsaw group again to learn about other changes that have taken place.

Part 1: FOR ALL GROUPS: Jigsaw Group Guiding questions

1. What are the major changes that have taken place globally?

2. How are humans involved in these changes?

3. What types of change do you think have taken place locally?

Part 2: Expert Groups

Group 1: Lyme Disease

1. What does the map and the graphs tell you about Lyme disease in our area?

2. List all the possible reasons you can think of for the change in Lyme disease.

3. How would you investigate the cause of the changes? Brainstorm, with your group, a possible experiment.

4. Use the "Resource Packet" provided by your teacher to research possible answers.

5. Why do you think the incidence of Lyme disease has changed in our area? Use evidence to support your answer.

6. Based on the information you find, what recommendations would you make to land owners in order to reduce the incidence of Lyme disease? How confident are you in your answer? What else would you like to know?

Group 2: Hudson River Fish Changes

1. What has happened to the numbers of Rainbow Smelt in the Hudson?

2. What has happened to the numbers of Atlantic tomcod in the Hudson? Do you think the two graphs are related? Why?

3. List all the possible reasons you can think of for the two species' declines.

4. How would you investigate the cause of the changes? Brainstorm, with your group, a possible experiment.

5. Use the "Resource Packet" provided by your teacher to research the changes.
6. Why do you think the fish species population has changed? Use evidence to support your answer.

7. Based on the information you find, what recommendations would you make to change the situation in the Hudson River? How confident are you in your answer? What else would you like to know?

Group 3: Pearly Mussel Declines in the Hudson River

1. What happened to the population of pearly mussels (unionids) in the Hudson River?

2. List all the possible reasons you can think of for the species' decline.

3. How would you investigate the cause of the changes? Brainstorm, with your group, a possible experiment.

4. Use the "Resource Packet" provided by your teacher to research the changes in the mussel population.

5. Why do you think the mussel population has changed? Use evidence to support your answer.

6. What are the potential impacts of these changes on the river's ecosystem? Is there anything else that could have caused the mussels' decline? What else would you like to know to be more confident in your answer?

Group 4: Marsh Bird Population changes

1. How is the population of birds at Iona Island different from that of the other marshes?

2. List all the possible reasons for the differences in marsh bird population.

3. How would you investigate the cause of the differences? Brainstorm, with your group, a possible experiment.

4. Use the “Resource Packet” provided by your teacher to research the changes.
5. Why do you think the population on Iona Island is different from the other marshes? Use evidence to support your answer.

6. What does this data tell you about the relationship between *Phragmites australis* and birds? How confident are you about your answer? What more would you like to know?

7. Would you recommend the removal of the common reed? Why or why not? What else would you like to know before making this decision?

Group 5: Acid Rain & Fish

1. Describe the changes in the fish population over time.

2. Why do you think the fish population changed so much? List all the possible reasons you can think of for the changes.

3. How would you investigate the cause of the changes? Brainstorm, with your group, a possible experiment.

4. Use the “Resource Packet” provided by your teacher to research the changes.

5. Why do you think the fish population was so different in 2005-07 when compared with the 1960s? Use evidence to support your answer.

6. What other consequences might there be for the aquatic ecosystems in the Adirondacks, and for other parts of the country? What steps do you think should be taken to reduce the impacts of acid rain?

Part 3: Jigsaw Group

Take notes on the major changes that the other groups are describing.

Group	Changes

Which of the six major environmental changes are responsible for each group's topic? Then, decide if these changes are permanent or temporary. How can you tell the difference? Discuss with your class what other types of information you would like to have to be certain about your decisions.

	Climate Change	Loss of biodiversity	Land Use Change	Pollution	Exotic Species	Infectious disease	Permanent (P) or Temporary (T) change?
Lyme Disease							
Hudson River Fish							
Pearly Mussel Declines							
Marsh Bird Changes							
Acid Rain & Fish							

Part 4: Reading

Read the short article titled "Human Accelerated Environmental Change" and answer the following questions.

1. What are the major changes outlined by the author?

2. Why does he believe that HAEC is more important than climate change?

3. How do you feel about this statement?

4. What do you think should be done?
