

APPENDIX A: Teacher Pages

Investigating Environmental Issues Procedure Summary

*Oyster Sanctuaries in Chesapeake Bay: Events, Problems, and Issues
Concept Map*

Research Questions Related to Oyster Sanctuaries

Oyster Sanctuaries Conversation Map – Belief Statements and Value Descriptors

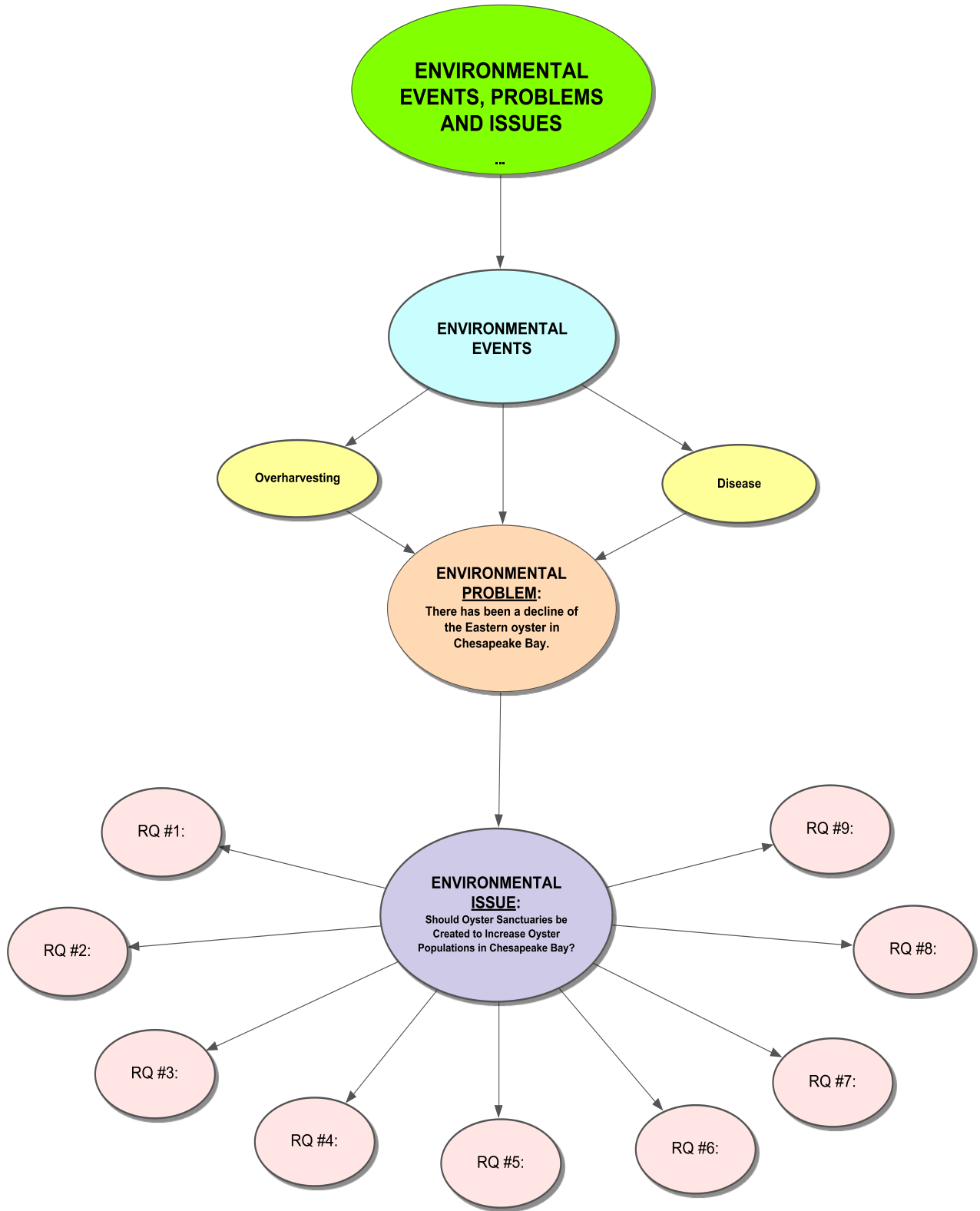
Investigating Environmental Issues Procedure Summary

Student will proceed using the following steps:

- Choose an environmental topic to investigate based on their interests or concerns;
- Conduct background research, and from that research, choose an issue associated with their chosen topic.
- Evaluate the environmental events, problems, and issues;
- Develop research questions to investigate the issue;
- Determine the knowledge, beliefs, and values of stakeholders involved with the issue;
- Determine how they will collect data that answers their research questions;
- Identify the population they want to sample;
- Create survey instruments to collect data;
- Organize the data so that it is easy to communicate (e.g., using graphs, etc.);
- Interpret the data collected, and develop conclusions, and inferences based on the data collected;
- Identify methods of action, and choose one or more as recommendations to solve an environmental problem as it relates to their project;
- Write a report about their research;
- Present their research and findings to their teacher and peers;
- Present their research and findings to their peers and the community;
- Create an action plan; and
- Carry out the action plan (optional).

Teacher Note: More detailed information about developing survey instruments, sampling, making recommendations, and developing action plans are available in Hungerford, et al, 2003. Additionally, student practice activities, student investigation contracts and checklists, and action analysis criteria can also be found here.

Oyster Sanctuaries in Chesapeake Bay: Events – Problems – Issues



Research Questions Related to Oyster Sanctuaries

(1) Research Question:

To what extent will creation of oyster sanctuaries improve ecosystem services?

- a. To what extent would creation of oyster sanctuaries in Harris Creek improve water clarity?
- b. To what extent would creation of oyster sanctuaries in Harris Creek increase denitrification of the sediments?
- c. To what extent would creation of oyster sanctuaries in the Tred Avon River increase habitat for striped bass?
- d. To what extent would creation of oyster sanctuaries in Harris Creek increase SAV growth in the creek?
- e. To what extent would creation of oyster sanctuaries in Harris Creek affect reproduction and spat set in the Choptank River?

(2) Research Question:

To what extent will creation of oyster sanctuaries affect the ability of watermen to make a living?

- a. To what extent would creation of oyster sanctuaries in the Little Choptank River affect the number of watermen who move their oyster harvest sites to a different river system?
- b. What are the attitudes of watermen who work in the Little Choptank River toward oyster sanctuaries?
- c. In what ways would creation of oyster sanctuaries in Harris Creek affect Tilghman Island culture?
- d. To what extent would oyster sanctuaries in the NOAA Choptank Complex Habitat Focus Area affect the restaurant business?

(3) Research Question:

To what extent does the type of substrate used in oyster sanctuaries affect crabbing success?

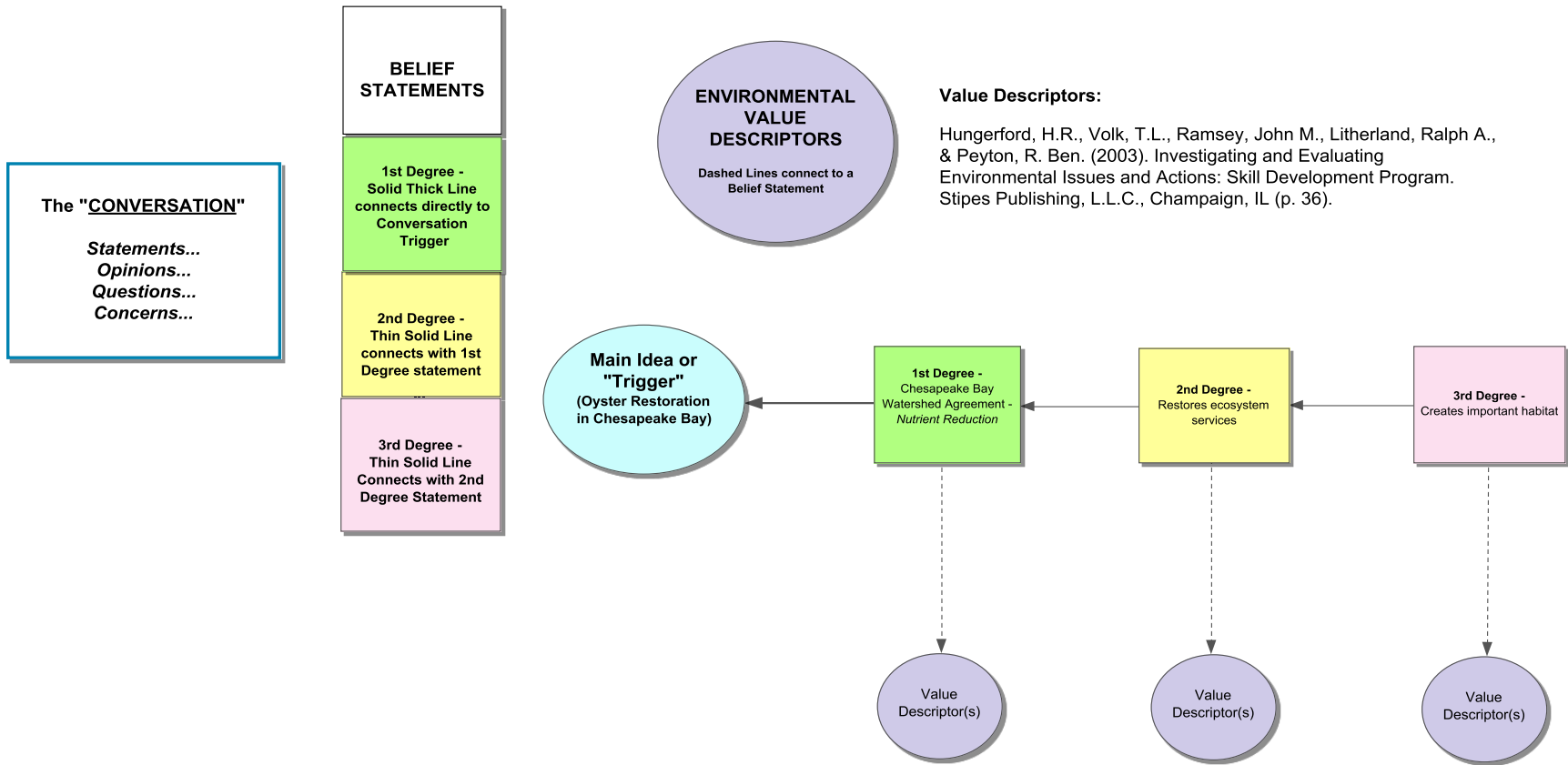
- a. To what extent does using granite as substrate in the Tred Avon River sanctuary affect the trot line crabbers' catch?

(4) Research Question:

To what extent does climate change affect oyster reproduction, life history, oyster disease, other?

- a. To what extent would an increase in temperature in the Little Choptank River oyster sanctuary affect the reproduction of oysters?
- b. To what extent does the increase in acidic waters of Chesapeake Bay due to climate change affect oyster shell hardness and predation of oysters in Harris Creek?
- c. To what extent would severe drought affect oyster disease in the Tred Avon River?

Key to Oyster Restoration Conversation Map



Oyster Restoration in Chesapeake Bay Conversation Map

