

**The Gulf of Mexico Dead Zone**

**Science Grade-Level Expectations**

The exercises in this instructional task addresses content related to the following science grade-level expectations:

- LS-M-C4 Identify the various relationships among plants and animals (e.g., mutualistic, parasitic, producer/consumer) (GLE 27)
- SE-M-A4 Analyze the consequences of human activities on ecosystems (GLE 39)
- SE-M-A5 Construct or draw food webs for various ecosystems (GLE 40)
- SE-M-A8 Identify and analyze the environmental impact of humans’ use of technology (e.g., energy production, agriculture, transportation, human habitation) (GLE 43)

**Contents**

Teachers may choose to use or modify the tasks as part of an instructional lesson or as a formative or summative assessment.

	Objectives
Task	<ul style="list-style-type: none"> <li>- Create a model from given scientific information</li> <li>- Draw a food web</li> <li>- Analyze how the interdependence of species affects an ecosystem</li> </ul>
<a href="#">Sample Exemplar Student Response</a>	

## Task

Watch [Happening Now: Dead Zone in the Gulf 2014](#) then read [No Oxygen, No Life: The Gulf of Mexico's 'Dead Zone'](#).

- A. Draw a model depicting the cause and effects of the Gulf of Mexico's Dead Zone.
- B. Draw a food web containing the 10 species found in the Gulf of Mexico that were mentioned in the articles plus decomposing material.
- C. Explain how the interdependence of animal and plant species in the Gulf of Mexico contributes to the expansion of the Dead Zone.

**Sample Exemplar Student Response:**

**Part A**

Draining of fertilizers, sewage, pesticides and industrial wastes into the Mississippi River

Human alteration of land around the river basin

Excess nutrients in the river, especially nitrogen

Hampers the river's ability to overflow and discharge some of the nutrients into the surrounding land

Excess nutrients in the Mississippi River enter the Gulf of Mexico

Excessive growth of phytoplankton

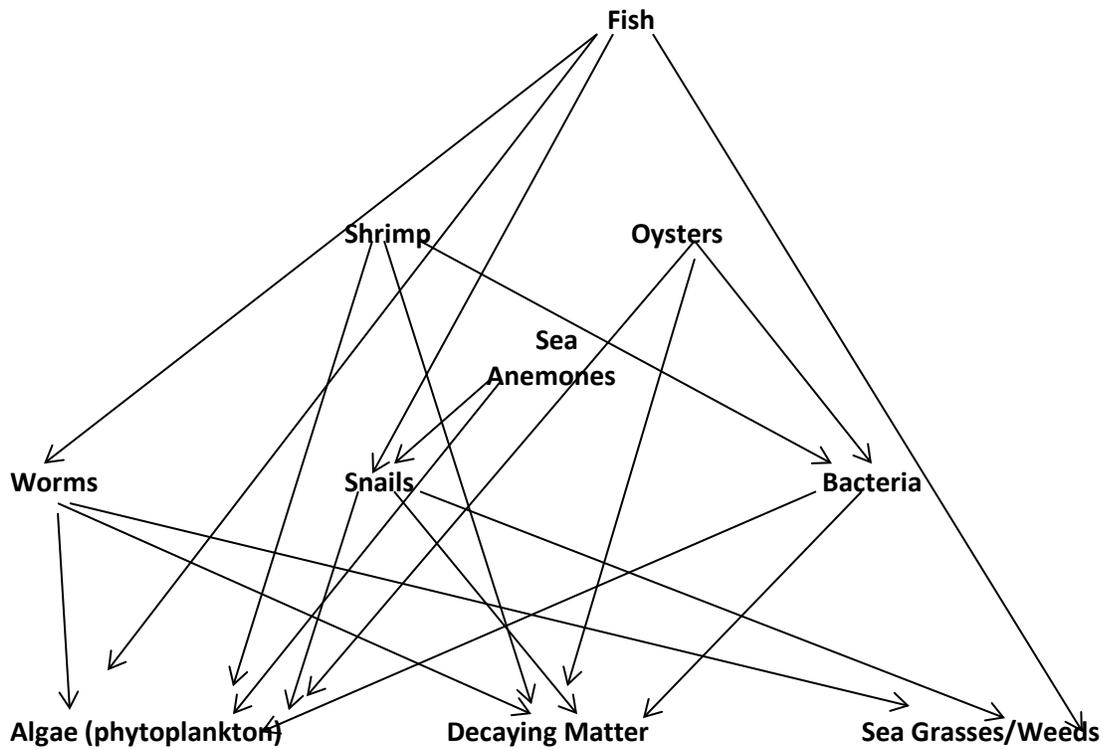
Phytoplankton sink to the ocean floor and decompose, depleting oxygen

Colonies of bacteria feed off phytoplankton and further deplete oxygen from the bottom levels of the Gulf of Mexico

Oxygen levels near floor of Gulf of Mexico are too low to sustain life

Natural food web is disrupted causing total death of living organisms in the area

**Part B**



**Part C**

The interdependence between phytoplankton and bacteria contributes to the dead zone. When conditions are right, phytoplankton can grow rapidly to create a “bloom.” In the aftermath of the bloom, dead phytoplankton sink to the floor of the ocean or lake. The large number of dead phytoplankton leads to the growth of large colonies of bacteria, which depletes the oxygen in the water. The lack of oxygen in the water causes some animals to flee to other areas. Those animals and plants that can’t flee are suffocated.