## Opening

<table>
<thead>
<tr>
<th>Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statement of Objective:</strong></td>
<td>What should students know and do as a result of the lesson?</td>
</tr>
</tbody>
</table>

- National Science Teacher Standards:
  - Content Standard A: Science as Inquiry
  - Content Standard C: Life Science
  - Content Standard D: Earth and Space Science

- VSC:
  - Skills and Processes - Grd. 7 - 1.A.1.c and 1.B.1.a
  - Life Science - Grd. 8 - 3.D.1.a / Grd. 5 - 3.F.1.a
  - (8.A.1.b; 6.F.1.a)
  - Environmental Science - Grd. 7 - 6.B.1.a

- Objectives:
  - Students will analyze the causes of pollution in the Potomac in order to list the principal pollutants in our nation’s rivers.
  - Students will compare and contrast the effects of the Gulf oil leak in order to draw connections between individual actions and results at the community level.
  - Students will investigate water pollution in the Potomac and the Gulf in order to understand cause and effect.
  - Students will conduct a simple investigation in order to identify at least two successful methods of oil spill/leak cleanup.
  - Students will evaluate data in order to explain how an oil spill/leak affects the environment.

## HEART OF THE LESSON

<table>
<thead>
<tr>
<th>Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Directed Activities:</strong></td>
<td>How will you aid students in constructing meaning of new concepts? How will you introduce/model new skills or procedures?</td>
</tr>
</tbody>
</table>

- Who Polluted the Potomac?
  - Students will participate in the activity by contributing their container's contents to the bowl of water that represents the Potomac.
  - Ask students about the recent oil leak in the Gulf.
  - Show pictures of the oil leak to show the environmental effects.

<table>
<thead>
<tr>
<th>Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher-Monitored Activities:</strong></td>
<td>What will students do together to use new concepts or skills? How will you assist students in this process?</td>
</tr>
</tbody>
</table>

- Oil Spills and Leaks
- Life Science - 6th, 7th & 8th
- Summer 2010
### Exploration

**STUDENT INVESTIGATION:**
Each group is an Oil Spill/Leak Cleanup Team called on to clean up an oil spill/leak in the Chesapeake Bay. Each group of students will get a pan of water containing several small stuffed animals. I will go around the room and create an oil spill/leak by pouring some of the colored vegetable oil in each group’s pan. The group’s task will be to try as many clean-up methods as possible, observe, and record the results in your journal.

**CLEAN-UP MATERIALS:**
- Paper towels
- Soap
- Detergent
- Saw-dust
- Sponges
- Brillo pads
- Strips of paper
- Comet cleanser
- Arm & Hammer Baking Soda
- Dawn dish soap
- Paper towels
- Pine Sol
- Plastic spoons
- Plastic cups

### Explanation

**Extension, Refinement, and Practice Activities:**
What opportunities will students have to use the new skills and concepts in a meaningful way? How will students expand and solidify their understanding of the concept and apply it to a real-world situation? How will students demonstrate their mastery of the essential learning outcomes?

### Extension, Refinement, and Practice Activities:
- **1.** "Your Place on the Planet" an article for student to read and make connections with the BP Gulf Oil leak. [http://www.populationeducation.org/media/upload/yourplaceplanet_nov2002.pdf](http://www.populationeducation.org/media/upload/yourplaceplanet_nov2002.pdf)
  Describe how the Gulf Oil leak is a social injustice. Support your ideas with information you have read. (This can also be used in conjunction with the Discovery Education activity in #2.

- **2.** [http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5](http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5)
  Write a letter to BP expressing your feelings about the oil leak and how it will affect your future.

- **3.** Go back to the ‘Who Polluted the Potomac’ activity and use the questions at the end of the activity.

- **4.** Birds and Oil Activity.
  Examine a bird feather. Oilliness on the feather keeps the feathers from becoming waterlogged. Notice how it can fluff up after it’s handled. Drop the feather into a pan of clean water. Does it float? Shake it off. Allow it to dry completely. Does it still fluff up? Drop a bird feather into the pan of water and oil. What happens to it? Try to clean it up. Some students may use liquid detergent; others may just scrub with a toothbrush. Allow the feather to dry naturally, or dry it with a hair dryer. Does it still fluff up? Drop it into a pan of water. Does it still float as well as it did before? These tests indicate that the feather has lost its ability to insulate, and to resist water. [http://octopus.gma.org/favicon.ico](http://octopus.gma.org/favicon.ico)

- **5.** Poster - Create a poster depicting the dangers of oil spills and leaks. Include the short-term and long-term effects.

### Evaluation

**Ongoing Assessment:**
How will you monitor student progress throughout the lesson?

**Culminating Assessment:**
How will you ensure that all students have mastered the identified learning indicators? How will you assess their learning?
Give an example an organism found in the Chesapeake Bay and ask the student to explain how polluted water would affect this organism and their life/their families/neighborhoods life. OR
Show students an illustration of an ecosystem, cross out a portion that would be destroyed by an event such as an oil spill/leak and have students explain how the entire system would change.

<table>
<thead>
<tr>
<th>Time</th>
<th>6 All Models</th>
</tr>
</thead>
</table>
| Closure | **Closure Activities:** Through this teacher-guided activity, how will you assist students in reflecting upon what they learned today and preparing for tomorrow’s lesson? What homework will be assigned to help students practice, prepare, or elaborate on a concept or skill taught?

- Why are oil spills so hard to clean?
- What happens to the environment and organisms that are contaminated with oil?
- What do you think can be done to prevent oil spills/leaks?

### DAILY LESSON PLANNER - RESOURCE PLANNER

#### Text Resources
- How will various forms of text (e.g., print, video, etc.) be used to help learners develop a deeper understanding of the key concepts and skills? What text resources can be utilized to assist learners in enhancing literary experiences?

- [http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5](http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5)

#### Technology Resources
- How can the use of technology enhance the learning experience? What tools may be accessed to further develop students’ skills in using technology as an integrated part of their learning?

- Discovery Education Videos: [http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5](http://player.discoveryeducation.com/index.cfm?guidAssetId=3c7e824b-eacd-421b-9fca-5e08b86fa8e5)

#### Cooperative Groupings
- What cooperative structures will facilitate learning? How will students be involved in group processing? How will students work with one another during the unit?

- Students will be in groups of 4.
  - 1 AGL, 2 OGL, 1 BGL
  - Students must decide on a clean-up method for the oil spill/leak, sharing group work responsibilities (i.e., Recorder, Manager, Clean-up, Reporter roles are to be decided upon by group members)

#### Writing Opportunities
- How will students have an opportunity to further extend their thinking through writing?

- During the Evaluation activities (student choice between the two), students will express their personal ideas, understanding and concept knowledge about the effects of oil spills/leaks.

### Hands-On Experiences and/or Manipulative Usage
- What hands-on experiences and/or manipulatives will be used to help students develop an understanding of key skills and processes for investigation?

### Individualized Instruction
- How will the lesson need to be adapted for students with special needs (i.e., special education, talented and gifted, ESOL/language minority)? In what ways will you vary the modalities of learning to ensure that ALL students have an opportunity to learn?

### Material Resources
- What materials will need to be prepared before the lesson in order to ensure the lesson goes smoothly?

### Other Planning Considerations
- What else should be considered when planning and delivering this lesson? What reminders should you record for yourself? What are the time constraints and considerations for this lesson?
Students will use the following materials as clean-up tools for the oil spill/leak:

Students with special needs will be given the information both verbal and auditory modes. Students will benefit from working with student's AGL, for the Special Education students, and AGL students will benefit from directing students who need additional help understanding concepts, as they will be explaining their understanding to peers. Students also have the opportunity to choose from activities in the Elaboration and Evaluation that suits their learning style or preference.

Oil mixture needs to be prepared in advance, materials for the clean-up activity need to be assembled to ensure sufficient items, and quantities are available.
Access to the internet is needed.
Visualizer is needed.
Picture of an Ecosystem needs to be on a Transparency and an Elmo is needed.

Consideration of the nature of some of the photos (dead birds) should be expressed to the students prior to viewing. Tell students they can turn their head, or cover their eyes if they feel the pictures will be too disturbing. Some students might be sensitive to the video about the BP oil leak due to the graphic explanation of the effects of the oil on the Gulf region and humanity.