



## Planning for Rain (Learning Experience #1) Student Procedure



1. Your teacher has posted the essential question for *Planning for Rain* (Learning Experience #1). Write a preliminary answer for the essential question in your journal. After you complete this learning experience we will review this question, so leave some space for additional ideas.
2. Your teacher has described a problem currently faced by older cities and suburban areas in the Chesapeake Bay watershed. The City of Lancaster, located in southeastern Pennsylvania, has combined sewage treatment systems are able to meet the Total Maximum Daily Load (TMDL) of pollutants standards set by the Environmental Protection Agency (EPA) about 85% of the time. The city risks stiff fines and penalties if the capacity of their wastewater treatment systems is not increased to meet the TMDL standards 100% of the time. Answer the following questions in your science journal:
  - a. *Why do you think the EPA has placed the six Chesapeake Bay watershed states on a “pollution diet?”*
  - b. *Where could you locate the answer to this question?*
3. Your teacher will assign you to a project team of three to four members. Each team member will have a task: researcher (may have two of these), recorder, communicator. Sit with your team so that all members may talk to each other.
4. Each team is playing the role of a consulting group of city planners and civil engineers. Your team has been hired by the City of Lancaster to design a project to allow the City to solve its wastewater overflow problem at a reasonable cost to the taxpayers. Think about what you saw during the *Combined Stormwater System Simulation* and what you may have observed in your neighborhood during and after a large rainstorm event. Record your observations in your science journal so that you may refer to them later.
5. Before your team begins to work, list the types of information you will need in order to complete the assignment and where you can locate each source of information. Record this information in your science journal.



6. Begin the challenge by brainstorming what you may already know about the wastewater and stormwater that flows down indoor and outdoor drains and into a sewage treatment plant. Complete *Building for the Future* (Student Sheet #1) and share at least one of your answers or ideas with the class by adding it to the chart that has been posted.
7. As a team, research the meanings of the following terms: gray infrastructure, green infrastructure and pervious/ impervious surfaces that are found in urban and suburban areas. You should be able to describe the meanings of the terms and provide an example of each during a class discussion. Complete question #1 of *Meeting the Challenge: Gray vs. Green* (Student Sheet #2), then fill in the table, “Reduction of Wastewater During Wet Weather.”
8. After your team has developed a plan and organized the steps into the table, design a public relations (PR) campaign that will persuade the citizens of Lancaster to participate in reduction of wastewater, even if it will result in slightly higher taxes. Record your public relations plan in your science journal as it will be used again during Learning Experience #2.
9. Imagine that you need to draw a map of the City of Lancaster that includes every building, road, park, tree and parking lot within its borders. How would this task have been accomplished 60 years ago? How would you do it today? Refer to *Techie’s Eye View* (Student Sheet #3) and explore the new kinds of technology that are employed by modern city planners and engineers to develop plans and produce visual images that are used in presentations to clients.