Below you will find the Goals and Standards for each activity presented in the "Catch Up" with John Smith" science section of the Teachers' Lounge at www.missmaggie.org . Here we offer you some tips, suggestions and extension ideas for each activity. You will also find an answer key if appropriate. While the activities presented are designed to be self-guided, we hope you will choose to expand on some of the topics presented through these extension ideas. Have some ideas of your own? Please feel free to share and we will post them here. Contact our Project Coordinator, Jessica Mocarski at Jessica@missmaggie.org

Jerome Bruner said in *The Culture of Education*, "Learning to be a scientist is not the same as "learning science": it is learning a culture, with all the attendant "non-rational" meaning making that goes with it." (pg. 132)

"Women in Science: Dr. Grace Bush"

Goals and Standards:
Students will read about Dr. Grace Brush, a paleoecolgist who studies changes in the Chesapeake Bay. After reading the article, students will demonstrate their understanding by answering both literal questions and those that require higher-level thinking. This activity is available on both the intermediate and primary levels. The activity correlates with Content Standard G, History and Nature of Science, Science as a Human Endeavor of the National Science Standards.

Tips

- Perfect activity to use in March, Women's Month. More activities about women involved in the field of Science can be found in "Maggie's Archival Section" available at www.missmaggie.org/bookstore

- Ask your children to research various female scientists and write a biography. Make a class book containing your biographies.
    - Have children dress as their scientist and give a speech. Imagine a "day in the life of" and write an hour-by-hour account of what their person might do in a typical day. The ideas are endless.
    - Arrange a virtual field trip to a job-site where a female scientist works

- Use paleoecologist as a jumping off point for studying prefixes and suffixes-log on to www.missmaggie.org and play "Short Circuit"

Answer Key: Primary (You will note that the questions begin with cognitive responses that are lower on Bloom's Taxonomy. We 'go up the pyramid' and encourage higher level thinking as your students encounter questions 2 through 4. We have not provided answers for these questions as thoughts may vary.)

1. Students will note that forests have been cut, fertilizers are used, and Bay grass does not grow as abundantly as it once did. There are fewer crabs and oysters.

Answer Key: Intermediate (You will note that the questions begin with cognitive responses that are lower on Bloom's Taxonomy. We 'go up the pyramid' and encourage higher level thinking as your students encounter questions 3 through 5. We have not provided answers for these questions as thoughts may vary.)

1. Students will note that forests have been cut, fertilizers are used, and Bay grass does not grow as abundantly as it once did. There are fewer crabs and oysters.
2. Humans have cut the trees to make room for farms and more recently, for housing and other buildings. They have used fertilizers. Some children may note that boats with motors cause pollution in both the water and air of the Bay.

"Don't Get Caught – Solve the Next Problem, Too!"

Goals and Standards:

Students will complete a science inquiry-based activity about a disease hurting rockfish in the Chesapeake Bay. They are encouraged to use information to form their own hypotheses and to develop a plan to test one of these hypotheses. This activity is available on the primary and intermediate levels. The activity correlates with Content Standard C, Life Science, and Content Standard F, Science in Personal and Social Perspectives of the National Science Standards.

Tips:

- Perfect topic to help your budding scientists develop their inquiry skills.
- Encourage students to identify problems, formulate hypotheses, and design research to help them confirm or deny their "guesses."
- Create an atmosphere where mistakes are looked upon as wonderful opportunities for growth. Model your own errors for children and positively reinforce students who are willing to take chances and make mistakes.
- Color code questions. Those that require a child to come up with an answer "on their own," may be highlighted in blue. This gives a visual clue so they know the answer is not directly stated in the reading material and will often make them feel more comfortable

- Have children break into groups to discuss their answers

Suggested answers and points of discussion-
Teaching note: This disease is called mycobacteriosis epidemic.

To save this fish – answers will vary. Perhaps many children will note that a reduction in fishing could result in a gain in the fish population.

Think about this – Children may think about tags that scientists put on birds to trace migration routes. This can be done with fish.

Hypotheses and plans to prove them will vary. Encourage children to compare answers.

Discuss what issues may occur because of this disease. People may be afraid to eat them in restaurants. Fishers may wonder if diseased fish are safe to handle.

"What Happened to the Chesapeake Bay Filtering System?"

Goals and Standards:
Students will read an article about oysters in the Chesapeake Bay. Follow-up activities involve higher-order questions regarding oyster gardens and decline of the oyster. An inquiry-based approach forms the basis for these questions. The activity is available in both the primary and intermediate level and correlates with Content Standard C, Life Science, and Content Standard F, Science in Personal and Social Perspectives of the National Science Standards.

Tips:

- Point out the importance of making predictions. Not only is this important in science, but children who are good readers are always making guesses.

- Simple statements such as, "Good readers make guesses/predictions as they read" will help children learn how to approach subject-matter text.

- Have children think and make predictions. Encourage them to design ways to solve problems

- Make sure your classroom atmosphere makes children feel comfortable to take academic risks.

Answer Key:
Answers will vary.
Some reasons that oysters are in decline in the Chesapeake Bay include:
Disease (particularly two parasites that kill during their first two years of life)
Over-harvesting
Pollution
Loss of habitat