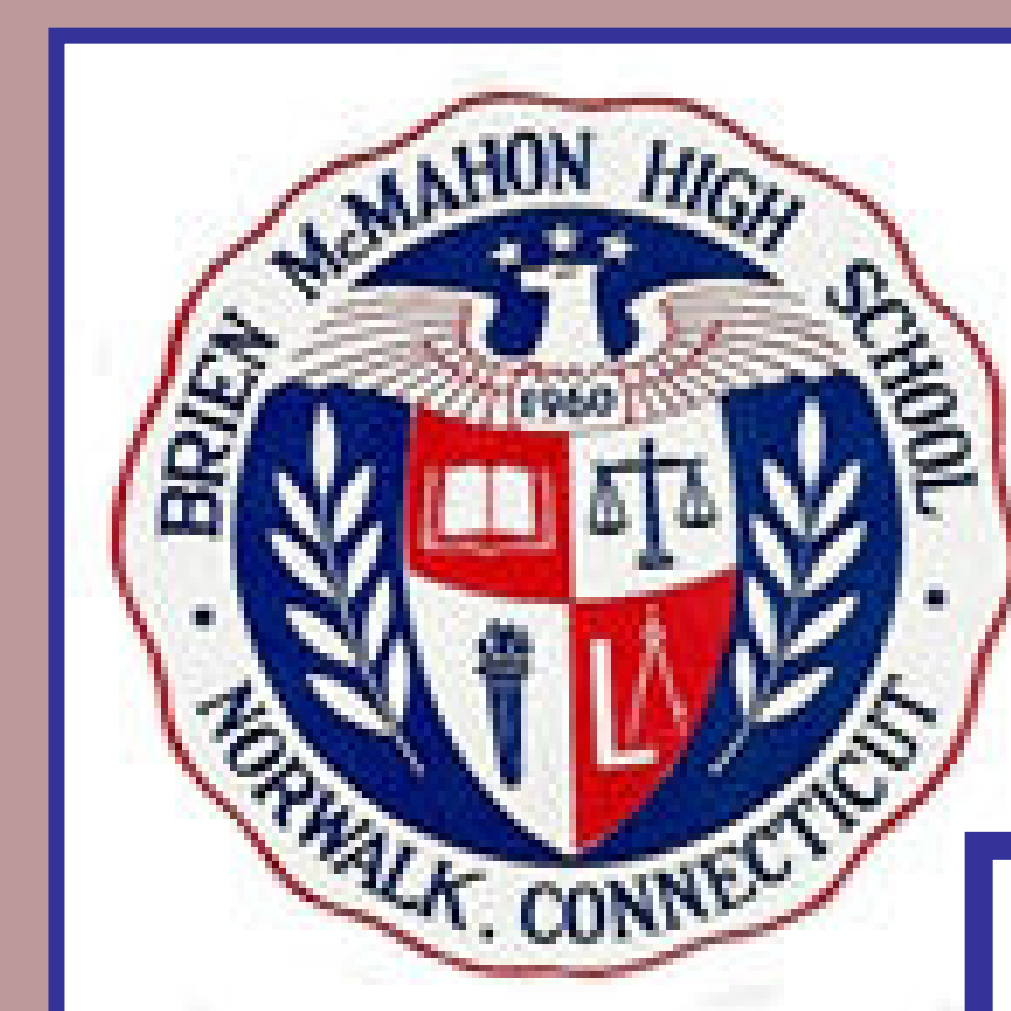


Development of instructional materials to lay foundations for an integrated research experience

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Goal:

I am proposing to develop three (3) tiers of background information regarding polymers:

(1) a teacher resource

- to provide teachers relevant and up-to-date information on the topic of synthetic polymers
- to provide them with resource materials and relevant Internet links to assist in teaching.

(2) a classroom resource

- to provide both teachers and students a PowerPoint resource representing synthetic polymers
- to provide 9th grade students with much needed background information to assist them in meeting the learning objective found in the state-mandated, embedded task entitled Synthetic Polymers.

(3) Once these two resources are created and refined, I would then feel prepared to develop another classroom resource that would address at least three of the INQUIRY standards for the Synthetic Polymer embedded task.

Targeted Content Standard

9.6 - Chemical technologies present both risks and benefits to the health and well-being of humans, plants and animals.

Targeted Scientific Inquiry, Literacy and Numeracy Standards

D INQ. 1 Identify questions that can be answered through scientific investigation.

D INQ. 3 Formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.

D INQ. 4 Design and conduct appropriate types of scientific investigations to answer different questions.

D INQ. 5 Identify independent and dependent variables, including those that are kept constant and those used as controls.

D INQ. 6 Use appropriate tools and techniques to make observations and gather data.


D INQ. 7 Assess the reliability of the data that was generated in the investigation.

D INQ. 9 Articulate conclusions and explanations based on research data, and assess results based on the design of an investigation.

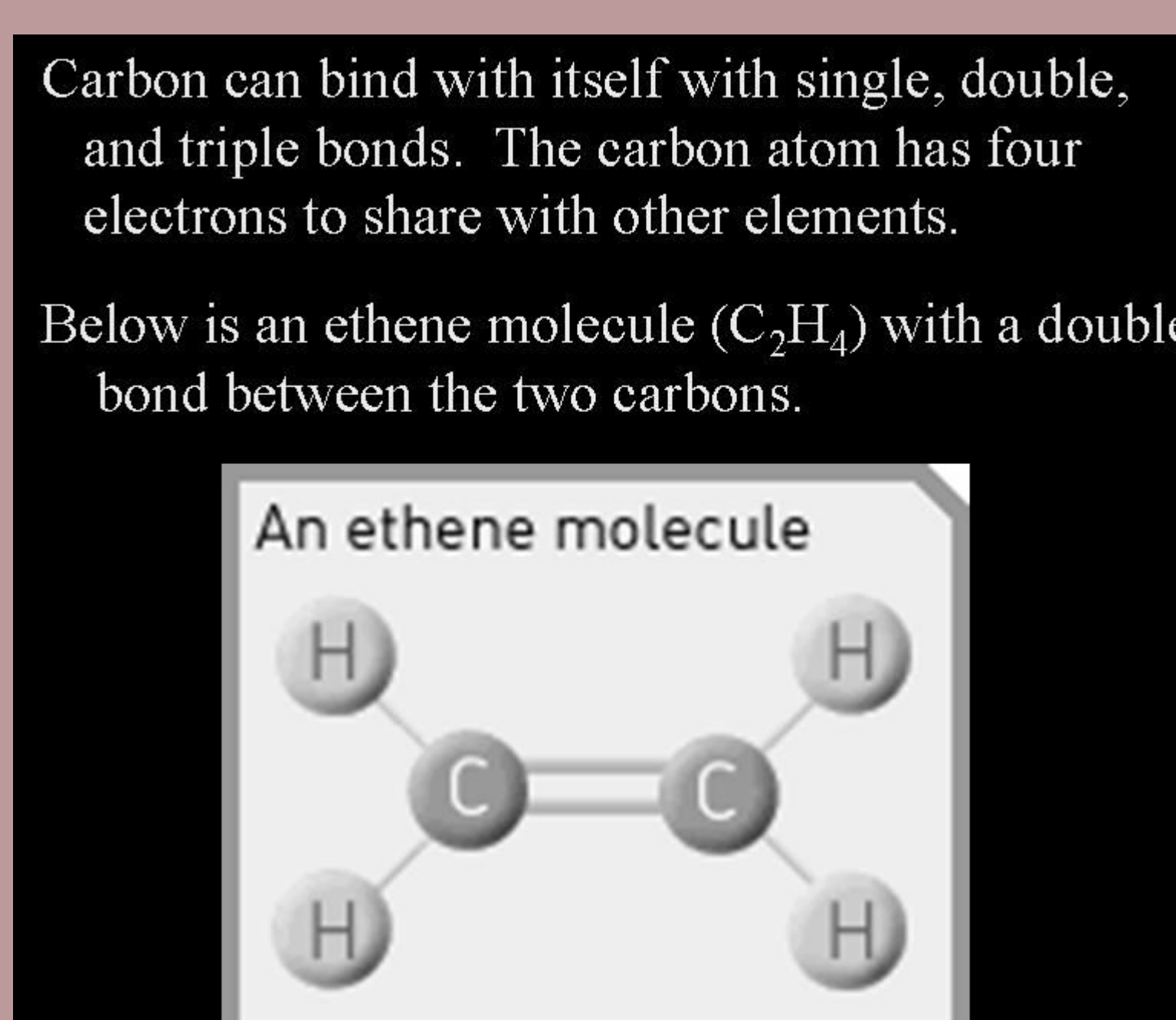
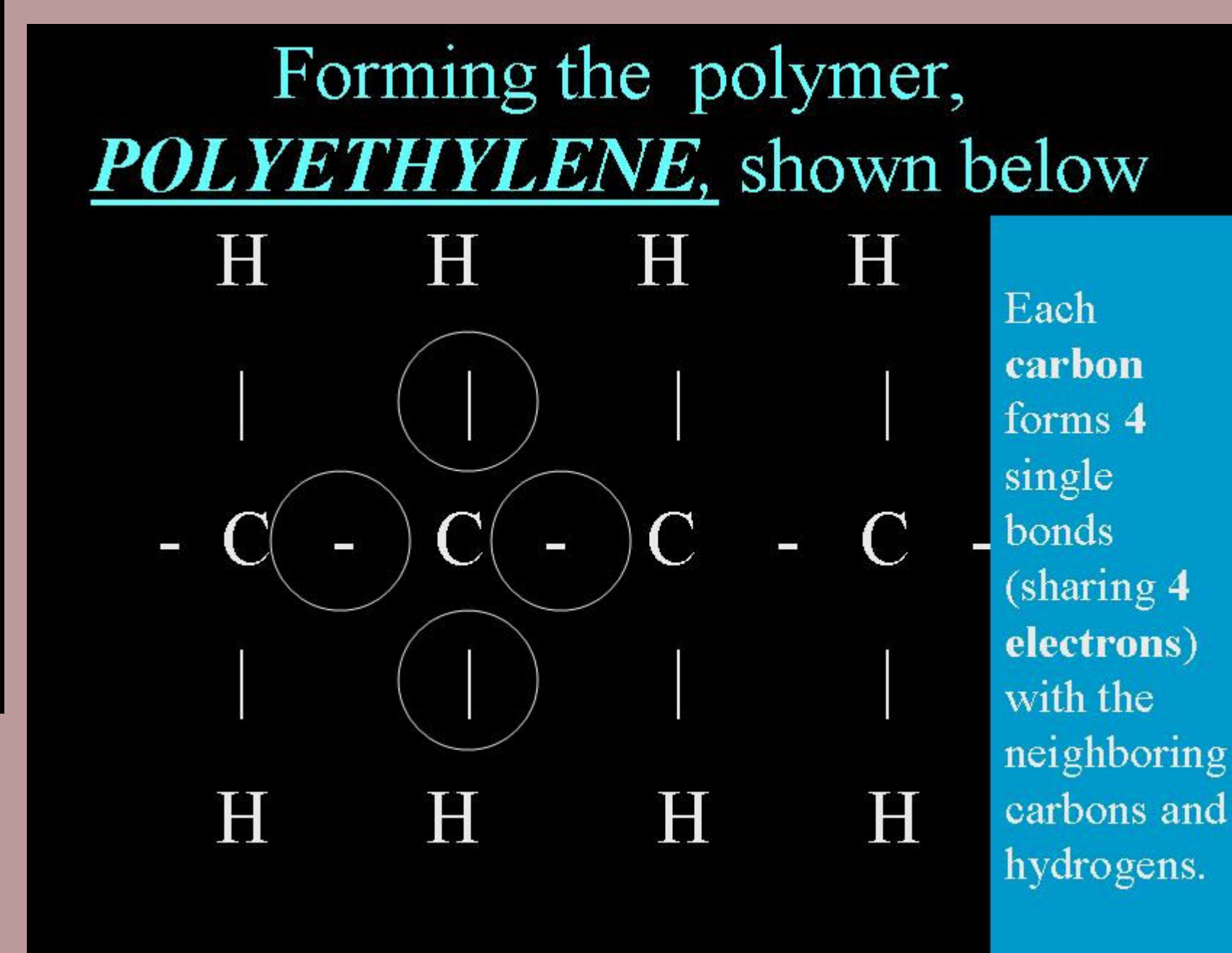
Sample slides from Polymer Basics presentation

SOME DEFINITIONS

Just like a pop-bead necklace is made from many single beads,



a polymer is often a long chemical chain of smaller chemical parts.



Hypothesis:

If these three resources on polymers are made available to teachers and if teachers utilize these resources while they are teaching the Synthetic Polymer unit, students will be able to understand polymers more completely. This understanding should be measurable using the Norwalk district-wide assessment tool, administered after the Chemistry Strand, as well as student achievement the following year in the state-wide CAPT.

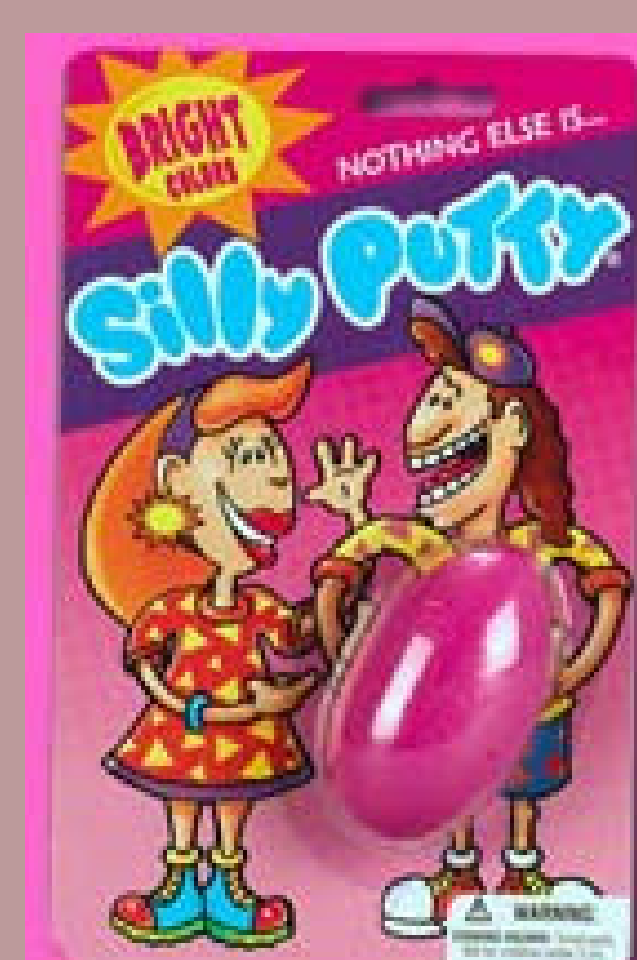
Outcomes:

*Preliminary qualitative assessment based on teacher observations.

1. Teacher confidence about teaching the polymer unit increased.
2. Students discovered that polymers are significantly present in everyday life, in obvious (plastics and textiles) and not-so-obvious ways (DNA, starch, cellulose).
3. Exposure to university research in Dr. Frederick's lab helped students grasp the importance of gaining basic understanding of polymer chemistry.
4. Results from the Norwalk district-wide assessment tool and state-wide CAPT are not yet available.
5. More assessment will be needed over time to see if the experience carries any long-term effects (greater percentage of students pursuing science degrees and careers, for example).

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Examples of common polymers

