Name: Date: Class:

Bacterial Adaptations and Their Application in Genetic Engineering: Student Lab Sheet Part 3

PART 3 – RESEARCH & PRESENTATION

Genetic engineering is the deliberate modification of the characteristics of an organism by manipulating its genetic material. It involves the group of techniques used to cut up and join together genetic material, like DNA, from different biological species, and to introduce the resulting hybrid DNA into an organism in order to form new combinations of heritable genetic material. The process of genetic engineering is used to create genetically modified organisms.

A GMO (**genetically modified organism**) is the result of a laboratory process where genes from the DNA of one species are extracted and artificially inserted into the genes of an unrelated plant or animal. The foreign genes may come from bacteria, viruses, insects, animals or even humans.

Some examples of genetically modified organisms are a papaya bred to resist a deadly plant disease and rescued the Hawaiian papaya industry and saved the livelihoods of thousands of small farmers, apples that stay ripe longer, reducing food waste, and a drought resistant maize that can provide an extra nine months of food for farming families.

You will now research different types of adaptations found in organisms in all kingdoms, (specifically those living in extreme environments) and brainstorm imaginative ways we could incorporate some of those adaptations to create genetically engineered organisms that would benefit humanity.

Directions:

Work with a partner to research adaptations of organisms in extreme environments. Once you have enough information, create a poster creatively illustrating and explaining your GMO ideas in detail. Use the rubric below while working on your research and poster.

Requirement	Possible Points	Points Earned
Title and the names of your group members.	10	
Drawing of the genetically engineered organism with an explanation caption.	10	
Explanation of the GMO – What is it? What organisms were used? What specific adaptation did you add to what organism and why? Be specific!	40	

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At least three benefits of the GMO.	15	
At least two possible drawbacks of the GMO.	15	
Professional and neat display of material.	10	
Total		