

Project Jurassic Park:

A different way of approaching the field of genetics and new advances in biotechnology

After reading "Jurassic Park", I was very impressed with Michael Crichton's ability to blend science and suspense- so impressed that I had to look up the author. It turns out that his dramatic ideas are very accurate for a reason; Crichton is a graduate of Harvard Medical School!

The premise of the novel is discovering the ability to recover and clone fossilized dinosaur DNA from the abdomen of fossilized gnats and mosquitoes preserved in amber (fossilized tree sap). There is a high degree of biotechnological applications as these genetic engineering procedures are explained.

I hope you enjoy the novel, but I also hope you start to view the process of science in a different manner than what you traditionally do.

REQUIREMENTS FOR THE NOVEL "JURASSIC PARK" BY MICHAEL CRICHTON

By April 13th, you will have read this novel combining both adventure and science. Although the novel is currently science-fiction, nothing about it is entirely outside the realm of possibility. Much of the novel is based on tested scientific principles, especially in the field of genetics. As you read through the novel, please keep in mind the following underlying themes:

1. The use of biotechnological advancements in science (mostly in genetics). Should there be a limit? Who shall decide what should and should not be allowed?
2. The evolution and behavior of dinosaurs. What are the latest theories on their existence?
3. The scientific theory of chaos. What does it attempt to explain? What are its implications?

ACCOUNTABILITY:

You are not required to do this. You may choose to write your remaining lab reports as originally required. If you cannot write a report for a lab in class, you may choose to write a lab report for any of the experiments performed by the many scientists discussed in this class over the course of the school year (Pasteur, Redi, Mendel, Chargaff, Griffith, Avery, Watson & Crick, Hershey & Chase, Darwin, - just to name a few!).

If you did not pass two lab reports from the first semester, you must pass three by the end of the spring semester (read your contracts). If you passed one from last semester, you have a remaining two lab reports. If you decide to do this project, it will replace **two** lab reports. So, if you have not passed a single lab report this year, you can do this project but still must turn in and pass one lab report.

The Project

- A Summary/review and Answers to provided Questions about the book
- A three page paper on the biotechnology/genetics concepts of the book

Part 1: Summary & Questions

Write a one page, single spaced summary (Times New Roman, size 12 font, 1 inch margins) of the plot of *Jurassic Park*. In this one page, include a review of the book (your reaction, its role in how you view science in our world, recommendation to other readers, etc.).

Questions (Moves through the book chronologically)

Explain how the biotechnological revolution is different from past scientific changes in the world.

What problems can be foreseen in biotechnology?

What type of animal did the lizard-like creature that Tina plays with resemble?

Why is Costa Rica ecologically unique?

Describe what Alice Levin suspects from the lizard sample. What leads her to her hypothesis?

Describe the professions of Dr. Grant and Ellie.

What is amber?

Describe the discovery Grant and Ellie make from the fax message.

Who is Hammond and what does he want from Grant?

Describe the CAST system and how it will revolutionize fossil hunting.

Describe the body plan (adaptations) of a velociraptor.

How can dinosaur DNA be recovered?

Explain Malcolm's profession.

Explain the basis behind Malcolm's prediction for Hammond's Island.

Explain the theory of chaos (use the weather as an example).

Describe some of the new theories which have been developed to help explain dinosaurs and their behavior.

Where has the dinosaur DNA been coming from? Who is Dr. Wu?

Why are the scientists not concerned with analyzing the entire strand of dinosaur DNA?

Explain phylogenetic mapping using DNA sequences.

Describe the two ways Dr. Wu has attempted to prevent the dinosaurs from breeding.

Describe the basic purpose of the procompsognathids on the island.

How have the scientists genetically altered the DNA sequence to prevent the dinosaurs from living in the outside world? Where is the lysine found?

Who is Muldoon? Explain his problems with the park.

Which dinosaur was responsible for the death of the construction worker early in the novel? How is this dinosaur adapted for hunting?

What evidence does Grant uncover pointing towards the dinosaur population breeding?

How does Malcolm explain the problem with the computer dinosaur tracking method? What does this data confirm?

Describe Nedry's fate.

What does Grant find about the baby velociraptor. Why is this so important?

Describe Malcolm's view of "scientific power" and the problems associated with it.

How would Malcolm react to the following quote, "Science has always said that it may not know everything now but it will know, eventually."

Explain why it is so difficult to predict animal behavior.

Why does Malcolm feel that the planet Earth is not in any state of jeopardy? What actually is in jeopardy?

Describe the special quality some amphibians and other organisms have when it comes to reproduction?

Describe the conclusion of the novel as to the fate of the island, dinosaurs, and the surviving characters.

Extension (short answer – typed):

A. Explain, in detail, the reasoning behind supplementing the dinosaur's diet with the amino acid lysine. Include in your explanation the basic process of protein synthesis.

B. Since much of the dinosaur DNA recovered from the abdomens of biting insects is fragmented (missing some nucleotides), explain how the correct sequence is made? Hint: Dr. Wu is in charge of the process. What genetic engineering procedures from class tie in to this? Describe each process.

C. Explain how Malcolm, viewing the following Height Distribution graph (found in any normal, healthy biological population), reinforced his theory that something was going wrong with Jurassic Park.

D. How does the procompsognathids' role on the island relate to ecological balance? Explain.

Part 2: Essay

Write a three page paper (Times New Roman, 12 pt font, 1 inch margins) answering this question. Include at least three additional sources apart from *Jurassic Park*. Use APA citations.

Jurassic Park by Michael Crichton discusses the several potential uses of biotechnological advancements in science. Geneticists are making significant breakthroughs in understanding and manipulating genes. Should there be a limit? Who should decide what should and should not be allowed? Provide evidence both for your claim and the counterclaim.

ENJOY THE BOOK!