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TE 861B: Report on a Book Describing Scientific Inquiry

I. Selecting a Book to Read

Even when we read a lot about science, we often don't learn very much about the work of the scientists who developed that knowledge. The purpose of this assignment is to give you a chance to read and reflect on the work of scientists, based on a book that provides a detailed account of that work.

You will find a list of books that provide the information you need for an analysis of scientists' work at https://www.msu.edu/course/te/407/FS05Sec3/te407/tradebooks.htm. Although all of the books are adequate for this assignment, I think that some work better than others. They are marked with a "Recommended" box. In particular, these are books that I really like:

Chemistry
- Uncle Tungsten, by Oliver Sacks
- Transforming Matter, by Trevor Levere

Biology
- The Beak of the Finch, by Jonathan Weiner
- The Growth of Biological Thought, by Ernst Mayr (focus on one section)

Earth Science
- The Ice Finders, by Edmund Bolles
- Devil in the Mountain, by Simon Lamb

Interdisciplinary, environmental science
- The Discovery of Global Warming, by Spencer Weart
- Collapse, by Jared Diamond (focus on one section)

II. Brief Report

Book that you chose: The Beak of the Finch, by Jonathan Weiner (Part One)

Part I: Summary of the Reading

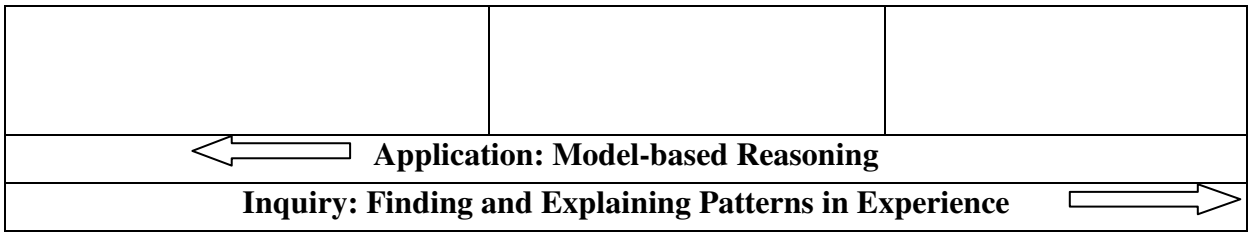
Write a brief summary of your trade book here. What was this book about?

The Beak of the Finch by Jonathan Weiner is about a group of scientist who travel to the island of Daphne Major to study Darwin's finches. The research started with Peter and Rosemary Grant. They collected data about the finches and compared it to what Darwin had collected. They claimed that Darwin never realized what he had started and the finches were more than Darwin had realized. They learned that evolution doesn't have to take place within years but it can happen right in front of you. There were many other scientists who continued the Grants research, including the Abbotts, Peter Buag, Laurence Ratcliffe, Trevor Price and Lisle Gibbs.

Part II: Finding Experiences, Patterns, and Explanations in the Trade Book

Use the table below to record the observations, patterns and theoretical models (as described in *TSMU*) that you uncovered in the trade book. You may find that different sections or chapters of the book describe different episodes leading to the development of different models. If this is the case, choose one episode to focus on.

Observations or experiences (examples, phenomena, data)	**Patterns (laws, generalizations, graphs, tables, categories)**	**Explanations (models, theories)**
Measuring and classifying birds that have been caught and tagged for future date pg. 4-6 Measuring finch behavior pg.56 Volume of finch food down by 84% pg. 59 Observers taking a census pg. 77 Beaks change color when ready to mate pg. 80 Marking nests with red flagging tape pg.84 Measuring finch chicks at 8 days old to compare later pg.84	4 of Darwin's finches: pg. 18 1- large ground finch 2- medium ground finch 3- small tree finch 4- warbler finch Darwin's Ground Finches: pg. 41 1- medium ground 2- large ground 3- sharp beaked ground 4- small ground 5- large cactus 6- cactus Not every small young finch survived, and not every big young finch died, but the small were most likely to succeed. Pg. 85	Variations are the cornerstones of natural selection pg. 37 4 genera of Galapagos finches: pg. 42 1- birds all live in tress and fruits and bugs 2- birds also live in trees- but strict vegetarians 3- birds live in trees but look and act like warblers 4- birds spend most of their time hopping on the ground Favorable variations will be more likely to be passed down. Pg. 66 Natural selection by itself is not evolution. Pg.79 Individual birds had not changed but the cohort as a whole did pg. 84-85 Bigger birds couldn't crack the big hard seeds because the beaks were still soft pg. 85 Bigger is not always better pg.85



Part III: Reflecting on the Activity of the Scientists

Think about the activities of those actually engaging in the science in the story. Did you see examples where they were engaging in inquiry (developing models by finding and explaining patterns in data), application (using models to predict or explain new data), or both? Write a paragraph or two highlighting one example of where the scientist(s) in the story were engaging in inquiry.

The scientists had measured out 8 sites of 23 thousand square meters. They then made a grid of reference points by red flagging hundreds of cactus bushes and trees. They then would keep watch with binoculars and keep track with stopwatches and a notebook to see what the finches ate for breakfast. They found that the finches were eating about 2 dozen different kinds of seeds. Pg. 56-59

Part IV: Comparing the Scientists' Activities with Your Definition of Inquiry

Compare the description of the scientists' activities with the features of inquiry that you listed in your initial survey. Describe one way in which reading this report helps you to modify or extend your definition of inquiry.

My original idea of inquiry was that it gives students ownership and empowerment in their learning. It let's students formulate questions about the world. Inquiry also let's students discover or investigate the answers to the questions and it let's students explore science beyond the covers of their books. I think this book is exactly that. These scientists definitely took ownership in their research and they were investigating the answer to some of the questions or ideas that Darwin had started.

Part V: Implications for your Teaching

Brainstorm and describe the usefulness of this book in your future teaching. What did you learn that might be helpful to you as a teacher? What are the various ways in which you might use ideas or examples from this book?

In my classroom this book itself would be very difficult to use. The reading level and the content of this book would be too difficult for my students. I would

not use this typical book but if I could find maybe some trade books or some non fictional informational books from great companies such as Time Life for Kids or Scholastic. I can use the ideas and the concepts that were given in the classroom. For instance the research and study of birds and how thing evolve can be used with my class. I could have my students do this as an inquiry experiment and make scientific guesses and gather information to either prove or disprove what they had believed were reasons for change. If I was a high school teacher then maybe I would be able to use this book more in depth but for the class that I teach than this book is not really as useful as other things that I may be able to find for my students.

Turning in the Report

When you turn in the report to the dropbox, add your last name to the beginning of the file name. So a report that I turned in would be named GotwalsTradeBookReport.doc, for example.

Scoring Rubric: Total points = /100

Component	***Points***	***Comments***
Summary of book 20 points)		
EPE Table (15 points)		
Reflecting on activity of scientists (20 points)		
Comparing activity of scientists (20 points)		
Implications for teaching (25 points)		