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School: Michigan City High School

Grade level for this unit: 9th Physical Science

Title of Lesson: From Idea to Invention: The Wright Brothers

Brief summary of lesson: Using the Wright Brothers and their airplane as an example, this lesson is designed to use primary source documents (the picture of the Wright Brothers' airplane and their journal) to reinforce how inventors and scientists transform an idea to a working invention. This lesson serves as a simple beginning of the year review of the importance of the scientific method and keeping accurate and detailed notes, as well as an introductory lesson in flight.

Topics covered: how scientists and inventors think, the scientific method, scientific inquiry, importance of record keeping, basics of flight

List of Materials / Supplies:

Wright, Wilbur, Orville Wright, and John T. Daniels. *First Flight, 120 Feet in 12 Seconds, 10:35 A.m.; Kitty Hawk, North Carolina*. 1903. Photograph. Library of Congress Prints and Photographs Division, Washington, D.C. 20540 USA. *Library of Congress*. Web. 2 Aug. 2012. <<http://www.loc.gov/pictures/item/00652085/>>.

Wright, Orville, and Wilbur Wright. "Diaries and Notebooks: 1903." 1903. MS. Library of Congress, Washington D.C. *Library of Congress*. Web. 2 Aug. 2012. <<http://memory.loc.gov/cgi-bin/ampage?collId=mwright&fileName=01/01007/mwright01007.db&recNum=27&itemLink=r?ammem/wright:@field%28DOCID+@lit%28wright002238%29%29>>.

Procedures or Steps:

1. Pass out the photograph “*First Flight*”. Ask students if they recognize the picture and discuss what they know about the first airplane and flight in general. How similar is this to the modern airplane? How and why does an invention change over time?

Divide students up into small groups and have them brainstorm how an inventor would go from a concept such as flight, to an invention such as the airplane using the following guiding questions: What steps might be involved in their idea that a flying machine could be built to their final invention? What must be known about flight before the Wright Brothers could build such an invention? Where and how do you think the Wright Brothers got their ideas on how to build an airplane? How long do they think it took to go from idea to the final product?

2. After students have had time to discuss the picture and the questions, pass out pages from the diary of the Wright Brothers. Ask them to look over the manuscript and discuss what they think are reading and what they notice about the style and format. Students will identify what they are reading as pages from a journal or lab notebook describing specific experimental conditions as the Wright Brothers were designing and testing their flying machine.

After discussing the previous points, have students read deeper into the manuscript, noticing why they think it was written, what was going on as it was written, and why were these details recorded. What did the Wright Brothers know about flight at this point in their work? Knowing what we know today, what did they still have to discover at this point? Have them jot down any questions they have as they discuss in their groups to discuss later in the period.

3. Come back together as a large group, discussing the findings of the small groups, addressing questions, etc. Make sure specific aspects and details are discussed, including what the Wright Brothers knew about flight as they were doing their research compared to what we know today and why they wrote what they did in this journal.