Group Project 1: Titan, the journal article

How do scientists communicate with each other? Unlike the Middle Ages, when alchemists and astrologers jealously guarded their (untrue) secrets, modern scientists share a significant amount of the information they uncover in the course of their research. Scientific conferences feature both talks and posters, which encourages face-to-face discussion of topics. More often, though, scientific research is published in journals (sort of a trade publication for science). When a scientist submits a manuscript to a journal, the journal editor sends the manuscript to specialists in the scientist’s field who review the work. Often, manuscripts are rejected at this stage because, in the opinion of the reviewers, the evidence the scientist presents is insufficient to justify the scientist’s conclusions. After revising the manuscript, the journal may accept the manuscript and publish it; on the back of this sheet is a successful publication.

Your project is to look at the Nature article (Nature is a prestigious British journal), choose one of ten topics for discussion, do some research on it and present your findings to the class in an oral presentation, accompanied by at least one visual aid (poster, drawing, website, overhead transparency, etc.). Your research notes will comprise the written portion of this project and will also be turned in.

Day 1 (Thursday): Break up into groups of three or four. Introduce yourselves and figure out some way of communicating with each other outside of class so that both of you know who is doing what over the weekend and next week. List all of your names on a sheet of paper. Look over the first page of the Nature article (attached), especially the ten circled areas, and choose three circled areas that would be interesting to you to investigate. Write your choices down on the sheet with the names and turn it in to me. To avoid overlap, I will choose one statement from your list such that all groups end up investigating different statements. Over the weekend, research the questions associated with that number (see list below).

You can start by either reading the rest of the article, reading the textbook (or any of the textbooks at the front of the classroom), or doing some Googling.

Questions:

1. What does this term mean? How is it measured? What sort of scale is it reported on? What is it used to determine?

2. What does this term mean? Give an example of a feature created by this process on Earth. How can the authors tell that this process is occurring on Titan?

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6. How did the authors plan to detect liquids on the surface? What prevented them from doing so?

7. What does this term mean? Give an example of such a thing on Earth. How can the authors tell that this occurs on Titan?

8. How do the authors infer such a thing? And how do they get a numerical measure of the speed?

9. What is needed for a photochemical reaction to occur? What is a hydrocarbon and why does it block visible wavelengths? And what is a “photochemical lifetime”?

10. In what ways does Titan resemble the early Earth (define “pre-biotic”)? How do we know anything about the atmosphere of early Earth?

Day 2 (Tuesday): Meet in groups again to share the answers, and figure out what can be discussed in a three-minute talk. Determine who will be doing the presentation and what visual aid(s) will be used. Over the next day, make the visual aid and write down or type up a set of notes for the presentation. Make sure the sources of your information are given credit (i.e., keep track of your sources). The written portion will be turned in, so make sure it is reasonably organized and neat (especially if it is handwritten). It might work best if one person is given all the group’s notes at this point to organize into a report, while someone else develops the talk and another person makes the visual aid.

Day 3 (Thursday): Give a three-minute presentation to the class on your statement. This may be done with all members taking turns talking, or just one member presenting. Make sure to introduce all members of the group, however. There will be a short question-and-answer session after each presentation.

• Turn in the written summary, along with a bibliography. Make sure the names of all group members who contributed to the presentation are on the summary. The bibliography should contain the author, title, publisher and publication date of the textbook(s) you used and/or the author or sponsoring organization, the URL (i.e., http://...) and the last update date of the website(s) you used.