

Text Complexity Analysis of

Finding the Origins of Life in a Drying Puddle (*title*)

John Toon and Rob Margetta (*author*)

Recommended Complexity Band: 11-12

Qualitative Measures

Meaning/Purpose: (*Briefly explain the levels of meaning (Literary Text) or purpose (Informational Text.)*) The purpose of this article is implied in the title. The article explains new evidence that could help scientists better understand how life formed on early Earth. Specifically, the article discusses how polypeptides, the subunits of proteins, can be formed simply by going through cycles of wet and dry conditions.

Text Structure: (*Briefly describe the structure, organization, and other features of the text.*) This article is written using mostly descriptive and cause/effect text structures. The authors discuss the process that scientists went through to discover a new way to produce polypeptides. The article has section headings that help readers follow the transition between ideas in the text. In the online version of the article, there are also some additional pictures and a video to increase understanding of the text's content.

Language Features: (*Briefly describe the conventions and clarity of the language used in the text, including the complexity of the vocabulary and sentence structures.*) The text includes many abstract concepts. The chemistry and biology vocabulary are quite complex. The article uses many domain-specific words (e.g. *polypeptides, amino acid, hydroxyl acid, polymerization, ester, prebiotic, catalytic*) and academic words (e.g., *theory, activating, pristine, synthesize, subjecting, robust, synthetic, emergent*). The text uses mostly compound and complex sentence structures.

Knowledge Demands: (*Briefly describe the knowledge demands the text requires of students.*) Students will need a strong background on the basic organic macromolecules that are needed for life. Knowledge of basic chemistry and bonding will also be necessary for students to truly comprehend the experiment. In addition, students should also be knowledgeable about the current theories for the origins of life (they are referenced in the article).

Text Description

Briefly describe the text: This text is designed to support reading in the content area. The article describes how researchers at Georgia Tech have discovered that polypeptides, which are the main component of proteins, can be formed by mixing amino and hydroxyl acids, and then simply putting them through wet and dry cycles. This would be a more plausible way for early prebiotic molecules to form. Previously, the only way to produce polypeptides involved boiling temperatures, which are not conducive to life.

Quantitative Measures

Complexity Band Level (provide range): Above 11-12

The text falls above the 11-12 grade band according to a quantitative reading measure.

Considerations for Reader and Task

Below are factors to consider with respect to the reader and task.

Potential Challenges this Text Poses:

The biggest challenge of this text is the prior knowledge needed to truly understand the complex and abstract topics and key points presented in the article. A basic chemistry knowledge is a must. In addition, students must be knowledgeable about previous origins of life theories. For example, students need to have a very basic understanding of the Miller and Urey experiment about producing organic molecules from inorganic molecules. Struggling readers may need assistance with the large numbers of complex domain-specific vocabulary, as well as some of the academic vocabulary with multiple meanings.

Recommended Placement

Briefly explain the recommended placement of the text in a particular grade band: . The quantitative measure places this article beyond the 11-12 grade band. Students that have a basic understanding of chemistry and previous theories on the origins of life will be able to comprehend the topics in the article. Due to the complexity and degree of background knowledge needed to fully grasp the key points of the text, this article is recommended for the 11-12 grade band.