Nature of Science and Math: Article Review

In Coral Skeletons, Microscopic Portraits of Resilience?

Part A: Nature of Science

- Scientific Knowledge is Open to Revision in Light of New Evidence.

This article discusses the current debate regarding the process by which coral produces its exterior skeleton (calcification) and whether or not the increasing acidity in the sea water will affect that process. Therefore, there is new evidence suggesting that, regardless of the acid levels in the sea, coral will still be able to find a way to grow back any lost skeleton material. This biological process study has created new evidence, creating a potential revision to the previous scientific knowledge.

- Scientific Knowledge Assumes an Order and Consistency in Natural Systems

A scientist quoted in this article, Alex Gagnon, believes the increased carbon will greatly impact the calcification of corals and bases his facts on a natural order of systems existing in the world today.
“Acid dissolves calcium carbonate, so the more acidic the ocean is, the more difficult it is for corals to organize that first bit of skeleton” (Yin, 2017, paragraph 14). This scientist is assuming that the order and consistency of the given information regarding natural systems will work for the debate regarding calcification of corals in the sea.

- Science Addresses Questions about the Natural and Material World

This article is directly addressing questions about the natural and material world and, more specifically, the interaction between the natural and material world. The debate between scientists almost seems as though they are arguing between whether the calcification is due to nature or nurture, to make a comparison.

Part B: Common Core Mathematics Practices

- Reason abstractly and quantitatively.

The debate among scientists regarding the calcification of coral skeletons exists *only* because they must make reasonings both abstractly and quantitatively. They admit that part of the calcification process is invisible and unknown to them (abstract), although they are able to confirm the fact that increased acid in the sea does lead to a slow down of calcification. The debate then leads to whether or not a continued increase in acid in the salt water will further the slow down or if the biological processes innate in the corals will allow their exteriors to continue to grow.

- Look for and make use of structure

"Mathematically proficient students look closely to discern a pattern or structure" (Standards for mathematical practice, 2018, paragraph 8). By closely investigating the structure and pattern of calcification on the corals, the scientists had a basis for which to hold their argument in support of the biological processes of corals. By using microscopic images, they were able to use the coral's structure in their defense.

- Look for and express regularity in repeated reasoning

This math tenet was shown in the article when speaking with the scientists who believed the increased carbon would have a severely negative affect on the corals. They used repeated reasoning by seeing the correlation between past environmental hazards affecting the corals and relating those reasonings to this situation. In addition, they linked their past experience with increased acidity negatively affecting the formation of calcium carbonate on corals, which shows repeated reasoning skills.

References

Yin, S. (2017, June 01). In Coral Skeletons, Microscopic Portraits of Resilience? Retrieved September 18, 2018, from https://www.nytimes.com/2017/06/01/science/coral-skeletons-ocean-acidification.html?ribbon-ad-idx=8&rref=science&module=Ribbon&version=context®ion&action=click&contentCollection=Science&pgtype=article

Standards for Mathematical Practice. (n.d.). Retrieved September 18, 2018, from http://www.corestandards.org/Math/Practice/