Writing Analysis Activity

Before you do this assignment, review the science paper category descriptions from the main assignment document.

This activity contains two examples of student written science arguments. Your task will be to analyze the statements to determine the quality of the writing. This will be determined by how each sentence relates to the six kinds of statements that make up a science argument. Notice whether each sentence is in its proper place in the paper and whether the interpretations are supported by observations, or data. The quality of the presentation of the data and scientific discussion in the two papers varies widely. The figures have not been included and we will take it as "given" that the figures are of acceptable quality.

You will focus on the Observations and Interpretations sections of the two papers. Each sentence in the Observations section is labeled as O-?, where ? indicates a number. In the Interpretations section, sentences are labeled as I-?. Next to the sentence label is a place to enter the argument category number (1 to 6) and described in the category descriptions in the main assignment document. Notice that the sentence label and category labels are at the beginning of each sentence.

Is it an observation or an interpretation?

Read the two papers and classify each labeled sentence according to the six argument categories. Ignore sentences that don't fit any of the argument classifications. A sentence may contain information that pertains to more than one of the argument categories. When that happens, enter both category numbers.

Students' note: neither of these papers are particularly good examples of science writing, but one is better than the other. So, paraphrasing this writing is not advisable..

Paper 1:

Introduction
The area of study is the Kurile trench, identified as a small area on the class CDROM (Fig. 1). This area corresponds to a plate boundary thought to exist by geologists between the Pacific plate and the Indo-Australian plate (Segar, p.62). The data collected supports the theory of plate tectonics at a convergent plate boundary.

Methods
The data includes topographical profiles created through the ETOP05 elevation dataset which consists of digital elevation data of sea floor and land. The sources for this data come from: Ocean Areas—US Naval Oceanographic Office; USA, W. Europe, Japan, Korea, US Defense Mapping Agency; Australia: Bureau of Mineral Resources; New Zealand: Department of Industrial and Scientific Research; US Navy Fleet Numerical Oceanographic Center. Gridded data varies in resolution from 5 minutes latitude/longitude to 1 degree. Earthquakes are from USGS preliminary determination of epicenters and volcano data are from the Smithsonian Institution Volcano database.

Observations
(O-1) (category #:__)Three profiles taken along the coastal region of the Kamchatka Peninsula display the

topographic features of an oceanic trench (see Fig. 2 for profile locations). (O-2)(category #:__) Thousands of volcanoes exist parallel to the trench and 200-400 km inland (Fig. 2). (O-3)(category #:__) The trench lies at 60 degrees N latitude and 160 degrees E longitude and extends for 2,200 km in length along this coast. (O-4)(category #:__) One profile displays the gentle upward slope of the Pacific Ocean Basin which then becomes drastically altered by the sudden drop-off of the trench (Fig. 3). (O-5)(category #:__) Following the trench, a virtual linear rise occurs as the profile moves northwest and inland. (O-6)(category #:__) A second profile confirmed the presence of the trench 500 km to the south of the first profile, but showed a 400 km long basin located behind the vertical rise of the volcanoes. (O-7)(category #:__) The basin dips 3,000 m below sea level (Fig. 4).

(O-8)(category #:__) A third profile shows both the existence of the trench another 250 km to the south and the land features described by the first two profiles (Fig. 5).

(O-9)(category #:__) Earthquakes' foci were also plotted along the same path as the middle topographic profile of the Kamchatka coast. (O-10)(category #:__) The plot shows earthquakes occur consistently along this trench (Fig. 6). (O-11)(category #:__) A cross section of earthquake activity along the middle profile shows a descending pattern of earthquakes to depths of 600 km (Fig. 7).

Interpretations
(I-1)(category #:__) Areas such as the Kurile Trench along the Kamchatka coast show the characteristic patterns of a continental convergent margin between two plates. (I-2)(category #:__) In this scenario, a plate containing oceanic crust collides with a plate made of continental crust. (I-3)(category #:__) One of the plates descends beneath another, into the Earth's asthenosphere (Figure 8).(I-4)(category #:__) A topographic trench is formed where one of the plates begins its descent. (I-5)(category #:__) This process is called subduction. (I-6)(category #:__) The sinking plate causes a corresponding pattern of deep earthquakes along its boundary. (I-7)(category #:__) Melting magma along the upper edge of the plate rises to the surface, creating volcanoes. (I-8)(category #:__) Figure 9 shows a cross-section diagram across the middle profile, showing the subduction model and observations of topography, quakes, and volcanoes that occur in agreement with the model.

Paper 2:

Introduction
I will discuss the motions of the plates and their effecting result on the sea floor and the Earth. At the center of my discussion will be the Mid-Atlantic Ridge and why it has formed into an S shape. It is an underwater mountain range, also known as an oceanic divergent margin.

Observations
(O-1)(category #:__) The Mid-Atlantic Ridge is a very interesting part of our Earth. (O-2)(category #:__) It is an underwater mountain range, also known as an oceanic divergent margin. (O-3(category #:__)) This ridge runs north to south down the center of the Atlantic from the North Pole to Antarctica. (O-4)(category #:__) Many different plates meet at the ridge including the North American, the Eurasian, the South American, and the African Plate. (O-5)(category #:__) The ridge extends at one point as deep as 5,625 m below sea level. (O-6)(category #:__) It stretches east to west from Europe and Africa to the east coast of the Americas, 2,547 km. (O-7)(category #:__) This is evident in Fig. 1.

(O-8)(category #:__) An oceanic divergent margin means that the plates, which form the Earth, meet and disperse in opposite directions. (O-9)(category #:__) The resultant gap from these diverging plates is filled up with uprooted, low density magma. (O-10)(category #:__) This process leads to the series of volcanoes which form into a ridge in the gap left by the plates. (O-11)(category #:__) This process is known as sea floor spreading. (O-12)(category #:__) This is also illustrated in Fig. 1. (O-13)(category #:__) The aging crust then sinks steadily down, while the mountains in the ridge slowly move outward while new ones fill in their place.(O-14)(category #:__) The mountains move in the direction of the plate. (O-15)(category #:__)This part of the process, combined with narrowness of the Atlantic and the shape of the continents, leads to the S shape formed by the ridge.

Interpretations
(I-1)(category #:__) My study shows the Mid-Atlantic Ridge is an oceanic divergent margin that is formed

in an S shape due to many different factors including ocean size, plate motion, volcanic activity, and sea floor spreading. (I-2)(category #:__) This is proven by the data gathered from the map program and is reinforced by the area's topography, which includes volcanoes and earthquakes.

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with funding from:
National Science Foundation
Division of Undergraduate Education (DUE)