

EXAMPLE ARGUMENTATIVE THEME WITH A COUNTERCLAIM, VERSION 1

Prompt: Choose a topic and a claim related to scientific events in the world, and write a multi-paragraph Argumentative Theme about it, based on your research. Be sure to have at least five paragraphs in your theme. One of the paragraphs should provide support for the counterclaim. Include at least one quotation, in-text citations where needed, and a reference list. Use the APA style.

TITLE OF PAPER: Asteroids: The New Frontier?

Asteroids:
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Asteroids: The New Frontier?

Are asteroids a new frontier that humans should settle? Some people think that they are; others do not agree. Most people think of asteroids as big rocks floating randomly around in space, such as those in the asteroid field encountered by Han Solo, Princess Leia, and Chewbacca in the movie “The Empire Strikes Back” (Lucas, 1980). Nevertheless, asteroids are much more than big rocks. They are actually called “minor planets” because they orbit around the sun (“Asteroids,” n.d., p. 1). With regard to size, some of the smallest asteroids are almost a mile across. The largest is about a quarter of the size of the Earth’s moon (“Asteroids,” n.d.). All the asteroids together equal the mass of the Earth’s moon (“Asteroids,” n.d.). With regard to location, many of them are located in the asteroid belt. This is a region between the orbits of Mars and Jupiter (“Asteroids: Overview,” n.d.). Because of their natural resources, opportunities for jobs and investments, and possible use as way stations to other planets, asteroids offer great potential as places to live and work in the future.

Most importantly, asteroids should be settled because they contain valuable natural resources. For example, metals might be mined on asteroids that can be used back on Earth or in space. Very pure iron and nickel plus other byproducts like platinum and germanium can be used to produce steel and electronic equipment. John Lewis (1997) has calculated that the “...iron and nickel in Amun [an asteroid] have a market value of \$8,000 billion, the cobalt content adds another \$6,000 billion, and the platinum-group metals add another \$6,000 billion” (p. 25). For another example of a type of natural resource, volatiles can also be found on asteroids. These are chemical elements and compounds with low boiling points, like sulfur, chlorine, and nitrogen. On some asteroids, volatiles like oxygen, carbon,

and water might also be found. Such substances are critical to sustaining life and will aid the settlement of asteroids and the larger planets.

Also importantly, since these natural resources are potentially useful for humans, they represent a great source of new opportunities. Clearly, workers will be needed to travel to asteroids to work in the mines and extract the metals and volatiles. Workers also may be needed to create steel and other products from the mined materials that can be used in constructing new homes and buildings on asteroids and larger planets. Additionally, inventors will be needed to create the technologies for extracting metals and volatiles and transforming them into useful products on the asteroids. Also, pilots will be needed to ferry workers to and from the asteroids. They will also be needed to take materials and people to other planets. Surely, investors and business people will be needed to supply the funds for space travel, salaries, starting up mines, buying equipment, and running the mines.

Then, once some asteroids have been settled and are productive, they will have great potential as way stations. First, because asteroids are scattered throughout the solar system, they can be places for space travelers to stop to refuel and buy supplies. They can also be communities where space travelers get information or even have their space ships repaired. Second, because launching heavy materials into space from Earth is expensive, space pioneers can avoid that cost by stopping at the appropriate asteroid to pick up their heavy materials. The gravitational field of an asteroid will be less than that of the Earth, so less fuel will be required for all launches on asteroids. Third, because some asteroids are close to the Earth, they can be used to test new materials, technology, and structures for space living. All kinds of inventions can be tried out in asteroid environments that are devoid of the amenities available on the Earth.

Of course, some people object to trying to obtain resources from and settling on asteroids. Not surprisingly, they indicate that traveling to and working on asteroids will be dangerous. Some people have died during space travel, and others have experienced physical problems like brittle bones after space travel. Additionally, no one really knows the hazards that might be associated with mining certain metals and volatiles on asteroids. Mining has always been dangerous, even here on Earth. Furthermore, space travel is very expensive. A single space launch can cost millions of dollars. People wonder whether this money should be spent to cure diseases and feed the world's hungry people. Finally, there are many international legal issues associated with obtaining natural resources on asteroids. Although questions related to who owns materials mined on asteroids and whether whole asteroids can be owned have been settled, future court cases are sure to surface.

Despite these problems, living and working on asteroids should be seriously pursued because of the resources, opportunities, and need for way stations in space. Obviously, resources such as metals and volatiles are going to be needed in space as more and more space travel and space settlement takes place. These resources can be mined on asteroids. Because many people are unemployed, they need the work opportunities that asteroids would provide. Mine workers, inventors, and pilots will be able to find jobs on asteroids. Because some asteroids are located near the Earth, they can be used as way stations for space travelers to obtain fuel and supplies as they go to other planets. Some scientists have suggested that some asteroids can be "nudged" into orbit around the Earth and hollowed out so that cities can be built within the hollowed-out spaces. Humans are adventurers, and they need new worlds to explore and tame.

Exploration has always been dangerous, and some people are willing to take the required risks. Private investors are likely to be willing to supply the funds needed for this exploration. Thus, asteroids should be a new frontier to be explored, mined, and settled, and people should prepare themselves to become the next space pioneers.

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