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Asteroids are large space objects made of rock and ice. There are hundreds of thousands of asteroids in our solar system. Though we often hear ideas about establishing colonies of humans to live and work on our Moon or our neighboring planet, Mars, some think that sending people to an asteroid would actually be the best colonization option for a number of reasons. Low Gravity To begin with, asteroids are often much smaller than planets, so they have lower gravity. When landing a spaceship, the craft would not be pulled as strongly or as forcefully toward the asteroid' s surface, making the landing safer than landing on the Moon or Mars; it would also allow a spacecraft to carry much more equipment needed to set up the colony. It would also be easier for the spacecraft to take off again, so the spaceship would need to carry considerably less fuel for the trip back to Earth. Mining Valuable Metals Next, some asteroids are rich in valuable elements and precious metals that are relatively rare on Earth, such as gold and platinum. An asteroid colony would be extremely profitable and a good source of these raw materials. The colonists or businesses sponsoring them could more than pay for the cost of their support by mining minerals and sending them back to Earth. Easy to Reach Finally, asteroids are a good option for colonization because some of them would be very easy to reach. There are a number of asteroids that periodically come within or near Earth' s orbit. Some of them actually get closer to Earth than our Moon. So these asteroids would be much easier and more affordable to get to and get back from than a planet like Mars, which would require a two-year trip in each direction.

NARRATOR Now listen to part of a lecture on the topic you just read about. MALE PROFESSOR Asteroid colonization is not a very practical idea. Each of the points in the reading has a serious downside. First, while low gravity on an asteroid would make landing and taking off relatively easy, low-gravity environments also present certain risks. In a low-gravity environment, people start losing muscle mass and their bone density becomes lower. Even astronauts who spend just a few months in spaceships, which are low-gravity environments, suffer from health problems like muscle and bone density loss. Imagine the health problems that long-term colonists would experience on asteroids. Second, the availability of valuable metals might make an asteroid colony seem like a profitable idea, but that' s not the whole picture. You have to consider additional factors. One thing is the costs: the costs of supporting a colony and of transporting the metals are likely to be high and will reduce the profits. And furthermore, there' s no guarantee that the price for which you can sell the metals will remain the same. If precious metals are mined in large quantities, it would increase the supply of the metals, which could end up lowering their market price. So mining on asteroids may not be very profitable. Third, even if some asteroids are easy to reach, they may not be easy to return from. Asteroid orbits—the paths on which asteroids travel through space—can be unusual. Some orbital paths come close to Earth, but then move away from Earth—often a great distance away from Earth. So even if an asteroid gets close to Earth at one point, making it easy for colonists to get to the asteroid, it does not stay close to Earth. It can actually travel much farther away from Earth than a planet like Mars. Getting back from an asteroid that travels that far would be a challenge.

Summarize the points made in the lecture, being sure to explain how they respond to the specific points made in the reading passage.

Do you agree or disagree with the following statement? The rules that societies today expect young people to follow and obey are too strict. Use specific reasons and examples to support your answer.