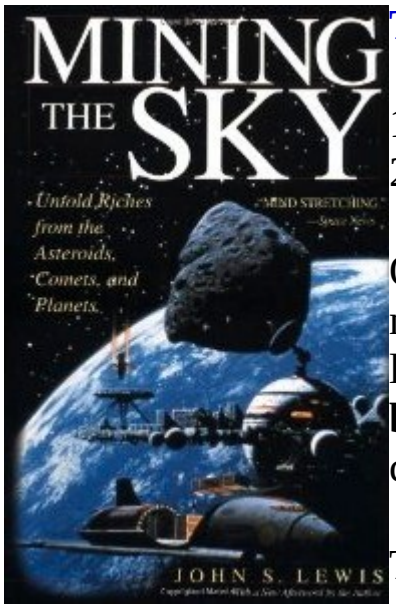
Source: http://space.stackexchange.com/



The Question:

1) What resources could be gained from asteroid mining?
2) Would it be worth the effort?

Obviously asteroids are **abundant** in many of the raw materials we use today, but considering the (presumably) large expense involved in mining from asteroids it **may not be worthwhile to mine** some materials since it is more cost-effective to get them on Earth.

There are mainly three issues here:

1) What is the approximate cost to develop an asteroid mining enterprise?

2) What would the approximate on-going cost of operations be?

3) What resources are available on asteroids that would be more cost-effective to mine that way (considering the above expenses) than to obtain using conventional methods?

4) When can we start developing the asteroid enterprise and how long it would take to develop, because these things affect both the cost and benefit.

Clarification:

We're looking primarily for asteroid mining of resources **for use on Earth**, though an answer addressing asteroid mining of resources **for use in space** would also be interesting. Obviously the answer to the latter would be very different since it is probably more worthwhile to mine resources in space for use in space.

Source: http://space.stackexchange.com/

An Answer:

NASA has actually published a study on this.

The first thing that should be noted is that Asteroids have **large amounts of precious metals**. Estimates show that even a small asteroid could have a fortune in Platinum, at least at today's prices.

There are 3 primary types of asteroids.
C-type,
S-type, and
M-type.

The latter two contain significant amounts of iron, and the C type carbon. Now, metal on the ground is quite cheap. The cost of Iron Ore is about $115 per ton. It would be difficult to make money on Earth using Iron Ore. **So, it's not worth it. But...**

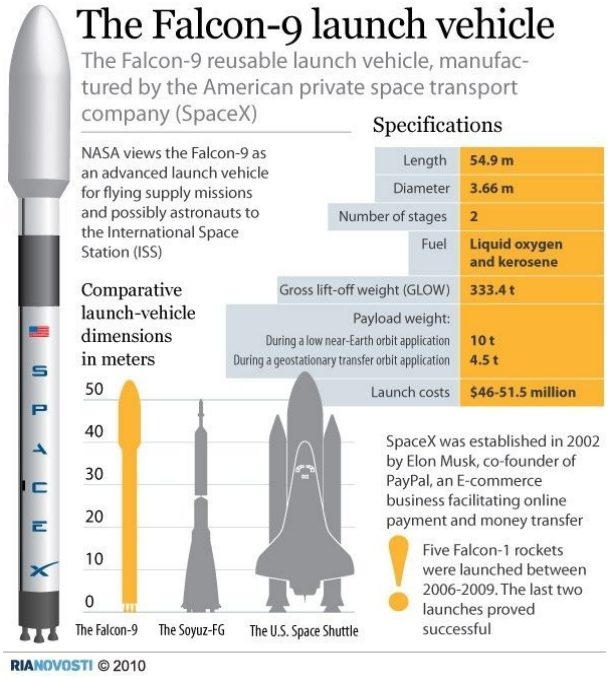
Source: http://space.stackexchange.com/

However, there is an alternative way to make money.

The Falcon 9 (a rocket for transporting satellites) has a cost per pound of $1800+ if loaded to it's maximum capacity.

Thus, if you can make something useful in space of your asteroid, it's value has suddenly increased dramatically.

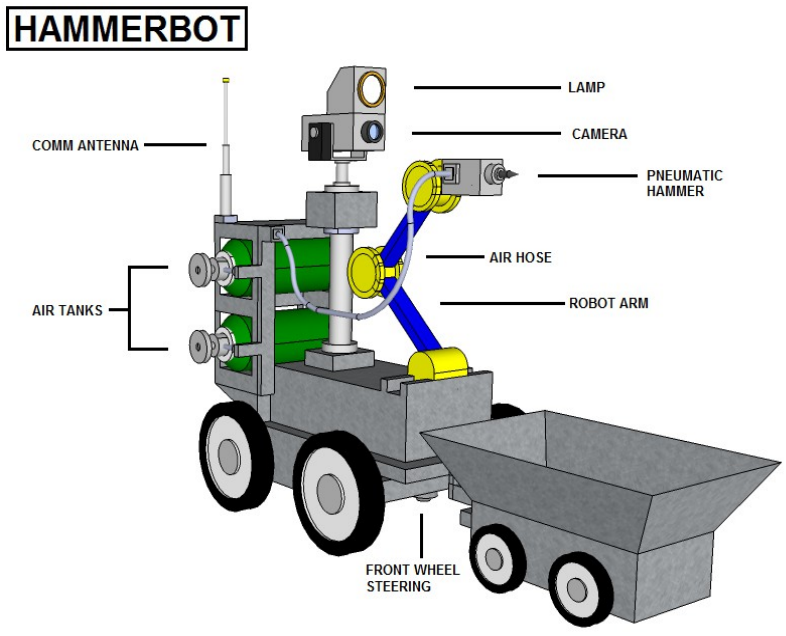
The key for the short term profitability in space is the ability to manufacture and otherwise assist satellites.



The amount of money that can be made increases dramatically if you can pull it off. Rocket Fuel, which could easily be made from an asteroid, has the same cost of $1800/pound, if you can get it to the source. It might even be worth more, as fuel would extend the lifetime of the satellites, which are significant investments.

So, what does it take to make a space mining operation profitable?

- Manufacturing.



If you can develop an autonomous set of **manufacturing robots**, then you might be able to make something work. There is a number often quoted of $2.6 billion to break even, but that depends on making these advanced robotics work. It could work, but I think only time will tell.

Source: http://space.stackexchange.com/

The bottom line is, it's a long time before the Earth mining industry will be affected by Space Mining, but it would likely significantly affect the aerospace industry, moving operations to in orbit. And some day, some of those materials may return to Earth.