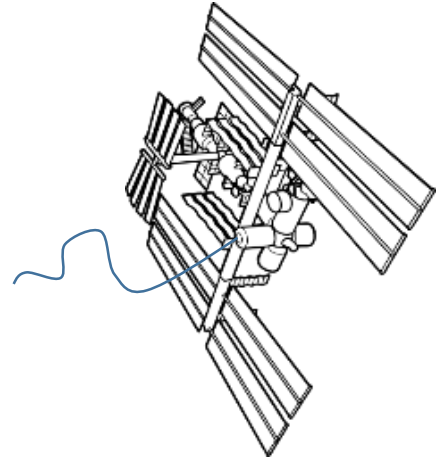


Save the astronaut's life?

During a spacewalk, an astronaut's tether comes loose so that she is stranded, stationary, in free space 25 metres from her space station. She only has 50 minutes of Oxygen left. Apart from her spacesuit, she only has a 640g hammer with her.



- 1) Explain how, by throwing the hammer, she could get back to the space station.

- 2) The mass of the astronaut (including her spacesuit, air tanks *etc.*) is 130kg. Calculate the minimum speed she would need to throw the hammer at in order to get back to the space station before her air runs out. Comment on whether this is feasible.

- 3) The very next day, due to nothing more than extremely bad luck, the same thing happens to a different astronaut. However, this astronaut is stranded whilst drifting away from the space station at 0.15 ms^{-1} . All other data relating to this astronaut is the same as in the previous case. Calculate whether he will be able to do the same hammer trick to save himself.