

The Martian

"I'm going to have to science the #@*^%! out of this"

Mark Watney

There is a ton of great science in the movie *The Martian*. Some is futuristic but most is real science and technology that our society currently uses or is investigating. To explore these ideas, you are asked to do **two** things related to the science brought out in the movie. You will be asked to identify what you choose at our next class.

1. **Individual Research Paper** - Research one of the science principles from the movie and write a two or three page paper describing the science/technology. You can talk about the scientific principles, any current research going on with the principles, problems to be overcome regarding the science, applications of the science/technology, etc,

Research paper is DUE May 31, 2016 (1st, 2nd, 4th), June 1, 2016 (5th, 7th, 8th). Upload to Moodle.

Research Topics – Investigate a topic related to the science of the Martian. Possible ideas are listed below. If you are interested in something not on the list talk with Ms Barge before commencing research.

Farming on Mars	Hydroponics	Zero gravity affect on cell growth
Vertical Farming	Soil science	Recycling in space flight (water, waste, etc)
Living in space/on Mars	Communication in space	Electrolysis of water
Growing food in space	Space Station Experiments	Codes: Hexidecimal code/Morse Code
Solar energy	Mars Rovers	History of Mars exploration
Spacesuits	Training of astronauts	Nutrition, food and exercise in space
Water on Mars (or other planets)	Storms on other planets	Radiation exposure on Mars/space flight
Potatoes	Rocket fuel	Comparison of book with film
Topography of Mars	Orbital Dynamics	Travel to Mars (launches, alignment, etc)
Planned missions to Mars	Time on other planets/in space	Is Math the Language of the Universe?
Space and International Treaties	Physiological effects of space travel	Locations on Mars involved in the movie
Long-term space travel	Investigation of likelihood of survival by injuries to Watney	
NASA Martian Science – many things to investigate	http://www.nasa.gov/realmartians	

2. **Individual or Small Group Model or Experiment** – Design or build something related to the science in the movie out of repurposed materials. Repurposed materials means using materials that were made for something else but you use for a different purpose. OR, conduct an experiment to investigate some aspect of the science in *The Martian*.

Individual or Small Group Model is DUE June 9, 2016 (1st, 2nd, 4th), June 10, 2016 (5th, 7th, 8th)

Models/Experiments – Design/create a model of something related to the science in the movie using repurposed materials. Or conduct an experiment involving some aspect of science from the movie. Possible ideas are listed below. If you are interested in something not on the list talk with Ms Barge. Experiments must be approved by Ms Barge before initiation.

Martian Rover	Airtight HAB to attach to the rover for the trip to Schiaparelli Crater	
Martian Greenhouse	Visualization of Watney's trip across Mars using Mars Imagery	
Make a bath tub using NASA tubing and an old RTG	How to cook a potato 1000 different ways (These two are from deleted scenes http://www.slate.com/blogs/bad_astronomy/2015/10/10/the_martian_scifi_blockbuster_is_about_the_science.html)	
Plant growth exp	Soil condition exp	Write a computer program for orbital paths
SSEP – Student Spaceflight Experiments Program – enter an application for an experiment to be done on the International Space Station (http://ssep.ncesse.org)		

