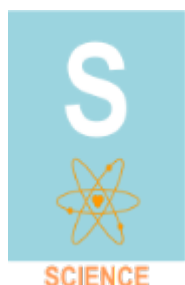


STEM/STEAM & The Movie SCIENCE



SCIENCE	FILM(S) REFERENCED	CONCEPTS
<p>Super Hero Physics THE “MARVEL”-OUS NATURE OF SCIENCE: Using superhero movies to teach methods and values in science (Science Teacher July 2019)</p> <p>Movie scences & instructional prompts</p>	<p>References to graphic novels rather than films Iron Man, Captain America, Thor, Black Panther, Ant-Man, Avengers and Guardians of the Galaxy.</p>	<p>Many</p> <p>nature of science,</p>
<p>The Science (and the Scientists) Behind “The Antman”</p>	<p>Antman & The Wasp Annihialation Jurassic World Thor:Ragnorok Black Panter Iron Man</p>	<p>molecular density molecular misequilibrium quantum decoherence organic atom reduction</p>
<p>Jurassic World: Skimps on Dinosaur Science</p>	<p>Jurassic World</p>	
<p>The Science Behind Pixar (exhibit, lessons)</p>	<p>All Pixar films</p>	<p>Many</p>

Science of 3D Movies: How do images on a flat screen pop out?		depth perception; stereoscopic vision; polarized light
Visible invisibility: the science of cinematography	Saving Pvt Ryan Citizen Kane Vertigo Pulp Fiction Ben Hur Lawrence of Arabia A Space Odyssey Tangerine The Hateful Eight	exposure time chemicals resolution
The Future Science of Star Wars	Star Wars	
The Science in “The Martian”	The Martian	ion engines, orbital dynamics, interplanetary travel, chemistry, solar energy
The Physics of “Back To The Future”	Back To The Future	special relativity photons general relativity
How Science Helps Create Realistic Explosions in Movies	Avatar, Iron Man 3, Super 8, Man of Steel	wavelet turbulence
Physics Journal Recommends Teachers Use Interstellar	Interstellar; Star Trek; Stargate	Wormholes; black holes

Stunts Makes A Believer of Physics Expert	Fast & Furious 7	speed; terminal velocity; momentum
Neuroscientist Takes A Scientific Look at Art of Filmmaking	Airplane, Chicago, Moulin Rouge	Brain Science
The Physics of Spiderman's Webs	Spiderman	downward gravitational force; upward force; momentum; tension; velocity; kinematic equations;
Science Goes To The Movies	Various	Varies
Great & Realistic Physics Movies related: Good & Bad Examples from Movies (video)	Gravity, Apollo 13, October Sky, The Abyss, IQ, Infinity, 2001: A Space Odyssey	

<p>Science of Hollywood Stunts (video)</p>	<p>The Firm; A Time to Kill; Spiderman; Mission Impossible;</p>	<p>solid, liquids, gas, steam, expansion, chemical reactions, metal, hydrocarbon, fluids, carbon, refraction, atoms, gravity, compression, pulleys, force, direction, load, friction, vectors, pressure, electrical circuits, magnet</p>
<p>Physics in Wall-E</p>	<p>Wall E</p>	<p>Applied Physics, Gravity</p>
<p>Interstellar Film Technology & Black Holes The Surprising Science Behind Interstellar Christopher Nolan/Kip Thorne Discuss Physics of Interstellar</p>	<p>Interstellar</p>	<p>Black Holes, Worm Holes, Caustics, Relativity</p>
<p>Movie Magic Conjured by Science</p>	<p>Toy Story, Harry Potter, Hellboy, Quantum of Solace, Chronicles of Narnia, Tron</p>	<p>Fluid Dynamics</p>

<p>Science of the Movies in 3D (Video)</p>	<p>Terminator 2; Metalstorm, Journey to The Center of the Earth</p>	<p>Stereo, Depth, Polarization, Light Waves</p>
<p>How Movies Makers Use Science to Make Magic</p>	<p>The Incredibles, Jurassic Park, Benjamin Button, Avengers, Pirates of the Caribbean, My Week With Marilyn, The Ten Commandments, Avatar</p>	<p>Visual effects, CG, third-degree polynomials, higher frame rates, 3D, linear perspective, aerial perspective, composition,</p>