

WAYS TO USE SCIENCE FICTION IN THE SCIENCE CLASSROOM

by

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1. SF can be used to teach science concepts

Many stories explain and incorporate science concepts.

- Arthur C. Clarke's "Silence, Please" discusses wave interference
- Larry Niven's RINGWORLD shows us a Dyson sphere
- the setting in Connie Willis's "The Sidon in the Mirror" is based on Harlow Shapley's theory of red giants
- H. Beam Piper's "Omnilingual"'s plot revolves around the periodic table
- George Gamow's MR. TOMPKINS IN PAPERBACK dreams of relativity and quantum effects
- Anthologies such as THE UNIVERSE, THE PLANETS, AND THE MICROVERSE (edited by Byron Preiss) put essays by eminent scientists and stories by noted sf authors side-by-side
- Hal Clement, a retired high school chemistry teacher, has written a number of stories, including the classic MISSION OF GRAVITY, about all those things you learned in high school science classes.

Bad science in science fiction (especially in the movies) can teach science concepts, too.

- Why is it impossible for the spaceship in CAPRICORN ONE to make it back from Mars in a mere three months?
- Why does the strength to mass ratio make King Kong and Godzilla impossible?
- What about all those loud explosions in outer space? And those spaceships that bank and turn just like fighter planes?

2. SF can be used to make abstract scientific concepts concrete.

- Larry Niven's RINGWORLD shows us a Dyson sphere.
- John Stith's REDSHIFT RENDEZVOUS takes place on a spaceship traveling at near-light speeds and on which relativistic effects can be seen by the passengers
- Connie Willis's "At the Rialto" envisions a world in which the effects of quantum theory take place at a macrolevel instead of a subatomic level
- Damon Knight's "A Subway Named Mobius" and Edwin A. Abbott's FLATLAND show us mathematical worlds
- James Blish puts the reader right in the world of amoebas and rotifers in "Surface Tension"

3. SF can be used to look at the implications of science and technology on our society

- William Gibson's NEUROMANCER shows us a world in which computers are omnipresent and omnipotent
- Frederik Pohl's GATEWAY and Michael Crichton's JURASSIC PARK (to say nothing of Mary Shelley's FRANKENSTEIN) shows us the consequences of using technologies we don't fully understand or control

- BLADERUNNER (based on the Philip K. Dick novel, DO ANDROIDS DREAM OF ELECTRIC SHEEP?) explores the concept of what is human through its story of human replicants created to be slaves
 - Connie Willis's REMAKE imagines a Hollywood in which the computer graphics revolution is complete and movies no longer star humans
- 4 SF can be used to look at science and the scientific method
- in Arthur C. Clarke's RENDEZVOUS WITH RAMA, scientists attempt to decode an alien civilization by examining a derelict spaceship
 - in Connie Willis, BELLWETHER, scientists attempt to discover the scientific causes of fads (and of serendipitous scientific discoveries)
 - Isaac Asimov's "The Endochronic Properties of Resublimated Thiotimoline," written just like a scientific paper, is about a substance so soluble it dissolves before the water hits it, and is a good example of how the authority and jargon of science can be used to deceive
5. SF can be used to stimulate imaginative thinking and to teach students to extrapolate and think about the possible trajectories and consequences of current scientific developments
- Harry Harrison's "Make Room, Make Room" and John Brunner's THE SHEEP LOOK UP examine the consequences of overpopulation
 - Gordon Dickson's "Computers Don't Argue" and Ron Goulart's "Lawagon" show the hilarious and deadly consequences of relying too much on computers
 - Nancy Kress's BEGGARS IN SPAIN shows us a society in which genetic engineering is common, and has unexpected effects
 - The movie 2001: A SPACE ODYSSEY embodies the challenges and promise of space (it's also interesting to look at in terms of where we are at the turn of the millennium as compared to where the movie, made thirty years ago, thought we would be)
 - STAR TREK (not always accurate in its science) has introduced many exciting concepts, such as matter transporters, cyborgs, wormholes, and nanotechnology

Judith Merrill has said that all of science fiction is an experiment, with each author observing the world, developing hypotheses about it, and setting up experiments in the form of stories to examine those hypotheses. This makes it an ideal literature for use in the science classroom.