

Investigation Backpack

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WELCOME TO “INVESTIGATION BACKPACK.” We will briefly describe intertwined math and science investigations, then leave most of the fun to you and your students.

Intertwined is a term coined by Ted Nelson to express the complexity of interrelations in human knowledge. Nelson wrote in *Computer Lib/Dream Machines*:

Everything is deeply intertwined. In an important sense there are no “subjects” at all; there is only all knowledge, since the cross-connections among the myriad topics of this world simply cannot be divided up neatly.

We begin with brief descriptions of two investigations that intertwine math and science:

- Enlightenment 2020: Earth, Moon, and Mars
- Is That Ticket Fair?: Social Justice at the Stoplight

Enlightenment 2020: Earth, Moon and Mars

Level and subject: Middle school through high school, math and science

The Hook

The investigator plays the role of a habitat lighting designer in Earth year 2020. She or he can opt to design lighting for habitats on Earth, in Earth-orbiting space stations, or for future habitats on the Moon and Mars.

Earth Year 2007

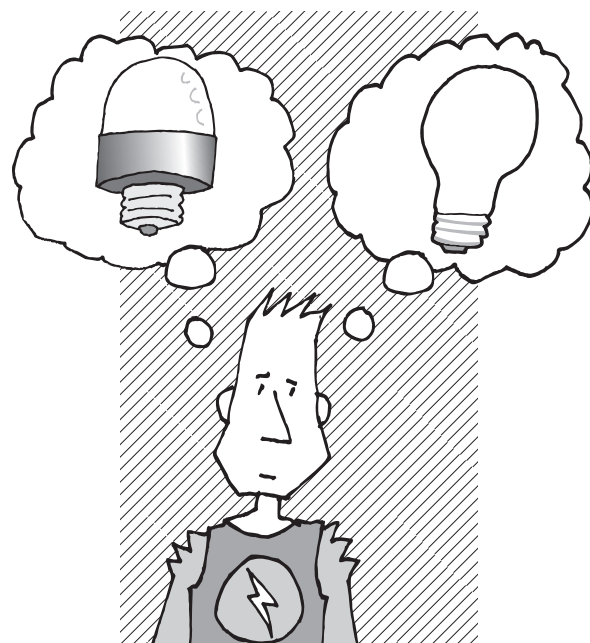
Earth habitats are switching from energy-gobbling incandescent light bulbs to energy-miserly compact fluorescent lamps (CFLs). Light-emitting diodes (LEDs) are displacing other light sources in traffic lights, flashlights, camp lanterns, et cetera, et cetera. NASA is using LEDs as the source of light for growing plants in space farms. Designers of future habitats on Earth, Moon, and Mars plan to use LEDs as the primary light source.

Earth Year 2020

LEDs have become the preferred standard for habitat lighting on Earth, replacing CFLs. Designers of future habitats on Earth, Moon, and Mars plan to use LEDs as the standard light source, and are investigating new lighting technologies.

Your Task

Investigate the above claims. Are the claims for 2007 true? If yes, why is this happening? Are there



Which idea's better?

cost benefits? Are there environmental benefits? Are the claims for 2020 reasonable? If yes, explain why. Compare the cost of lighting using incandescent bulbs, CFLs, and LEDs in 2007. Use credible projections to do the same for the year 2020 and beyond.

For more information about this investigation, go to <http://starshipgaia.net/BobGeorge>.

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