Six Things Everyone Should Know About Astronomy

ESU #6 Workshop
4/10/06
Big Ideas

1. The Organization of the Universe
2. Why the Earth has Seasons
3. Why the Moon has Phases
4. How We Learn about the World through Light
5. How Stars Work
6. How Stars are Born, Live and Die
The Organization of the Universe

- **Stars are fundamental**
  - Planets (asteroids, comets) orbit stars
  - Moons (satellites) orbit planets
  - Stars with their planets are stellar systems
- Billions of stellar systems form Galaxies
- Galaxies form the Universe

Analogy: Stars are atoms, galaxies are bricks, universe is the building
Why the Earth has Seasons

- How does the Earth tilt toward or away from the sun?
- What does “More direct sunlight” mean?
Why the Moon has Phases

- Is it because of the Earth’s shadow?
- Is it because of reflection off the Earth?
How We Learn about the World through Light

- What is Light?
- Blackbodies
- Spectral Lines
- Scattering
- Polarization
How Stars Work

- What are stars made of?
  How do we know?

- How do stars generate their energy?

- How does the energy get out of the star?
How Stars are Born, Live and Die

- Analogy with human lifecycles

- How we can learn about all this?
  - Planetarium Software
  - Data Centers, Online Journals
  - Micrometeorites