LEARNING GOALS
WHAT DO WE KNOW? HOW DO WE KNOW?

1. TIME, MOTION, AND ORIENTATION
2. CALCULATIONS: DIMENSIONAL ANALYSIS, NEWTON'S LAWS OF MOTION AND GRAVITY, KEPLER'S LAWS, MEASURING DISTANCE IN SPACE
3. NATURE OF LIGHT
4. HISTORICAL PERSPECTIVE OF THE SOLAR SYSTEM
5. FORMATION OF THE SOLAR SYSTEM
6. PLANETARY DIFFERENTIATION
7. TERRESTRIAL PLANETARY GEOLOGY AND ASTROBIOLOGY*
8. MOONS*
9. ASTEROIDS AND COMETS*
10. ROBOTIC EXPLORATION OF THE SOLAR SYSTEM – PAST, PRESENT, AND FUTURE*
11. CAREER OPPORTUNITIES IN SPACE SCIENCE*

MISSION IS POSSIBLE

Solar System Astronomy

Dave Schlichting – Astronomy & Space Science
Eaglecrest High School

PROJECT OUTLINE

Groups research, then develop an interactive presentation and lesson plan for planets, comets/asteroids, Sun.

PROJECT OUTLINE

Orbital Semimajor axis	_____AU	**Perihelion**	_____AU	**Aphelion**	_____AU
Mean Orbital Speed	_____km/s	Sidereal Orbital Period	_____days	Synodic Orbital Period	_____days
Equatorial Radius	_____km	Mean Density	_____kg/m^3	Surface Gravity	_____m/s^2
Sidereal Rotation Period	_____days	Mean Surface Temperature	_____K	Number of Moons	

1. Use class activity worksheets to compile all required data on orbital and physical properties

PROJECT OUTLINE

2. Provide historical descriptions from the following perspectives

a – Greek/Roman

b – Islamic

c - Chinese

PROJECT OUTLINE

2. What did each civilization "know"?

   What did they "perceive"?

   What day of the week does your planet represent?

PROJECT OUTLINE

3. Describe how human understanding of your planet (and the "universe") evolve after the invention of the telescope.

PROJECT OUTLINE

3. Describe elemental composition and surface features.

   What are the sidereal/synodic orbital periods? (Kepler's Laws)

   Distance from the Sun? (Bode's Law, Edmund Halley)

PROJECT OUTLINE

4. Describe past/present/future space missions to your planet – with an emphasis on how data has changed (or not) previous telescopic understanding.

PROJECT OUTLINE

4. Mercury – Mariner 10
Mercury Messenger

Venus - Venera (multiple)
Mariner (multiple)
Zond
Pioneer
Vega
Magellan
Venus Express

PROJECT OUTLINE

4. Mars - Mariner (multiple)
Viking 1 & 2
Mars Global Surveyor
Mars Pathfinder
MRO
Sojourner, Spirit, Opportunity
Mars Science Laboratory
MAVEN

PROJECT OUTLINE

4. Jupiter - Pioneer
Voyager
Ulysses
Cassini
New Horizons
Galileo
Juno

PROJECT OUTLINE

4. Saturn – Pioneer 11
Advanced Dom
Voyager 1 & 2
Cassini/Huygens

Uranus, Neptune – Voyager 2

Pluto – New Horizons

PROJECT OUTLINE

4. Asteroids - Galileo

AdvancedCom

Comets NEAR Shoemaker

Deep Space

Stardust

Hayabusa

Rosetta

Dawn

Giotto

PROJECT OUTLINE

4. Sun - Skylab
ACE
GGS
HINODE
RHESSI
SOHO
SDO
STEREO
SOLAR/SMO

DEBRIEF