

ASTRONOMY
CURRICULUM MAP
SAUGUS HIGH SCHOOL

Week 1		Week 2	
<p style="text-align: center;">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>		<p style="text-align: center;">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>	
<p style="text-align: center;">Unit/Topic./Lesson</p> <p>History of Astronomy Pre-Historic Astronomy Classical Astronomy</p>		<p style="text-align: center;">Unit/Topic./Lesson</p> <p>History of Astronomy Renaissance Astronomy Modern Astronomy</p>	
<p style="text-align: center;">Objectives</p> <p>You should come away from this unit with a knowledge of : The celestial sphere Contributions and approximate dates of Aristarchus, Eratosthenes, Aristotle, Ptolemy, the methods they used, and approximately when they lived</p>	<p style="text-align: center;">Essential Question</p> <p>What Contributions can be credited to prehistoric and classical astronomers?</p>	<p style="text-align: center;">Objectives</p> <p>You should come away from this unit with a knowledge of : Contributions of Kepler, Copernicus, Galileo, Newton and about when they lived Kepler's laws and their use The Kelvin Temperature scale</p>	<p style="text-align: center;">Essential Question</p> <p>What Contributions can be credited to Renaissance and modern astronomers?</p>
<p style="text-align: center;">Teacher Resources</p> <ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 1 • Power Point Note Packets • Star Chart 	<p style="text-align: center;">Media/Technology Resources</p> <ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's 	<p style="text-align: center;">Teacher Resources</p> <ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 1 • Power Point Note Packets • Star Chart 	<p style="text-align: center;">Media/Technology Resources</p> <ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's - <i>Newton's Dark Side</i>
<p style="text-align: center;">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>	<p style="text-align: center;">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>

Week 3	
Performance Standards	
<p>Earth Science 1.5: Explain how the revolution of Earth around the Sun and the inclination of Earth on its axis cause Earth's seasonal variations (equinoxes and solstices.)</p>	
Unit/Topic./Lesson	
History of Astronomy Motion of Sun and Stars The Seasons The Moon	
Objectives	Essential Question
You should come away from this unit with a knowledge of: Definition of celestial equator, poles Definition of angular diameter Definition of Ecliptic, Zodiac Cause of seasons Cause and appearance of eclipses Phases of Moon	What is the cause of seasons on Earth?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 1 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's
Assessment Activities	Completion date:
<p>Homework: To be Given daily on each introduced topic.</p> <p>Quiz: Given at the end of the week on all introduced topics and concepts.</p> <p>Astronomer Wanted Poster</p>	<p>Completed by:</p> <p>Comments</p>

Week 4	
Performance Standards	
<p><i>The students will:</i></p> <p>N/A</p>	
Unit/Topic./Lesson	
Telescopes Observatories Detecting the Light	
Objectives	Essential Question
To understand how telescopes aid astronomers and the importance of observing at other wavelengths. Properties of Telescopes Types of Optical Telescopes Refractors use lenses to collect and focus light Reflectors use mirrors to collect and focus light Collecting area and how larger areas allow viewing of dimmer objects Increasing resolution and how that allows finer details to be seen How both collecting area and resolution depend on the size of the mirror or lens.	What is the main difference between a refracting and a reflecting telescope? Which one is in more common use today?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 4 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - Contact
Assessment Activities	Completion date:
<p>Homework: To be Given daily on each introduced topic.</p> <p>Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completed by:</p> <p>Comments</p>

Week 5		Week 6	
<p align="center">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>		<p align="center">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>	
<p align="center">Unit/Topic./Lesson</p> <p>Telescopes Observing Non-visible Wavelengths Observatories in Space</p>		<p align="center">Unit/Topic./Lesson</p> <p>Constellations, Backyard Astronomy, Telescopes Learning the Constellations Star Charts Celestial Coordinates</p>	
<p align="center">Objectives</p> <p>You should come away from this unit with a knowledge of: The importance of different wavelength regions for observing Radio Telescopes Problems of observing through our atmosphere Image blurring (seeing) Blockage of some wavelengths of light (absorption) Importance of Telescopes in space</p>	<p align="center">Essential Question</p> <p>What advantages does observing from space give to the astronomer?</p>	<p align="center">Objectives</p> <p>You should come away from this unit with a knowledge of: Identification of Circumpolar constellation Folklore and Myths surrounding major constellations. Star charts and how to read them The ability to locate celestial objects using celestial coordinates</p>	<p align="center">Essential Question</p> <p>What are the constellations involved with the Andromeda Myth?</p>
<p align="center">Teacher Resources</p> <ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 4 • Power Point Note Packets • Star Chart 	<p align="center">Media/Technology Resources</p> <ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's 	<p align="center">Teacher Resources</p> <ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Essay 1 • Power Point Note Packets • Star Chart 	<p align="center">Media/Technology Resources</p> <ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's - <i>The Universe: Constellations</i>
<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>	<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts. Activity: Constellation ID Activity Test: Unit 2</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>

Week 7	
<i>Performance Standards</i>	
Earth Science 4.2: Describe the influence of gravity and inertia on the rotation and revolution of orbiting bodies. Explain the Sun-Earth-moon relationships (e.g., day, year, solar/lunar eclipses, tides).	
Unit/Topic./Lesson	
The Solar System Components of the Solar System	
Objectives	Essential Question
You should come away from this unit with a knowledge of: Names of planets and their order from Sun Structural "simplicity" of the Solar System All planets orbit in same direction and same plane Planets form two main types Terrestrial - small and rocky Jovian - big and gas/liquid	Can you diagram the Solar System (all objects) outward from the Sun?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Overview 4 and Chapter 7 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>Planets and the Solar System</i> - <i>Another Earth</i> - <i>Mars: Dead or Alive</i>
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by:
	Comments

Week 8	
<i>Performance Standards</i>	
Earth Science 4.3: Explain how the Sun, Earth, and solar system formed from a nebula of dust and gas in a spiral arm of the Milky Way Galaxy about 4.6 billion years ago.	
Unit/Topic./Lesson	
The Solar System Origin of the Solar System	
Objectives	Essential Question
You should come away from this unit with a knowledge of: All objects in Solar System about the same age Density plays an important role (learn approx. range of values) Theory of formation of the Solar System Properties of solar nebula Planetesimals Introduction to interstellar matter and the idea that a rotating mass flattens.	What role did density play in the formation of the solar system?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Overview 4 and Chapter 7 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - Hyperspace: Are we alone? - Hyperspace: New Worlds
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by:
	Comments

Week 9	
Performance Standards	
<i>The students will:</i>	
N/A	
Unit/Topic./Lesson	
Meteors, Asteroids, and Comets Meteors and Meteorites Asteroids Comets Giant Impacts	
Objectives	Essential Question
You should come away from this unit with a knowledge of: The properties of meteors, asteroids, and comets and their differences Nature, appearance, and origin of meteors, asteroids, and comets Cause of meteors (shooting stars) How comets form their tail and their relation to meteor showers Note that asteroids and comets are probably debris left over from Solar System's formation These bodies thus give us clues to the birth of the Solar System Important in scarring surfaces of other objects with craters Asteroid may have caused Cretaceous extinction	What evidence has been found to support the asteroid-dinosaur extinction theory?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 10 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>Armageddon</i> - <i>Stopping Armageddon</i> - <i>Hyperspace: Staying Alive</i>
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts. Unit 3 Test	Completed by: Comments

Week 10	
Performance Standards	
<i>The students will:</i>	
N/A	
Unit/Topic./Lesson	
Measuring the Properties of Stars Measuring a Star's Distance Measuring the Properties of Stars From Their Light	
Objectives	Essential Question
You should master the following ideas: A star's distance by parallax Inverse-square Law Concept of magnitudes (i.e., brightness) A star composition using its spectrum lines	What distinguishes the spectral class of stars?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 12 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by: Comments

Week 11	
Performance Standards	
<i>The students will:</i>	
N/A	
Unit/Topic./Lesson	
Measuring the Properties of Stars Binary Stars The H-R Diagram Variable Stars	
Objectives	Essential Question
You should master the following ideas: Main sequence Red Giants White Dwarfs Be able to label an H-R diagram Learn approximate radii, masses, and luminosity of stars relative to Sun Learn how astronomers use binary stars to measure stellar masses and radii	What is the H-R Diagram?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 12 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - Hyperspace: Star Stuff
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by:
	Comments

Week 12	
Performance Standards	
<i>The students will:</i>	
N/A	
Unit/Topic./Lesson	
Stellar Evolution The Evolution of Stars Star Formation Main Sequence Stars Giant Stars	
Objectives	Essential Question
Specifics to be learned: Protostars and their formation hydrostatic equilibrium energy generation Role of temperature in nuclear burning and synthesis of heavy element Life expectancy of stars Difference in evolution of low- and high-mass star	What is the key element that determines the timeline for a star's life?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 13 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - Stellar Evolution
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by:
	Comments

Week 13	
Performance Standards	
<i>The students will:</i>	
N/A	
Unit/Topic./Lesson	
Stellar Evolution Yellow Giants and Pulsating Stars Death of Stars like Our Sun Old Age of Massive Stars	
Objectives	Essential Question
You should come away from this unit with a knowledge of: Causes of a star's death Cause and features of supernova explosions High- and low-mass stars evolve very differently, with the former ending their life as supernovas and the latter as planetary. The reason for this difference is that high-mass stars can burn heavier elements as they evolve. The nuclear burning in massive stars is what created the elements of which we and the Earth are composed. Dead and dying stars leave compact remnant "stars" such as white dwarfs, neutron stars, black holes.	What is the origin of the elements that we have on Earth?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 13 Power Point Note Packets Star Chart 	<ul style="list-style-type: none"> Power Point Presentations Internet labs and resources Movies/DVD's <ul style="list-style-type: none"> <i>Death of a Star</i>
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Quiz: Given at the end of the week on all introduced topics and concepts. Unit 4 Test	Completed by: Comments

Week 14	
Performance Standards	
Earth Science 4.1: Explain the Big Bang Theory and discuss the evidence that supports it, such as background radiation and relativistic Doppler effect (i.e., "red shift").	
Earth Science 4.3: Explain how the Sun, Earth, and solar system formed from a nebula of dust and gas in a spiral arm of the Milky Way Galaxy about 4.6 billion years ago	
Unit/Topic./Lesson	
Galaxies and Cosmology Discovering Galaxies Measuring Properties of Galaxies	
Objectives	Essential Question
To understand the varieties of galaxy types and how they are structured. Galaxies consist of numerous stars and are held together by gravity. The factors that determine what type a galaxy becomes are uncertain, but probably include amount of initial rotation and random motions and the interactions with neighbors.	How do the basic galaxy types differ in shape, stellar content, and interstellar matter?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 16 Power Point Note Packets Star Chart 	<ul style="list-style-type: none"> Power Point Presentations Internet labs and resources Movies/DVD's
Assessment Activities	Completion date:
Homework: To be Given daily on each introduced topic. Lab/ Lab Report: Quiz: Given at the end of the week on all introduced topics and concepts.	Completed by: Comments

Week 15	
<i>Performance Standards</i>	
<p>Earth Science 4.1: Explain the Big Bang Theory and discuss the evidence that supports it, such as background radiation and relativistic Doppler effect (i.e., “red shift”).</p> <p>Earth Science 4.3: Explain how the Sun, Earth, and solar system formed from a nebula of dust and gas in a spiral arm of the Milky Way Galaxy about 4.6 billion years ago</p>	
Unit/Topic./Lesson	
Galaxies and Cosmology Measuring Properties of Galaxies Galaxy Clusters	
Objectives	Essential Question
You should know: Types of other galaxies and their differences and basic features Ellipticals Spirals Irregulars Theories of how these types form Properties of galaxy clusters and superclusters.	If you wanted to look at yourself as a baby, how far out in space would you need to be? (Assume you have a sufficiently powerful telescope and that you can travel instantly to any distance.) How does this relate to astronomers studying young galaxies?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 16 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>The Creation of the Universe</i>

Week 16	
<i>Performance Standards</i>	
<p>Earth Science 4.1: Explain the Big Bang Theory and discuss the evidence that supports it, such as background radiation and relativistic Doppler effect (i.e., “red shift”).</p> <p>Earth Science 4.3: Explain how the Sun, Earth, and solar system formed from a nebula of dust and gas in a spiral arm of the Milky Way Galaxy about 4.6 billion years ago</p>	
Unit/Topic./Lesson	
Galaxies and Cosmology Observations of the Universe Evolution of the Universe The Shape of the Universe The Origin of the Universe The Inflationary Universe	
Objectives	Essential Question
To understand what we know about the structure and possible evolution of the whole Universe. You should know Evidence for expanding Universe Why we think there was a "Big Bang" Hydrogen and helium abundance as clues to temperature and density of early universe. Geometry of model universes (open vs. closed, i.e., bounded or not) Fate of the Universe - open or closed - and how we might tell Properties of young Universe Inflationary Universe and its relation to the Big Bang Grand Unified Theories (GUTS) and inflation.	Why do astronomers believe the Universe is expanding?
Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • McGraw Hill - Explorations: An Introduction to Astronomy: Chapter 17 • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>21st Century Cosmos</i>

<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Lab/ Lab Report: Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>
<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Lab/ Lab Report: Quiz: Given at the end of the week on all introduced topics and concepts. Unit 5 Test</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>

Week 17		Week 18	
<i>Performance Standards</i>		<i>Performance Standards</i>	
<p><i>The students will:</i></p> <p>N/A</p>		<p><i>The students will:</i></p> <p>N/A</p>	
Unit/Topic./Lesson		Unit/Topic./Lesson	
<p>NASA History of Rockets and Un-manned Flight History of Manned Flight</p>		<p>NASA History of Manned Flight cont.</p>	
Objectives	Essential Question	Objectives	Essential Question
<p>You should come away from this unit able to: Identify the important events that led to the formation of NASA Identify the purpose and personnel associated with the Mercury Project Identify the purpose and personnel associated with the Gemini Project</p>	<p>What were the world events that led to the creation of NASA?</p>	<p>You should come away from this unit able to: Identify the purpose and personnel associated with the Apollo Project Identify the purpose and technologies for current NASA Projects</p>	<p>Who was the first person to walk on the Moon? When?</p>
Teacher Resources	Media/Technology Resources	Teacher Resources	Media/Technology Resources
<ul style="list-style-type: none"> • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>The Right Stuff</i> 	<ul style="list-style-type: none"> • Power Point Note Packets • Star Chart 	<ul style="list-style-type: none"> • Power Point Presentations • Internet labs and resources • Movies/DVD's <ul style="list-style-type: none"> - <i>Apollo 13</i>

<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Lab/ Lab Report: Quiz: Given at the end of the week on all introduced topics and concepts. Assign Power Point Presentation Final Project</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>	<p align="center">Assessment Activities</p> <p>Homework: To be Given daily on each introduced topic. Lab/ Lab Report: Quiz: Given at the end of the week on all introduced topics and concepts.</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>
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Week 19		Week 20	
<p align="center">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>		<p align="center">Performance Standards</p> <p><i>The students will:</i></p> <p>N/A</p>	
<p align="center">Unit/Topic./Lesson</p> <p>NASA History of Manned Flight cont.</p>		<p align="center">Unit/Topic./Lesson</p> <p>NASA History of Manned Flight cont.</p>	
<p align="center">Objectives</p> <p>Explore and Present the NASA Space project Power point</p>	<p align="center">Essential Question</p>	<p align="center">Objectives</p> <p>Explore and Present the NASA Space project Power point</p>	<p align="center">Essential Question</p>
<p align="center">Teacher Resources</p>	<p align="center">Media/Technology Resources</p>	<p align="center">Teacher Resources</p>	<p align="center">Media/Technology Resources</p>

<p>Assessment Activities</p> <p>NASA Mission Power point Presentation Review for Final Exam</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>		<p>Assessment Activities</p> <p>NASA Mission Power point Presentation Final Exam</p>	<p>Completion date:</p> <p>Completed by:</p> <p>Comments</p>
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