Course: Astronomy **Unit # 3:** The Stars	**Year of Implementation:** 2025-2026

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Stage One - Desired Results

Link(s) to New Jersey Student Learning Standards for this course:
https://www.nj.gov/education/standards/

- **Unit Standards:**
  - ***Content Standards***
    - **HS-ESS1-1.** Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.
    - **HS-ESS1-2**. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.
    - **HS-ESS1-3.** Communicate scientific ideas about the way stars, over their life cycle, produce elements.
    - **HS-ESS1-4.** Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.
    - **HS-PS4-5**. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
    - **HS-PS2-1.** Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
    - **HS-PS2-4.** Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.
    - **HS-PS4-1.** Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
  - ***Science and Engineering Practices***

    The content of this unit will strengthen student skills in the following SEPs.
    - Practice 1 Ask Questions
    - Practice 2 Developing and Using Models

        - Practice 3 Planning and Carrying Out Investigations
        - Practice 4 Analyzing and Interpreting Data
        - Practice 5 Using Mathematics and Computational Thinking
        - Practice 6 Constructing Explanations and Designing Solutions
        - Practice 7 Engaging in Argument from Evidence
        - Practice 8 Obtain, Evaluate and Communicate Information
    - ***21st Century Life & Career Standards***
        - 9.4.12.CI.1 - Demonstrate the ability to reflect, analyze and use creative skills and ideas
        - 9.4.12.IML.2: Evaluate digital sources for timeliness, accuracy, perspective, credibility of the source, and relevance of information, in media, data, or other resources (e.g., NJSLSA.W8, Social Studies Practice: Gathering and Evaluating Sources.
        - 9.4.12.IML.3 - Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions.
        - 9.4.12.IML.4: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience (e.g., S-ID.B.6b, HS-LS2-4).
        - 9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specific task (e.g., W.11-12.6.).
        - 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6). https://www.state.nj.us/education/cccs/2020/2020%20NJSLS-CLKS.pdf
    - ***English Companion Standards***
        - NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
        - NJSLSA.R2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
        - NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
        - NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

- NJSLSA.R8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
- NJSLSA.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
- NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
- NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- NJSLSA.W3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
- NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
- NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
- NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
- NJSLSA.W8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
- NJSLSA.W9. Draw evidence from literary or informational texts to support analysis, reflection, and research.
- NJSLSA.W10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.
- WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- Grade 9-10 Companion Standards: https://www.nj.gov/education/standards/ela/Docs/2016NJSLS-ELA_Companion9-10.pdf
- Grade 11-12 Companion Standards: https://www.nj.gov/education/standards/ela/Docs/2016NJSLS-ELA_Companion11-12.pdf

- ***Interdisciplinary Content Standards***
  - MP.2 - Reason abstractly and quantitatively.
  - MP.4 - Model with mathematics.
  - HSN-Q.A.1 - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
  - HSN-Q.A.2 - Define appropriate quantities for the purpose of descriptive modeling.
  - HSN-Q.A.3 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
  - HSA-SSE.A.4 - Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
- ***NJ Statutes:*** NJ State law mandates the inclusion of the following topics in lesson design and instruction as aligned to elementary and secondary curriculum.

  Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

  Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

  LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion (N.J.S.A. 18A:35-4.36a) A board of education shall incorporate instruction on diversity and inclusion in an appropriate place in the curriculum of students in grades kindergarten through 12 as part of the district's implementation of the New Jersey Student Learning Standards.

Asian American and Pacific Islanders (AAPI) P.L.2021, c.410 Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLS) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416)

For additional information, see

NJ Amistad Curriculum: ***https://www.nj.gov/education/amistad/about/***

Diversity and Inclusion: ***https://www.nj.gov/education/standards/dei/index.shtml***

- *(Sample Activities/ Lessons):* ***https://www.nj.gov/education/standards/dei/samples/index.shtml***

Asian American and Pacific Islanders:

- ***Asian American and Pacific Islander Heritage and History in the U.S.***
  A Teacher's Guide from EDSITEment offering a collection of lessons and resources for K-12 social studies, literature and arts classrooms that center around the experiences, achievements and perspectives of Asian Americans and Pacific Islanders across U.S. history.

Transfer Goal: Students will be able to independently apply their understanding of the Sun's energy and stellar phenomena to analyze its broader implications.

As aligned with LRHSD Long Term Learning Goal(s): https://www.lrhsd.org/academics/program-of-studies/curriculum

The Lenape Regional High School District Science program, in alignment with the New Jersey Core Curriculum Content Science Standards, prepares our students to become scientifically literate and informed citizens able to function in an increasingly complex society. Through completing our coursework with its emphasis on authentic experiences that enable students to investigate and explain scientific phenomena, our students will be better able to

1. design, critique, and carry out experiments in order to investigate scientific questions and/or propose solutions
2. collect, interpret, and analyze data in order to solve a defined problem

3. apply mathematics to express relationships efficiently and accurately
4. draw evidence-based conclusions from data in order to make informed decisions;
5. construct, interpret, and refine models (scientific and mathematical) to explain the physical and natural world
6. effectively communicate scientific ideas and evidence-based arguments to an appropriate audience through written and oral means
7. evaluate the validity of arguments that rely on scientific reasoning presented in the popular press and informational sources

Enduring Understandings Students will understand that. . . *EU 1* stars generate energy and transform matter. *EU 2* stars have cycles of life and death that have direct implications to the regions around them.	*Essential Questions* ● *How does the life and death of a star impact space?*
Knowledge *Students will know . . .* *EU 1* ● electromagnetic radiation is made up of electric and magnetic fields, has wave-like and particle-like properties, and travels at the speed of light. **(HS-PS4-3, PS4.B)** ● the study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth. **(HS-ESS1-2, ESS1.A)** ● the star called the sun is changing and will burn out over a lifespan of approximately 10 billion years. **(HS-ESS1-1, ESS1.A)**	*Skills* *Students will be able to. . .* *EU 1* ● communicate scientific and technical information (e.g. about the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). **(HS-PS2-6, SEP8)** ● compare and contrast the properties of various wavelengths of the electromagnetic (EM) spectrum.**(HS-PS2-6, SEP8)** ● identify a particular element through analysis of an emission or absorption spectra. **(HS-PS4-1, SEP4)**

● gravitational collapse of gas and dust in the early stages of star formation leads to the conditions necessary for nuclear fusion to begin **(HS-PS2-4, ESS1.B)** ● other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova stage and explode. **(HS-ESS1-3, ESS1.A)** ● the Sun has several different layers, including the corona, transition zone, chromosphere, photosphere, convection zone, radiation zone, and core. **(HS-ESS1-1, ESS1.A)** ● solar flares, prominences, sunspots, and coronal mass ejections (CMEs) are a few examples of solar activity that is caused by the Sun's large magnetic field. **(HS-ESS1-1, ESS1.A)** ● astronomers use the principles of wave behavior to analyze the light emitted or absorbed by stars and other celestial objects. **(HS-PS4-5, PS4.B)** ● the spectra of stars can determine their composition, temperature, and motion.**(HS-PS4-5, PS4.B)** ● various types of telescopes exist and can collect a wide array of data. **(HS-ESS1-3, ESS1.A)** ● ground based telescopes are useful but have limitations compared to space-based telescopes. **(HS-ESS1-3, ESS1.A)** ● telescopes and other astronomical instruments utilize wave behavior to capture and analyze electromagnetic radiation from stars and galaxies. **(HS-PS4-5, PS4.B)**	● determine if an object is moving towards/away from an observer by analyzing its Doppler shift in the EM spectrum. **(HS-PS4-1, SEP4)** ● illustrate the layers of a star to include the process of nuclear fusion and the transfer of energy through conduction, convection and radiation. **(HS-ESS1-3, SEP2)** ● explain the effects of iron formation in a star's core. **(HS-ESS1-3, SEP6)** ● compare and contrast how much of the Sun's energy is distributed to each of the planets. **(HS-ESS1-2, SEP2)** ● describe how a star's magnetic field creates sunspots, prominences, flares, & coronal mass ejections. **(HS-ESS1-4, SEP2)** ● explain why the number of sunspots on the Sun at any given time varies over an 11 year cycle. **(HS-ESS1-4, SEP2)** ● describe how the sun's solar wind impacts human life and the solar system. **(HS-ESS1-2, SEP8)** ● select the most appropriate telescope when given a specific observational task. **(HS-ESS1-3, SEP2)**

EU 2 ● atoms of each element emit and absorb characteristic frequencies of light. These characteristics allow identification of the presence of an element, even in microscopic quantities. **(HS-PS4-1, PS4.B)** ● the death of a star, such as in a supernova explosion, plays a vital role in the distribution of elements throughout the universe **(HS-PS2-1, ESS1.A)** ● the Sun is a relatively average star on the main sequence that is middle-aged and halfway through its life cycle. **(HS-ESS1-1, ESS1.A)** ● stars have an apparent brightness, which is different from intrinsic brightness. **(HS-ESS1-1, ESS1.A)** ● absolute visual magnitude of a star can be found by using the magnitude-distance formula. **(HS-ESS1-1, ESS1.A)** ● luminosity of a star is the total energy that a star radiates in one second and can be used to determine the size of a star. **(HS-ESS1-2. ESS1.B)** ● stars can be classified by spectral types, or classes, based on temperature. **(HS-ESS1-3, ESS1.A)** ● a Hertzsprung-Russell (H-R) diagram is a graph that plots stars based on luminosity and temperature. **(HS-ESS1-3, ESS1.B)** ● our Sun is currently a main-sequence star **(HS-ESS1-3, ESS1.B)** ● stars belong to a luminosity class, which is based on size. **(HS-ESS1-3, ESS1.A)** ● spectroscopic parallax is different from stellar parallax, as it is a technique used to estimate the distance to a star by utilizing the H-R diagram. **(HS-ESS1-4, ESS1.B)** ● binary stars, two stars that orbit their common center of mass, are abundant in the universe and allow	EU 2 ● distinguish between apparent magnitude, absolute magnitude, and luminosity**. (HS-ESS1-1, SEP2)** ● determine a star's color given its surface temperature. **(HS-ESS1-1, SEP5)** ● assign a star to a spectral class by analyzing a star's temperature/color and its radius. **(HS-ESS1-2, SEP4)** ● derive the characteristics of a star, including our Sun, by analyzing its location on an H-R diagram. **(HS-ESS1-3, SEP2)** ● determine a star's distance through analyzing a star's magnitude and its spectral class. **(HS-ESS1-4, SEP4)** ● predict the end of a star's life cycle by analyzing its mass. **(HS-ESS1-3, SEP2)**

astronomers to directly calculate the mass of stars within the system. **(HS-ESS1-4, ESS1.B)** ● light curves show variation of brightness over time. **(HS-ESS1-4, ESS1.A)** ● main sequence stars follow a mass-luminosity relationship; the more massive a star, the more luminous it is. **(HS-ESS1-3, ESS1.A)** ● the interstellar medium (ISM) is gas and dust between stars. **(HS-ESS1-2, ESS1.A)** ● stars evolve as energy and matter get transformed, and their positions on the H-R diagram change. **(HS-ESS1-3, ESS1.A)** ● when a star comes to the end of its life cycle, it will become either a white dwarf, neutron star, or black hole. **(HS-ESS1-4, ESS1.A)** ● there are two types of supernovae, which are rare and caused by the violent, explosive death of stars. **(HS-ESS1-4, ESS1.A)** ● neutron stars are dense stars made of tightly packed neutrons created when giant stars die and their cores collapse. **(HS-ESS1-4, ESS1.A)** ● a black hole is created by the death of a massive star; they exhibit strange behavior and emit no light. **(HS-ESS1-4, ESS1.A)** ● stellar evolution is significant in shaping the composition of galaxies and contributing to the cosmic abundance of elements crucial for planet formation and life. **(HS-PS2-1, ESS1.A)** ● stars progress through their life cycles, influencing the formation of new stars and planets in the universe. **(HS-PS4-1, PS4.B)**	

Stage Two - Assessment

Performance Task:

Other Evidence:

- Quizzes
- Summarizers
- Essays
- Research
- Presentations
- Formal lab write ups
- Discussions
- Diagrams
- Models
- Debate
- CER
- Unit Test

Stage Three - Instruction

Learning Plan: **Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.** *{place A, M and/or T along with the applicable EU number in parentheses after each statement} All knowledge and skills must be addressed in this section with a corresponding lesson/activity which teaches each concept. The following color codes are used to notate activities that correspond with interdisciplinary connections and 21st Century Life & Career Connections (which involves Technology Literacy): Red = Interdisciplinary Connection; Purple = 21st Century Life & Career Connection*

PHENOMENON: Why is space black?

Goal: Students will be able to demonstrate that the Electromagnetic Spectrum contains components other than visible light that allows astronomers to collect information about the universe.

1. Teacher-led notes and discussions about how various types of telescopes exist and can collect a wide array of data. **(A) (EU1)**
2. Students will practice matching "famous" telescopes and the type(s) of data that they can collect. (Kahoot it) **(A) (EU2)**
3. Students will engage in a teacher-led presentation showcasing images captured by different telescopes, focusing on comparing their technologies and exploring various image enhancement techniques. **(A) (EU1)**
4. Students will analyze the differences between ground-based telescopes and space-based telescopes **(A/M) (EU1)**
5. "Students will practice choosing the most suitable telescope for specific observational tasks. **(M/T) (EU1)**
6. Students will be able to research, analyze, and present findings on a selected telescope model, communicating its specifications, capabilities, and potential applications in astronomy. **(M/T) (EU1)**
7. Students will be given a Word Splash of terms about electromagnetic (EM) radiation and asked to group words based on what they "think they mean" and "how do they apply to one another". **(A/M) (EU1)**
8. Students will participate in a teacher-led discussion and take notes on electromagnetic radiation, emphasizing its composition of electric and magnetic fields, wave-like and particle-like properties, and its speed of light travel.**(A/M) (EU1)**
9. Teacher-led notes and discussion on properties and applications of electromagnetic radiation and spectral analysis. **(A) (EU1)**
10. Students will construct a diagram of the EM Spectrum. **(A) (EU1)**
11. Students will analyze and contrast the characteristics of different wavelengths within the electromagnetic (EM) spectrum. **(A/M) (EU1)**
12. Students will identify specific elements by analyzing emission or absorption spectra. **(A/M) (EU1)**
13. Students will determine if an object is moving towards/away from an observer by analyzing its Doppler shift in the EM spectrum. **(A/M/T) (EU1)**
14. Students will conduct an investigation on the Doppler Effect **(A/M/T) (EU1)**
    https://www.purdue.edu/science/K12/docs/SMAP/The%20Doppler%20Effect%20with%20Sound.pdf

PHENOMENON: Supernova- Video/image
Goal: Students will be able to describe the properties and life cycle of a star and the implications to the regions around them.

1. Students will watch an explosion of a supernova, experiencing the power and transformative impact of these cosmic events. **(A) (EU1)**
2. Teacher-led notes/stations and discussion on our Sun.**(A) (EU1)**
3. Teacher-led discussion of nuclear fusion. **(A) (EU1)**
4. Students will illustrate the layers of a star to include the process of nuclear fusion and the transfer of energy through conduction, convection and radiation. **(A/M/T) (EU1)**
5. Students create a model of the Sun including all layers. **(A/T) (EU1)**
6. Students will describe the effects of iron formation in a star's core. **(A/M) (EU1)**
7. Students will compare and contrast the distribution of the Sun's energy among the planets. **(A) (EU1)**
8. Students will complete the following:Starry Night Activities
   http://www.starrynighteducation.com/products-astronomy-education-high-school.html
   F- The Sun as a Star
      F1: The Sun as a Source of Energy **(A) (EU1)**
      F2: Solar Weather **(M) (EU2)**
      F3: The Formation of the Sun and Solar System **(T) (EU1)**
9. Students will participate in a teacher-led discussion on a star's magnetic field, including topics such as sunspots, prominences, flares, and coronal mass ejections. **(A/M) (EU1)**
10. Students will describe how a star's magnetic field creates sunspots, prominences, flares, and coronal mass ejections (CME) **(A/M) (EU1)**
11. Students will describe how the sun's solar wind impacts human life and the solar system. **(A/M/T) (EU1)**
12. Teacher-led discussion and notes about star properties such as apparent magnitude, absolute magnitude, luminosity, color, surface temperature, spectral class, and radius. **(A) (EU1)**
13. Students will determine the characteristics of a star, including our Sun, by analyzing its position on an H-R diagram. **(M/T) (EU1)**
14. Students will determine a star's distance through analyzing a star's magnitude and its spectral class. **(M/T) (EU1)**
15. Students will plot stars on an H-R diagram using provided data on color and absolute magnitude. **(M/T) (EU1)**
    https://www.copley-fairlawn.org/cms/lib4/OH01001067/Centricity/Domain/460/H-R%20Diagram%20Wksht.pdf
    https://passionatelycurioussci.weebly.com/blog/plotting-the-stars
    Additional HR Diagram Activities

16. Teacher led discussion on the lifecycle of a star **(A) (EU2)**
17. Students will complete a KWL Chart (What I Know, What I Want to Know, What I Learned) on Black Holes (**A) (EU2**)
18. Black Hole Activities (**A/M) (EU2**)
https://www.cfa.harvard.edu/seuforum/einstein/resources/JourneyBlackHole/JourneyBlackHoleManual.pdf
19. Students will predict the end of a star's life cycle by analyzing its mass. (**M) (EU2**)
20. Students will complete the following:Starry Night Activities **(A/M/T) (EU1, EU2)**
http://www.starrynighteducation.com/products-astronomy-education-high-school.html
G- The Stars
G1: The Solar Neighborhood
G2: The Stars
G3: Black Holes
21. Video: Interstellar **(M/T) (EU1, EU2)**
22. Videos: The Universe http://www.history.com/shows/the-universe
Crash Course Astronomy https://www.youtube.com/playlist?list=PL8dPuuaLjXtPAJr1ysd5yGIyiSFuh0mIL
Through the Wormhole Series https://www.sciencechannel.com/tv-shows/through-the-wormhole/
How the Universe Works https://www.sciencechannel.com/tv-shows/how-the-universe-works/
The Cosmos Series http://channel.nationalgeographic.com/cosmos-a-spacetime-odyssey/ **(A/M) (EU1)**
23. Students will create a cartoon or children's book on the lifecycle of a star. **(T) (EU2)**

Aurora Borealis article 2024
Death of the Sun
Star color
Solar Flare/sunspots/solar cycle -https://thewonderofscience.com/phenomenon/2018/7/8/solar-flares-sunspots-and-the-solar-cycle

Pacing Guide

{This chart will be identical in all of the units for this course.}

Unit #	*Title of Unit*	*Approximate # of teaching days*
1	Our Place in Space	40
2	The Solar System	30
3	The Stars	40
4	The Universe	25

Instructional Materials

- Astronomy Crash Course Videos
- Chromebooks or Laptops
- Markers (for diagrams and notes)
- Highlighters (for highlighting key information in texts and notes)
- Rulers (for drawing and measuring diagrams)
- Pencils and Erasers
- Graph Paper (for plotting data and diagrams)
- Model Kits (for constructing models of stars and the Sun)
- Diagram Templates (for creating EM Spectrum and H-R Diagrams)
- Whiteboard and Dry Erase Markers (for teacher-led explanations and notes)
- Projector and Screen (for displaying videos and presentations)
- Science Lab Equipment
    - Telescopes (both models and actual working units, if available)
    - Spectrometers (for analyzing light spectra)
    - Photometers (for measuring light intensity)

    - Light Filters (for observing different wavelengths)
    - Star Maps and Star Charts (for observational exercises)
    - Data Loggers (for recording measurements during experiments)
    - Simulated Star Models (for educational demonstrations)
    - Graphing Calculators (for calculations involving astronomical data)
    - Light Boxes (for demonstrating light behavior and spectra)
    - Measuring Tapes (for distance measurements in models)
- Telescope Models (for practical demonstrations)
- Printed Worksheets (for H-R Diagram and other activities)
- Reference Books (for additional reading and information)
- Online Resource Links (for access to digital tools and simulations)

Accommodations

Special Education: The curriculum will be modified as per the Individualized Education Plan (IEP). Students will be accommodated based on specific accommodations listed in the IEP.

Students with 504 Plans: Students will be accommodated based on specific accommodations listed in the 504 Plan.

English Language Learners: Students will be accommodated based on individual need and in consultation with the ELL teacher.

Students at Risk of School Failure: Students will be accommodated based on individual need and provided various structural supports through their school.

Gifted and Talented Students: Students will be challenged to enhance their knowledge and skills through acceleration and additional independent research on the subject matter.