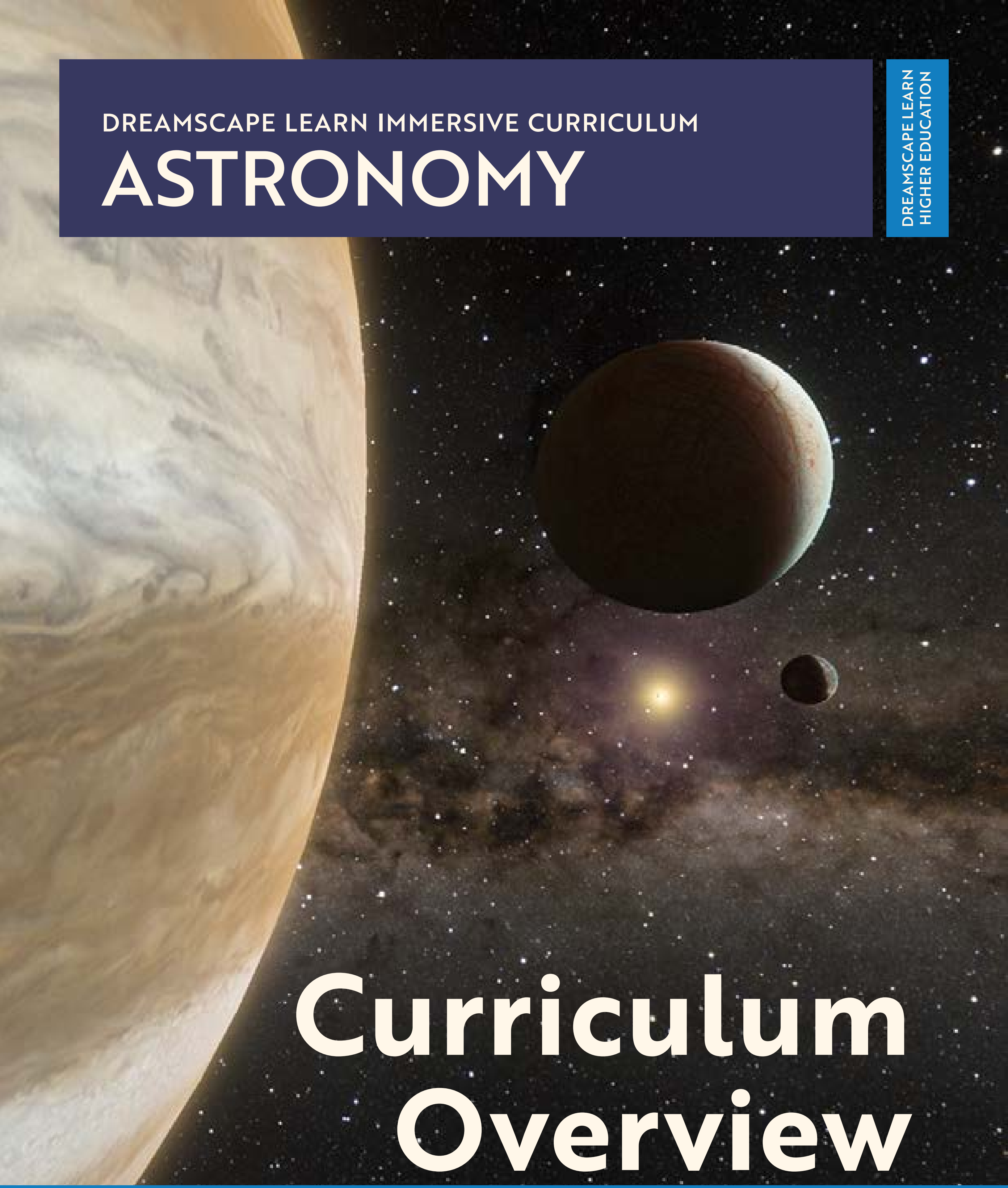
DREAMSCAPE LEARN IMMERSIVE CURRICULUM

ASTRONOMY

DREAMSCAPE LEARN
HIGHER EDUCATION



Curriculum Overview

DREAMSCAPE LEARN™

What is Dreamscape Learn's Immersive Curriculum?

Dreamscape Learn (DSL) is a new way of learning that combines Hollywood storytelling, advanced pedagogy, and immersive technology.

The Astronomy learning sequence begins with an immersive experience in which students step inside the Center for Planetary Observations (CPO). Guided by the CPO Director, Professor Thompson, students explore the mysteries of the night sky, until a routine observation reveals an unexpected object. As events unfold, students collect and analyze data to build an evidence-based understanding of the object and determine whether it is a newly discovered planet, or a potential threat to Earth.

In the classroom, the mission continues!

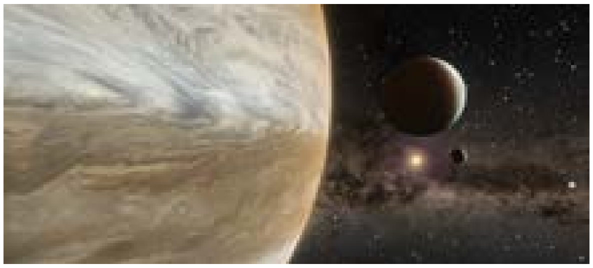
Students use data collected during the immersive experience to characterize astronomical phenomena, build and test models, and interpret potential outcomes. Working collaboratively, they analyze findings and draw evidence-based conclusions that shape the next phase of the storyline.

Across the curriculum, Dreamscape Learn provides repeated opportunities for students to practice core astronomy skills while developing scientific reasoning, quantitative analysis, and teamwork—mirroring how scientists investigate complex problems and refine solutions in the real world.

THE WHITETAIL MISSION: AT A GLANCE

ACT 1: AN UNEXPECTED DISCOVERY

Students discover a mysterious new object in the night sky and begin investigating whether it poses a threat to Earth. Using astronomical observations and measurements, students determine whether the object is celestial and begin tracking its position and motion.

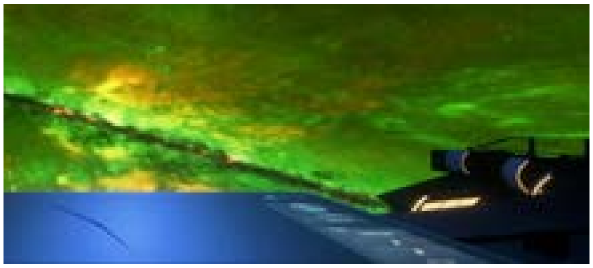


ACT 2: FARSIDE OF THE MOON

Students travel to the far side of the Moon to gather new observations of the mysterious object. Using coordinate measurements and models, students investigate its location, motion, and trajectory to determine where it is headed.

ACT 3: A TAIL OF ICE OR FIRE

Students get a closer look at the mysterious object as new clues about its identity emerge. Using spectroscopy and models of orbital motion, students investigate its composition and behavior to determine what kind of object it is and predict how it will move through the Solar System.



ACT 4: OPPORTUNITY OR EMERGENCY

Students discover the mysterious object is an interstellar comet that may be older than our Sun—an extraordinary scientific opportunity that also threatens Earth. Using evidence from past impacts and craters, students investigate the consequences of a collision and quantify the risk to Earth.

ACT 5: DEFLECTING DISASTER

Students discover the comet has split in two, increasing the uncertainty surrounding a potential impact with Earth. Using evidence from past impacts and planetary defense missions, students evaluate the consequences of an impact and investigate strategies for safely deflecting the comet.

ACT 6: THE FINAL COUNTDOWN

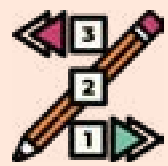
After a failed deflection attempt, students discover the comet will actually miss Earth. but a nuclear strike threatens to turn it into hundreds of dangerous fragments. In a final race against time, students redirect the strike, save Earth, and preserve the opportunity to study the interstellar comet as it passes.

THE MISSION-DRIVEN LEARNING CYCLE

Each act begins with an immersive experience that advances the mission and introduces new questions, evidence, or challenges. During Rewind & Reflect, students discuss what they observed, make sense of new evidence, and identify what they need to investigate next. Students then continue the mission through two connected labs, where they earn scientific certifications, use those skills to investigate the mission challenge, and make evidence-based decisions that move the story forward.

IMMERSIVE EXPERIENCE
20 MINUTES

REWIND & REFLECT
15 MINUTES



LAB A: ~120 MINUTES

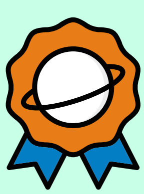
CERTIFY
45 - 60 MINUTES

INVESTIGATE
45 - 60 MINUTES

DECIDE
20 MINUTES

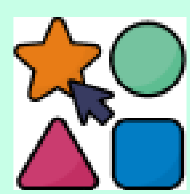
LAB B: ~120 MINUTES

CERTIFY
45 - 60 MINUTES



INVESTIGATE
45 - 60 MINUTES

DECIDE
20 MINUTES

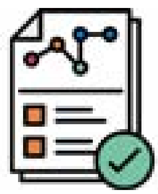


A COMPLETE INSTRUCTIONAL PACKAGE

Every act of Dreamscape Learn Astronomy is supported by a coordinated set of instructional resources designed to make implementation straightforward. Together, these materials guide instructors through immersive discussions, laboratory investigations, assessments, and evidence-based learning that advances the mission.

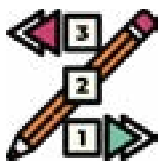
MISSION OVERVIEW

This high-level roadmap outlines the entire mission, including storyline progression, act summaries, and suggested lab activity pacing.



MISSION LEADER GUIDES

This primary instructor resource provides laboratory setup procedures, driving questions, learning goals, facilitation strategies, answer keys, and suggested student feedback for each act.



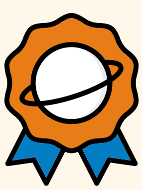
REWIND & REFLECT INSTRUCTIONAL SLIDES

These instructional slides are designed to facilitate class discussions about their immersive experience, share observations, clarify the problem, and plan their next steps in the mission.

DIGITAL DATA WORKBOOKS

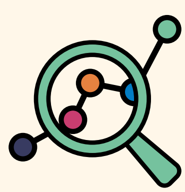
Google Sheets that provide students a structured place to record observations, analyze data, create models, and document evidence throughout their investigations.

Each lab investigation is broken down into three activities: Certify, Investigate, Decide.



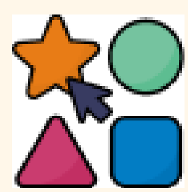
CERTIFY

Students learn, practice, and demonstrate proficiency in the required scientific knowledge, tools, or techniques for the investigation and earn a CPO Certificationupon completion.



INVESTIGATE

Students put their certified expertise to the work. Students use observations, data, experiments, calculations, or models to analyze and interpret evidence related to the mission challenge.



DECIDE

Students synthesize evidence from their analyses to make an evidence-based conclusion, prediction, assessment, or recommendation to advance the Whitail Investgiation.

CPO CERTIFICATIONS

Throughout the Whitetail mission, students earn ten CPO Certifications representing specialized astronomical skills they will use to investigate the universe. Each certification prepares students with new expertise they will put to work in the mission.

These certifications build across the course. As the investigation becomes more complex, students draw upon previously certified skills while developing new ones, combining multiple forms of astronomical evidence to characterize the mysterious object, model its behavior, and make evidence-based decisions.

Coming soon!!

Coming soon!!

Coming soon!!

Coming soon!!

Coming soon!!

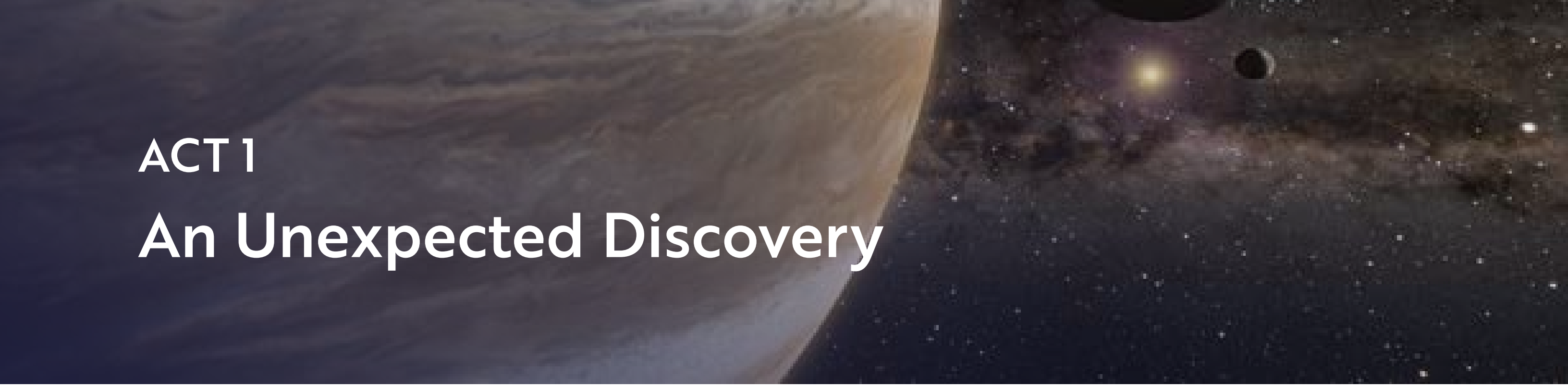
Coming soon!!

Coming soon!!

Coming soon!!

Coming soon!!

Coming soon!!



ACT 1

An Unexpected Discovery

In this act, students will...

Lab 1A

- Analyze digital astronomical images to identify distinguishing features of celestial bodies and visual artifacts, including light intensity and shape.
- Develop rule-based criteria to classify objects in astronomical images.
- Describe measurable properties of Solar System objects, including size, distance, and angular size.
- Construct and use physical and mathematical scale models to represent planetary distances and diameters.
- Calculate and compare angular sizes of Solar System objects using appropriate equations.
- Apply models to evaluate whether an unknown object could plausibly be a planet.
- Use qualitative and quantitative evidence to justify conclusions about the nature of an unknown astronomical object.
- Communicate a scientific claim supported by observational data and reasoning.

Lab 1B

- Describe the relationships among the Sun, Earth, and Moon that produce lunar phases.
- Identify and record illumination patterns on the near and far sides of the Moon.
- Construct and use physical and graphical models to represent how lunar illumination changes over time.
- Calculate the percentage of surface illumination on both sides of the Moon and relate those values to lunar phase.
- Apply the angular size relationship (diameter/distance) to predict whether a total or annular solar eclipse will occur.
- Use illumination data and angular size calculations to determine the optimal observation window for a lunar telescope.
- Justify whether a predicted solar eclipse will affect telescope functionality using quantitative and geometric reasoning.

ACT 2
Far Side of the Moon

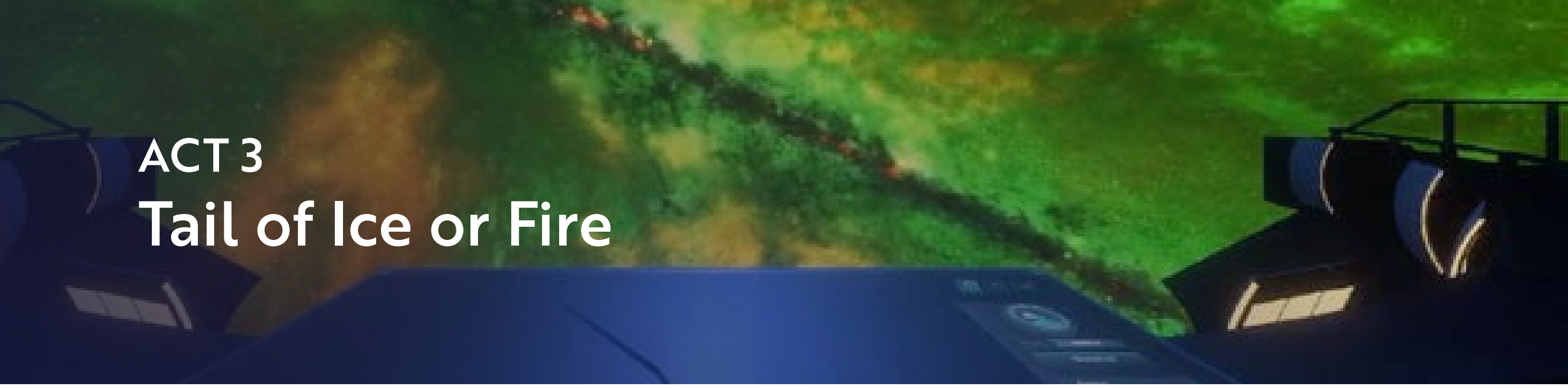
In this act, students will…

Lab 2A

- Distinguish between horizon and equatorial coordinate systems and determine when each is appropriate for astronomical observations.
- Identify the position of celestial objects using equatorial coordinates, including right ascension and declination.
- Analyze coordinate data collected over time to identify patterns in the motion of a celestial object.
- Construct and interpret graphical models that represent the past and predicted trajectory of a celestial object across the night sky.
- Apply observations of the ecliptic and zodiac constellations to predict whether a celestial object will intersect the plane of the Solar System.
- Use qualitative and quantitative evidence to evaluate the trajectory and likely path of an unknown celestial object.
- Communicate a scientific claim supported by observational data and reasoning.

Lab 2B

- Describe measurable properties of celestial objects using apparent magnitude as an indicator of observed brightness.
- Estimate and compare the apparent magnitudes of celestial objects using astronomical images and reference stars.
- Construct and interpret graphs to identify changes in a celestial object’s apparent magnitude over time.
- Analyze the relationship between apparent magnitude, brightness, and distance to infer whether a celestial object is moving toward or away from Earth.
- Apply observational evidence to evaluate how changes in brightness support predictions about a celestial object’s motion.
- Use qualitative and quantitative evidence to justify conclusions about the behavior and location of an unknown celestial object.
- Communicate a scientific claim supported by observational data and reasoning.



ACT 3

Tail of Ice or Fire

In this act, students will...

Lab 3A

- Describe how an object's orbital shape, distance from the Sun, and orbital size influence its motion.
- Apply Kepler's laws to predict changes in the velocity and orbital motion of celestial objects.
- Construct and interpret mathematical models that relate orbital size to orbital period.
- Analyze orbital data to estimate the semi-major axis, perihelion, and aphelion distances of planetary orbits.
- Compare planetary orbits with Whitetail's projected path to determine which planets could intersect the comet's trajectory.
- Use qualitative and quantitative evidence to evaluate potential interactions between Whitetail and objects in the Solar System.
- Communicate a scientific claim supported by observational data and reasoning.

Lab 3B

- Calculate the velocity of a celestial object using observational data.
- Compare an object's velocity to the escape velocity at different distances from the Sun.
- Analyze quantitative evidence to determine whether a comet is gravitationally bound to the Sun.
- Apply mathematical models of orbital motion and gravity to predict the future behavior of a celestial object.
- Evaluate evidence to determine the likelihood that Whitetail will remain in or leave the Solar System.
- Use qualitative and quantitative evidence to justify conclusions about Whitetail's trajectory and long-term motion.
- Communicate a scientific claim supported by observational data and reasoning.

ACT 4
Opportunity or Emergency

In this act, students will...

Lab 4A

- Distinguish impact craters from landforms created by volcanism, erosion, and tectonic activity using observable surface features.
- Analyze images of planetary surfaces to determine the relative ages of craters and other geological features.
- Compare planetary surfaces to infer their relative ages based on crater density and evidence of resurfacing.
- Classify impact craters as preserved, partially degraded, or heavily degraded using observational evidence.
- Evaluate planetary images to identify preserved craters suitable for scientific analysis.
- Use qualitative evidence to justify crater classifications and interpretations of planetary surface history.
- Communicate a scientific claim supported by observational evidence and reasoning.

Lab 4B

- Apply an impact simulation model to predict crater diameters from an impactor's physical properties.
- Compare predicted crater diameters with observed crater data to evaluate the accuracy of a scientific model.
- Calculate and interpret percent error to assess the reliability of model predictions.
- Use validated models to predict the crater diameter and impact energy of Whitetail under multiple impact scenarios.
- Analyze how an impactor's composition influences crater size and impact energy.
- Evaluate evidence to determine whether an impact model is sufficiently accurate for predicting real-world impact hazards.
- Communicate a scientific claim supported by quantitative evidence and mathematical modeling.

ACT 5
Deflecting Disaster

In this act, students will...

Lab 5A

- Insert learning objective here

Lab 5B

- Insert learning objective here

ACT 6
The Final Countdown

In this act, students will...

Lab 6A

- Insert learning objective here

Lab 6B

- Insert learning objective here