Amplify Science

Unit 1: Patterns of Earth and Sky

(with a focus on Science & Engineering Practices)

Grade 5

School/District Name: LAUSD
Date: April, 2022
Presented by: Suzy Takeda

TOP RATED BY EDREPORTS

PLPG CERTIFIED PROVIDER

Amplify's Purpose Statement

Dear teachers,

You do a job that is nearly impossible and **utterly essential**.

We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

Thank you for working with us to craft rigorous and riveting learning experiences for your classroom.

We share your goal of **inspiring all students to think deeply, creatively, and for themselves.**

Sincerely,
Amplify

Norms: Establishing a culture of learners

- **Take risks:** Ask any questions, provide any answers.
- **Participate:** Share your thinking, participate in discussion and reflection.
- **Be fully present:** Unplug and immerse yourself in the moment.
- **Physical needs:** Stand up, get water, take breaks.

Navigation Temperature Check

Rate yourself on your comfort level accessing Amplify Science materials and navigating a digital curriculum.

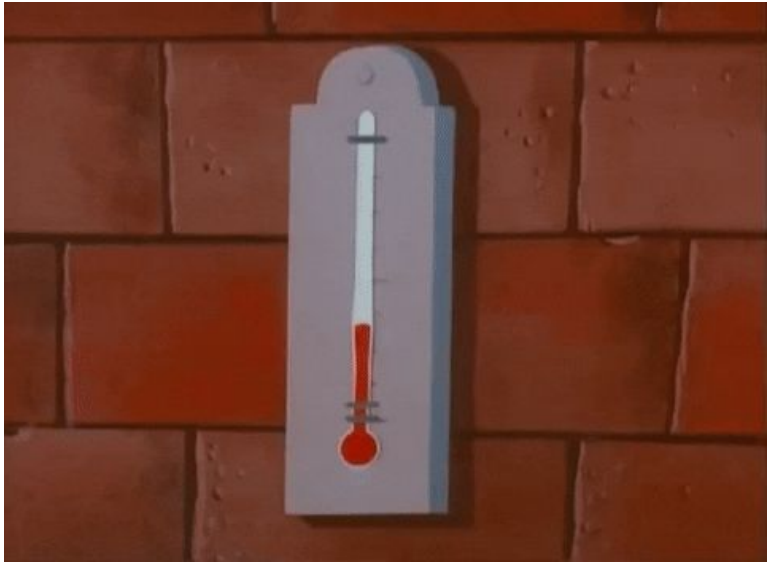
1 = Extremely Uncomfortable

2 = Uncomfortable

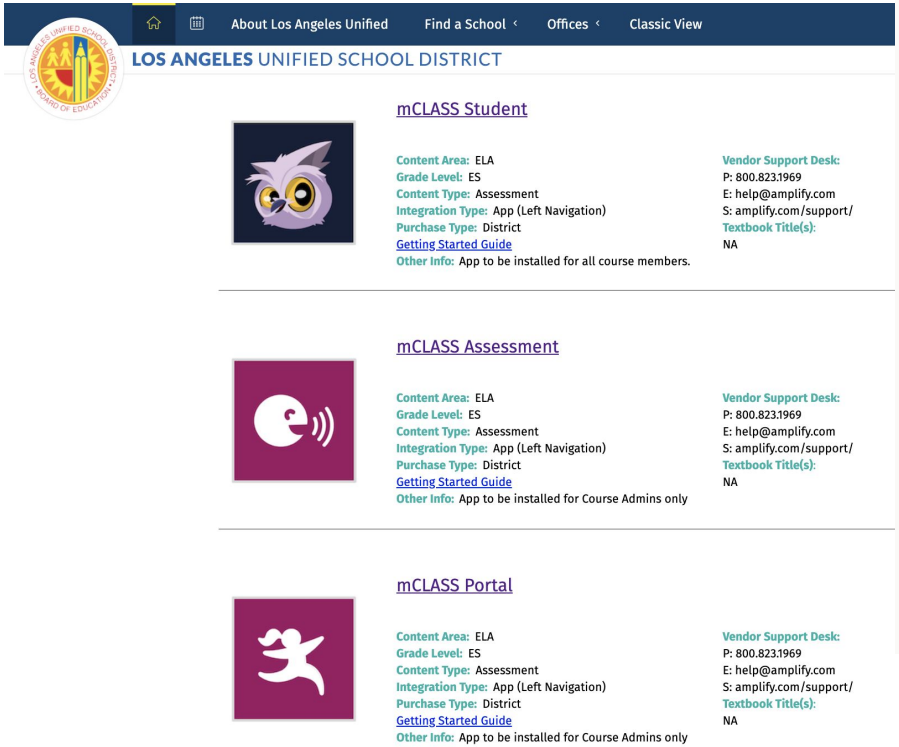
3 = Mild

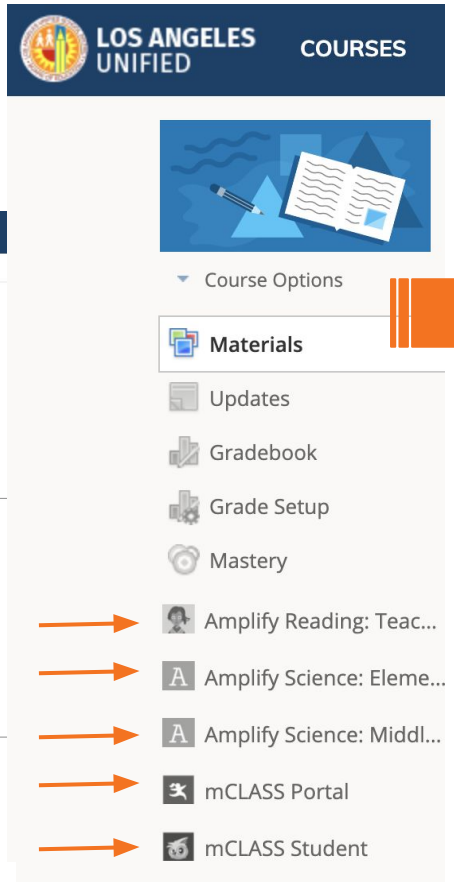
4 = Comfortable

5 = Extremely Comfortable

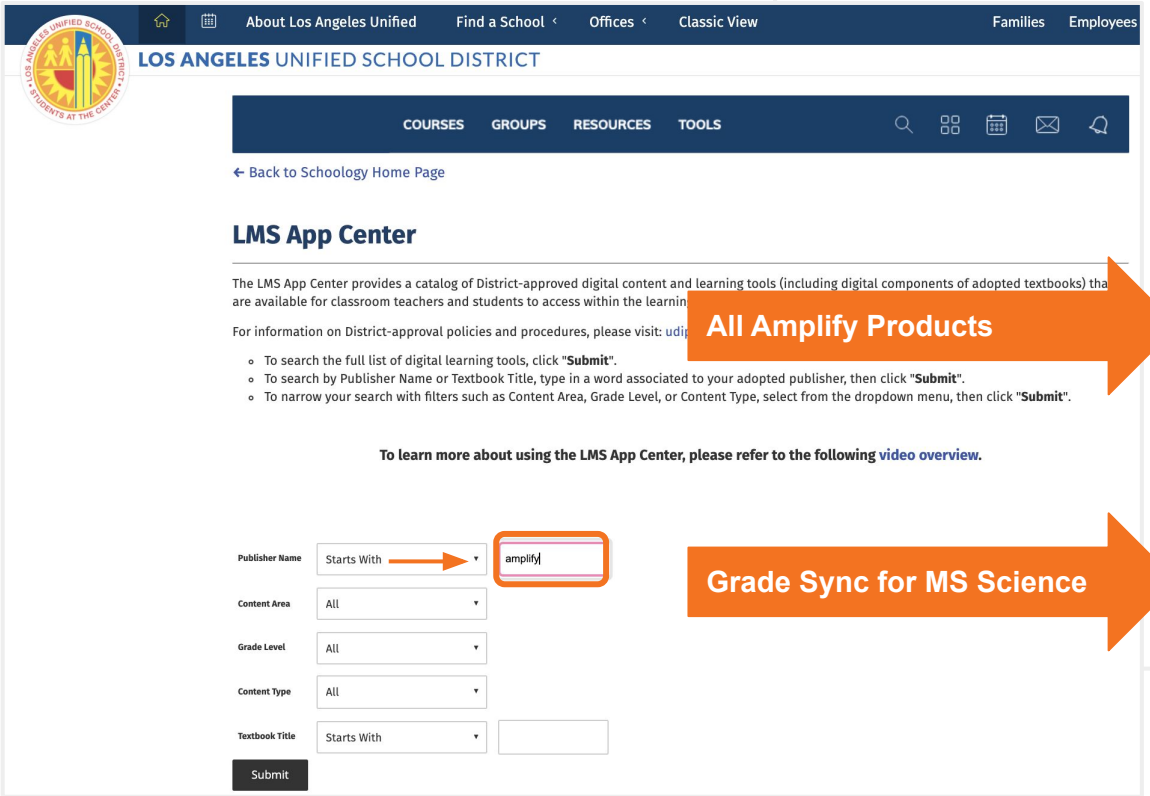


Last year's Amplify apps.



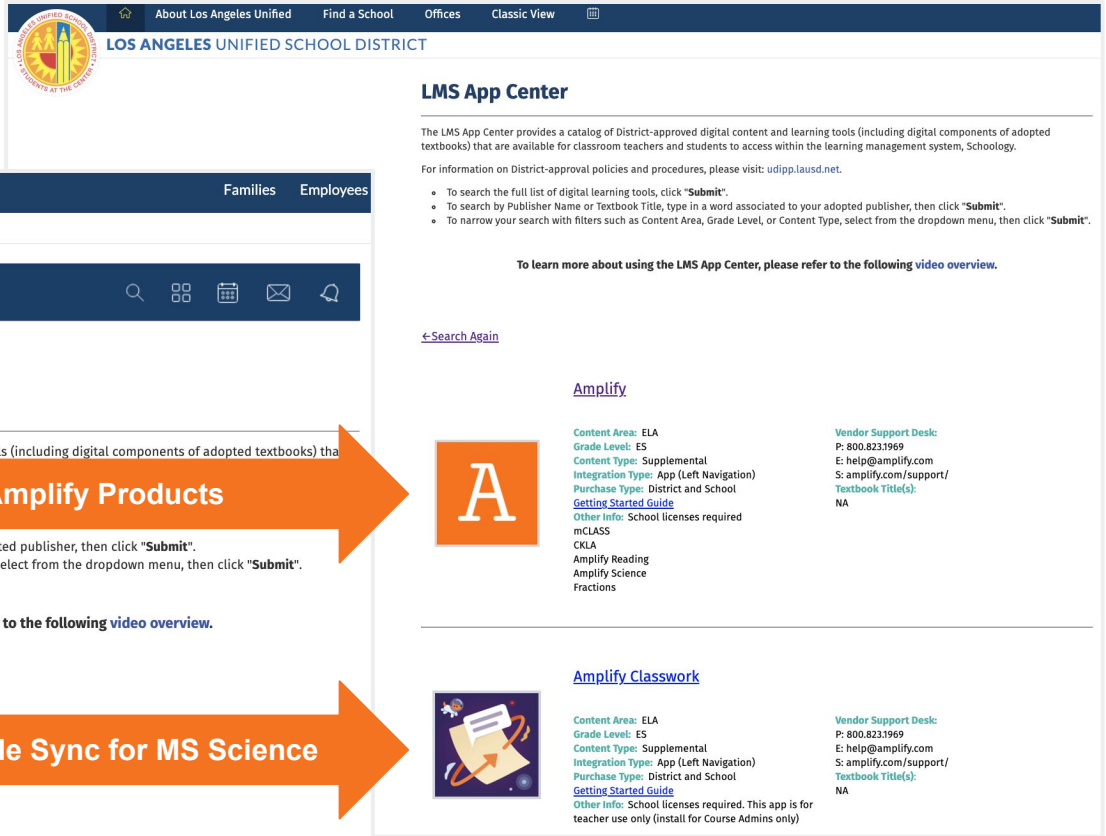


This year's app(s).



All Amplify Products

Grade Sync for MS Science



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Reading 6-8

Reading K-5

Science

Vocabulary

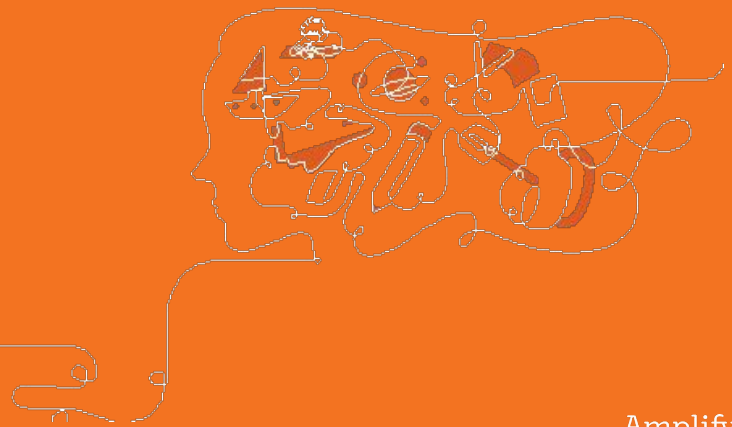
Amplify. on Schoology

2021-2022

Schoology

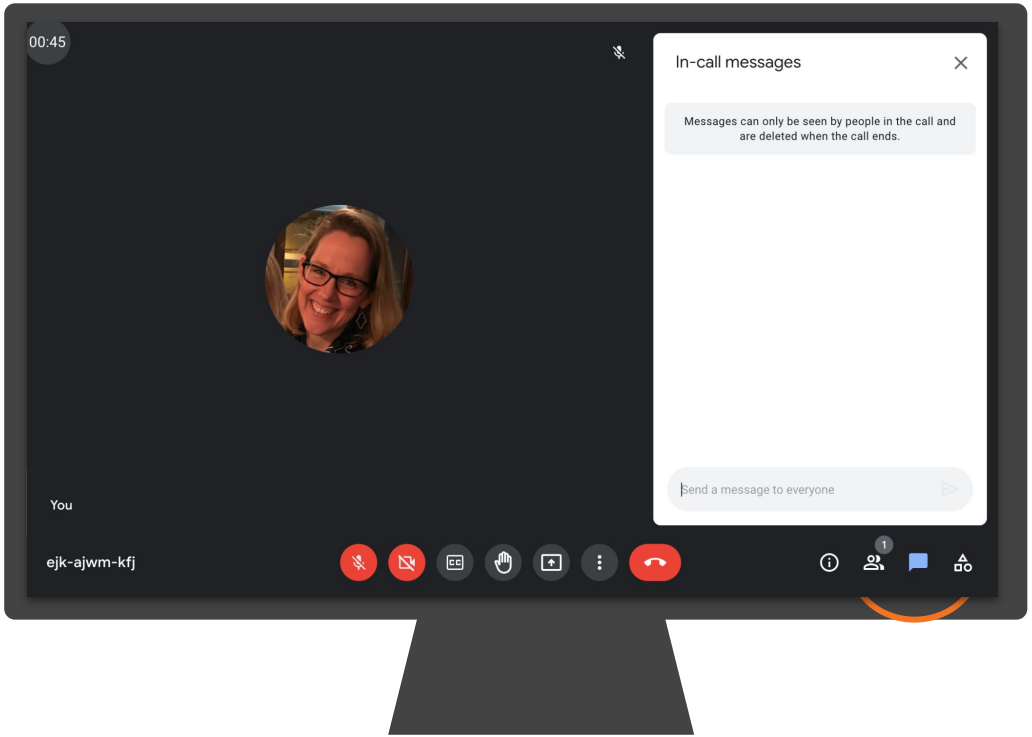
- To join Amplify ES Group: W4PK-W466-63F5B

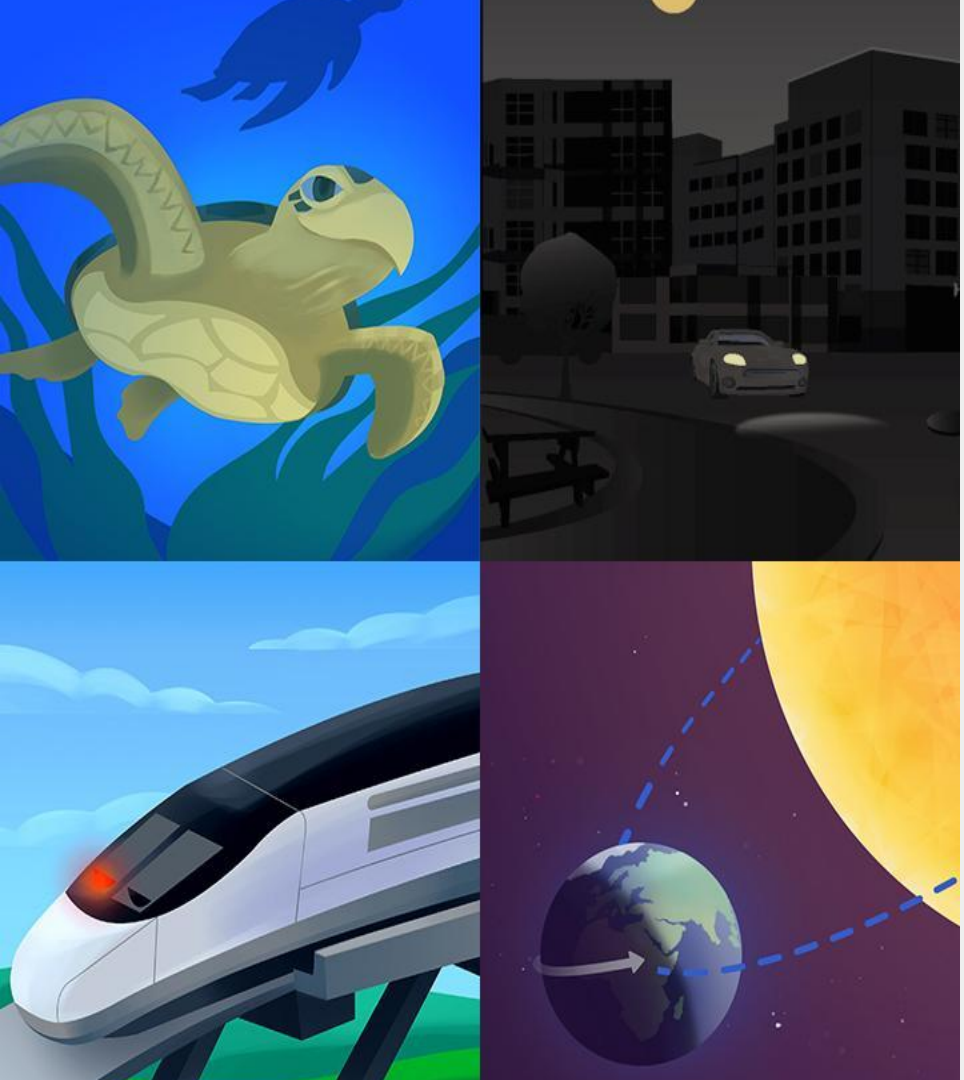
Part 1



Ice Breaker!

- **Question:** In the chat, share out a positive experience with your students using Amplify Science.





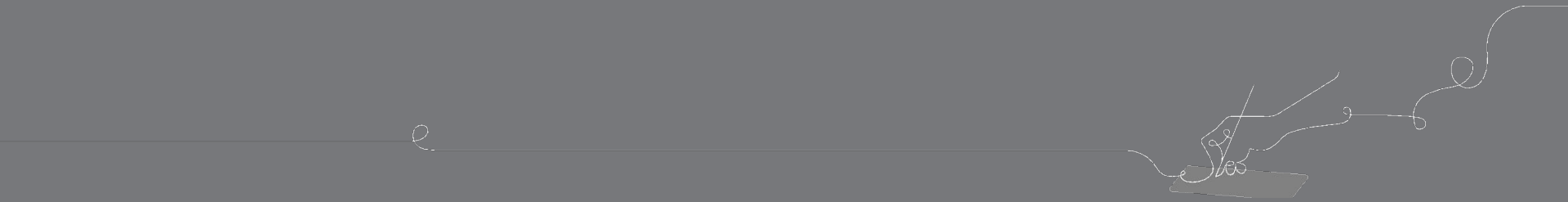
Plan for the day

- Framing
- Introducing the Unit
- Unit Internalization
- Identifying the Science and Engineering Practices at the unit and chapter level
- Science and Engineering Practices within a lesson
- Lesson Planning
- Closing

Overarching goals

By the end of this workshop, you will be able to:

- ❑ Internalize the unit
- ❑ Identify the Science and Engineering Practices within the unit

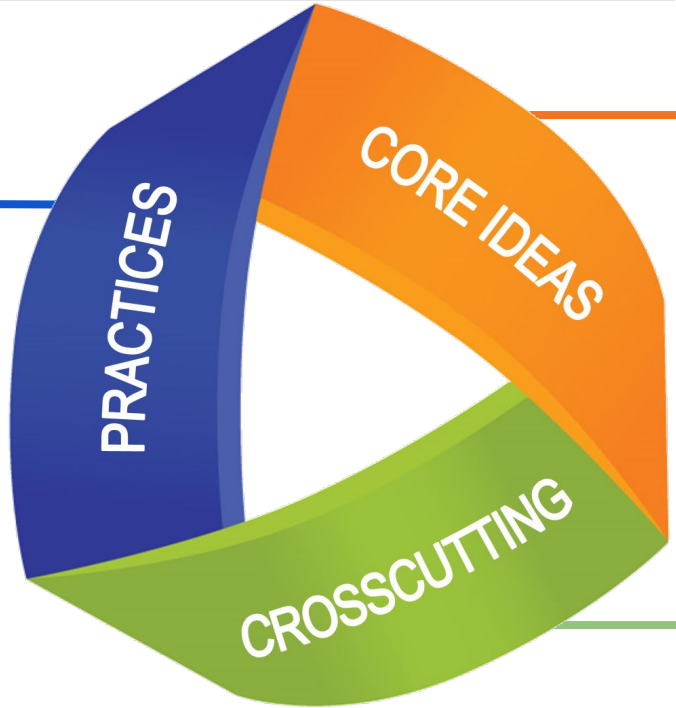


Next Generation Science Standards

Designed to help students build a cohesive understanding of science

What scientists do

Science and Engineering Practices



What scientists want to know

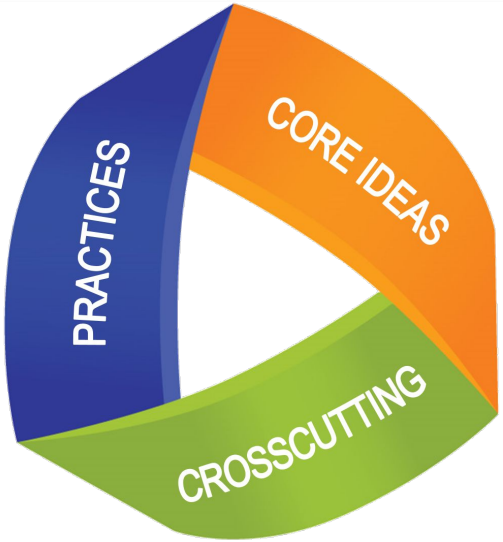
Disciplinary Core Ideas

How scientists think

Crosscutting Concepts

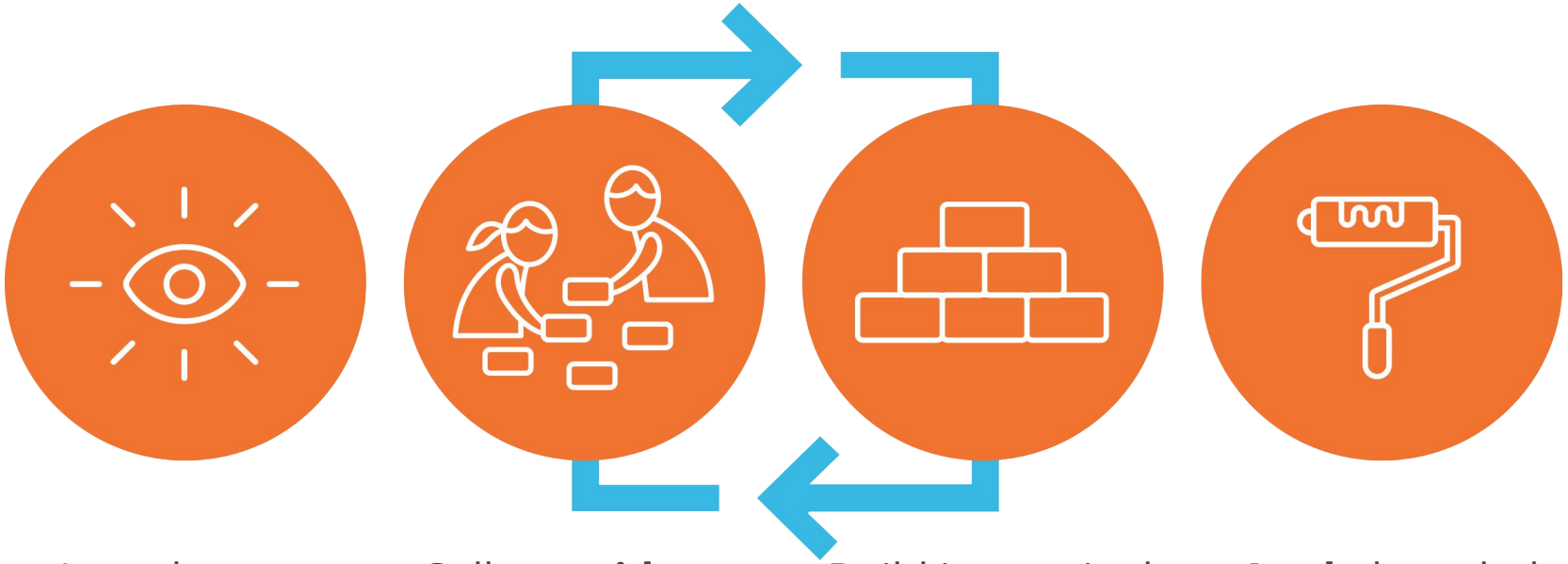
Next Generation Science Standards

Science and Engineering Practices



1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Amplify Science Approach



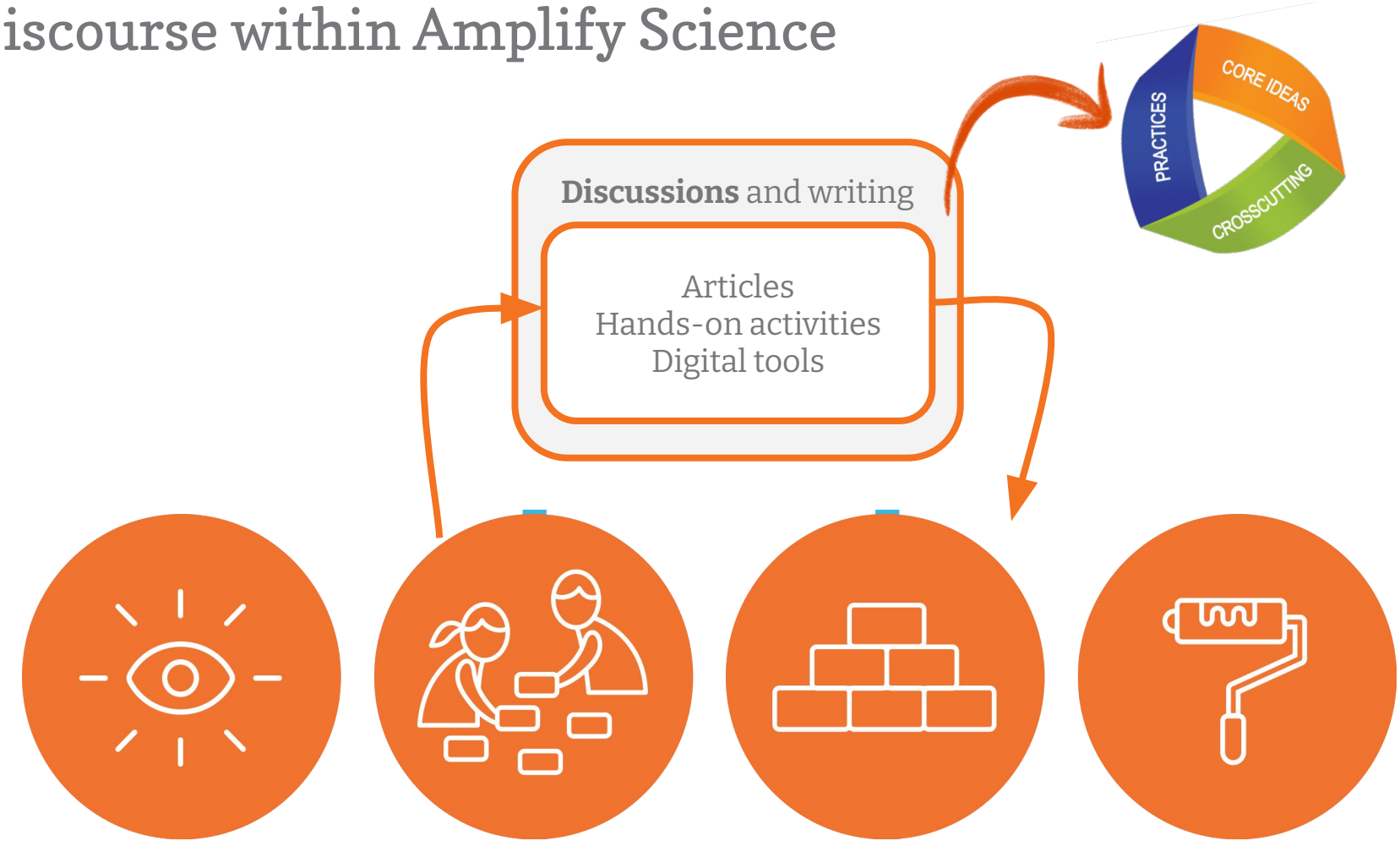
Introduce a **phenomenon** and a related problem

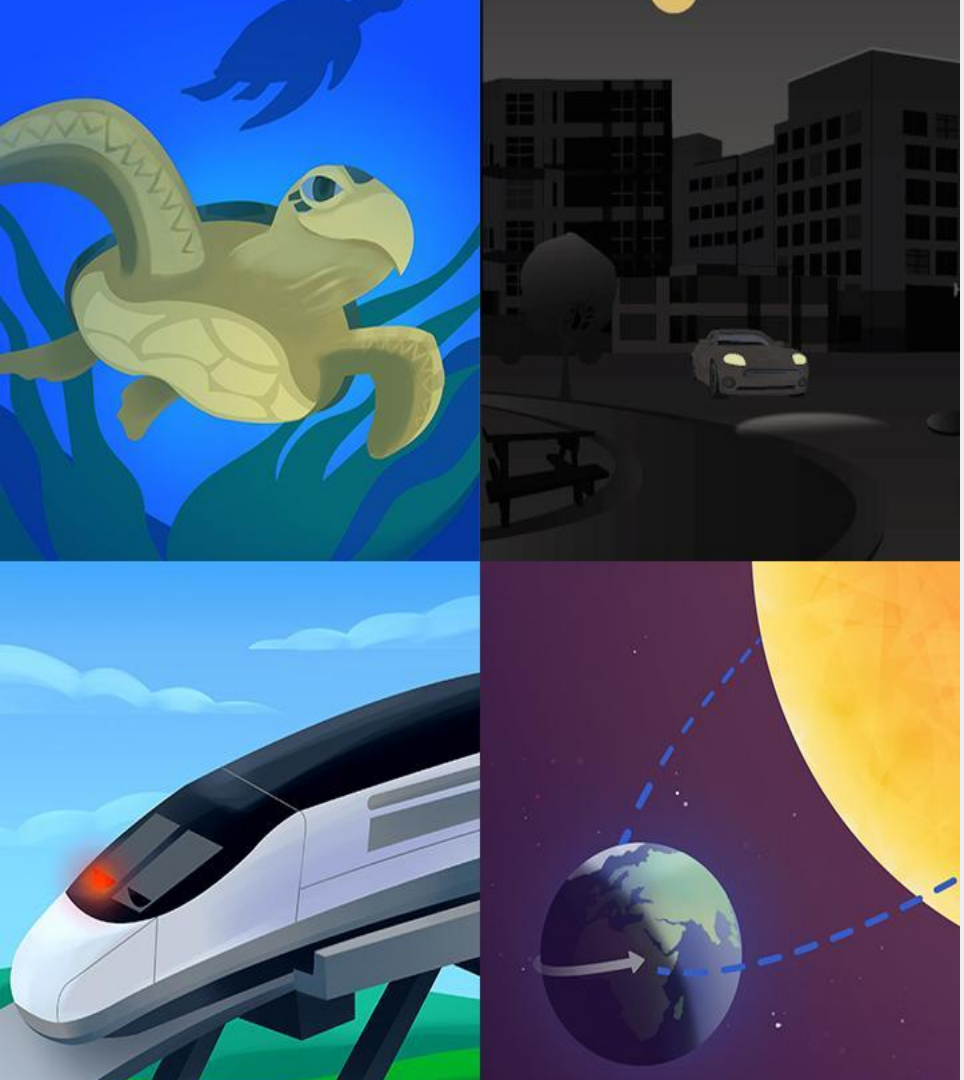
Collect **evidence** from multiple sources

Build increasingly complex **explanations**

Apply knowledge to solve a different problem

Discourse within Amplify Science





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Grade 5 | Patterns of Earth and Sky

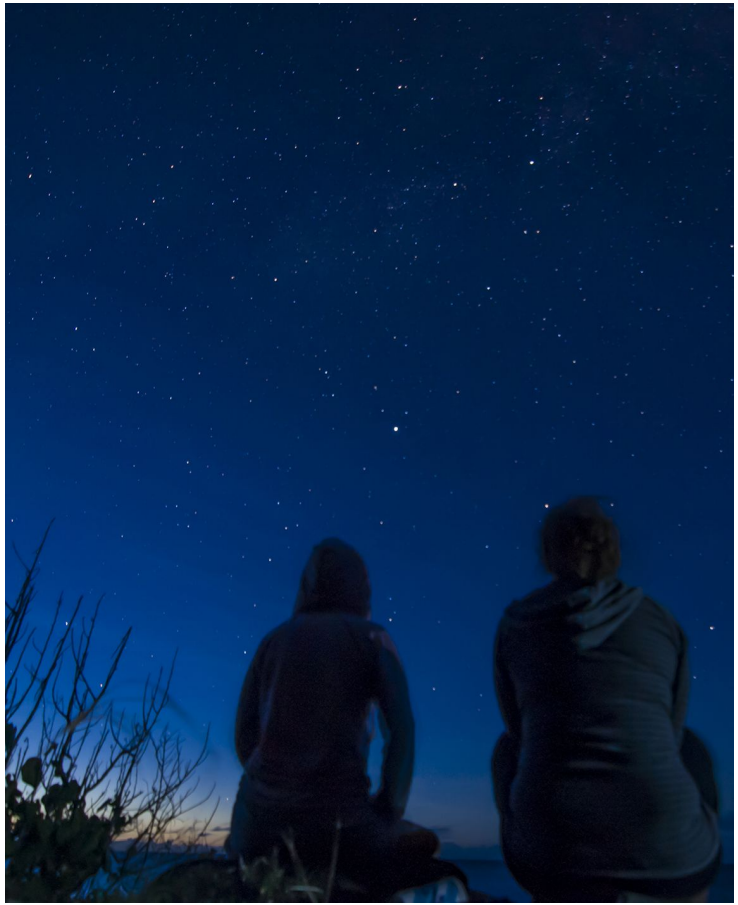
Lesson 1.1: Pre-Unit Assessment

AmplifyScience

10 MIN

Activity 1

Introducing the Unit

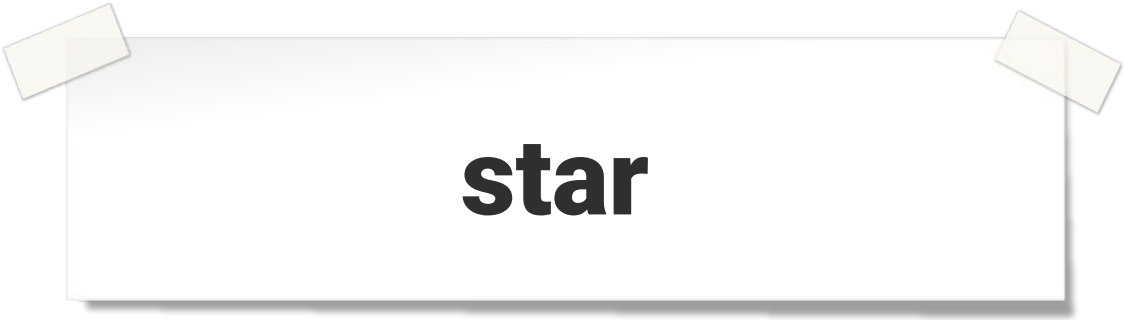


In this unit, we're going to take a closer look at the stars and use what we observe to help us solve a mystery.

What **ideas** do you have about stars?

What **questions** do you have about stars?

Vocabulary



a huge object in space that gives off heat and light

We’re going to look at some images together.

Observe each one silently. Then I’ll ask a few of you to **share** your thoughts of the image.

Sky Disc

Nebra, Germany
3,600 years old

Rock Painting

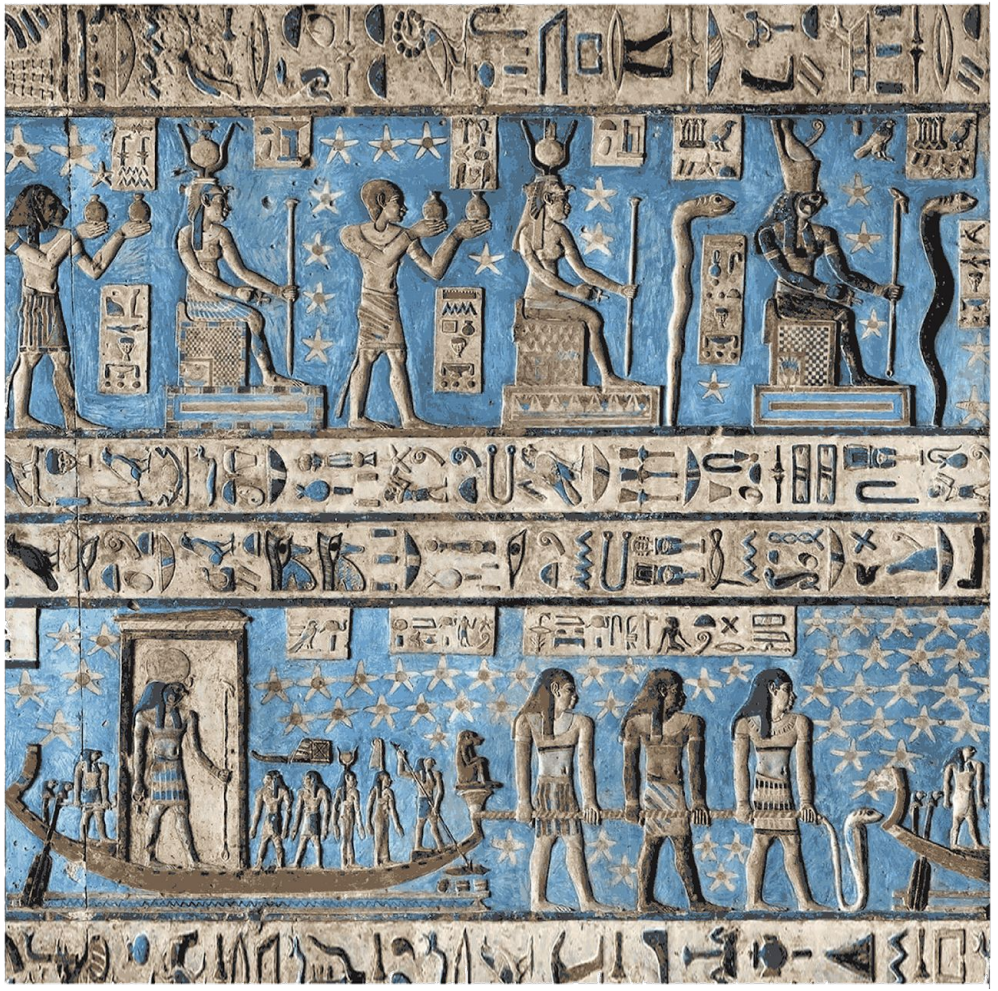
Chaco Canyon,
New Mexico
about 1,000 years old

Stonehenge

England, built between 4,000 and 2,000 years ago

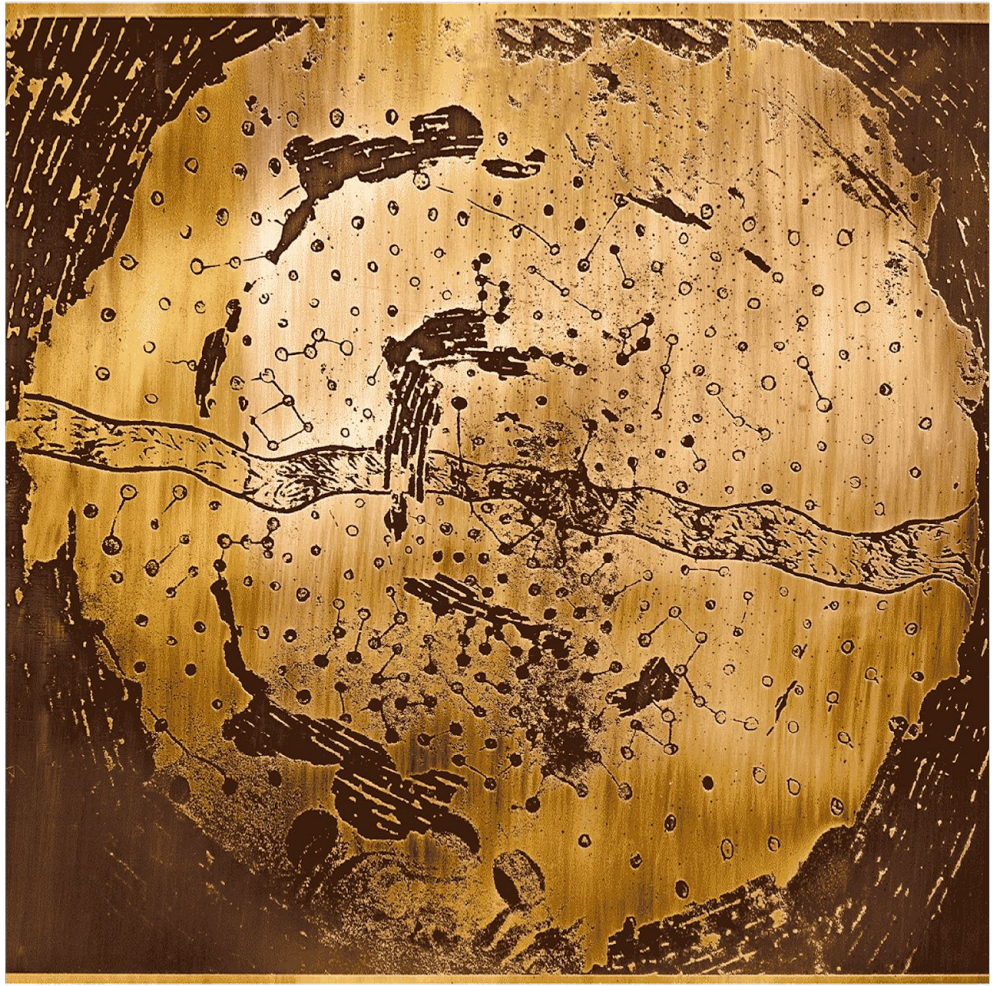
Temple Painting

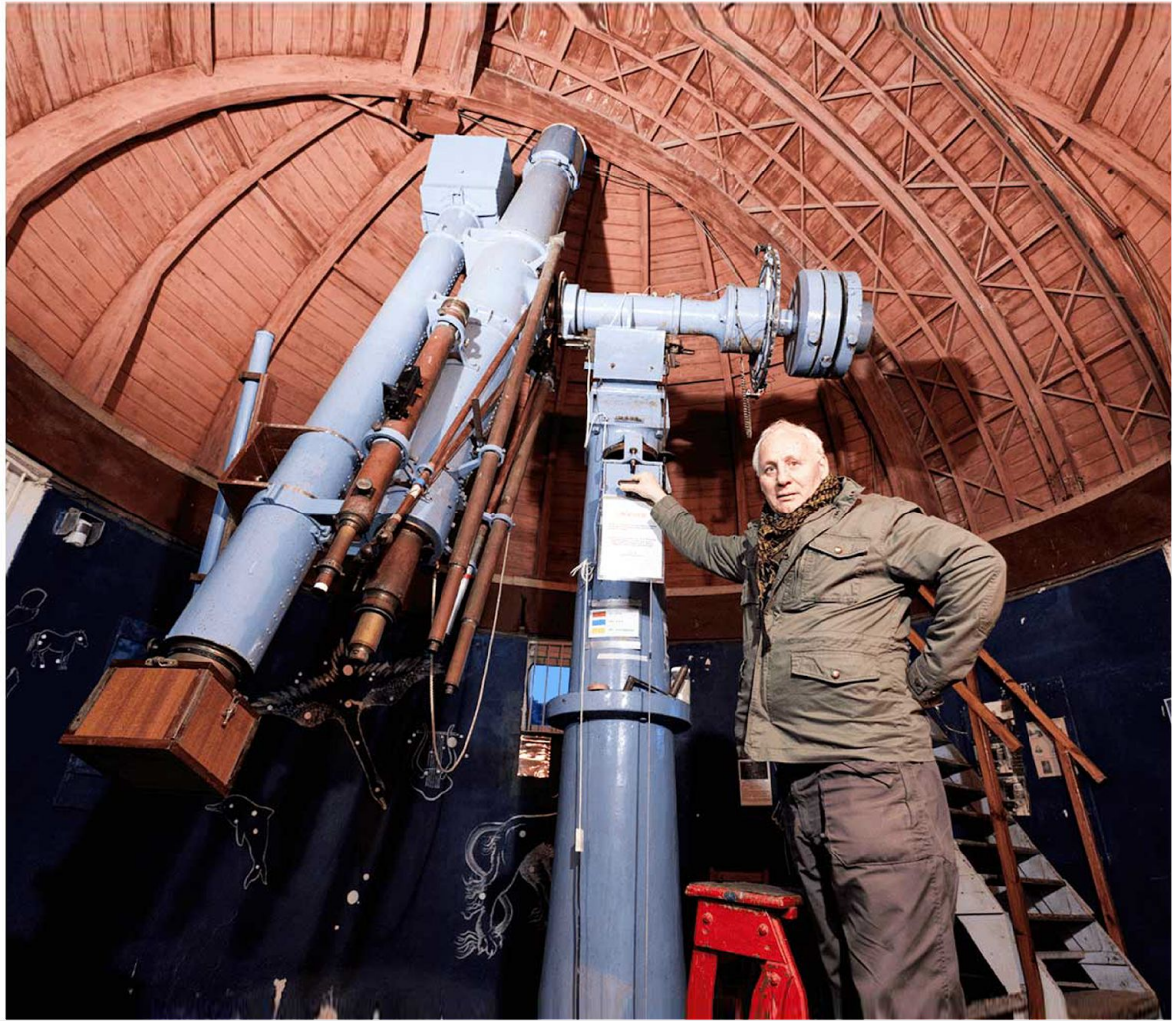
Dendera, Egypt
over 2,000 years old



Star Map

Tomb Painting
Luoyang, China
1,600 years old





You will take on the role of **astronomers** as you try to solve a mystery by investigating things we see in the sky as we're standing on Earth.

Vocabulary

astronomer

a scientist who studies stars, planets, and other objects in the universe

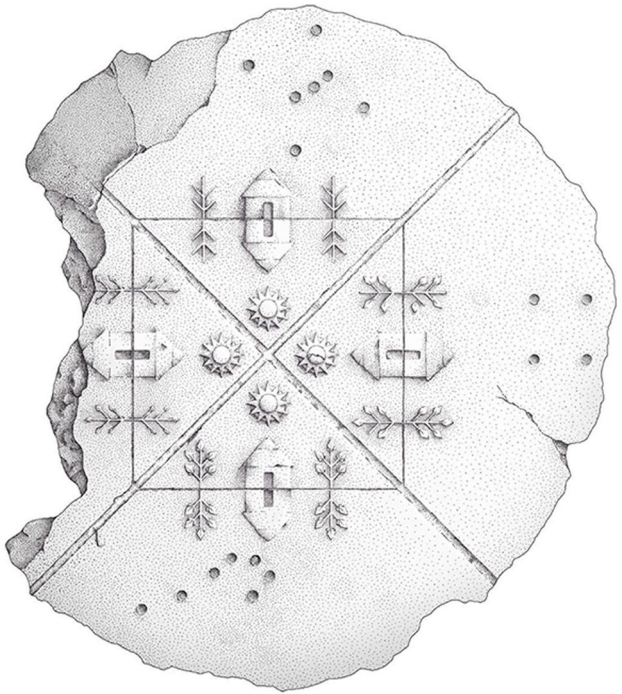
Unit Question

Why do we see different stars at different times?

10 MIN

Activity 2

Introducing the Artifact



Archaeologists uncovered this artifact.

What do you notice or observe about it?

To: Student Astronomers
From: Dr. Sabri, Museum of Archaeology
Subject: Mysterious Artifact

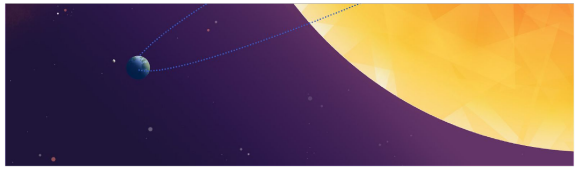
Our museum's field research team located an artifact, and we think it might be more than 1,000 years old. We believe it shows something about the sun and the stars, although one section is missing. Would you be able to help us figure out what the missing section looked like?

We want to put the artifact on display at the musuem, and it would be nice to show people how it might have looked before it was broken.

A map is attached to show you where the artifact was found, in case that is helpful.


Greenland
CANADA
U.S.
UNITED STATES
MEXICO
BRAZIL
ARGENTINA
CHILE
PERU
BOLIVIA
PARAGUAY
URUGUAY
COLOMBIA
VENEZUELA
ECUADOR
GUYANA
SURINAME
FRENCH GUIANA
RUSSIA
KAZAKHSTAN
MONGOLIA
CHINA
INDIA
PAKISTAN
AFGHANISTAN
IRAN
IRAQ
SAUDI ARABIA
YEMEN
OMAN
TURKEY
SYRIA
UKRAINE
BELARUS
POLAND
FINLAND
SWEDEN
NORWAY
FRANCE
SPAIN
PORTUGAL
ITALY
GREECE
GERMANY
UNITED KINGDOM
IRELAND
ICELAND
MOROCCO
ALGERIA
TUNISIA
LIBYA
EGYPT
SAHARA
MAURITANIA
MALI
NIGER
CHAD
SUDAN
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
SOUTH SUDAN
ETHIOPIA
SOMALIA
ERITREA
DJIBOUTI
KENYA
UGANDA
DEMOCRATIC REPUBLIC OF THE CONGO
REPUBLIC OF THE CONGO
GABON
TANZANIA
ANGOLA
ZAMBIA
ZIMBABWE
NAMIBIA
BOTSWANA
SOUTH AFRICA
LESOTHO
SWAZILAND
MOZAMBIQUE
MADAGASCAR
SEYCHELLES
COMOROS
MALDIVES
SRI LANKA
BANGLADESH
NEPAL
BHUTAN
MYANMAR
THAILAND
LAOS
VIETNAM
CAMBODIA
PHILIPPINES
INDONESIA
PAPUA NEW GUINEA
AUSTRALIA
NEW ZEALAND
JAPAN
NORTH KOREA
SOUTH KOREA
TAIWAN
BRUNEI
MALAYSIA
SINGAPORE
FEDERATED STATES OF MICRONESIA
MARSHALL ISLANDS
PALAU
KIRIBATI
TUVALU
SOLOMON ISLANDS
VANUATU
FIJI
TONGA
French Polynesia
Saint Helena, Ascension, and Tristan da Cunha
French Southern and Antarctic Lands
Antarctica
NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
ARCTIC OCEAN
SOUTHERN OCEAN

AmplifyScience



Patterns of Earth and Sky:
Analyzing Stars on Ancient Artifacts

Investigation Notebook

We are going to be using an **Investigation Notebook** like scientists use.

Name: _____ Date: _____

Observing the Mystery Artifact

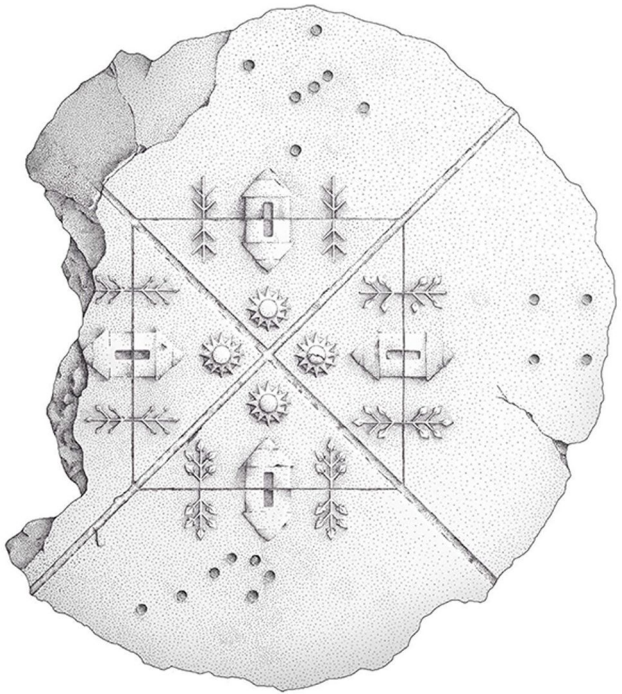
Observe each section of the artifact, and then record your observations.

1. What did you observe about this artifact?

2. What similarities or differences did you notice in the artifact sections?

Turn to page 3 in your notebooks.

Record your observations of the artifact.



You've now had time to look closely at this artifact.

What did you observe about it?

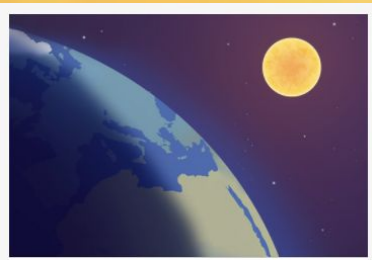
Patterns of Earth and Sky

Problem: **Archaeologists discovered part of an ancient artifact that depicts the sun and other stars. How can we figure out what would have appeared on the missing piece?**

Role: Astronomers

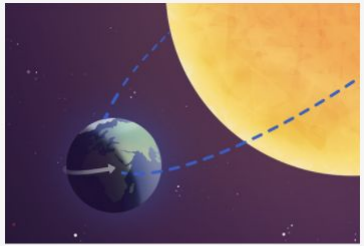
Patterns of Earth and Sky

Coherent Storylines



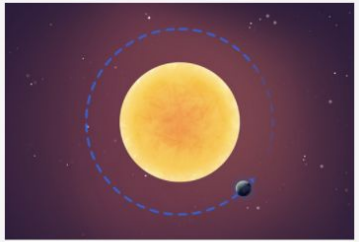
Chapter 1: Why don't we see a lot of stars in the daytime?

7 Lessons



Chapter 2: Why is the sun up sometimes, but not other times?

6 Lessons



Chapter 3: Why do we see different stars at different times of year?

6 Lessons

Chapter 4: How can we investigate why we see different stars on different nights?

3 Lessons

Patterns of Earth and Sky

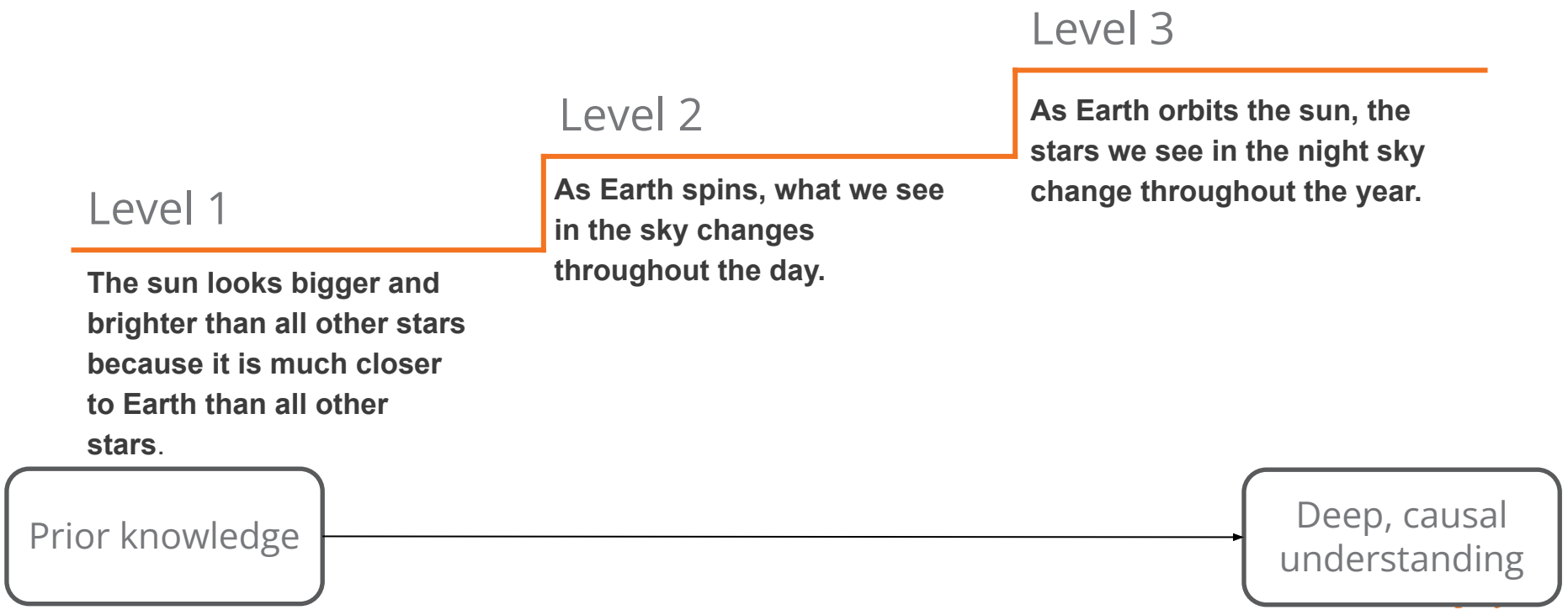
Unit Question: **Why do we see different stars at different times?**

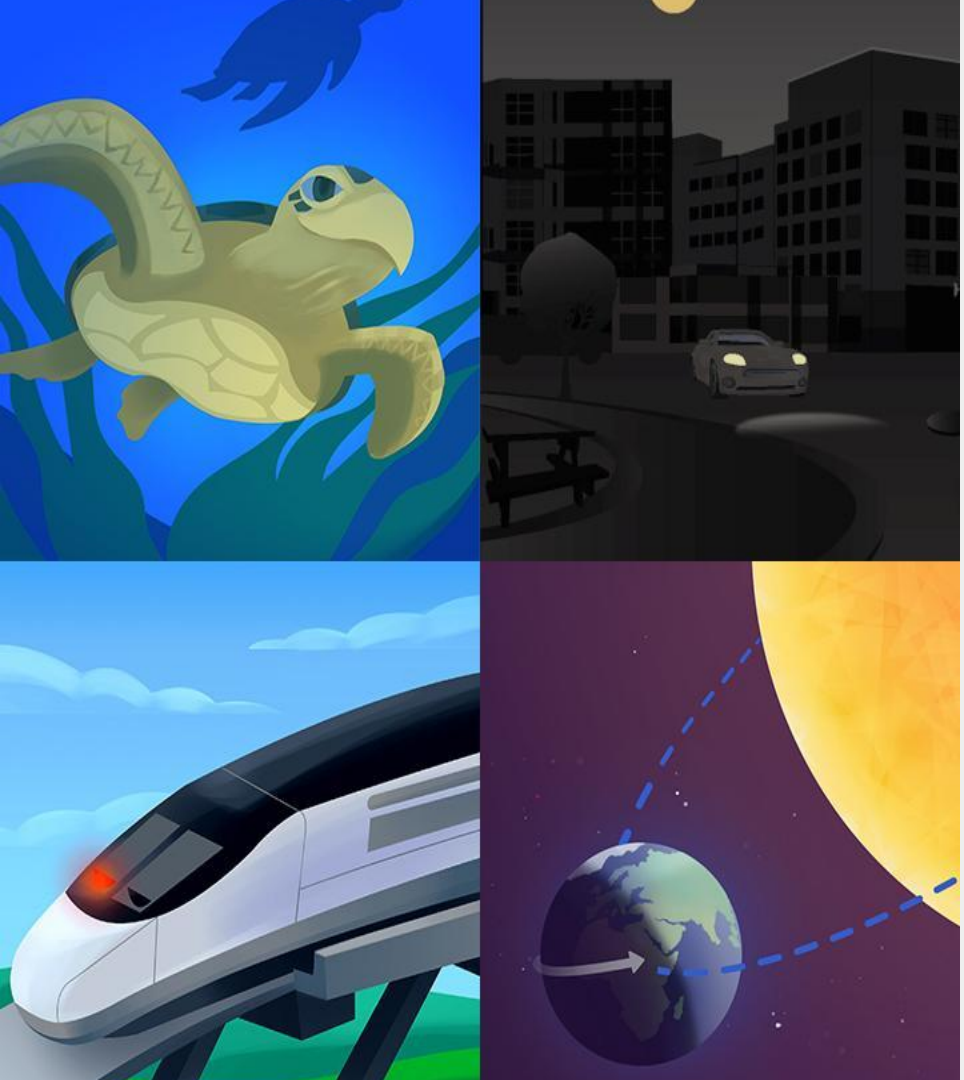
Patterns of Earth and Sky

What **science concepts** do you think students need to understand in order to **explain the phenomenon?**

Patterns of Earth and Sky, Progress Build

Assumed prior knowledge (preconceptions): Students are likely to know the sun is up during the daytime and stars are up during the nighttime. Students may understand that Earth is round and that Earth moves, although they may not know that Earth moves in two different ways simultaneously (spin and orbit). Students may have been exposed to the concept of gravity and that it makes things fall down to the ground





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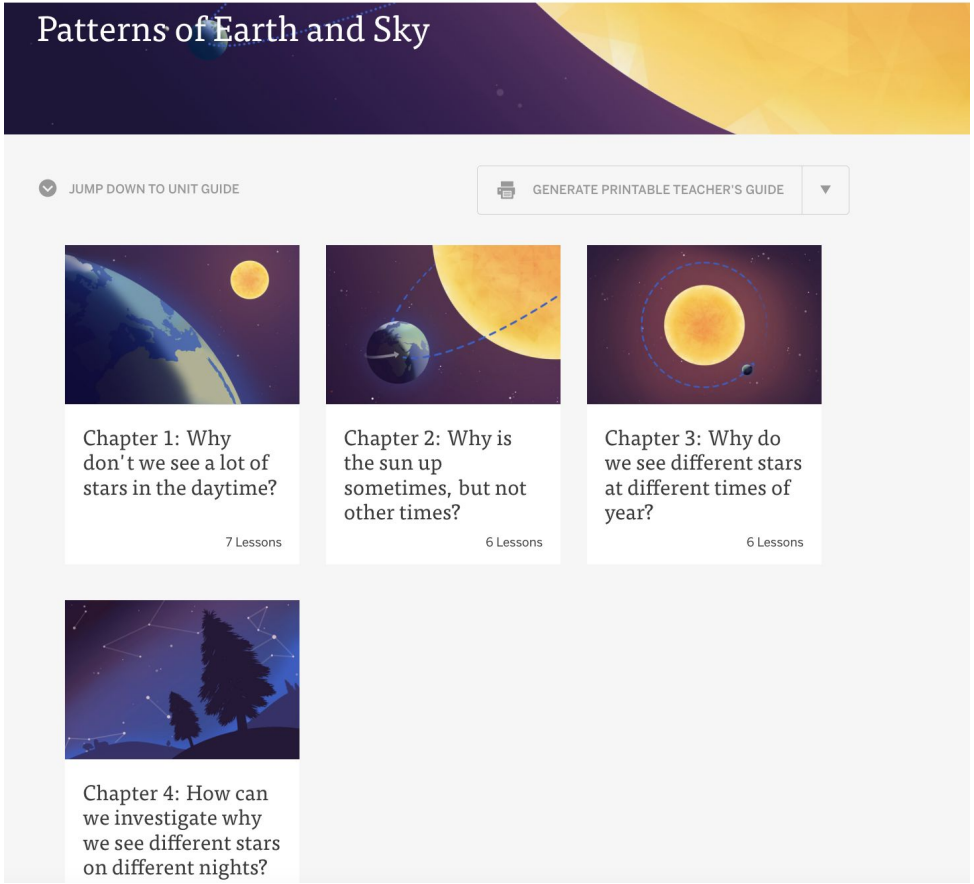
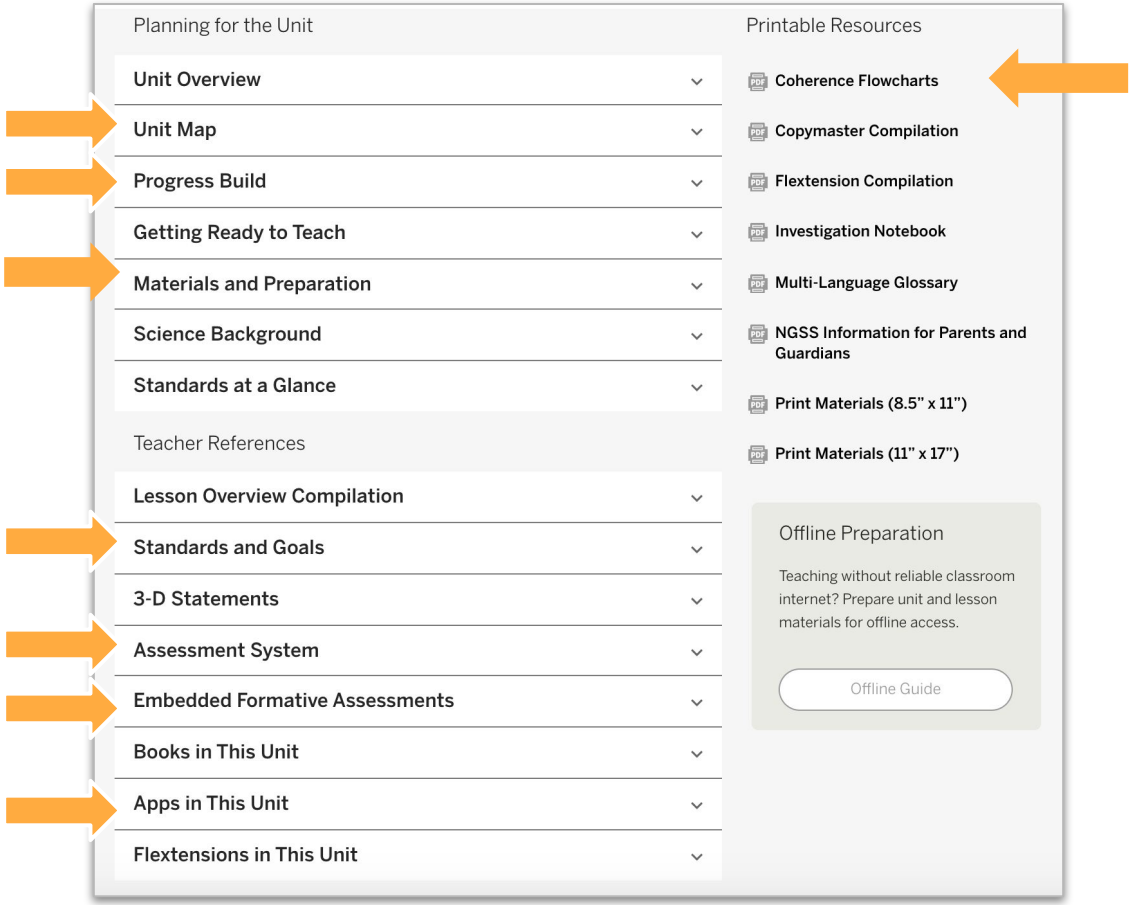
Navigate to the Unit Page



Key Unit Guide Documents for Planning



Core Unit Planning & Internalization

Unit Title: 1

Overview

[Resources: Unit Overview, Teacher's Guide, Coherence Flowchart, Unit Map, 3-D Statements]

What is the phenomenon/real-world problem students are investigating in your unit? 2

Student Role: 3

Unit Question: 4

Relationship between the Unit Phenomenon and Unit Question: 5

By the end of the unit, students figure out... 6

How do students engage with three-dimensional learning to figure out the phenomenon/real-world problem in your unit? 7

Unit Guide resources:
- Unit Overview
- Unit Map
- Coherence Flowchart

Unit Guide resources:
- Lesson Overview Compilation
- Unit Overview

Unit Guide resources:
- Unit Map

Unit Guide resources:
- 3D Statements at the Unit Level

Core Unit Planning & Internalization

Unit Title:	Patterns of Earth and Sky

Overview

[Resources: Unit Overview, Teacher's Guide, Coherence Flowchart, Unit Map, 3-D Statements]

What is the phenomenon/real-world problem students are investigating in your unit?	Student Role:
Archaeologists discovered part of an ancient artifact that depicts the sun and other stars. How can we figure out what would have appeared on the missing **piece?**	Astronomers
Unit Question:	Relationship between the Unit Phenomenon and Unit
Why do we see different stars at different times?	Students help a team of archaeologists figure out what the missing piece of a recently discovered artifact might have depicted. As they learn about the sun and other stars and the movement of Earth, students can explain what is shown on the artifact and what might be on the missing piece.

By the end of the unit, students figure out...

Our view of the stars in the nighttime sky changes in a pattern that repeats each year because Earth is traveling along its orbital path. This is why the artifact shows different constellations in the different nighttime panels.

How do students engage with three-dimensional learning to figure out the phenomenon/real-world problem in your unit?

Students investigate why we see different stars at different times, using digital and kinesthetic models to figure out what causes (cause and effect) daily and yearly patterns (patterns) of Earth and sky.

1

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Plan for the day

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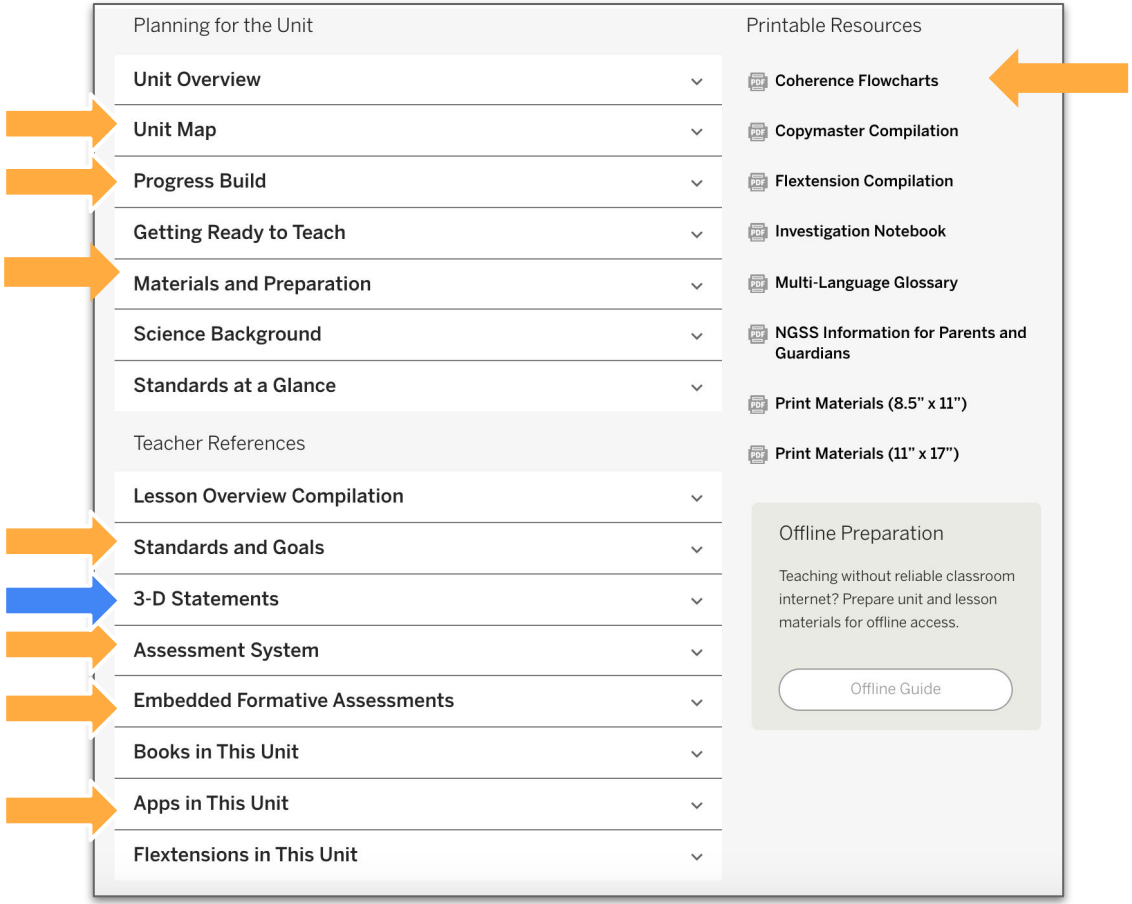
Key Documents for Planning Work Time



Unit 3D Statements

Key

Practices | Disciplinary Core Ideas | Crosscutting Concepts

Unit Level

Students investigate why we see different stars at different times, using digital and kinesthetic models to figure out what causes (cause and effect) daily and yearly patterns (patterns) of Earth and sky.

Unit 3D Statements

Key

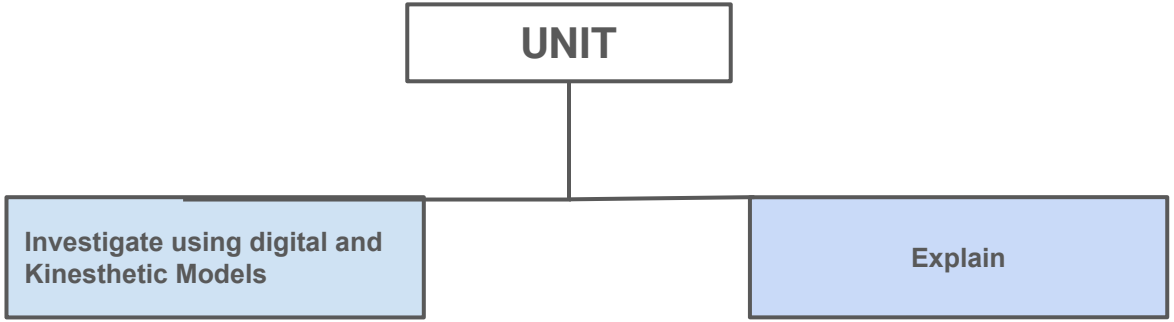
Practices | Disciplinary Core Ideas | Crosscutting Concepts

Unit Level

Students investigate why we see different stars at different times, using digital and kinesthetic models to figure out what causes (cause and effect) daily and yearly patterns (patterns) of Earth and sky.

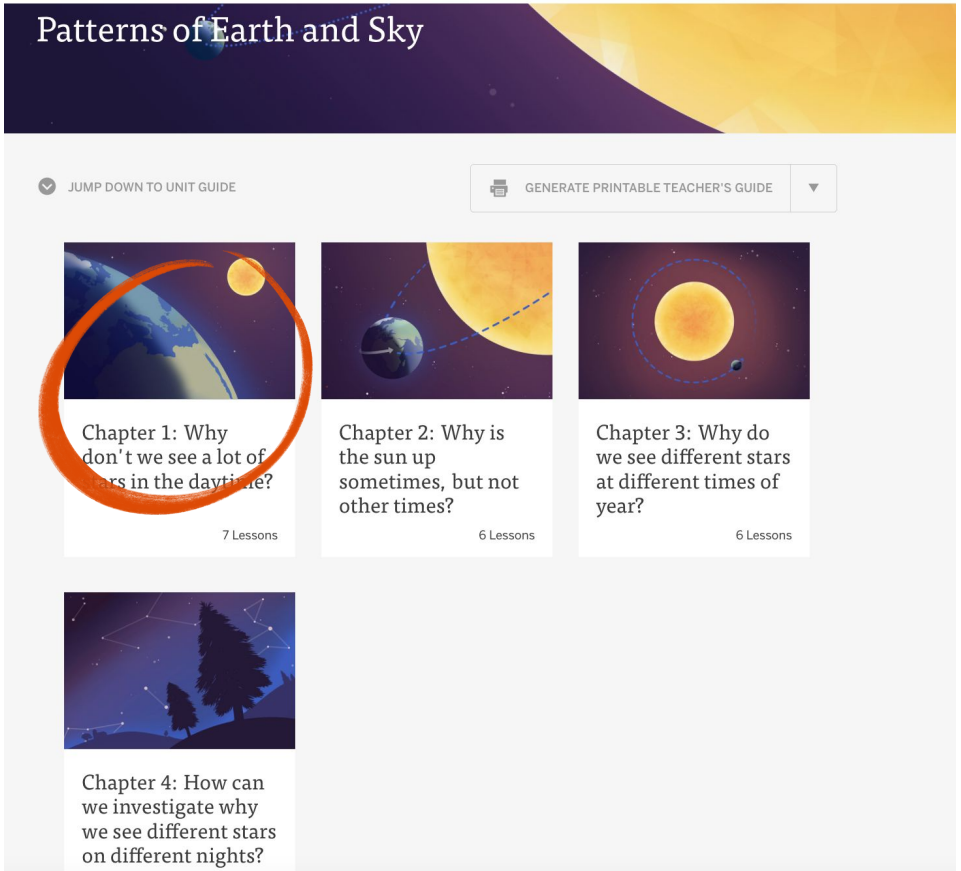
Energy Conversions

Science & Engineering Practices



These are the two main categories of Science and Engineering Practices that the students will be engaged with in this unit.

Waves, Energy and Information



Chapter 1 3D Statements

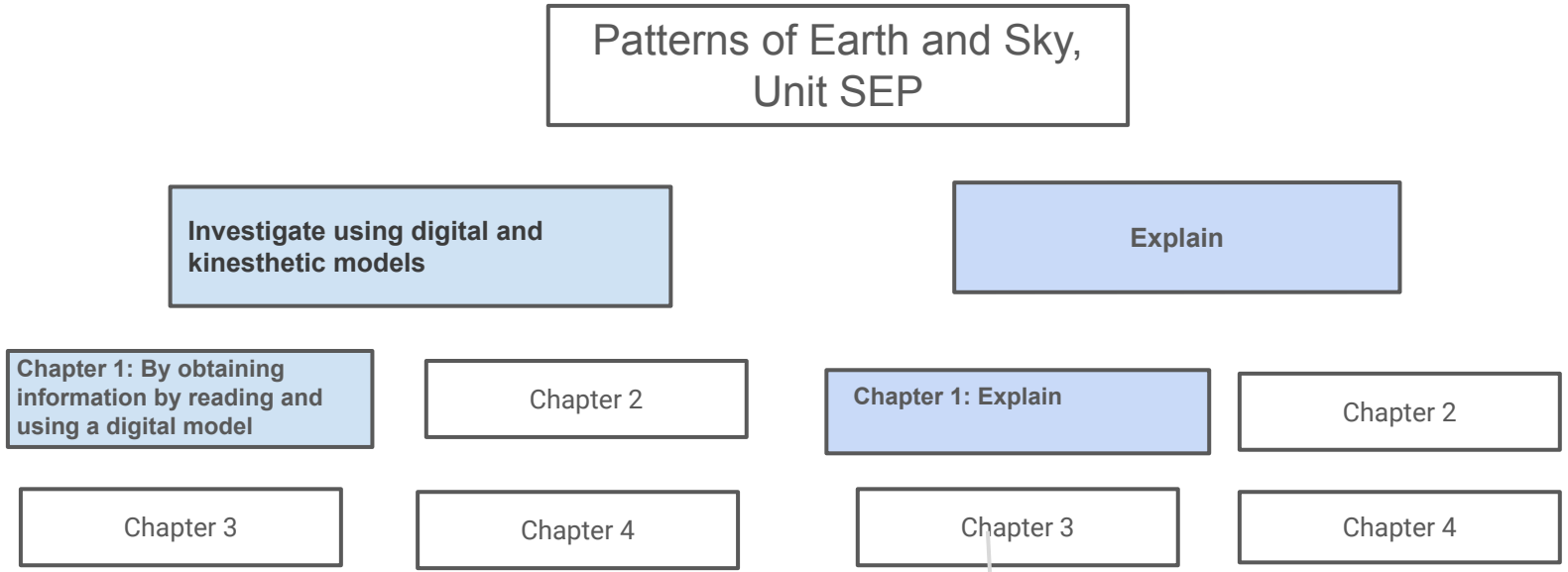
Key

Practices | Disciplinary Core Ideas | Crosscutting Concepts

Chapter 1: Why don't we see a lot of stars in the daytime?

Students investigate where stars are in space and obtain information from video, text, and models, to figure out that the difference in the scale of the sun and other stars' distances from Earth (scale, proportion, and quantity) affects what we see when we look up at the sky (cause and effect).

Science & Engineering Practices



Chapter 1 Overview

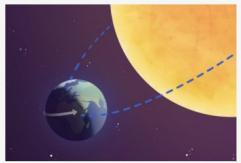
Patterns of Earth and Sky

JUMP DOWN TO UNIT GUIDE

GENERATE PRINTABLE TEACHER'S GUIDE

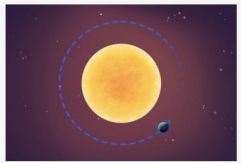
Chapter 1: Why don't we see a lot of stars in the daytime?

7 Lessons



Chapter 2: Why is the sun up sometimes, but not other times?

6 Lessons



Chapter 3: Why do we see different stars at different times of year?

6 Lessons

Chapter 4: How can we investigate why we see different stars on different nights?

Lesson 1.1: Pre-Unit Assessment

Lesson 1.2: Earth and Stars in Space

Lesson 1.3: How Big Is Big? How Far Is Far?

Lesson 1.4: Distances to the Stars

Lesson 1.5: Investigating Size and Distance

Lesson 1.6: The Brightness of Starlight

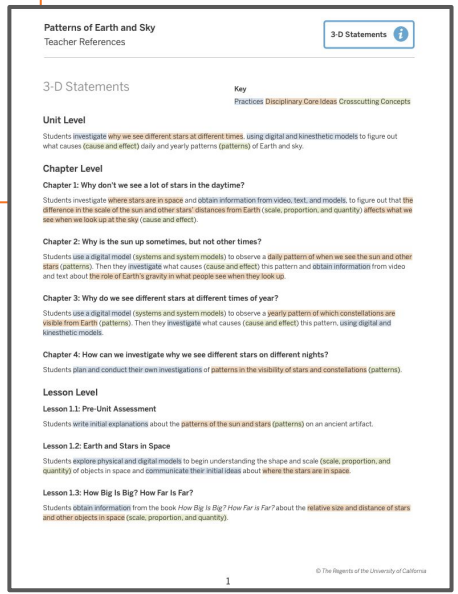
Lesson 1.7: Explaining When We See Stars

Chapter Overview

Students are introduced to their role as astronomers who are helping a team of archaeologists at the fictional Museum of Archaeology. They are tasked with identifying what might be depicted on a newly discovered ancient artifact and suggesting what might have appeared on the section that is missing so the archaeologists can ready the artifact for display in the museum. In Chapter 1, students investigate why most stars are not visible in the daytime. They begin by analyzing two potential models of Earth, concluding that a globe is the most useful representation of a spherical Earth for investigating the stars they see from Earth. The book *How Big Is Big? How Far Is Far?* introduces students to the scale and relative sizes of various objects in space and the distances between them. By applying the strategy of visualizing to a physical model, students observe that while most stars appear to be about the same distance from Earth, they are in fact very far from Earth and from each other. A series of activities, including participation in another physical model, allow students to construct the idea that the sun, which is a relatively small star, only appears large because it is the closest star to Earth. In addition, students come to understand that other stars only appear tiny because they are very far away. Students practice generating sentences that include science vocabulary and key science ideas with the Word Relati routine, which allows students to more accurately and fluently as through talk and writing. Finally, students are int ne of the scientific explanation and compos scientific *y don't we see a lot of* hapter is to introduce students to Earth as a sphere, and to orient them to the relative size and location of stars, including the sun, in space.

3D Statements Work time

1. Go to the **3D Statement** on the **Unit Page.**
2. Look at the 3D Statement **for each chapter**
3. Identify the **Science and Engineering Practices** for each chapter.
4. **Categorize** them.



Patterns of Earth and Sky
Teacher References

3-D Statements

3-D Statements

Key
Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

Students investigate why we see different stars at different times, using digital and kinesthetic models to figure out what causes (cause and effect) daily and yearly patterns (patterns) of Earth and sky.

Chapter Level

Chapter 1: Why don't we see a lot of stars in the daytime?

Students investigate where stars are in space and obtain information from video, text, and models, to figure out that the difference in the scale of the sun and other stars' distances from Earth (scale, proportion, and quantity) affects what we see when we look up at the sky (cause and effect).

Chapter 2: Why is the sun up sometimes, but not other times?

Students use a digital model (systems and system models) to observe a daily pattern of when we see the sun and other stars (patterns). Then they investigate what causes (cause and effect) this pattern and obtain information from video and text about the role of Earth's gravity in what people see when they look up.

Chapter 3: Why do we see different stars at different times of year?

Students use a digital model (systems and system models) to observe a yearly pattern of which constellations are visible from Earth (patterns). Then they investigate what causes (cause and effect) this pattern, using digital and kinesthetic models.

Chapter 4: How can we investigate why we see different stars on different nights?

Students plan and conduct their own investigations of patterns in the visibility of stars and constellations (patterns).

Lesson Level

Lesson 1.1: Pre-Unit Assessment

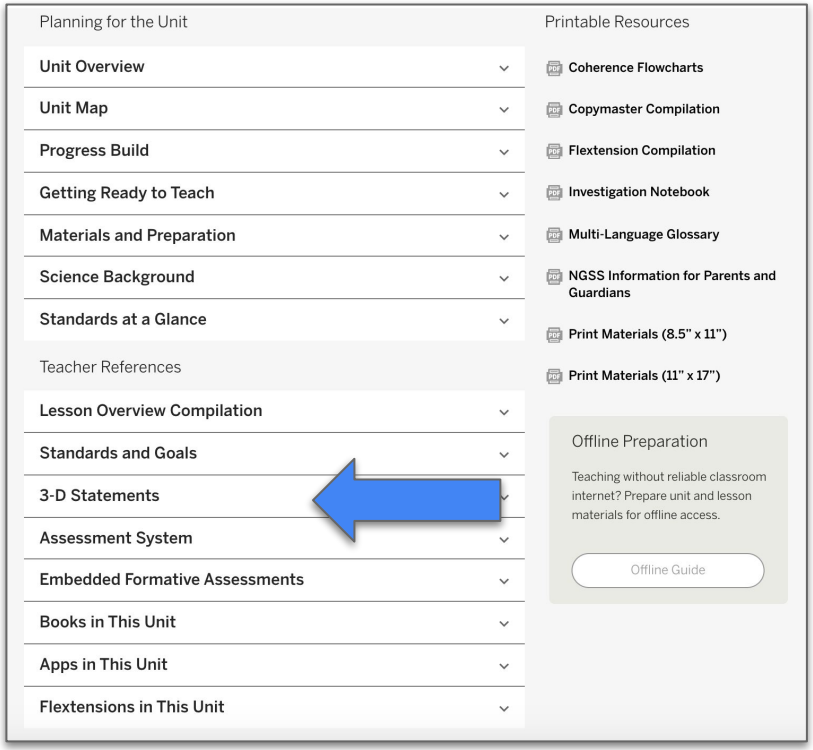
Students write initial explanations about the patterns of the sun and stars (patterns) on an ancient artifact.

Lesson 1.2: Earth and Stars in Space

Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.

Lesson 1.3: How Big Is Big? How Far Is Far?

Students obtain information from the book *How Big Is Big? How Far is Far?* about the relative size and distance of stars and other objects in space (scale, proportion, and quantity).



Planning for the Unit

- Unit Overview
- Unit Map
- Progress Build
- Getting Ready to Teach
- Materials and Preparation
- Science Background
- Standards at a Glance

Teacher References

- Lesson Overview Compilation
- Standards and Goals
- 3-D Statements
- Assessment System
- Embedded Formative Assessments
- Books in This Unit
- Apps in This Unit
- Flextensions in This Unit

Printable Resources

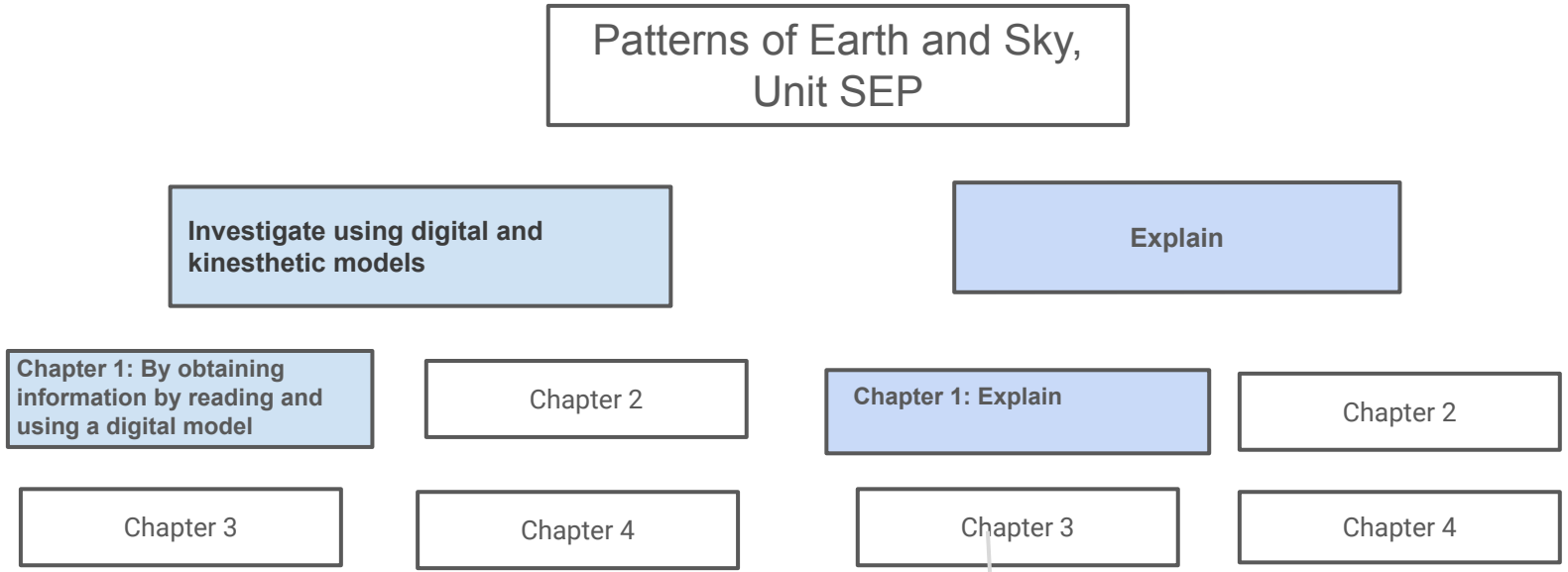
- Coherence Flowcharts
- Copymaster Compilation
- Flextension Compilation
- Investigation Notebook
- Multi-Language Glossary
- NGSS Information for Parents and Guardians
- Print Materials (8.5" x 11")
- Print Materials (11" x 17")

Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

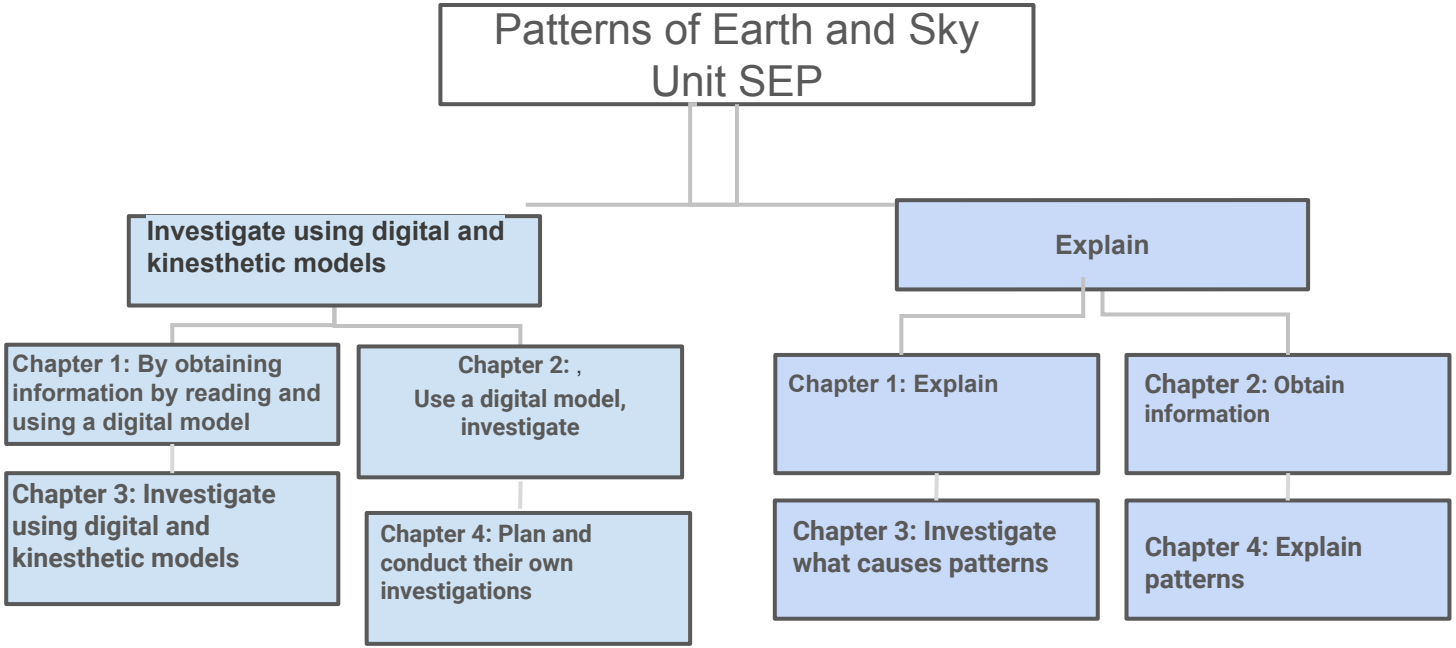
Offline Guide

Science & Engineering Practices

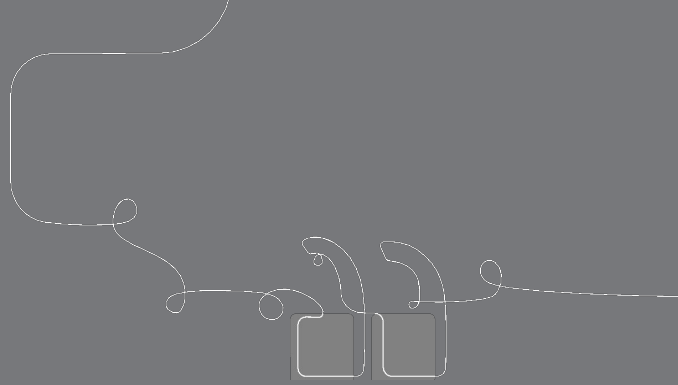


scientific explanations

Let's Review



Questions?



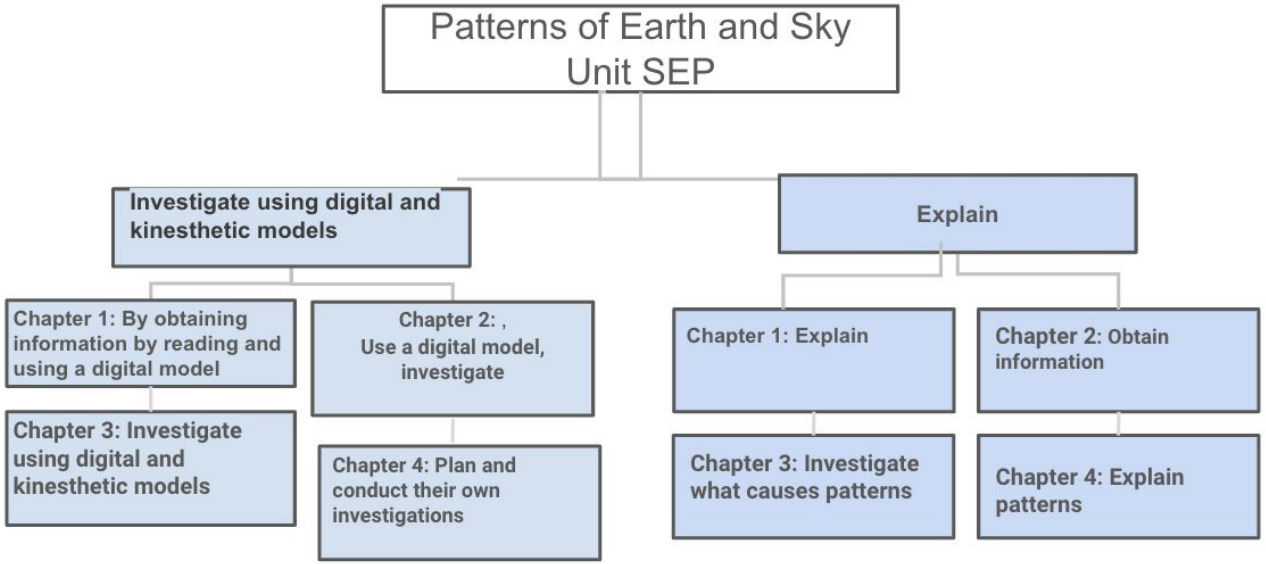
Share Out

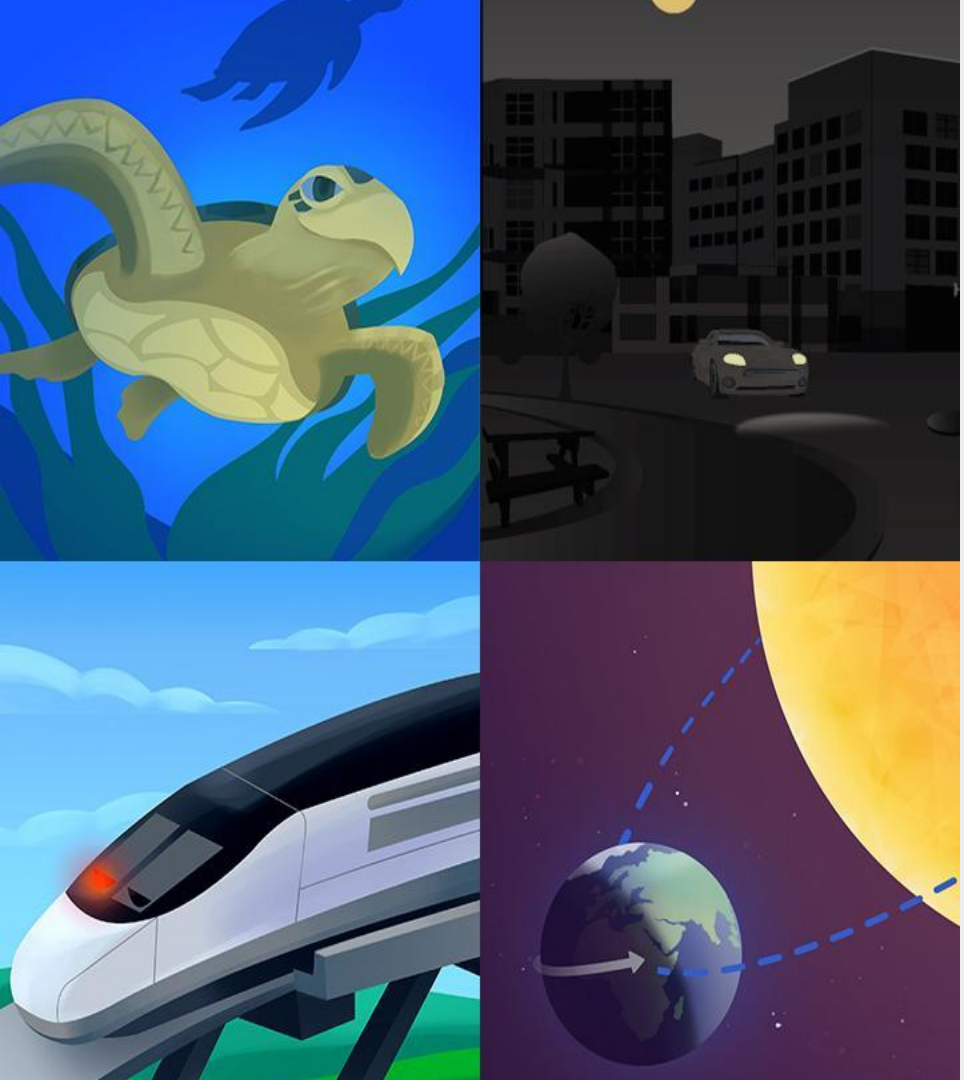
Jamboard

Reflect on how these practices are scaffolded through the unit and what that means for student learning.

Science & Engineering Practices:

Building the practices incrementally, chapter by chapter.





Plan for the day

- Framing
- Introducing the Unit
- Unit Internalization
- Identifying the Science and Engineering Practices at the unit and chapter level
- Science and Engineering Practices within a lesson
- Lesson Planning
- Closing

Energy Conversions

Lesson 1.1:
Pre-Unit Assessment

Lesson 1.2:
Earth and Stars in Space

Lesson 1.3:
How Big Is Big? How Far Is Far?

Lesson 1.4:
Distances to the Stars

Lesson 1.5:
Investigating Size and Distance

Lesson 1.6:
The Brightness of Starlight

Lesson 1.7:
Explaining When We See Stars

3D Statements, Lesson 1.1

Key

Practices | Disciplinary Core Ideas | Crosscutting Concepts

Students write initial explanations about the patterns of the sun and stars (patterns) on an ancient artifact.

Grade 5 | Patterns of Earth and Sky

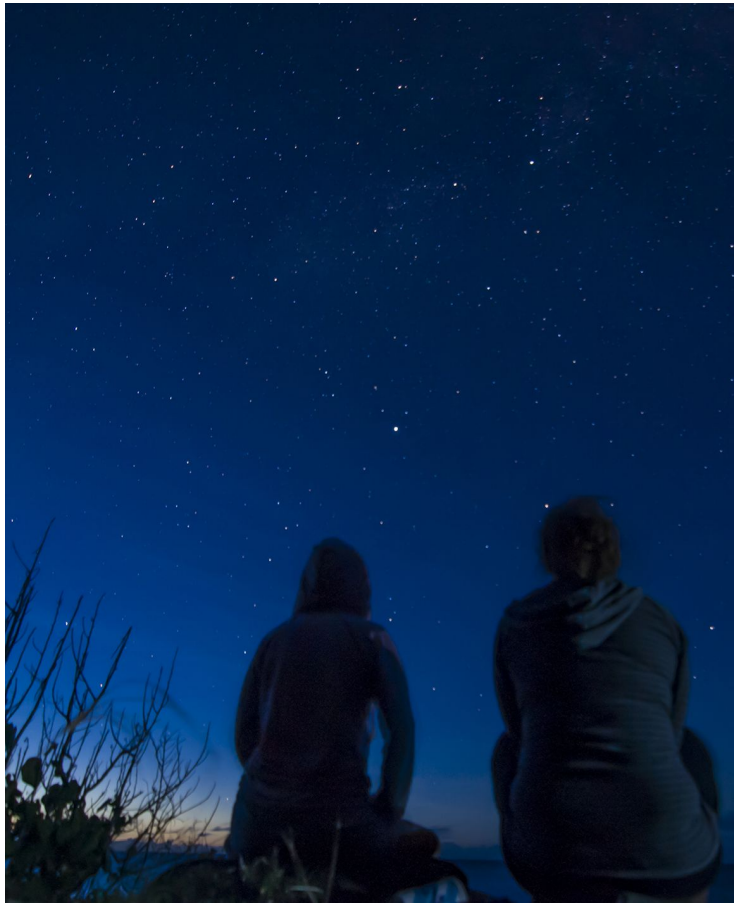
Lesson 1.1: Pre-Unit Assessment

AmplifyScience

10 MIN

Activity 1

Introducing the Unit

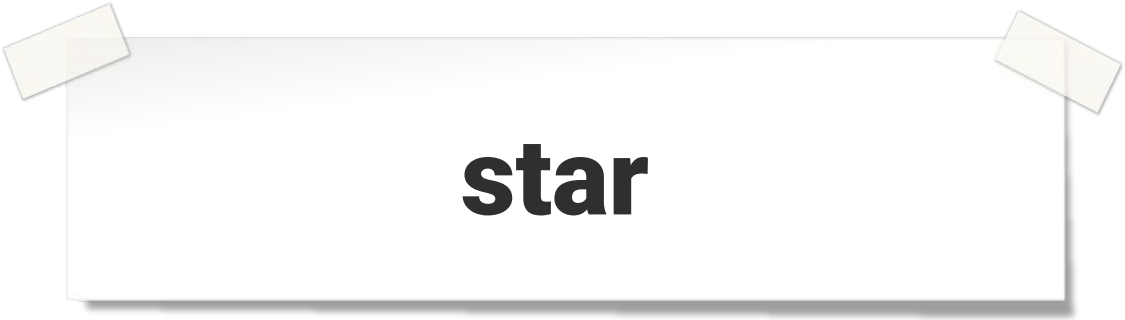


In this unit, we're going to take a closer look at the stars and use what we observe to help us solve a mystery.

What **ideas** do you have about stars?

What **questions** do you have about stars?

Vocabulary



a huge object in space that gives off heat and light

We’re going to look at some images together.

Observe each one silently. Then I’ll ask a few of you to **share** your thoughts of the image.

Sky Disc

Nebra, Germany
3,600 years old

Rock Painting

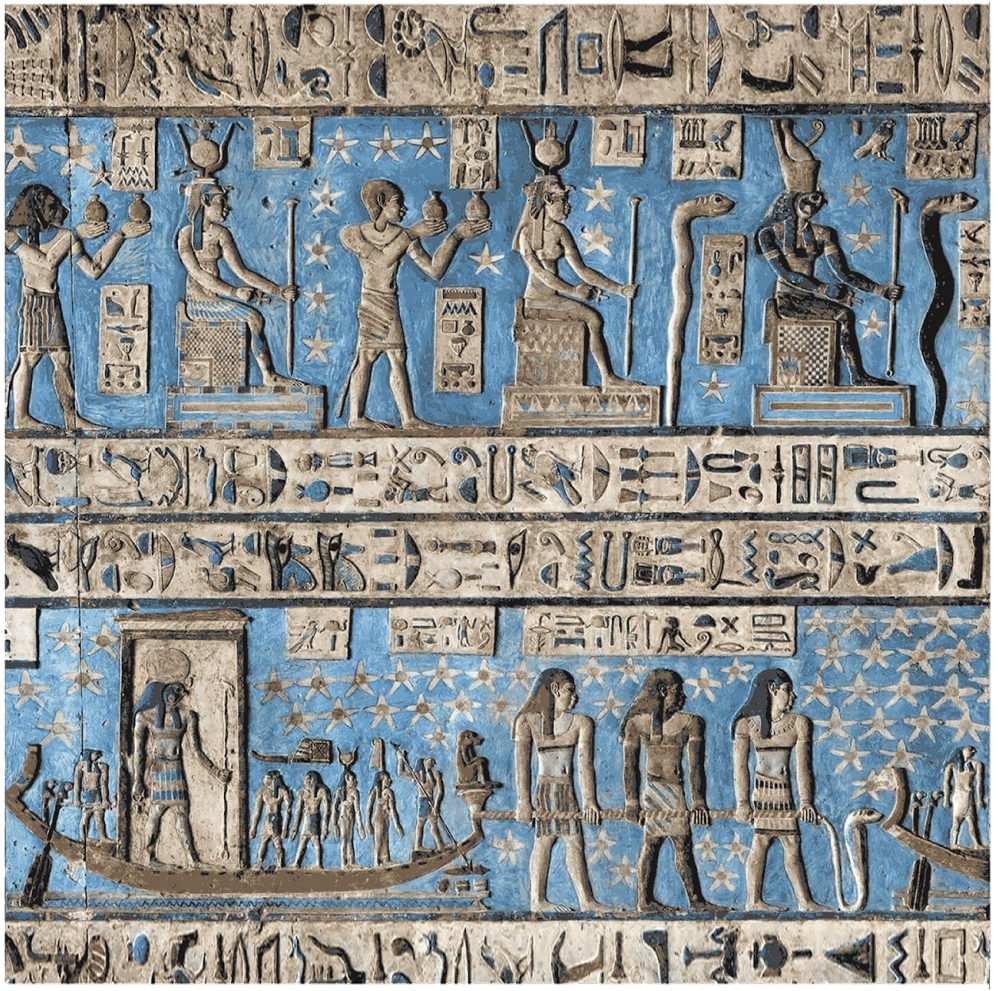
Chaco Canyon,
New Mexico
about 1,000 years old

Stonehenge

England, built between 4,000 and 2,000 years ago

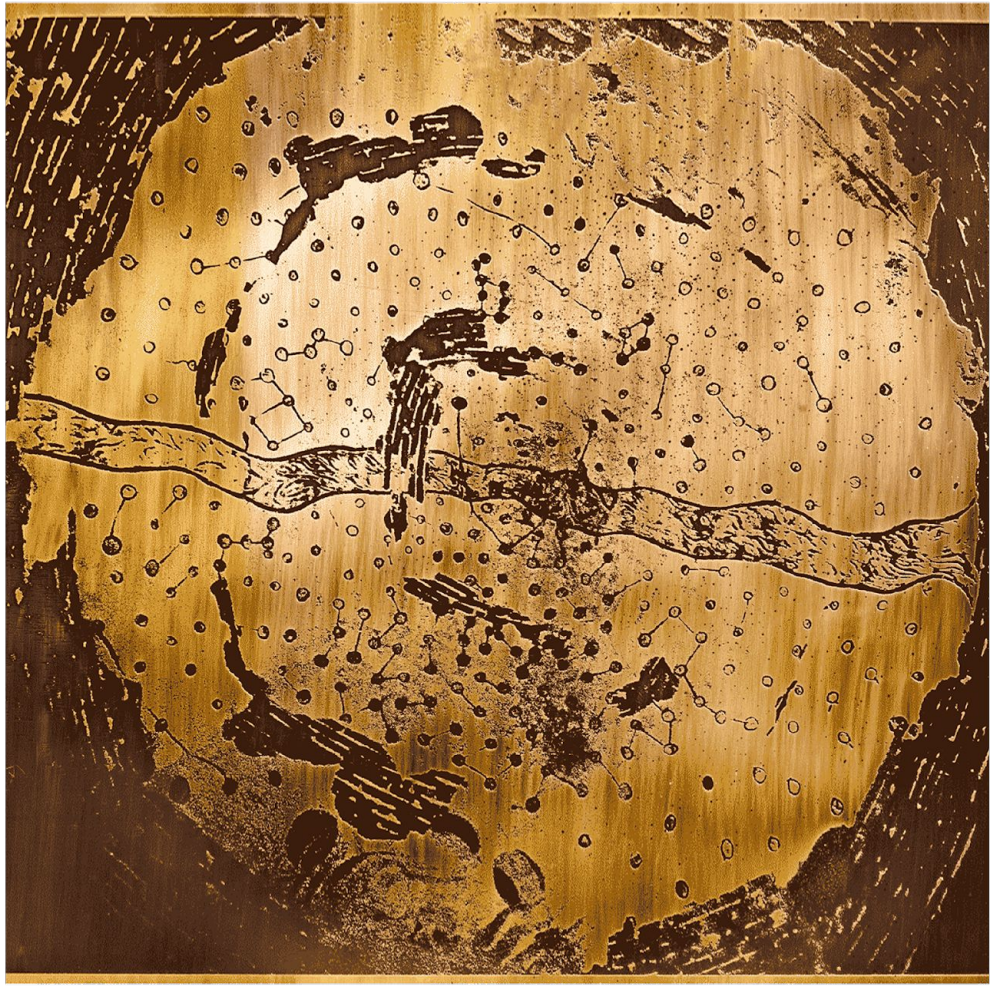
Temple Painting

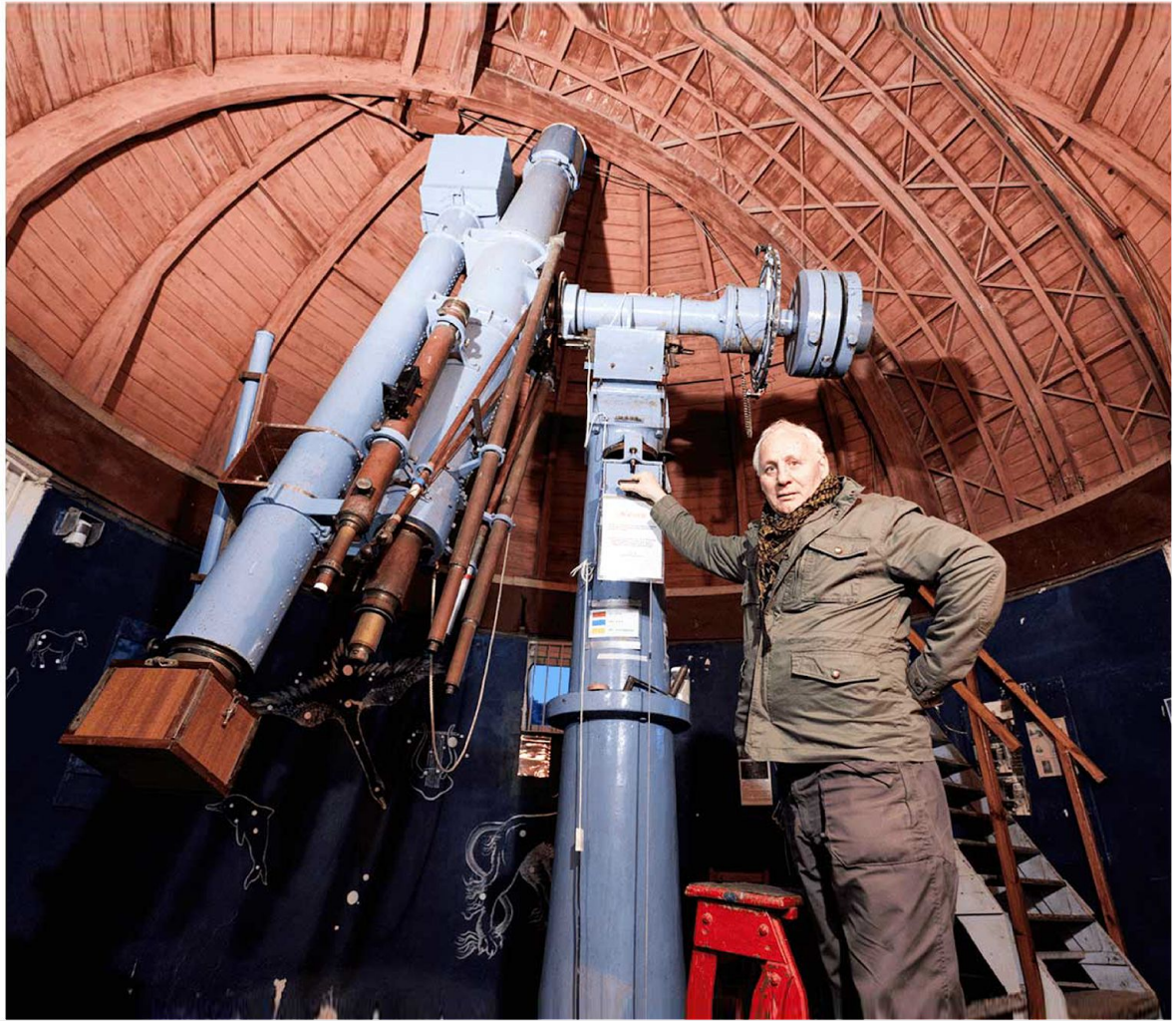
Dendera, Egypt
over 2,000 years old



Star Map

Tomb Painting
Luoyang, China
1,600 years old





You will take on the role of **astronomers** as you try to solve a mystery by investigating things we see in the sky as we're standing on Earth.

Vocabulary

astronomer

a scientist who studies stars, planets, and other objects in the universe

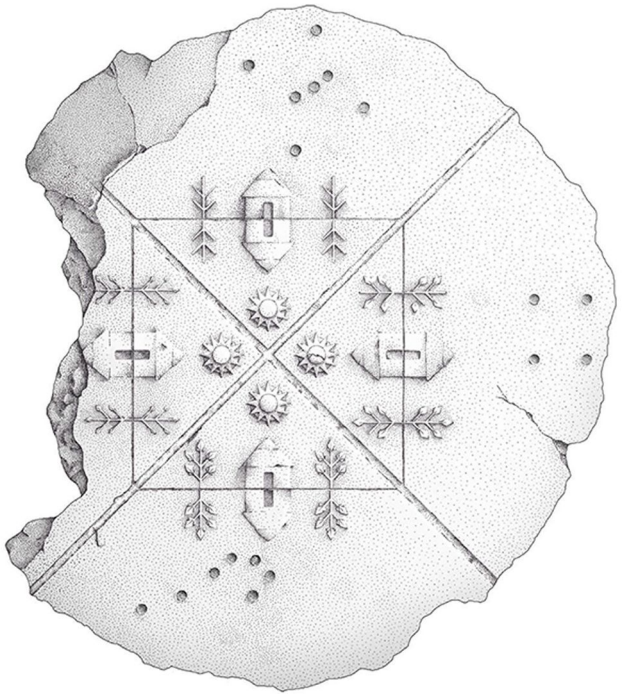
Unit Question

Why do we see different stars at different times?

10 MIN

Activity 2

Introducing the Artifact



Archaeologists uncovered this artifact.

What do you notice or observe about it?

To: Student Astronomers
From: Dr. Sabri, Museum of Archaeology
Subject: Mysterious Artifact

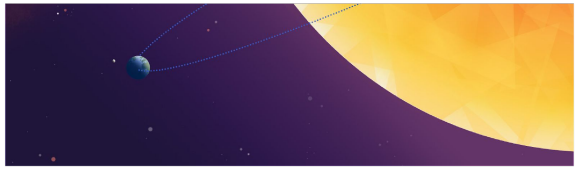
Our museum's field research team located an artifact, and we think it might be more than 1,000 years old. We believe it shows something about the sun and the stars, although one section is missing. Would you be able to help us figure out what the missing section looked like?

We want to put the artifact on display at the musuem, and it would be nice to show people how it might have looked before it was broken.

A map is attached to show you where the artifact was found, in case that is helpful.


Greenland
CANADA
U.S.
UNITED STATES
MEXICO
BRAZIL
ARGENTINA
CHILE
PERU
BOLIVIA
PARAGUAY
URUGUAY
COLOMBIA
VENEZUELA
ECUADOR
GUYANA
SURINAME
FRENCH GUIANA
RUSSIA
KAZAKHSTAN
MONGOLIA
CHINA
INDIA
PAKISTAN
AFGHANISTAN
IRAN
IRAQ
SAUDI ARABIA
YEMEN
OMAN
TURKEY
SYRIA
UKRAINE
BELARUS
POLAND
FINLAND
SWEDEN
NORWAY
FRANCE
SPAIN
PORTUGAL
ITALY
GREECE
GERMANY
UNITED KINGDOM
IRELAND
ICELAND
MOROCCO
ALGERIA
TUNISIA
LIBYA
EGYPT
SAHARA
MAURITANIA
MALI
NIGER
CHAD
SUDAN
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
SOUTH SUDAN
ETHIOPIA
SOMALIA
ERITREA
DJIBOUTI
KENYA
UGANDA
DEMOCRATIC REPUBLIC OF THE CONGO
REPUBLIC OF THE CONGO
GABON
TANZANIA
ANGOLA
ZAMBIA
ZIMBABWE
NAMIBIA
BOTSWANA
SOUTH AFRICA
LESOTHO
SWAZILAND
MOZAMBIQUE
MADAGASCAR
SEYCHELLES
COMOROS
MALDIVES
SRI LANKA
BANGLADESH
NEPAL
BHUTAN
MYANMAR
THAILAND
LAOS
VIETNAM
CAMBODIA
PHILIPPINES
INDONESIA
PAPUA NEW GUINEA
AUSTRALIA
NEW ZEALAND
JAPAN
NORTH KOREA
SOUTH KOREA
TAIWAN
BRUNEI
MALAYSIA
SINGAPORE
FEDERATED STATES OF MICRONESIA
MARSHALL ISLANDS
PALAU
KIRIBATI
TUVALU
SOLOMON ISLANDS
VANUATU
FIJI
TONGA
French Polynesia
Saint Helena, Ascension, and Tristan da Cunha
French Southern and Antarctic Lands
Antarctica
NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
ARCTIC OCEAN
SOUTHERN OCEAN

AmplifyScience



Patterns of Earth and Sky:
Analyzing Stars on Ancient Artifacts

Investigation Notebook

We are going to be using an **Investigation Notebook** like scientists use.

Name: _____ Date: _____

Observing the Mystery Artifact

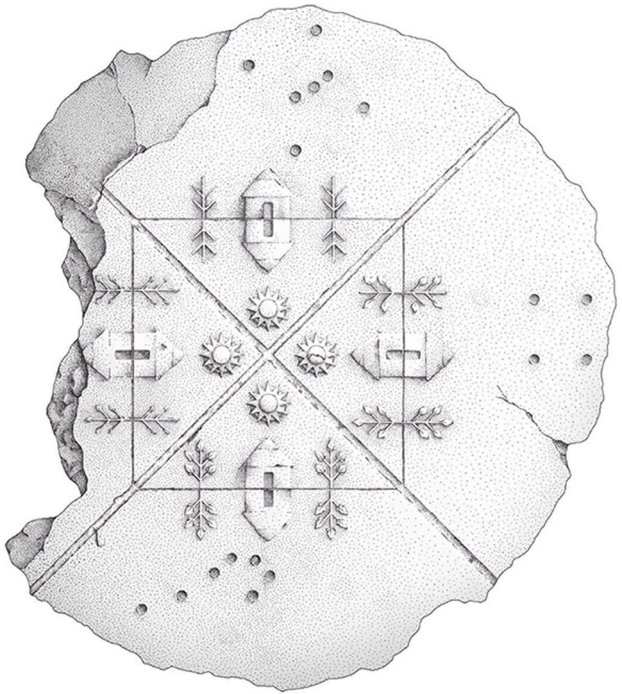
Observe each section of the artifact, and then record your observations.

1. What did you observe about this artifact?

2. What similarities or differences did you notice in the artifact sections?

Turn to page 3 in your notebooks.

Record your observations of the artifact.



You've now had time to look closely at this artifact.

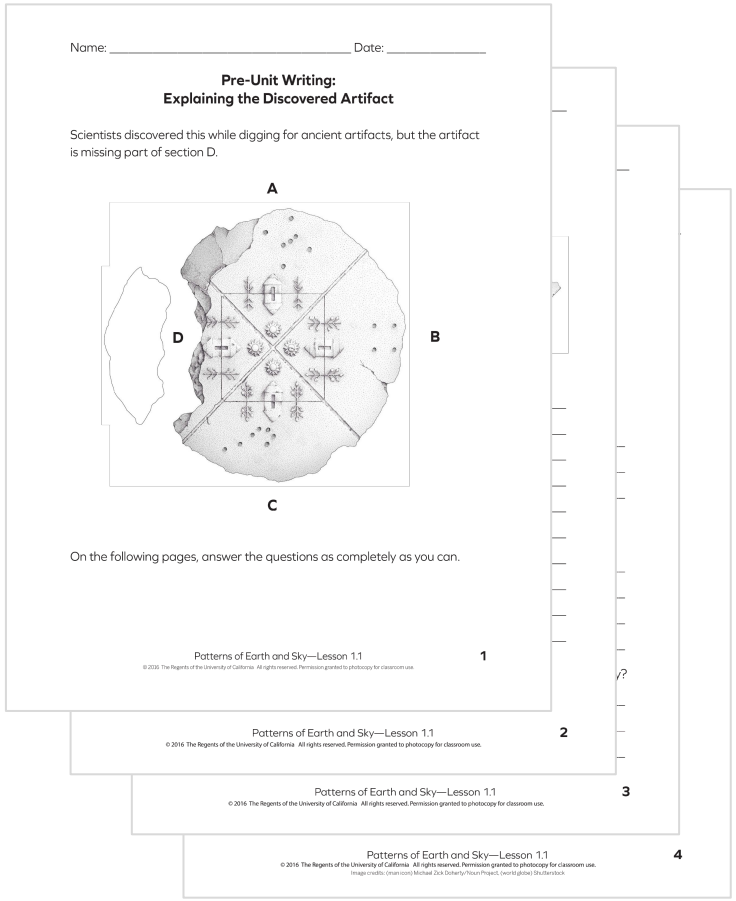
What did you observe about it?

30 MIN

Activity 3

Pre-Unit Assessment

Students write initial explanations about the patterns of the sun and stars (patterns) on an ancient artifact.



Name: _____ Date: _____

Pre-Unit Writing:
Explaining the Discovered Artifact

Scientists discovered this while digging for ancient artifacts, but the artifact is missing part of section D.

A

D

B

C

On the following pages, answer the questions as completely as you can.

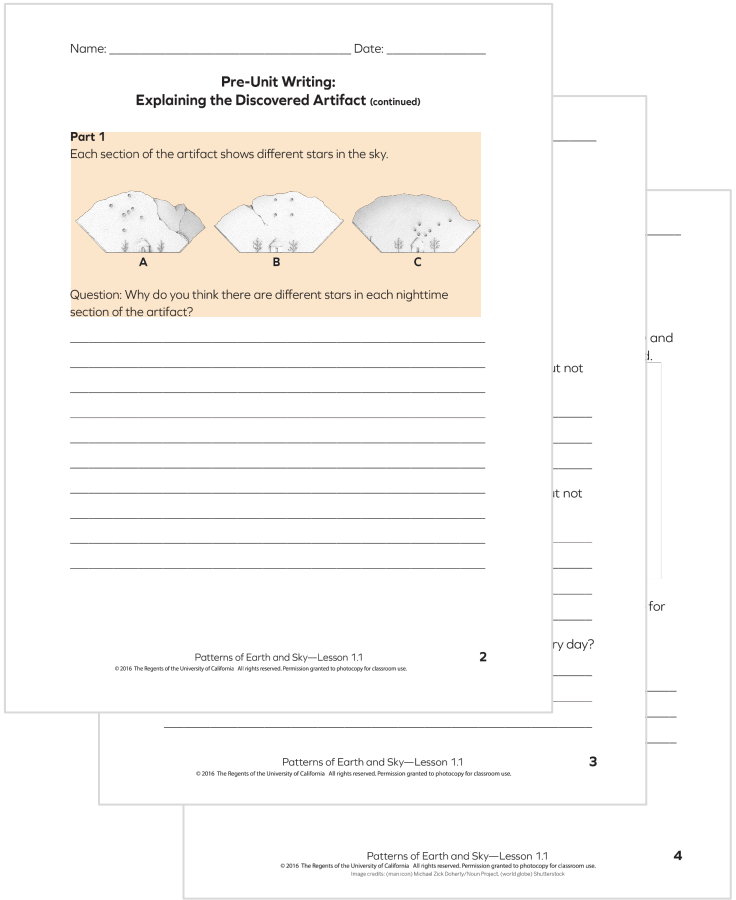
Patterns of Earth and Sky—Lesson 1.1 1

Patterns of Earth and Sky—Lesson 1.1 2

Patterns of Earth and Sky—Lesson 1.1 3

Patterns of Earth and Sky—Lesson 1.1 4

You are going to write your **first ideas** about why each section of the artifact might look the way it does.



Name: _____ Date: _____

Pre-Unit Writing:
Explaining the Discovered Artifact (continued)

Part 1
Each section of the artifact shows different stars in the sky.

A B C

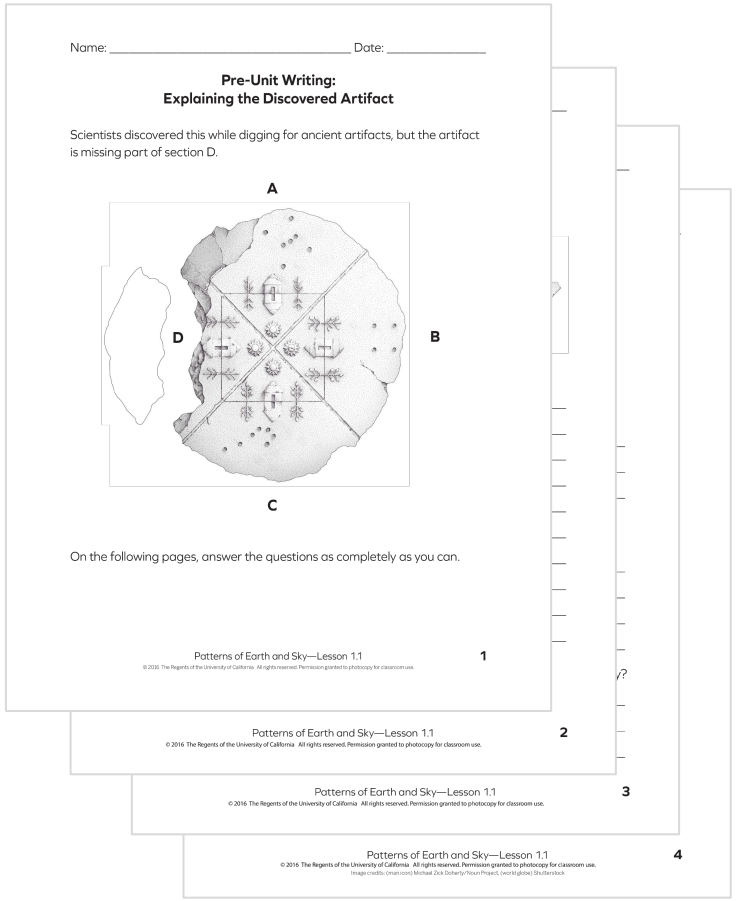
Question: Why do you think there are different stars in each nighttime section of the artifact?

Patterns of Earth and Sky—Lesson 1.1 2

Patterns of Earth and Sky—Lesson 1.1 3

Patterns of Earth and Sky—Lesson 1.1 4

There are **three parts to this assessment**. Each part has one page of questions to answer.



Name: _____ Date: _____

Pre-Unit Writing:
Explaining the Discovered Artifact

Scientists discovered this while digging for ancient artifacts, but the artifact is missing part of section D.

A

D B

C

On the following pages, answer the questions as completely as you can.

Patterns of Earth and Sky—Lesson 1.1 1

Patterns of Earth and Sky—Lesson 1.1 2

Patterns of Earth and Sky—Lesson 1.1 3

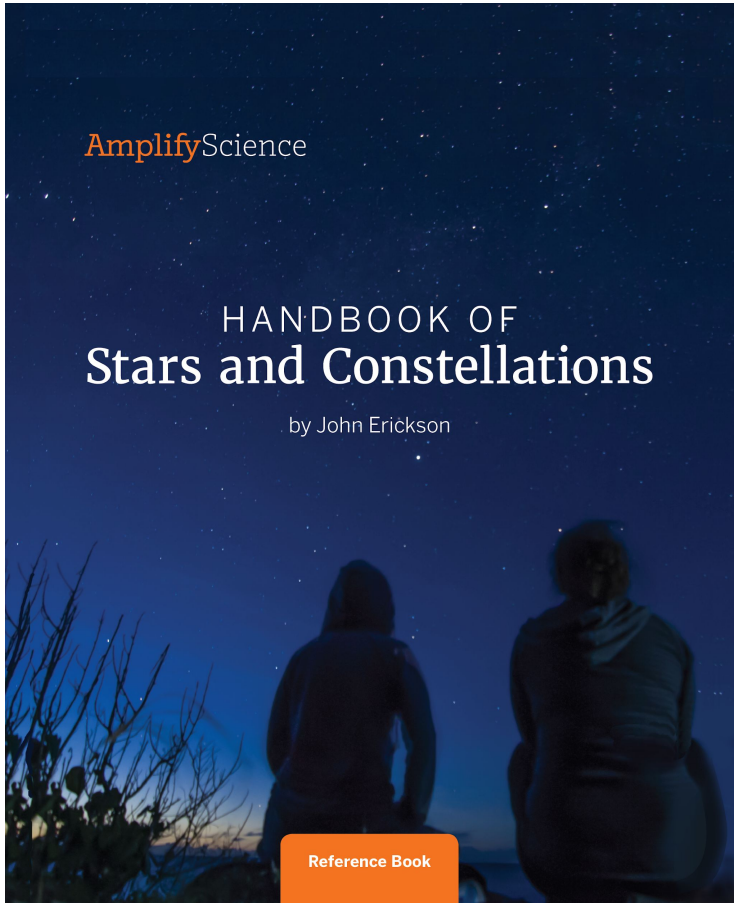
Patterns of Earth and Sky—Lesson 1.1 4

Record your ideas about the artifact, the people at the museum, and the dig site.

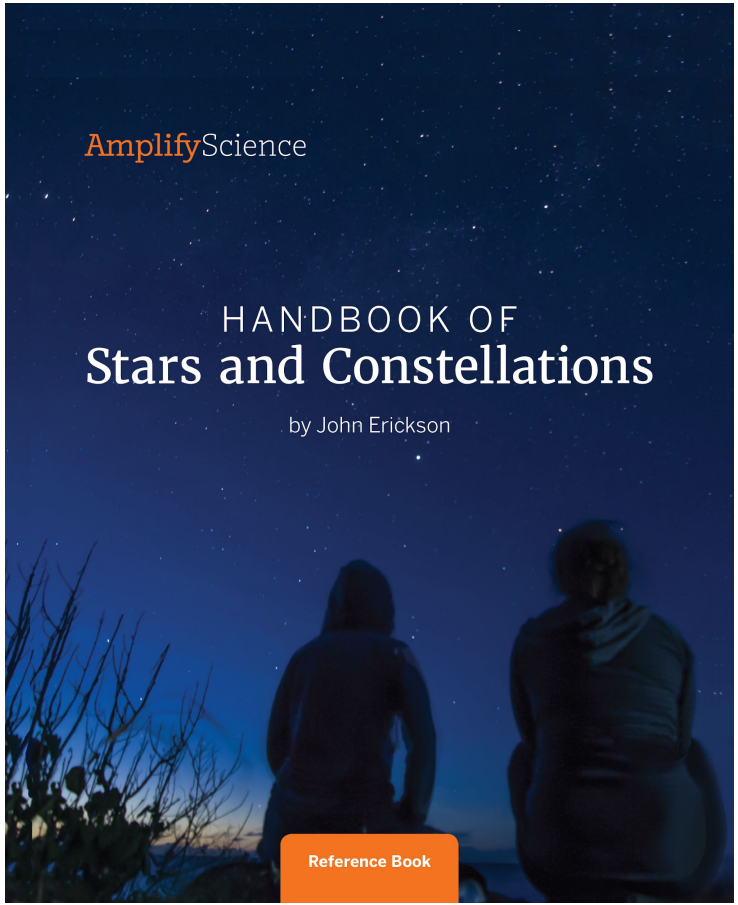
10 MIN

Activity 4

Previewing the Reference Book



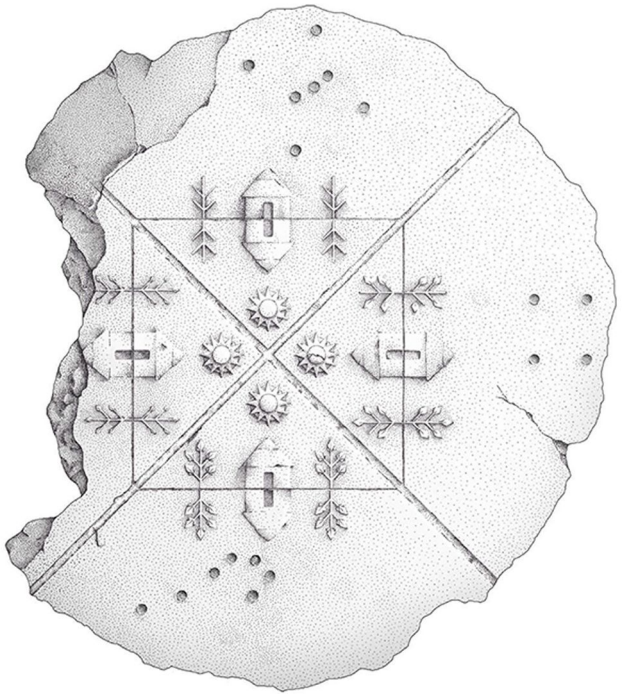
This kind of book is a **reference book**. Scientists often refer to reference books when they are looking for **information about a topic** they are studying.



Preview the book. Talk about what you notice.

What was something **interesting** that you read or saw in the book?

How could we **find specific information** in the book?



We will continue to **investigate** the artifact as we learn more about stars and other objects in the universe.

End of Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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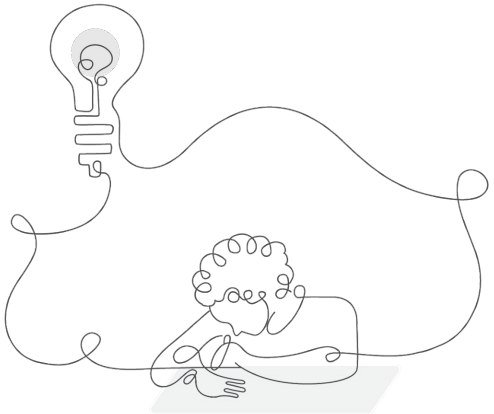
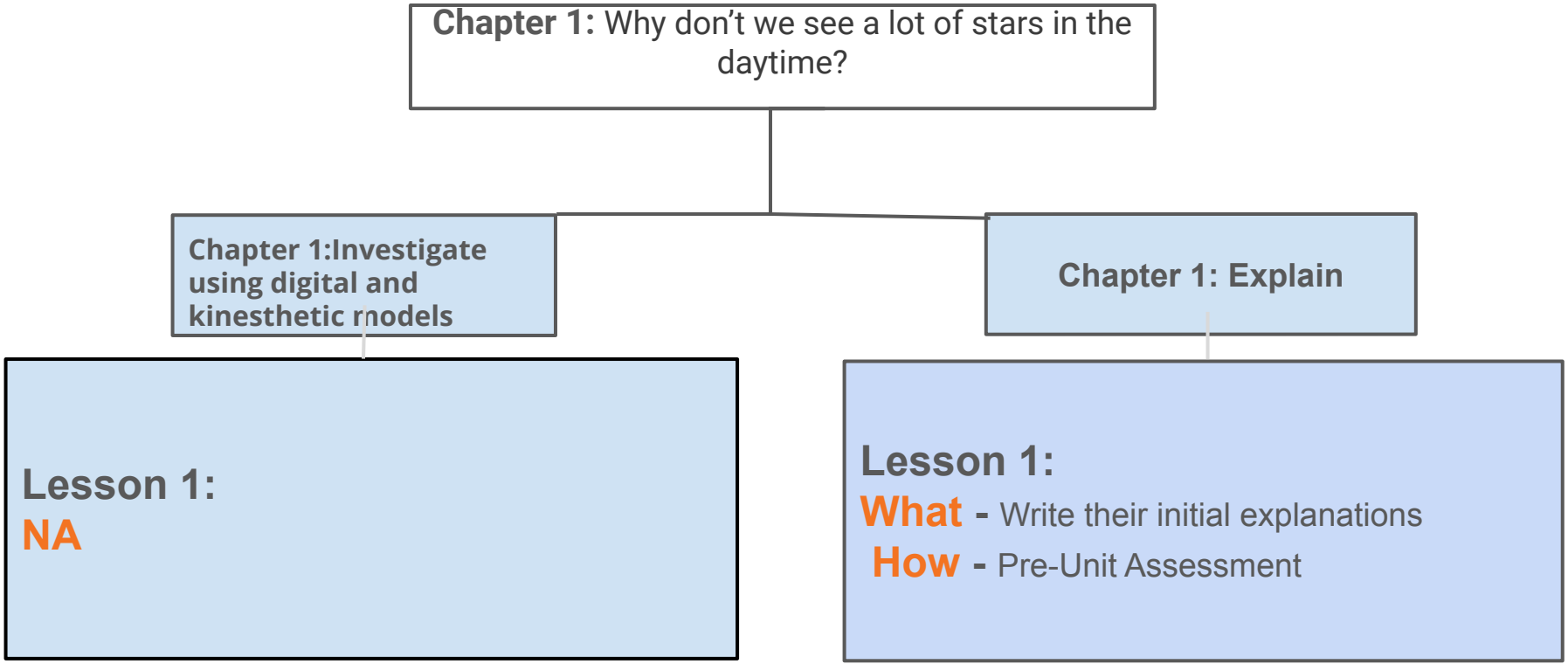
Science and Engineering Practices

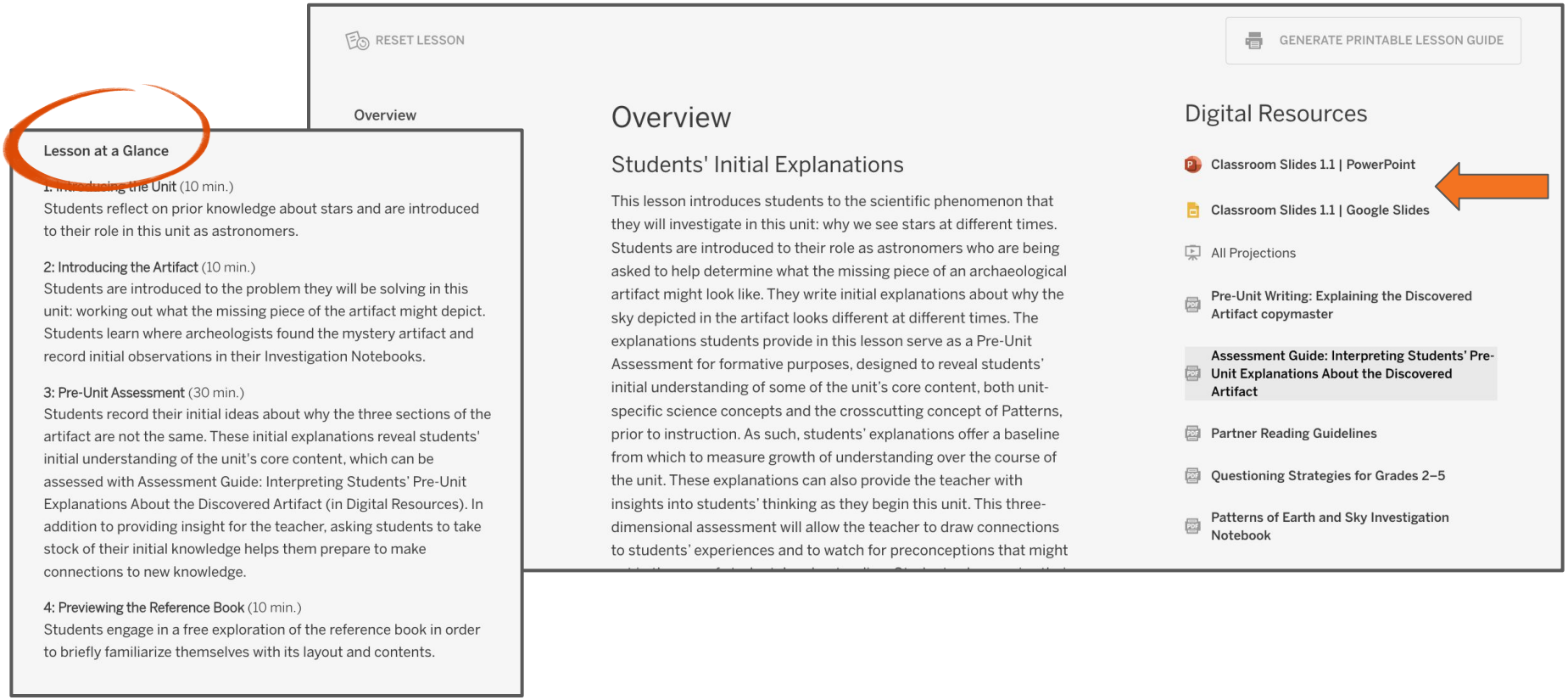
Describe the science and engineering practices the students were engaged in during this lesson.



Science & Engineering Practices



Lesson Brief



3D Statements, Lesson 1.2

Key

Practices | Disciplinary Core Ideas | Crosscutting Concepts

Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.

Grade 5 | Patterns of Earth and Sky

Lesson 1.2: Earth and Stars in Space

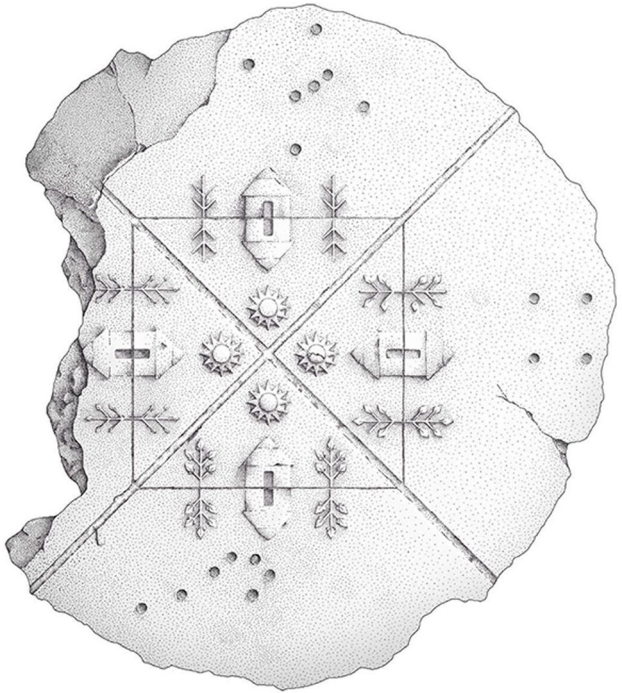
AmplifyScience

20 MIN

Activity 1

Modeling the Shape of Earth

Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.



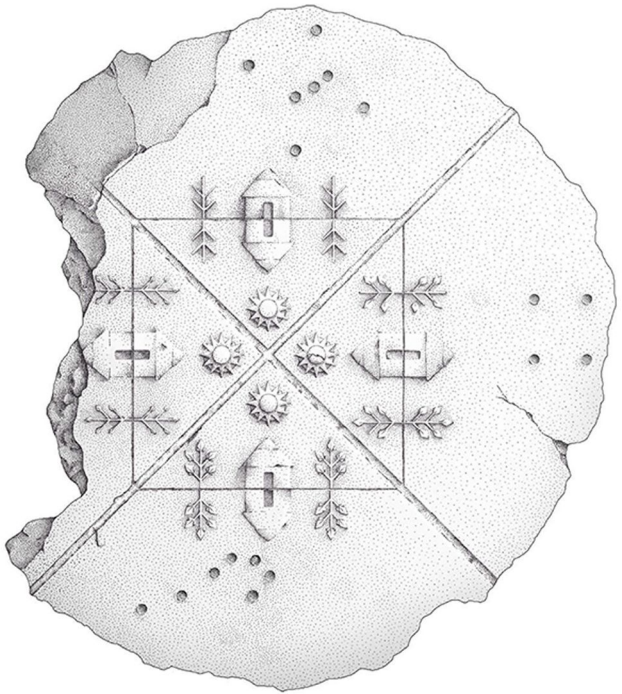
As **astronomers**, we are trying to figure out what the missing piece of this artifact might look like. To figure this out, we need to be aware of **when things appear in the sky.**

If we went outside **right now,** what do you think we would see in the sky?

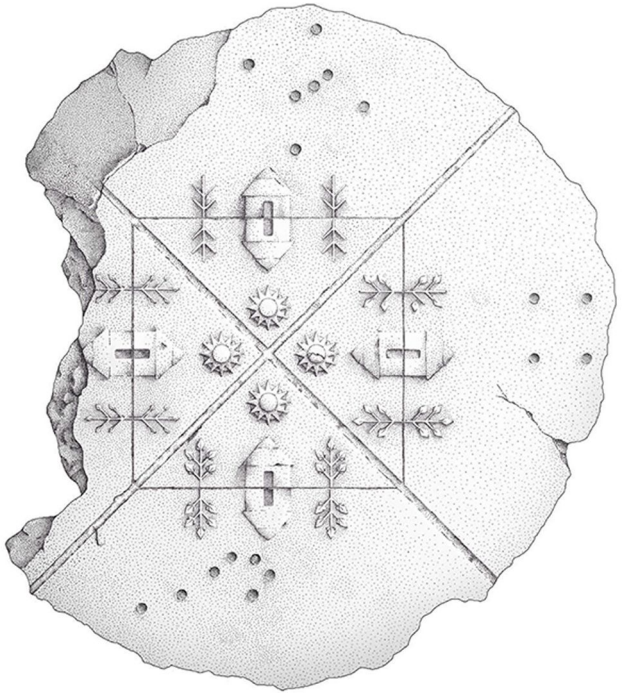
Would we see stars? The sun?

What if we waited **until dark,** what do you think we would see in the sky then?

Would we see stars? The sun?



Remember that the people who made this artifact 1,000 years ago would have depicted **what they actually saw in the sky**.



Do you see anything on the artifact that might also be **something you can see in the sky**?

Chapter 1 Question

Why don’t we see a lot of stars during the daytime?

If we want to understand what we see in the sky, we should first decide how we will show **Earth's shape**.

For this, we can use **models**.

These are two **models** of Earth.

In what way are these models **similar** to Earth's shape?

In what ways are these models **different** from Earth's shape?

Which model of Earth do these images support? Globe or map?

The photographs of Earth from space are **evidence**, or information that supports our idea, that **Earth is a sphere** like the globe, rather than flat like the map.

When might a **map** be a more useful representation of Earth?

Vocabulary

model

something scientists make to answer questions
about the real world

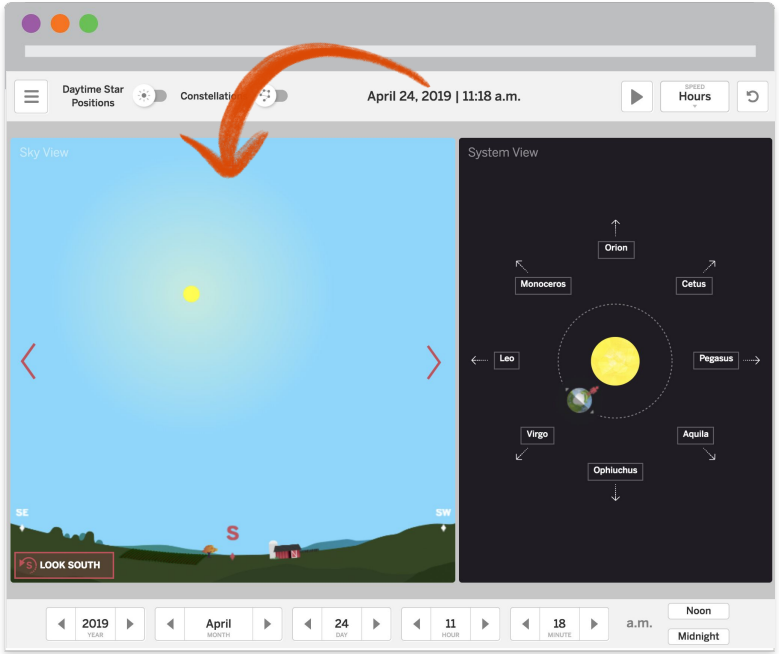
20 MIN

Activity 2

Exploring a Simulation of Earth and Sky

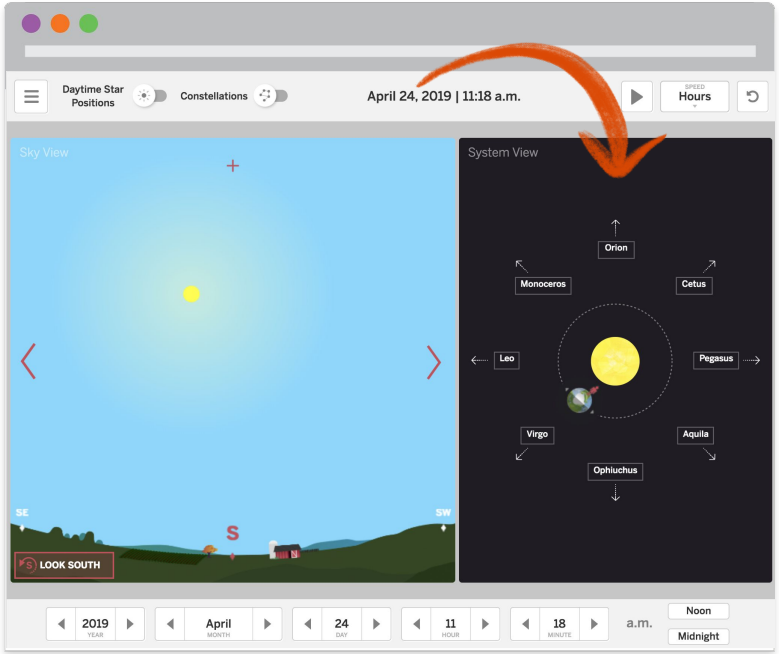
Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.

This Sim is a **scientific model of Earth and the sky.** Although this model is different from the real Earth and sky, it is also accurate in many ways.



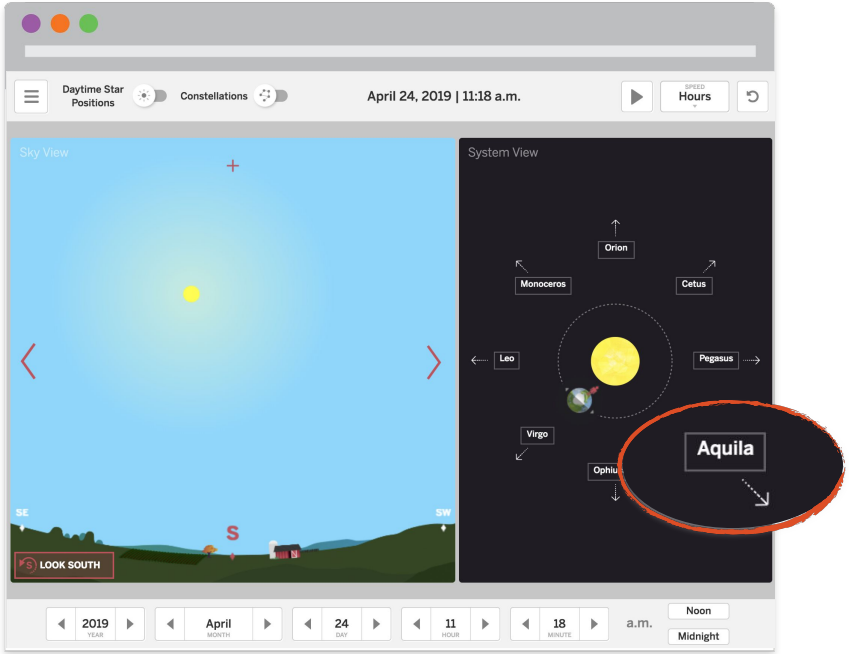
Sky View:

This view shows the sky as if you are **standing on Earth.**

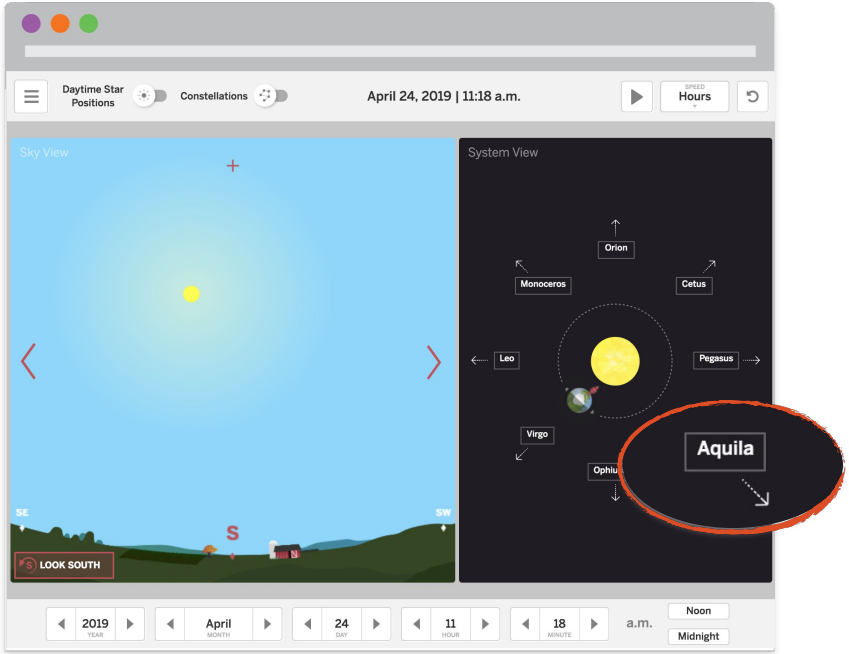


System View:

This view shows Earth as if you are seeing it from **above Earth's North Pole,** but far enough away to also see the sun.



Constellations:
The name labels (**in boxes**) do not represent the actual constellations because they are too far away.



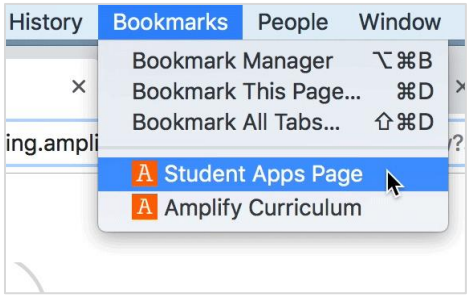
Arrows:

The white arrows represent the **direction in which you would need to travel** in space in order to get to those constellations.

Guidelines for Using Apps

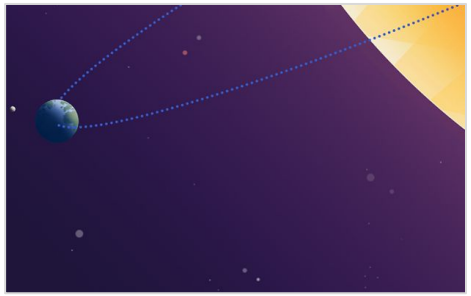
- Only one person “drives” at a time.
- Anyone can make suggestions about how to use the app.
- Talk about what you observe.
- Rotate the role of “driver.”

Open the Simulation



Step 1

Click on the **Student Apps Page** in your bookmarks.



Step 2

Scroll down and click on the ***Patterns of Earth and Sky*** **unit**.

Step 3

Click on the **orange box with a 1** to access the Sim.

Name: _____ Date: _____

Exploring Stars in a Simulation

Explore the Sim with your partner, and then record your ideas.

A. List some things you discovered about how the Sim works.

B. List some questions you have about how the Sim works.

Turn to page 5, Exploring Stars in a Simulation, in your notebooks.

Explore the Sim with your partner, and then **record** some things you discover and some questions.

10 MIN

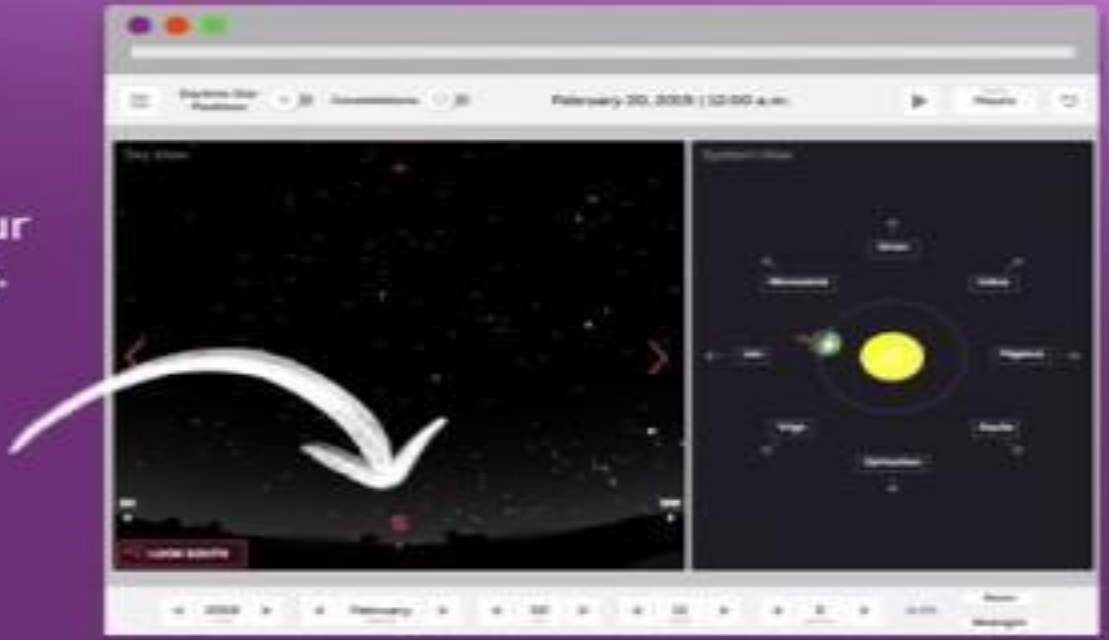
Activity 3

Sharing What We Discovered

Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.

What did you **notice** about the Sim?

When we press **LOOK SOUTH** we turn our view to the south horizon.



When do you think it will be helpful for you to use the Sim as a model?

10 MIN

Activity 4

Ideas About Where the Stars Are

Students explore physical and digital models to begin understanding the shape and scale (scale, proportion, and quantity) of objects in space and communicate their initial ideas about where the stars are in space.

We’re going to investigate this question:

Where are the stars in space?

Think-Write-Pair-Share Routine

Think

Think silently about the question.

Write

Write your ideas about the question in your notebook.

Pair

Turn and talk to a partner about the question.

Share

Share your ideas about the question with the class.

Name: _____ Date: _____

Think-Write-Pair-Share: Where Are the Stars in Space?

1. Think about the question, *Where are the stars in space?*
2. Record your ideas.
3. Share your ideas with your partner.

Turn to page 6 in your notebooks.

Where are the stars in space?

End of Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify.

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Science & Engineering Practices

Chapter 1: Why don't we see a lot of stars in the daytime?

Chapter 1: Investigate using digital and kinesthetic models

Lesson 1.1

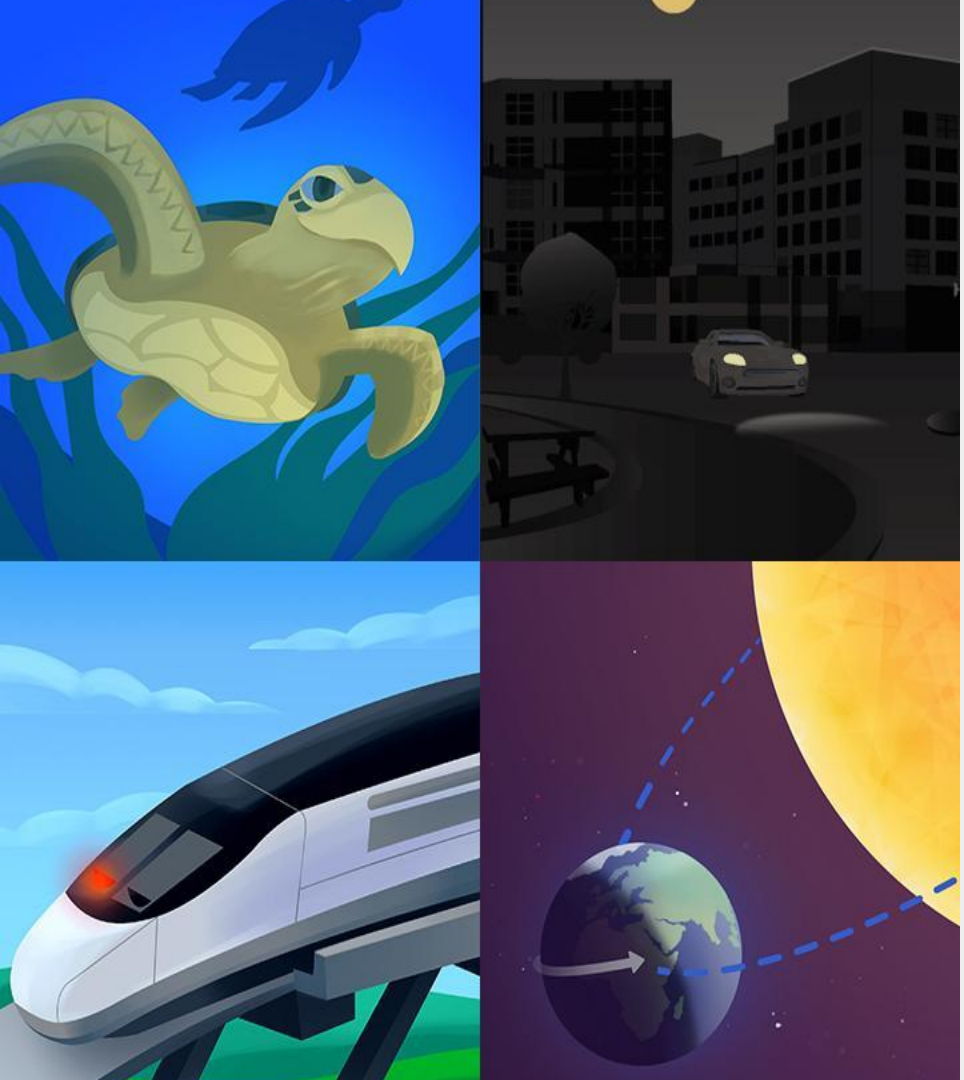
NA

Lesson 1.2
What - **Explore Physical and digital models**
How - Engage with inflatable globe and flat map of the earth and simulation

Chapter 1: **Explain**

Lesson 1.1
What - Write their initial explanations
How - Pre-Unit Assessment

Lesson 1.2
What - Communicate their initial ideas
How - Think Pair Share, Write ideas



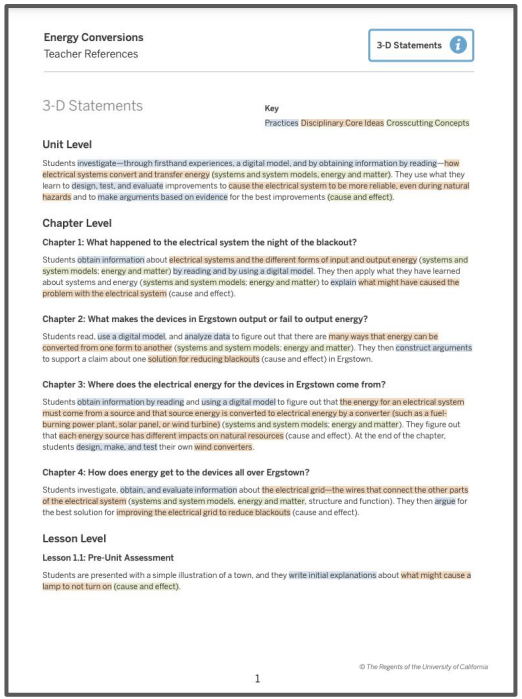
Plan for the day

- Framing and Review
- Introducing the Unit
- Unit Internalization
- Identifying the Science and Engineering Practices at the unit and chapter level
- Science and Engineering Practices within a lesson
- Lesson Planning
- Closing

3D Statements Lesson Work time

1. Identify what **Science and Engineering Practices** are addressed in each lesson in Chapter One.

2. Identify how the **Science and Engineering Practices** are addressed



Energy Conversions
Teacher References

3-D Statements

3-D Statements

Key
Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

Students investigate—through firsthand experiences, a digital model, and by obtaining information by reading—how electrical systems convert and transfer energy (systems and system models; energy and matter). They use what they learn to design, test, and evaluate improvements to cause the electrical system to be more reliable, even during natural hazards and to make arguments based on evidence for the best improvements (cause and effect).

Chapter Level

Chapter 1: What happened to the electrical system the night of the blackout?

Students obtain information about electrical systems and the different forms of input and output energy (systems and system models; energy and matter) by reading and by using a digital model. They then apply what they have learned about systems and energy (systems and system models; energy and matter) to explain what might have caused the problem with the electrical system (cause and effect).

Chapter 2: What makes the devices in Ergstown output or fail to output energy?

Students read, use a digital model, and analyze data to figure out that there are many ways that energy can be converted from one form to another (systems and system models: energy and matter). They then construct arguments to support a claim about one solution for reducing blackouts (cause and effect) in Ergstown.

Chapter 3: Where does the electrical energy for the devices in Ergstown come from?

Students obtain information by reading and using a digital model to figure out that the energy for an electrical system must come from a source and that source energy is converted to electrical energy by a converter (such as a fuel-burning power plant, solar panel, or wind turbine) (systems and system models: energy and matter). They figure out that each energy source has different impacts on natural resources (cause and effect). At the end of the chapter, students design, make, and test their own wind converters.

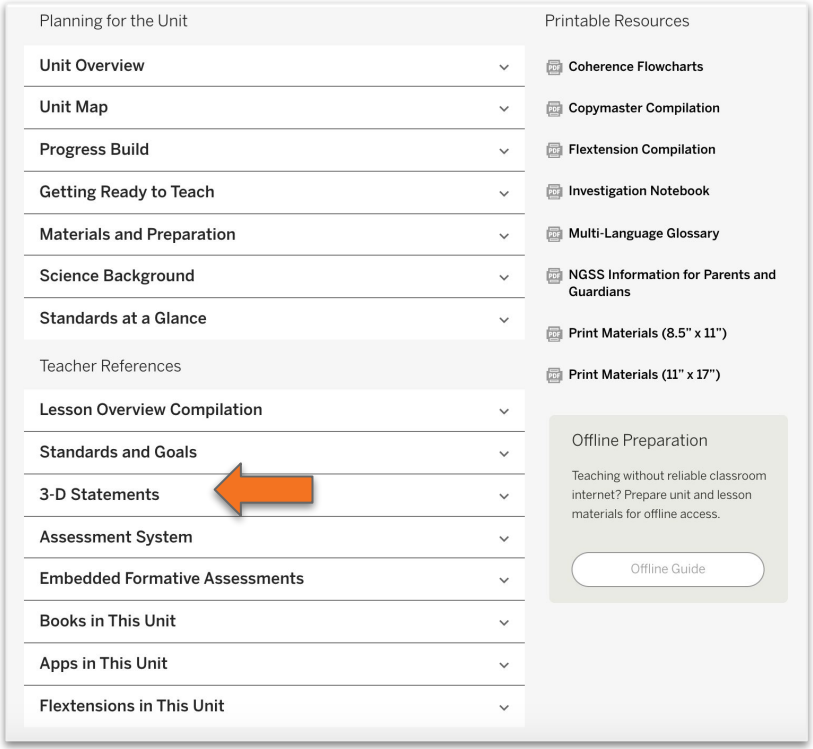
Chapter 4: How does energy get to the devices all over Ergstown?

Students investigate, obtain, and evaluate information about the electrical grid—the wires that connect the other parts of the electrical system (systems and system models: energy and matter, structure and function). They then argue for the best solution for improving the electrical grid to reduce blackouts (cause and effect).

Lesson Level

Lesson 1.1: Pre-Unit Assessment

Students are presented with a simple illustration of a town, and they write initial explanations about what might cause a lamp to not turn on (cause and effect).



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- Print Materials (11" x 17")

Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

Offline Guide

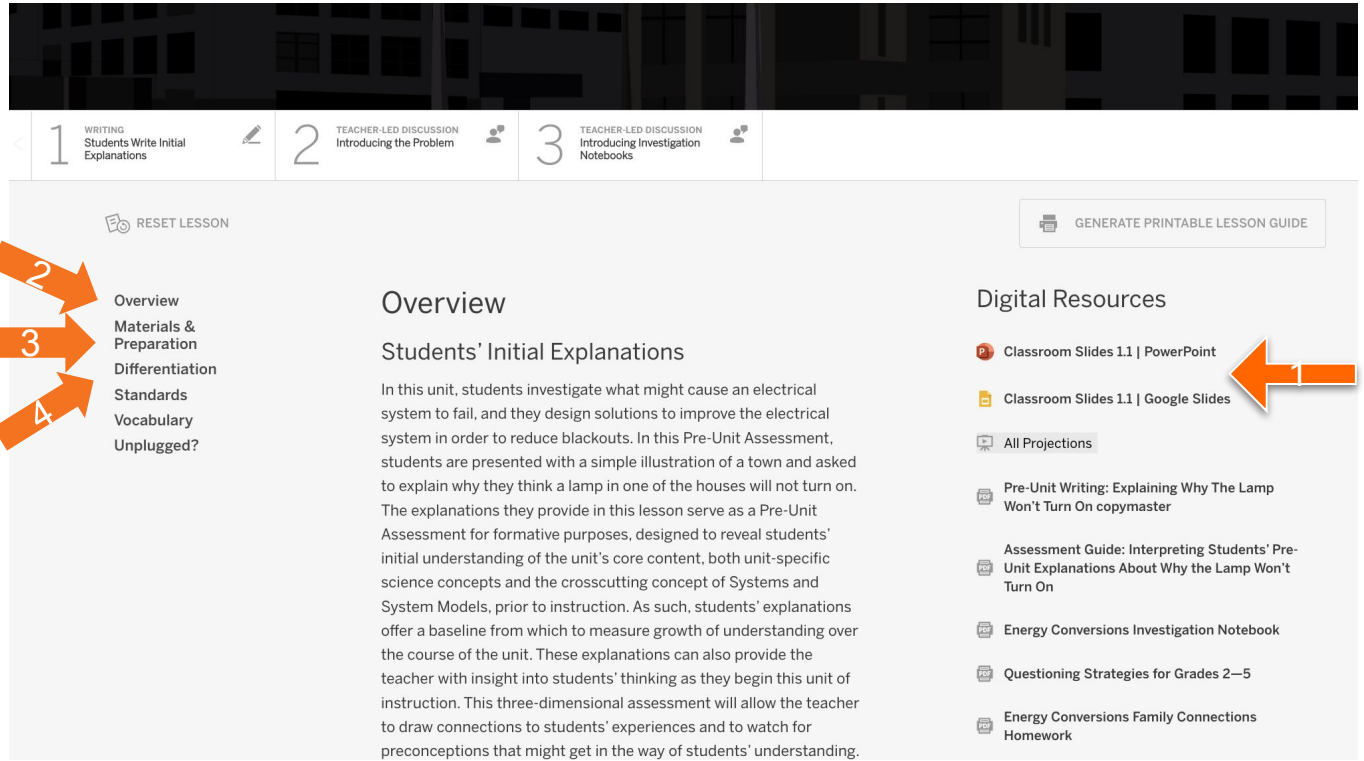
4 Easy Steps to Teaching an Amplify Lesson

Step 1: Download the Classroom Slides

Step 2: Read the Overview Section

Step 3: Read the Materials & Preparation Section

Step 4: Read the Differentiation Section



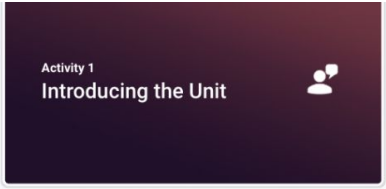
Slide View

Copy of Lesson 1.1 - Patterns of Earth and Sky

File Edit View Insert Format Slide Arrange Tools Add-ons Help Last edit was 2 minutes ago

1

2



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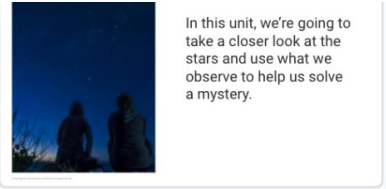

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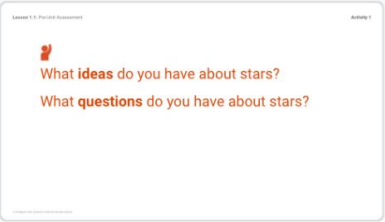

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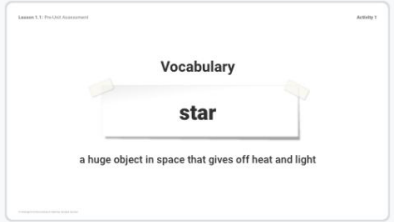

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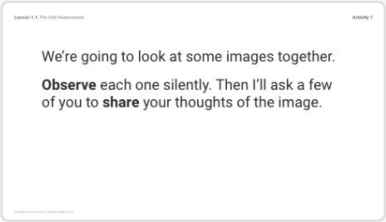


7

8

9

10

11

12

Please refer to this lesson's Materials & Preparation section in the digital Teacher's Guide or the Print Teacher's Guide for information abo

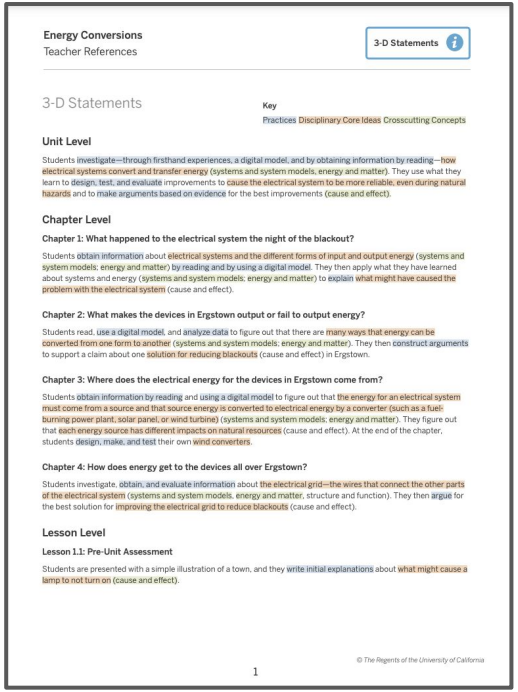
Materials Management

3.5	4	x		Prep Prior: • 1 tray with wind turbine designs and materials from Lesson 3.4
4.1	2	x		Prep Prior: For each group of 3-5 students: 1 self-sealing, plastic bag, 1 solar panel, 1 motor with fan blades attached • 2 cables with alligator clips
4.2	2			Teacher will do the system improvement demonstration: • 1 spool of two-conductor wire, 1 wire cutte, 1 motor with fan attachment, 1 solar panel, 4 wires with clip leads, 1 clamp lamp with lightbulb. • Set the motor with fan 3–7.5 meters (10–25 feet) from the light source (lamp or sunlight). • Clip two of the short wires to the fan. • Clip the other end of each short wire to one of the two wires at one end of the long two-conductor wire. • Stretch the long two-conductor wire to where the bright light is shining. • Use the two additional short wires to connect the other two ends of the long wire to the two connections on the solar cell. • Hold the solar panel in the bright light. The fan at the other end of the long 2-conductor wire should function. If you plan to use the clamp lamp, you may have to hold the solar panel within a few inches of the light source. Be careful if the lamp is hot. (IMPORTANT NOTE: The clips from different wires must not touch each other. If they do, the system will not function.)

4.2	2			within a few inches of the light source. Be careful if the lamp is hot. (IMPORTANT NOTE: The clips from different wires must not touch each other. If they do, the system will not function.)

3D Statements Share Out

Share the what and how of the **Science and Engineering Practices** addressed in each lesson.



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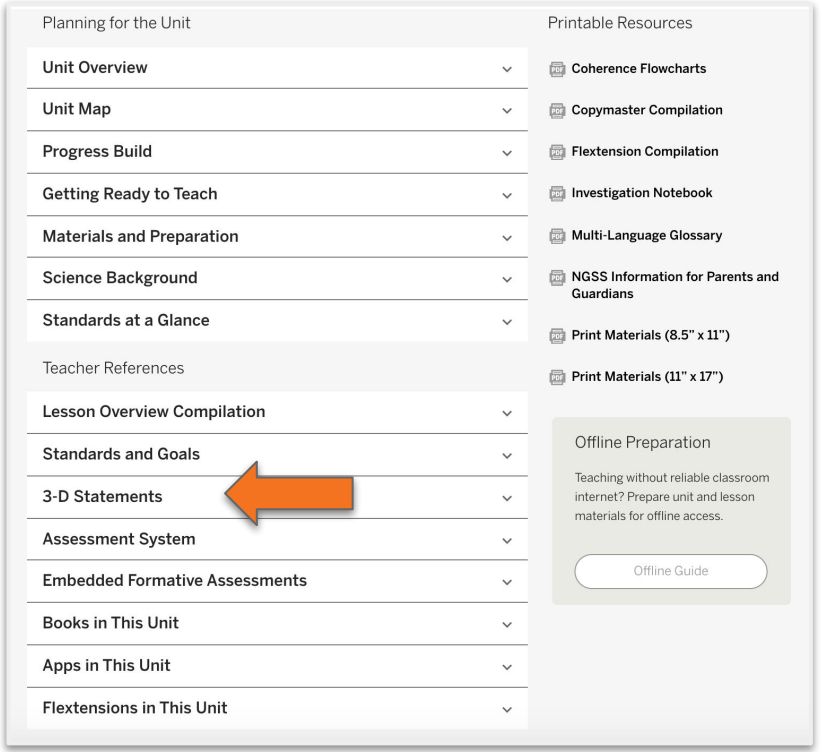

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Science & Engineering Practices

Chapter 1: Why don't we see a lot of stars in the daytime?

Chapter 1: By obtaining information by reading and using a digital model

Lesson 1.1

NA

Lesson 1.2
What - Explore Physical and digital models
How - Engage with inflatable globe and flat map of the earth and simulation

Lesson 1.3
What - Obtain information
How - Read *How Big Is Big? How Far is Far?*

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How - Pre-Unit Assessment

Lesson 1.2
What - Communicate their initial ideas
How - Think Pair Share, Write ideas

Lesson 1.3
What - Explain
How - Discussion about scale

Science & Engineering Practices

Chapter 1: Why don't we see a lot of stars in the daytime?

Chapter 1: By obtaining information by reading and using a digital model

Lesson 1.4
What - use a digital model to investigate
How - Use the simulation to investigate

Lesson 1.5
What - estimate the relative distance in a scale model to investigate
How - Students use the *Patterns of Earth and Sky* Simulation to make observations of stars in the daytime and the nighttime,

Lesson 1.6
What- obtain and evaluate information
How- Students will engage with images, video, and the reference book, Handbook of Stars and Constellations

Chapter 1: Explain

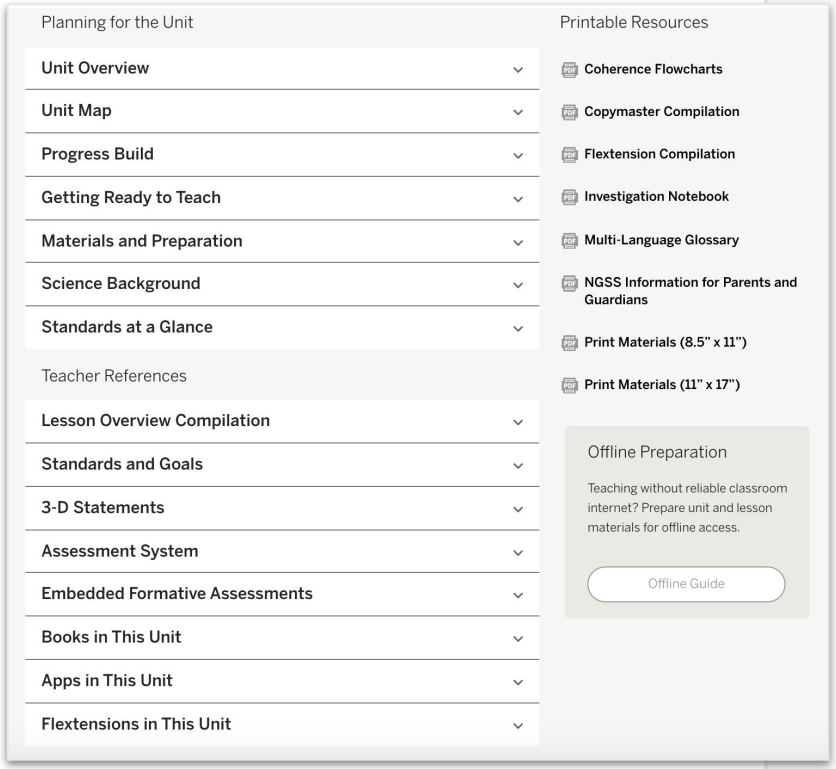
Lesson 1.4
What - Interpret their data
How - students reflect on their investigations and share responses to the Investigation Question.

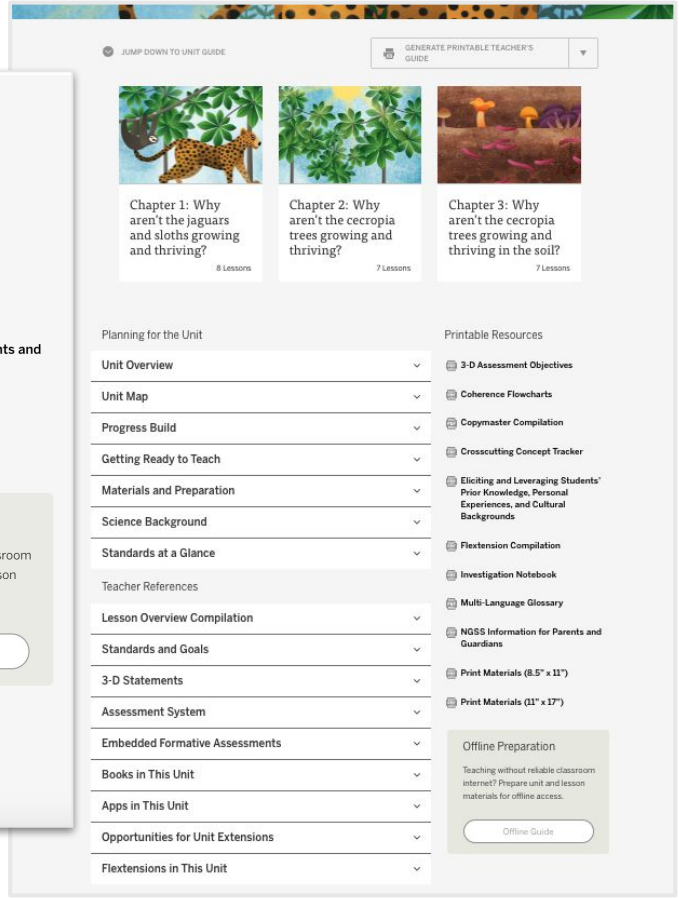
Lesson 1.5
NA

Lesson 1.6
What - Explain
How - think, pair, share discussion

Lesson 1.7
What - Write explanations
How -Write scientific explanations

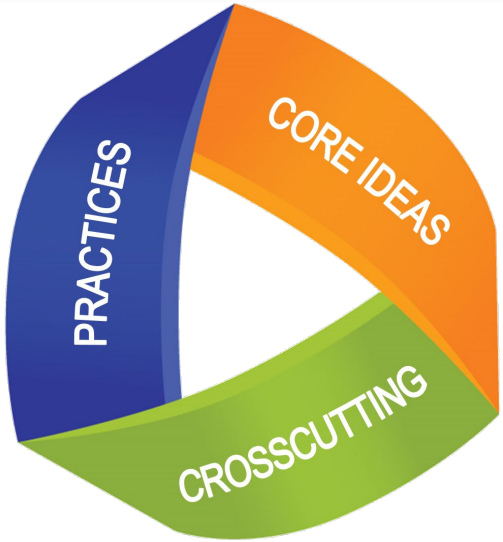
Standards at a Glance





Next Generation Science Standards

Science and Engineering Practices



1. Asking questions (for science) and defining problems (for engineering) Ch. 2,4
2. Developing and using models Ch. 1-4
3. Planning and carrying out investigations Ch. 1-4
4. Analyzing and interpreting data Ch. 1-4
5. Using mathematics and computational thinking Ch. 1-4
6. Constructing explanations (for science) and designing solutions (for engineering) Ch. 1-3
7. Engaging in argument from evidence Ch.1 -3,
8. Obtaining, evaluating, and communicating information Ch. 1- 4

Science & Engineering Practices:

Building the practices incrementally, lesson by lesson, chapter by chapter.

Patterns of Earth and Sky Unit SEP

- **Investigate using digital and kinesthetic models**
  - Chapter 1: By obtaining information by reading and using a digital model
  - Chapter 2: , Use a digital model, investigate
  - Chapter 3: Investigate using digital and kinesthetic models
  - Chapter 4: Plan and conduct their own investigations
- **Explain**
  - Chapter 1: Explain
  - Chapter 2: Obtain information
  - Chapter 3: Investigate what causes patterns
  - Chapter 4: Explain patterns

Chapter 1: Why don't we see a lot of stars in the daytime?

Chapter 1: By obtaining information by reading and using a digital model

Lesson 1.1
NA

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Lesson 1.2
What - Communicate their initial ideas
How - Think Pair Share, Write ideas

Lesson 1.3
What - Explain
How - Discussion about scale

Questions?

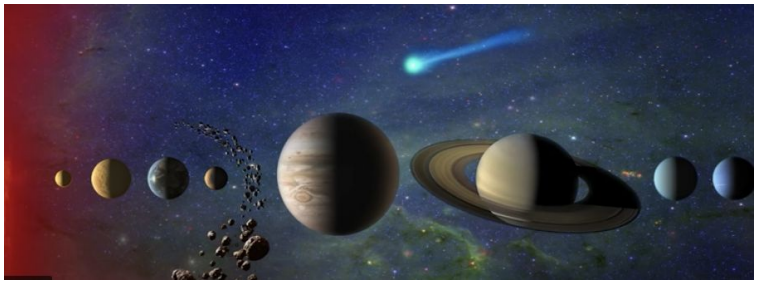
Unit Extensions

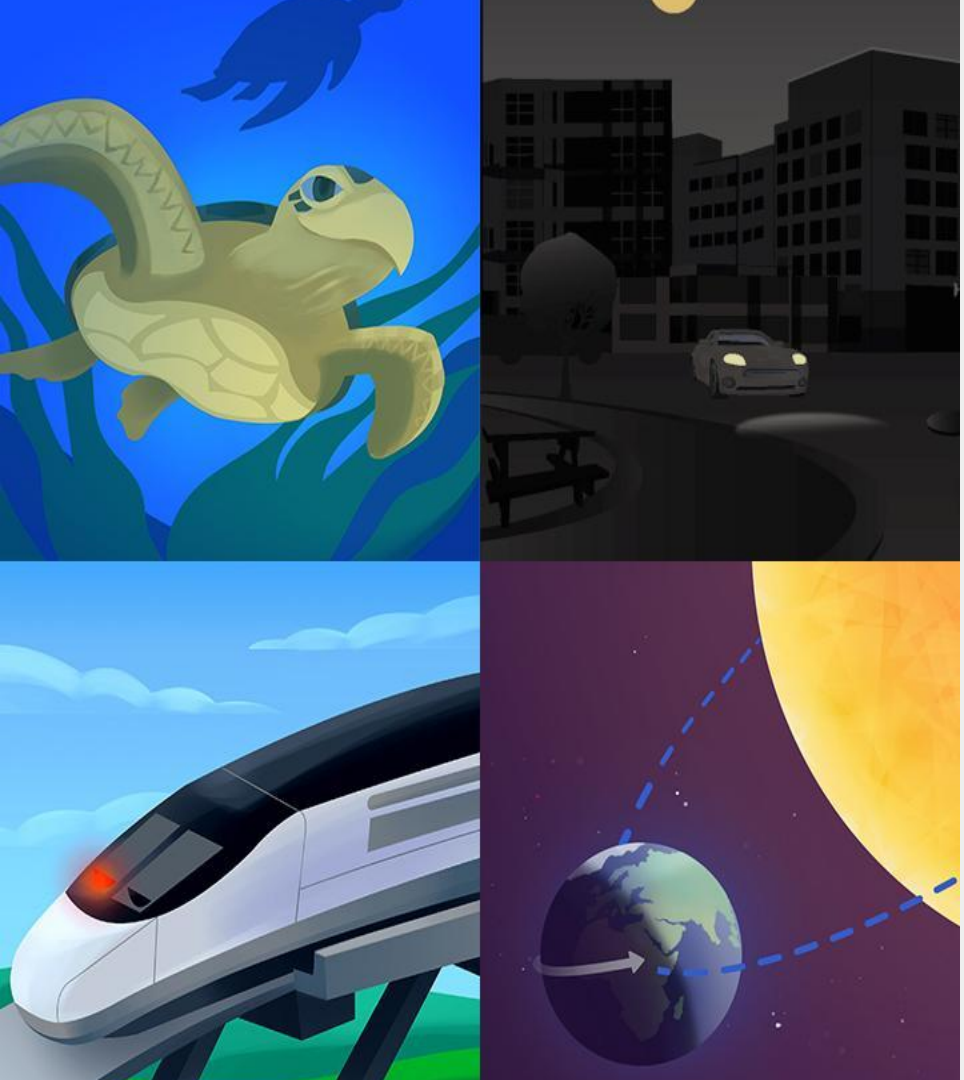
VIRTUAL FIELD TRIP TO ARCHAEOLOGICAL SITES:

- ASCSA Corinth Excavation virtual field trip via Skype: https://education.skype.com/u/corinthexcavations.educator
- Visit the Egyptian Museum in Cairo and learn about the archaeological sites where the museum's artifacts were excavated: https://education.skype.com/a/visit-the-egyptian-museum-in-cairo
- Tour the artifact collection from the Chaco Culture National Historic Park and learn about pre-Colombian culture and the Chaco people: https://education.skype.com/u/chacoculturenhp.museumprogram

VIDEO To Scale: The Solar system https://www.youtube.com/watch?v=zR3Igc3Rhfg

VIRTUAL FIELD TRIP TO PLANETARIUM https://www.youtube.com/watch?v=nP8JQUfUVIc





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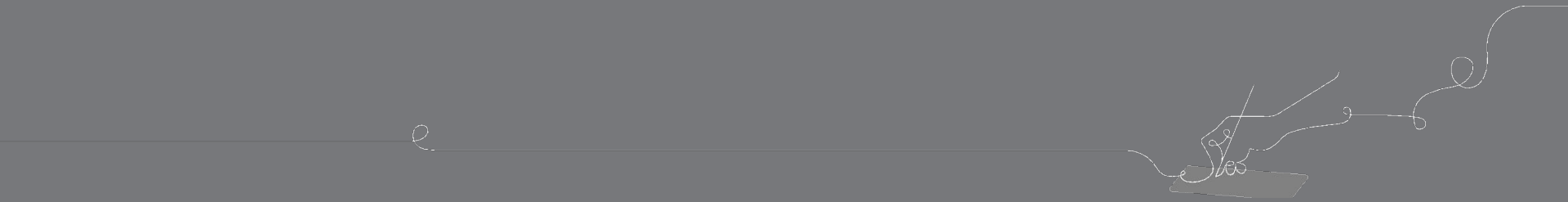
- Closing

Overarching goals

By the end of this workshop, you will be able to:

- ❏ Identify the Science and Engineering Practices within a lesson and how they are taught.
- ❏ Apply this knowledge to prepare to teach.



Closing reflection

Based on our work today, share:

Head: something you'll keep in mind

Heart: something you're feeling

Feet: something you're planning to do

LAUSD Microsite-
https://amplify.com/lausd-science

Welcome to Amplify Science!

This site contains supporting resources designed for the LAUSD Amplify Science adoption for grades TK–8.

- Access the Amplify Science Program Hub (To help orient you to the new design, watch this video and view this reference guide.)
- Find out more about Amplify Science@Home
- Share the Caregiver Hub (Eng/Span) with your families
- For LAUSD ES Teachers- Amplify Science & Benchmark Advance Crosswalk
- Instructional guidance for a Responsive Relaunch of Amplify Science in 21-22

Click the button below to preview the digital Teacher's Guide, and check back for exciting updates to this site!

ify.

Additional resources and ongoing support

Customer Care

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-10PM EST and weekends 10AM-6PM EST.

help@amplify.com

800-823-1969

Amplify Chat

End of Part 2