



# Amplify Science

New York City

**Make Science Accessible for  
All Learners**  
Grades 3-5

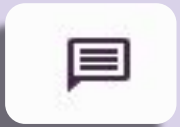
# Workshop Norms



- Please keep your camera on, if possible.
- Take some time to orient yourself to the platform



- Mute your microphone to reduce background noise unless sharing with the group



- The chat box is available for posting questions or responses to during the training



- Make sure you have a note-catcher present



- Be an active participant - chat, ask questions, discuss, share!

# Session Plan



- **Framing the day**
- Amplify Approach to Supporting Diverse Learners
- Access and Equity Frameworks
- Differentiation
- Explore a lesson
- Closing

# Overarching goals

By the end of this 2 -hour workshop, we will:

- Review the research-based principles that guided the creation of the access and equity supports & strategies in Amplify Science
- Identify the embedded supports for diverse learner needs within your current unit



# During this Session

We will visit and explore:

1. [\*\*The Amplify Science NYC Resources site\*\*](#)
2. [\*\*The Amplify Science Digital Teacher's Guide\*\*](#)
3. [\*\*The Amplify Science NYC Program Guide\*\*](#)
4. [\*\*The Amplify Science Program Hub\*\*](#)



# Reflect

Who are your/our  
diverse learners?



The background of the slide is a grid of numerous fingerprints, rendered in grayscale. The prints are arranged in rows and columns, creating a textured, repetitive pattern. An orange horizontal bar is positioned at the top, containing the main title. A light gray rectangular box is centered on the page, containing a quote in orange text. The website address 'cast.org' is located in the bottom right corner in orange text.

# Who are our Diverse Learners?

*“The way people learn is as  
as unique as their  
fingerprints...”*

*cast.org*

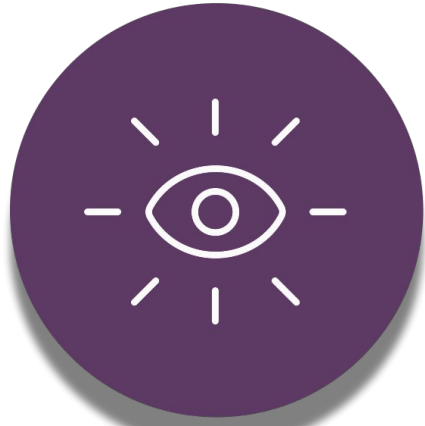
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# How does the Amplify Science Approach Support all learners?



**Introduce a phenomenon/real world problem**



**Collect evidence from multiple sources**



**Build increasingly complex explanations**



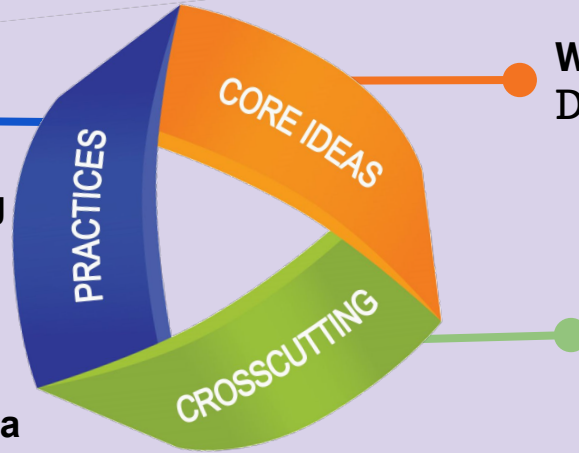
**Apply knowledge to solve a different problem**

# NGSS/NYSSLS 3D



## What scientists do Science and Engineering Practices

1. Asking questions and defining problems
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 and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



## What scientists want to know Disciplinary Core Ideas

## How scientists make sense of, organize and connect...

### Crosscutting Concepts

- patterns
- cause and effect
- scale, proportion, and quantity
- systems and system models
- energy and matter
- structure and function
- stability and change

# Reminder! Capitalizing on Amplify Science in a responsive relaunch

1. Amplify Science is NGSS-designed.
2. In Amplify Science units, students are figuring out phenomena.
3. Amplify Science has a robust system of formative assessment.
4. Amplify Science has a strong emphasis on literacy development.
5. Amplify Science is for all students.

## Amplify Science Resources for NYC (K-5)

Updated 7/2020. This is a resource supporting resources designed for the New York City Department of Education Amplify Science website (see page 4).

### Resources for Classrooms

Education Specialist Publications  
20-21 Log On Guide  
Instructional Planning Opportunities  
Introduction  
Setting up the resources  
Planning and implementing the resources  
Additional resources  
Change measures  
Tools for NYSED Learning Resources  
20-21 Professional Learning Resources  
20-22 Professional Learning Resources

### Returning to Classrooms

An overview to help build the 2020-2021 school year, and to help thinking about making your classroom program to include students in the next 100 pages. Please take time to read this information for more information on how to get the most out of the resources available in this site and to get the most out of the resources available in this site. For more information, see the Responsive Relaunch Introduction for support.

Student Instructional Resources  
LEAP to Amplify Science  
ELL in Amplify Science  
Responsive Relaunch Introduction Video  
Responsive Relaunch NYSED Brief

## Capitalizing on Amplify Science in a responsive relaunch

### Guidance for instructional leaders and teachers

The learning disruptions of the past year due to COVID-19 have created wide disparities in the amount and quality of science teaching and learning that has taken place in schools. The resulting unfinished learning in science will vary in each school and classroom, and for each individual student. This document highlights five key features of Amplify Science that can be leveraged in responsive relaunch plans:

1. Amplify Science is NGSS-designed.
2. In Amplify Science units, students are figuring out phenomena.
3. Amplify Science has a robust system of formative assessment.
4. Amplify Science has a strong emphasis on literacy development.
5. Amplify Science is for all students.

The recommendations outlined in the following pages are intended to support instructional leaders and teachers as they envision what science teaching and learning will look like in the upcoming back-to-school season and beyond.

# 5. Amplify Science is for all students.

The NYSSLS offers a vision for "all standards, all students." Teaching with Amplify Science aligns with this vision to support students in developing their identities as builders and active users of science knowledge, to promote cultural and linguistic inclusion, and to provide access to deep learning.



## Recommendations

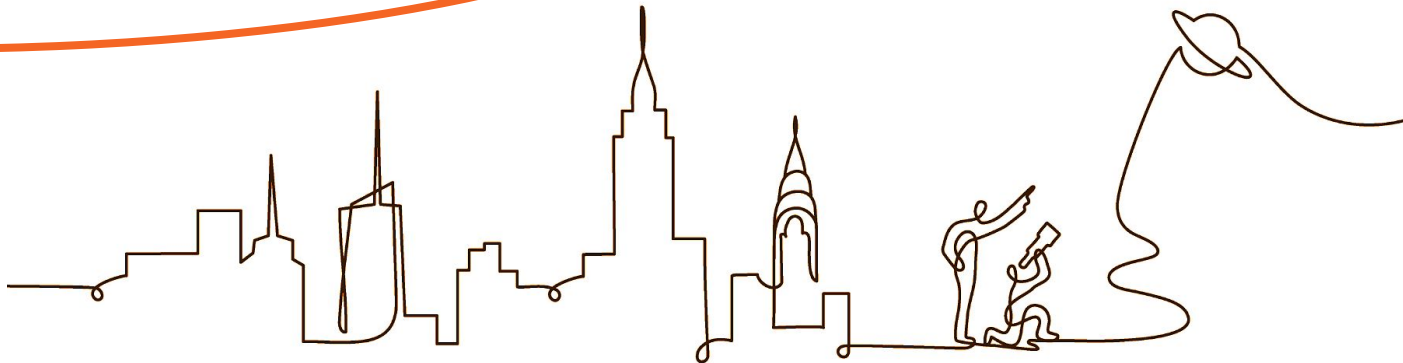
- Take time to establish a culture of figuring out.
- Utilize the **differentiation notes** in the Lesson Brief of each lesson.

**Tips for establishing a culture of figuring out**  
 To promote equity, relevance, and engagement

- Elicit and leverage students' prior knowledge, personal experiences, and cultural backgrounds
  - Find space and time where students can share their experiences and ideas related to the unit phenomenon or problem that they will be seeking to explain or solve.
  - Have students return to their funds of knowledge at key moments of the figuring out process for the purpose of building on their ideas, using their connections as a source of evidence, or to notice if their ideas have changed over time.
  - Think about how to attribute ideas from students who might not see themselves as contributors to the conversation.
- Value student questions
  - Utilize the embedded question-asking opportunities in the unit to elicit questions from students.
  - Document, return to, and sort student questions at key moments, such as the beginning of the unit when the unit phenomenon is introduced and at the beginning and end of each chapter.
- Connect to local and relevant phenomena
  - Welcome in students' interest in and experience with local and everyday phenomena, and help draw connections to what they're figuring out throughout the year about the unit phenomena.
  - Compare and contrast the unit phenomenon to local phenomena.
  - Encourage students' explorations and observations of everyday phenomena at home or in their communities.
  - Identify community resources that can help students explore phenomena in their community.
- Allow for a variety of sensemaking types and paces
  - Attend to how different students thrive with different modalities, or need less or more time with them.
  - Use the storyline in the unit to teach sequentially but allow for flexibility based on student need.
- Take on the role of an interested skeptic
  - Students might not be intrigued by a phenomenon right away because they believe they already know how or why it happens. Help students become dispassionate with what they can explain.
  - Ask questions such as: "Is that how a scientist would do it?", "Is that consistent with what we read about?", or "Do you agree with your partner's idea?"

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# NYC Resources



Amplify Science

## Social and Emotional Learning in Amplify Science



Culturally Responsive-Sustaining Education Framework

Amplify Science

## Culturally and Linguistically Responsive Teaching in Amplify Science



# New York City Resources site

## Amplify Science Resources for NYC (K-5)

Welcome! This site contains supporting resources designed for the New York City Department of Education Amplify Science adoption for grades K-5.

**No Login Required:  
Bookmark this  
website!**

### [Returning to Classrooms](#)

[Educator Spotlight Submission](#)

[20-21 Login Update](#)

[Professional learning opportunities](#)

[Introduction](#)

[Getting started resources](#)

[Planning and implementation resources](#)

[Admin resources](#)

[Caregiver resources](#)

[Remote and hybrid learning resources](#)

[20-21 Professional learning resources](#)

[19-20 Professional learning resources](#)

### [Returning to Classrooms](#)

As we start to look toward the 2021-2022 school year, you're likely thinking about making your classroom responsive to student needs due to the covid-19 pandemic. Please take a look at our recommendations for summer instruction using Amplify, our Social Emotional Learning and Culturally and Linguistically-Responsive Teaching documents, and our Responsive Relaunch resources for support.

### [Summer Instruction Resources](#)

[CLRT in Amplify Science](#)

[SEL in Amplify Science](#)

[Responsive Relaunch Introduction Video](#)

[Responsive Relaunch NYC Brief](#)





Questions?

# Session Plan



- Framing the day
- Amplify Approach to Supporting Diverse Learners
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**Two conceptual frameworks informed the Amplify Science approach to ensuring access and equity for all students:**

**Universal Design for Learning & Culturally Linguistically Responsive Teaching.**

# Universal Design for Learning

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- Universal Design for Learning (UDL) is a **research-based framework** for improving student learning experiences and outcomes by **focusing on careful instructional planning to meet the varied needs of students.**
- UDL is **NOT a special-education initiative.**
- Through the UDL framework, the **needs of ALL learners are considered** and planned for at the point of first teaching, thereby **reducing the need to reteach concepts.**

# UDL and the Amplify Science Approach

## Provide multiple means of Engagement →

Affective Networks  
The "WHY" of learning



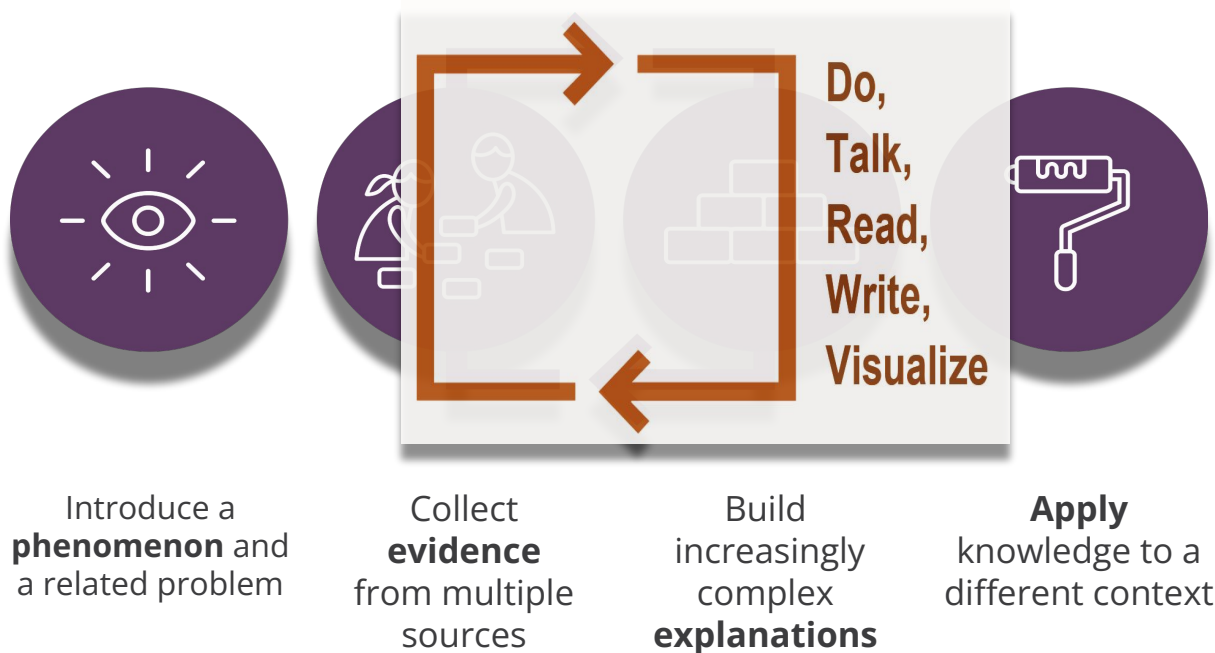
## Provide multiple means of Representation →

Recognition Networks  
The "WHAT" of learning



## Provide multiple means of Action & Expression →

Strategic Networks  
The "HOW" of learning



# Universal Design for Learning Guidelines

Provide multiple means of  
**Engagement** ➔

Affective Networks  
The "WHY" of learning



Provide multiple means of  
**Representation** ➔

Recognition Networks  
The "WHAT" of learning



Provide multiple means of  
**Action & Expression** ➔

Strategic Networks  
The "HOW" of learning



Access

Provide options for  
**Recruiting Interest** (7) ➔

- Optimize individual choice and autonomy (7.1) ➔
- Optimize relevance, value, and authenticity (7.2) ➔
- Minimize threats and distractions (7.3) ➔

Provide options for  
**Perception** (1) ➔

- Offer ways of customizing the display of information (1.1) ➔
- Offer alternatives for auditory information (1.2) ➔
- Offer alternatives for visual information (1.3) ➔

Provide options for  
**Physical Action** (4) ➔

- Vary the methods for response and navigation (4.1) ➔
- Optimize access to tools and assistive technologies (4.2) ➔

Build

Provide options for  
**Sustaining Effort & Persistence** (8) ➔

- Heighten salience of goals and objectives (8.1) ➔
- Vary demands and resources to optimize challenge (8.2) ➔
- Foster collaboration and community (8.3) ➔
- Increase mastery-oriented feedback (8.4) ➔

Provide options for  
**Language & Symbols** (2) ➔

- Clarify vocabulary and symbols (2.1) ➔
- Clarify syntax and structure (2.2) ➔
- Support decoding of text, mathematical notation, and symbols (2.3) ➔
- Promote understanding across languages (2.4) ➔
- Illustrate through multiple media (2.5) ➔

Provide options for  
**Expression & Communication** (5) ➔

- Use multiple media for communication (5.1) ➔
- Use multiple tools for construction and composition (5.2) ➔
- Build fluencies with graduated levels of support for practice and performance (5.3) ➔

Internalize

Provide options for  
**Self Regulation** (9) ➔

- Promote expectations and beliefs that optimize motivation (9.1) ➔
- Facilitate personal coping skills and strategies (9.2) ➔
- Develop self-assessment and reflection (9.3) ➔

Provide options for  
**Comprehension** (3) ➔

- Activate or supply background knowledge (3.1) ➔
- Highlight patterns, critical features, big ideas, and relationships (3.2) ➔
- Guide information processing and visualization (3.3) ➔
- Maximize transfer and generalization (3.4) ➔

Provide options for  
**Executive Functions** (6) ➔

- Guide appropriate goal-setting (6.1) ➔
- Support planning and strategy development (6.2) ➔
- Facilitate managing information and resources (6.3) ➔
- Enhance capacity for monitoring progress (6.4) ➔

Goal

Expert Learners who are...

Purposeful & Motivated

Resourceful & Knowledgeable

Strategic & Goal-Directed

<http://www.cast.org/>

**Reflect**  
**How are you supporting the use of multiple modalities in-class, hybrid, or remote?**

# Culturally and linguistically responsive teaching

Culturally and linguistically responsive teaching (CLRT) principles **emphasize validating and valuing students' cultural and linguistic heritage and creating positive and nurturing learning environments** so that learning is more effective.



Source: (l): Aaron Yaazie; (um): Kyle Spradley/ University of Missouri; (Im) Dr. Grace O'Connell; (ur) Jane Rigby; (lr) Tina Shelton/ John A. Burns/ University of Hawaii at Manoa

# Culturally and linguistically responsive teaching

**Reflect: What have you leveraged from the Amplify curriculum to support culturally and linguistically responsive teaching?**

## CULTURALLY AND LINGUISTICALLY RESPONSIVE TEACHING PRINCIPLES

- ∨ Promote a positive disposition toward diversity: +
- ∨ Leverage students' cultural and experiential backgrounds: +
- ∨ Value language diversity and multilingualism: +
- ∨ Cultivate students' development of the language of science: +

## Who Becomes a Space Scientist?



Hein is a theoretical

## Meet an Engineer Who Works with Genetics Equipment

When Steven Henderson was young, science wasn't his favorite class. "I wasn't into science as a kid," he says. However, things have changed since then: today, Henderson is a chemical engineer working with cutting-edge genetics equipment.

Henderson works for a company that makes equipment and software that analyzes the genes in body tissue. These machines sequence DNA—by running strands of DNA through chemicals, they can determine the order of the genes that make up the DNA. Understanding the order of the genes is important because it allows scientists to understand how an organism's genes interact.



The equipment Henderson uses is used in the lab for research.

## Designing Wheelchairs for All Shape and Sizes

People who use wheelchairs come in all different shapes and sizes—children are tall and short, big and small—and so do wheelchairs they use. Some wheelchairs have motors, and others are operated by hand. People who use wheelchairs do all kinds of different things. Wheelchair users may go to school or work in an office. They may play rock band, take their dogs to the park, or lead a parade through city streets.

## Meet a Scientist Who Studies How the Environment Affects Our Traits

Aiika Maunakea grew up in Hawaii and still lives and works there today. He says, "My great-grandmother was a Native Hawaiian medicine practitioner and whenever I got sick, she would treat me with herbs she grew in our yard." Maunakea grew up feeling a deep



Aiika Maunakea is a biomedical researcher. He studies how genes and the environment affect whether people get certain diseases.

## Bringing Back the Buffalo

Tens of millions of bison (also known as buffalo) once lived in the prairie ecosystems of North America. Huge herds of them crossed grasslands, eating the plants, moving in their droppings or caught in their droppings were hunted by wolves, grizzly bears, and people—the Native Americans who lived on the prairie—but the buffalo population was large and stable. Native Americans depended on the buffalo. They ate the meat and used their skins for clothing and shelter. Since time immemorial, buffalo were important and central to their way of life. About 150 years ago, European-American settlers arrived on the prairie. The settlers hunted buffalo for sport. The United States government encouraged people to kill buffalo in order to make life harder for Native American settlers could take their land. Over the next 100 years, nearly all of the buffalo were

## Meet a Scientist Who Studies Underwater Currents

In the dark of night, a ship sails through cold ocean waters. On the rain-soaked deck, the crew is busy keeping the ship safe during a powerful storm. Inside a cabin, Amy Bower calmly enters

important data to map the stormy help construct ocean currents.

Bower is an ocean research



## Meet a Scientist Who Studies Variation in Monkey Populations

Scientist Christopher Schmitt bends to measure the tail of a vervet monkey in the hot, dry savanna of South Africa. He stretches the measuring tape as a student holds the monkey gently but firmly. Just then Schmitt feels a strange tugging on his foot. He looks back and sees a large warthog with long, curved tusks trying to eat his shoe!

Schmitt studies variation in monkey populations. He has measured monkey tails, waists, and heights to find out about variation in their sizes. He has collected poop to find out about differences in the digestive systems of monkeys. He found out that some monkeys have more parasites in their guts than others.



Christopher Schmitt is a scientist.



## Meet a Scientist Who Changed How We Think About Brain Cells

Whether or not you realize it, the cells in your body are constantly performing a range of tasks that help you live: transporting oxygen, allowing muscles to contract, fighting infection, carrying messages to and from the brain. All cells in your body need glucose to release energy, but not all cells do the same things with that energy. Different body systems have specialized cells that

# The Amplify Science Program Guide

AmplifyScience

New York City

## Welcome

Program developers

Designed for the NGSS

Program components

Scope and Sequence

Phenomena, standards, and progressions

Assessments

Science and literacy

Access and equity

Resources

## Welcome

The Program Guide details information about the program, including its authorship, development, themes, and more. It serves as a resource for finding out more about the program's structure, components, supports, how it meets standards, and flexibility.

Navigate through the links on the left-hand side of the page to access more information about the program and to explore resources that can help with your implementation.

**No Login Required:  
Bookmark this  
website!**

ACCESS THE DIGITAL CURRICULUM

Resources

Support and FAQs

Technical Support

(800) 823-1969

scihelp@amplify.com

More Amplify Science

Transitional Kindergarten (TK)

Search Site ... >

Amplify.



## Access and equity

Universal Design for Learning

Culturally and linguistically responsive

Differentiation strategies

– English learners

– Students with disabilities

– Standard English learners

– Girls and young women

– Advanced learners and gifted learners

– Students living in poverty, foster children and youth, and migrant students

Lesson-level differentiation

# Diverse learner needs

- Explore each part of the program guide Access and Equity section
- Record strategies you've read about from the **Program Guide** & those from your **own practice**.
- **Please share one finding/recommendation in chat**



Questions?

# Session Plan



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# Digital Teacher's Guide

AmplifyScience > Patterns of Earth and Sky

22 Lessons

## Patterns of Earth and Sky

☑ JUMP DOWN TO UNIT GUIDE

🖨️ GENERATE PRINTABLE TEACHER'S GUIDE

Chapter	Topic	Lessons
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

The screenshot shows a user interface for a digital teacher's guide. At the top, it says 'AmplifyScience > Patterns of Earth and Sky' and '22 Lessons'. The main title is 'Patterns of Earth and Sky'. Below the title, there is a navigation menu with 'JUMP DOWN TO UNIT GUIDE' and a button to 'GENERATE PRINTABLE TEACHER'S GUIDE'. The main content area displays three chapter cards. Each card has a small image at the top, a title, and the number of lessons. Chapter 1 is 'Why don't we see a lot of stars in the daytime?' with 7 lessons. Chapter 2 is 'Why is the sun up sometimes, but not other times?' with 6 lessons. Chapter 3 is 'Why do we see different stars at different times of year?' with 6 lessons. A mouse cursor is visible over the bottom right of the chapter cards.



# Differentiation in Amplify Science

Overview

Materials &  
Preparation

Differentiation

Standards

Vocabulary

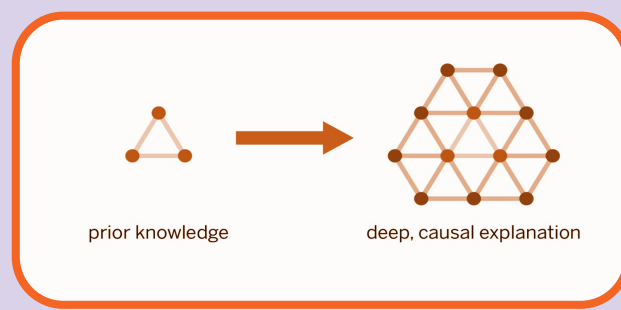
Unplugged?

## Differentiation

### Embedded Supports for Diverse Learners

**Multiple modalities with the same topic.** In the previous lesson, students read the “Hemophilia, Genes, and Proteins” article about genes. In this lesson, students use a physical investigation to consider the role genes play in building proteins. Engaging with the same ideas through different modalities provides students with multiple opportunities to make sense of a complex concept. It also provides an access point for different types of learners.

# Eliciting and Leveraging Students' Prior Knowledge, Personal Experience, and Cultural Background



## Planning for the Unit

Unit Overview



Unit Map



Progress Build



Getting Ready to Teach



Materials and Preparation



Science Background



Standards at a Glance



## Printable Resources



3-D Assessment Objectives



Coherence Flowcharts



Copymaster Compilation



Crosscutting Concept Tracker



Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds



Investigation Notebook



Multi-Language Glossary



Questions?

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The recommendations outlined in the following pages are intended to support instructional leaders and teachers as they envision what science teaching and learning will look like in the upcoming back-to-school season and beyond.

# A disciplinary literacy approach to learning science

In the Amplify Science program, students **learn to read, write, and speak as scientists do** as they acquire facility with the **academic language** and vocabulary of science. Through the **seamless integration of science and literacy instruction**, students also learn that reading, writing, and talking are **essential practices of science**, and that all scientists use these practices to gather information, communicate claims, leverage evidence, draw conclusions from data, and share their ideas through oral and written **explanations and arguments**.

# Explore Differentiation Brief and Teacher Notes

- Navigate to the lesson **activity** you would like to focus on
- Review the **differentiation brief** and record notes describing the supports you think would best support your **diverse learner**.

My Student May be Challenged by...	Suggestions from the Differentiation Brief	Suggestions from my own Teacher Toolkit

**Supporting  
Diverse Learners  
with  
Supplemental  
Materials from  
the Program Hub**



# Student Books

## Read-Aloud Videos

### Read-Aloud videos

Click below to access a playlist of this unit's Student Books being read aloud. Individual read-aloud videos can also be found within lesson playlists that use the book, and as shortened links in the @Home Unit student materials for those lessons. Find the Spanish playlist [here](#).

Amplify

### Grade 3 Balancing Forces\_Hoverboard B...

#### What Pulls the Hoverboard Downward?

The repelling magnets are pushing the hoverboard upward, away from its ramp. Think about this: Why does the hoverboard float just a little above the ramp? Why doesn't the repelling force of the magnets push the board higher and higher until it floats away? It's because magnets are not the only objects exerting a force on the hoverboard.

Earth pulls objects (including hoverboards) downward with the force of gravity.

There's something pulling the board downward: Earth. Earth There's something pulling the board downward: Earth. Earth actually pulls everything toward its center. This force is called gravity!

RECORDED WITH SCREENCAST MATIC

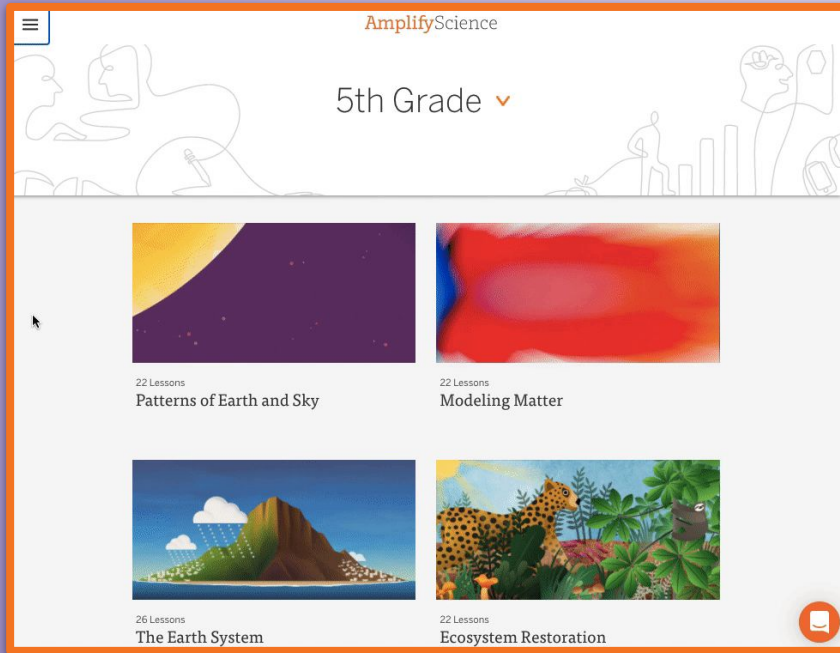


# Hands-on Videos

## Program Hub



# The Program Hub with supplemental and self study resources



The screenshot shows the AmplifyScience website interface for 5th Grade. At the top, the logo "AmplifyScience" is on the left, and "5th Grade" with a dropdown arrow is in the center. Below the header, there are four course cards arranged in a 2x2 grid. Each card features a colorful illustration, the number of lessons, and the course title. A mouse cursor is visible over the top-left corner of the first card. In the bottom right corner of the interface, there is a small red icon of a document with a checkmark.

Course Title	Number of Lessons
Patterns of Earth and Sky	22 Lessons
Modeling Matter	22 Lessons
The Earth System	26 Lessons
Ecosystem Restoration	22 Lessons





Questions?



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# Customer Care

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



[scihelp@amplify.com](mailto:scihelp@amplify.com)



800-823-1969



Amplify Chat