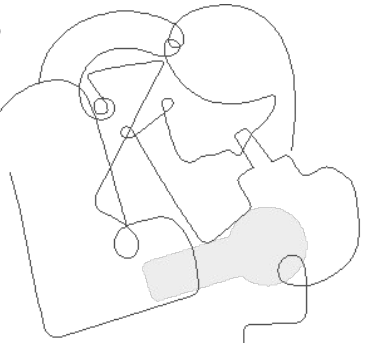
Amplify Science

Unit 2: *Wondering About Buildings* & Assessment - Part 1

Grade TK



LAUSD, CA
1/28/23

PLPG CERTIFIED PROVIDER

Presented by:

JoAnna Chocooj, MA Ed UCB, &
Amplify Professional Learning Specialist

Amplify Science - Transitional Kindergarten

AmplifyScience

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Welcome!

- **Please share your own "Fun Fact" with us!**

Intro: **JoAnna Chocooj**

- 30+ year veteran teacher in SF Bay Area = small Urban district in Vallejo, CA
- Grew up in tiny desert town of Trona, CA, just south of Death Valley
- **FUN FACT:** Extended family live in SoCal so we would come visit several times per/year. So whenever I return it's like visiting family.

AmplifyScience

- I got this wonderful water/sand sensory table for my classroom from Lakeshore - we use in all 3 Amplify Science TK Units!

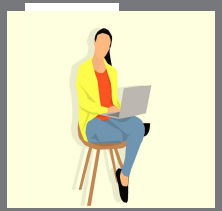
Plan for the Day

- **Introduction & Framing the day**

- Phenomenon-based Instruction

- Program Essentials - TK Structure & Materials **&** Unit Internalization

- Teaching & Learning in an Amplify Science TK Activity



- Assessment & Planning to Teach

- **Closing**

Dear teachers,

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

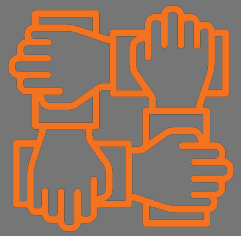
We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

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



- Participate actively: Engage at your comfort level - ask questions, reflect, discuss, share!

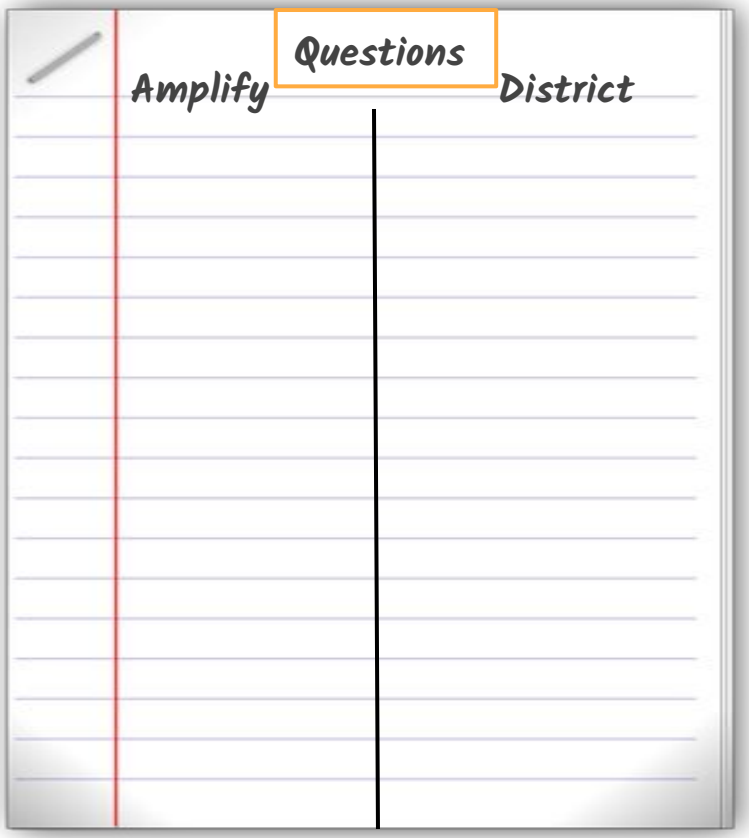
- Take care of yourself: stand up, get water; if you need anything, please let us know!

- Manage your tech; make sure you have a note-catcher present: we're here to help you access all the resources!

- What is learned here, leaves here: let's get ready to teach!!

Schoology

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



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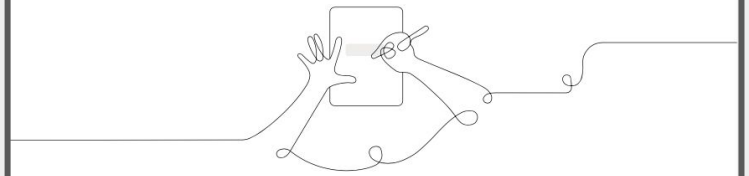
Participant Notebook

TK, Wondering About Buildings
Guided Unit Internalization Workshop



PN-TK-Unit-2-Guided-Internalization.pdf

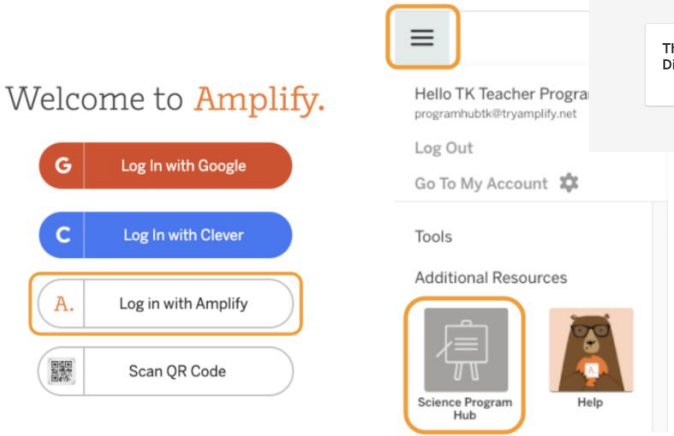
Amplify Science TK Program Hub Resources

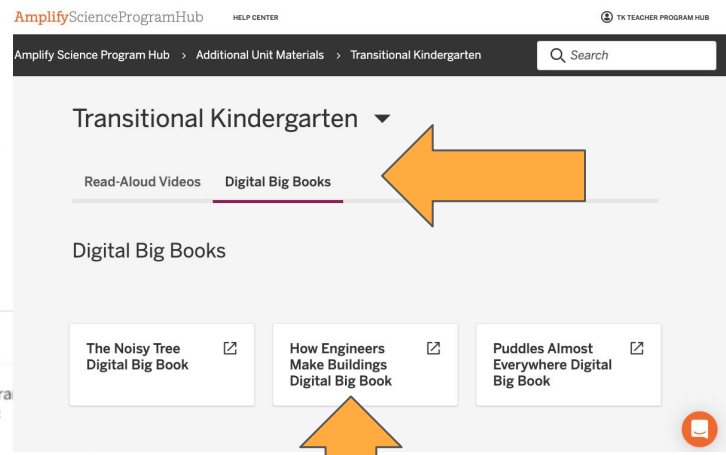
Amplify Science TK Resources

Accessing Digital Books and Read Alouds

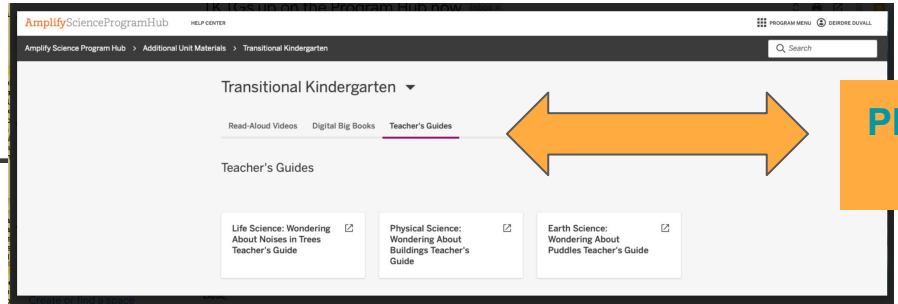
1. Go to learning.amplify.com
2. Click "Log in with Amplify"
   a. Username: programhubTK@tryamplify.net
   b. Password: Amplify Number1

3. Use the Global Navigation Bar to open the Science Program Hub
4. From the Program Hub> Open Additional Unit Resources
5. Click on Transitional Kindergarten
6. Explore the Read- Aloud videos and Digital Big Books





Digital PAGE-TURNER PDFs of unit big books that can be projected for lesson focus on images, vocabulary, etc.



PDFs of ALL 3 Unit TGs!

TK Unit 2 Resources Sheet

Collaborative Resources

These resources have been collected and put together by JoAnna Chocooj in collaboration with real TK teachers of Amplify Science! These are not official Amplify Science materials but connect to the Amplify Science Units!

Trainer: JoAnna Chocooj

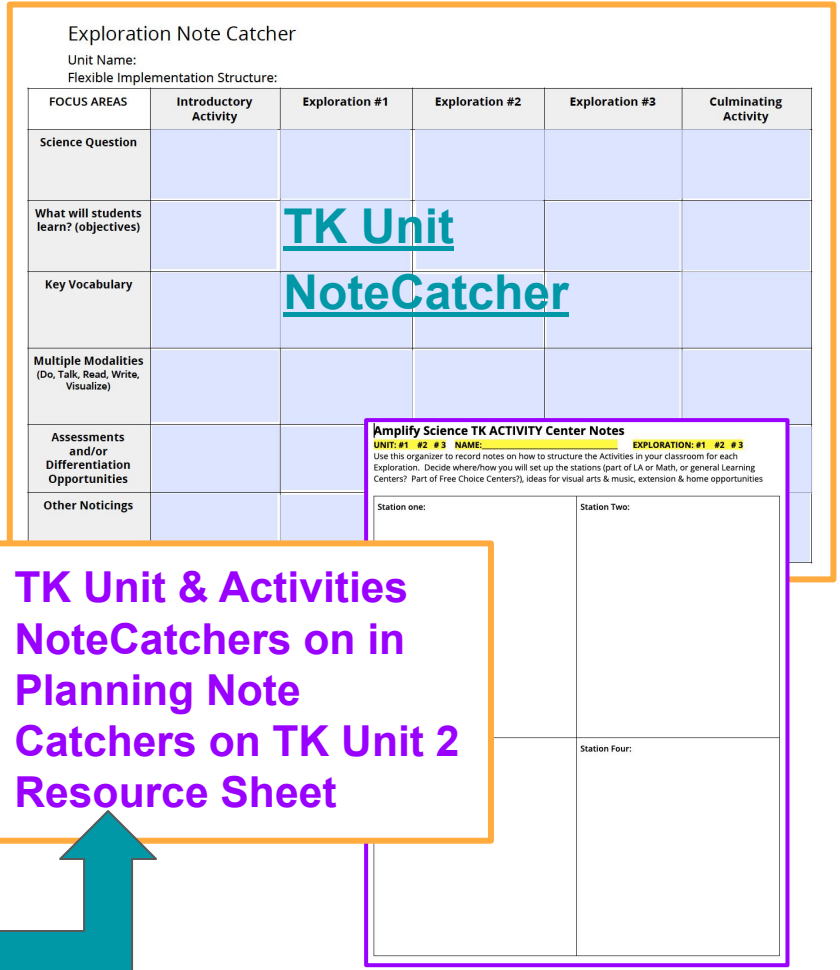
Contact Information: jchocooj@amplify.com

Unit 2: Wondering About Buildings

Resource	Description
Read Alouds	Read-Aloud links for Fiction & Non-Fiction related literature to the Wondering about Buildings Unit. Time-elapse videos of construction building projects for Unit 2 Explorations in a playlist format.
Songs	A playlist of songs that have connections to the themes in *Wondering about Buildings.* Songs in English and Spanish.
Assorted Videos	A playlist of time-elapsed videos of construction, tallest building comparisons and other engineering related.

Planning Resources

Planning Note Catcher



TK Unit & Activities NoteCatchers on in Planning Note Catchers on TK Unit 2 Resource Sheet

Join Amplify Science Schoology Group

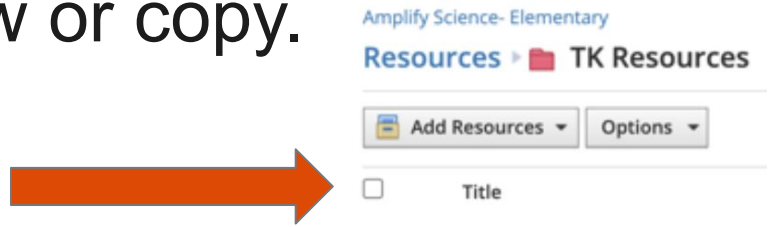
Then go to the red TK Resources Folder

1. To join Amplify Science Schoology:

ES Group: W4PK-W466-63F5B

2. Click on the Resources folder on the left
3. Scroll down the folder list & select the red **TK Resources folder**.

4. Select TK resources to view or copy.



Amplify.

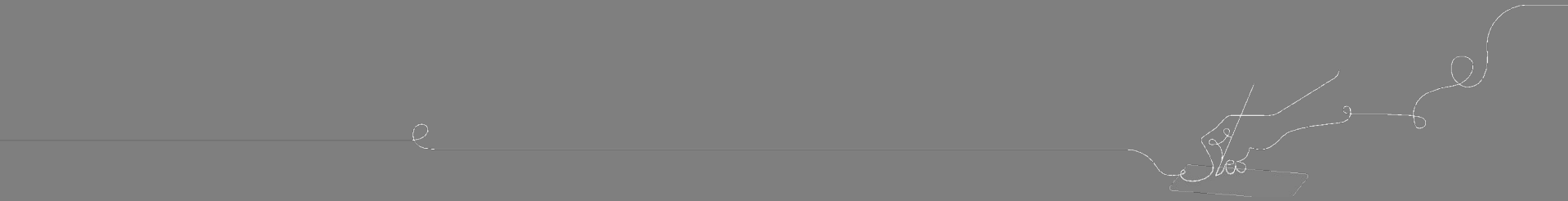
Ice Breaker

- ***Have you tried out the unit yet?***
- ***Have you been integrating science lessons into your other subjects or as stand alone time?***
- ***What has been a highlight so far?***

Overarching Goals

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

- **Outline the upcoming lessons in TK Unit 2, *Wondering About Buildings***
- **Understand & plan for assessments and next steps**



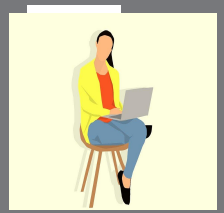
Plan for the Day

- Introduction & Framing the day

- **Phenomenon-based Instruction**

- Program Essentials - TK Structure & Materials **&** Unit Internalization

- Teaching & Learning in an Amplify Science TK Activity



- Assessment & Planning to Teach

- **Closing**

Amplify Science TK Units

Precursors & Linkages & between NGSS & PLFFs

DCI's
(Science Topics)

- Physical Science
- Earth Science
- Life Science

SEP's
(Best Practices)

(from Scientific Inquiry Topic)

- Wondering
- Comparing and Looking for Patterns
- Describing what happened
- Collecting Evidence
- Talking, writing & drawing about what we know, read and learn about new discoveries

CCC's
(Science Topics)

(from Scientific Inquiry Topic)

- Cause & Effect

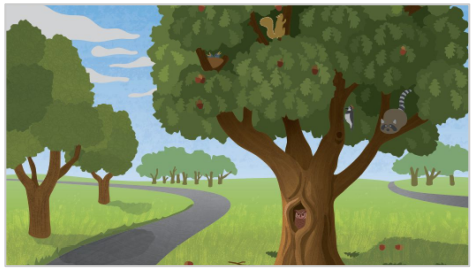
(from MATH Topics)

- Patterns
- Classification

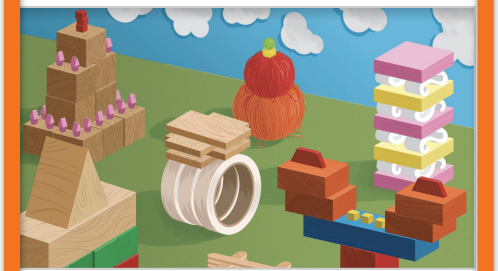
*Sourced from CA Science Framework 2016, Chapter 2 - Curriculum Frameworks (CA Dept of Education) https://www.cde.ca.gov/ci/sc/cf/documents/scifwchapter2.pdf

Amplify Science TK

Course Structure



Life Science:
Wondering About Trees



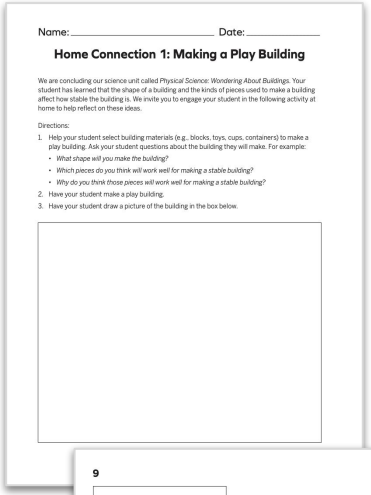
Physical Science:
Wondering About Buildings

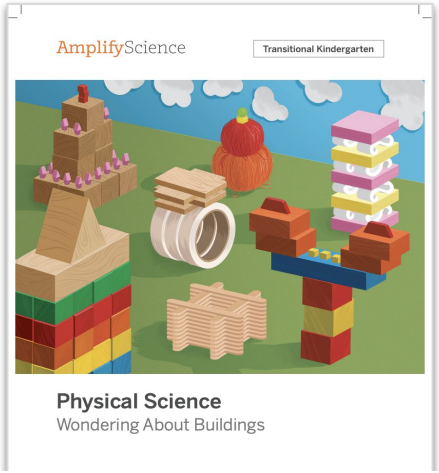
Earth Science:
Wondering About Puddles

Number of Lessons: 20 lessons per unit
Time: 15 mins per lessons
Instructional Time: 4 - 6 weeks per unit - **Flexible Implementation**

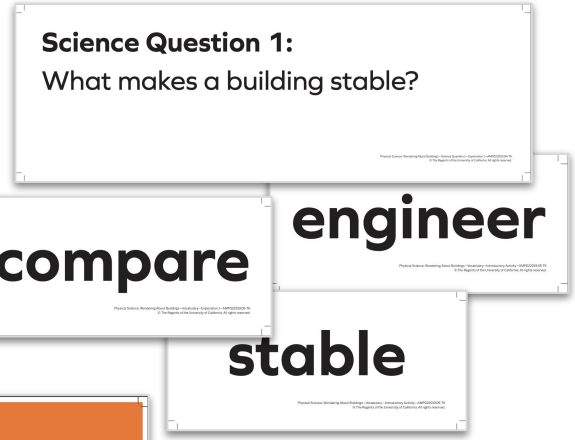
TK Curriculum Materials

Home Connections Copymasters

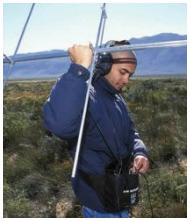




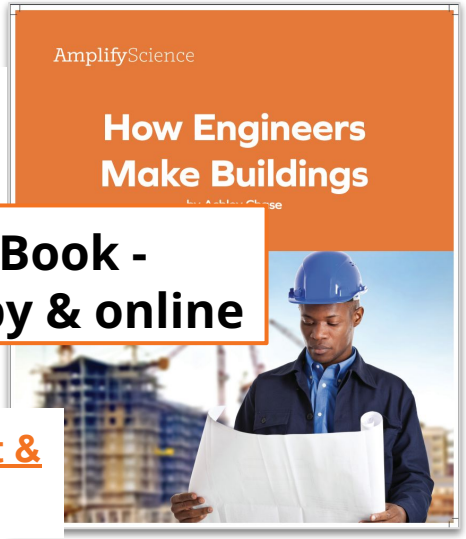
Science Wall Materials for classroom or online postings



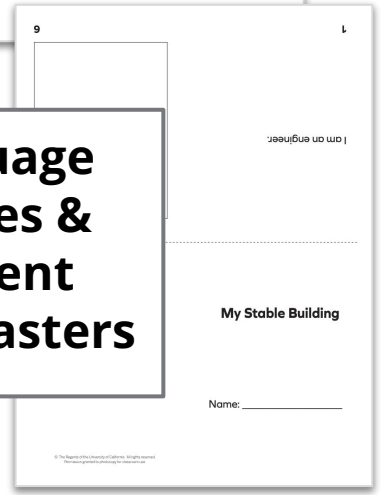
Print Teacher's Guide - hard copy & online



Unit Big Book - hard copy & online



Language Frames & Student Copymasters



Unit Picture Cards

Amplify Science Scientist & Engineer Profile Cards

Next Generation Science Standards

Phenomenon-based learning and teaching

A scientific phenomenon is an **observable event** that occurs in the universe that we can use science ideas to explain or predict.

SCIENTIFIC INQUIRY STRAND	CA NGSS SCIENCE & ENGINEERING PRACTICES
At around 48 months of age	*At around 60 months of age*
1.2 Observe objects and events in the environment and describe them.	**1.2 Observe objects and events in the environment and describe them in greater detail.**

an evidence-based account for natural phenomena.

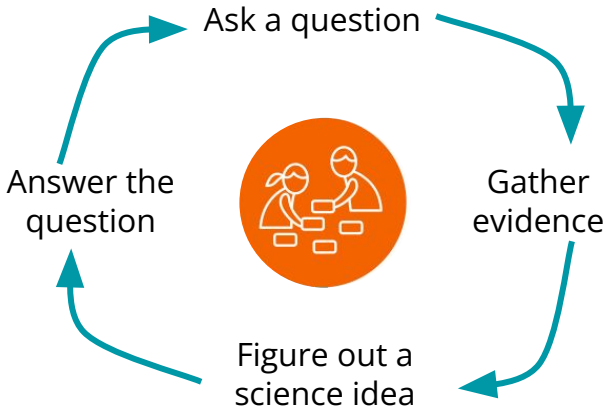
SEP-8 Obtaining, evaluating, and communicating information

- Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.
- Use information from observations to construct an evidence-based account.
- Communicate information in oral form using models and drawings that provide detail.

Amplify Science TK Instructional Approach

Find out about a Mystery, a Phenomenon

NGSS focus



Gather evidence to figure out science ideas

California PLFF's & NGSS 3D Learning

Explain the Mystery, the Phenomenon

California PLFF Application to NGSS !

Multimodal Instruction

Figuring out and making sense of ideas like scientists & engineers!

- Do
- Talk
- Read
- Draw & Write
- Visualize

Previewing the unit

Introducing the phenomenon

Amplify Science units are designed around complex phenomena that drive student learning throughout the unit.

What is the phenomenon, or observable event, students will figure out in our TK unit?

Wondering About Buildings

Analyze the unit structure document.

- ***What do you anticipate students will know and be able to do at the end of each Exploration?***

Science Question 1:
What makes a building stable?

Science Question 2:
What are stable buildings made of?

Science Question 3:
How can we make sure our buildings are stable?

Physical Science: Wondering About Buildings

Introductory Activity: Let's Be Engineers of a Play City

Exploration 1: What Makes a Building Stable?

Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Sharing Initial Ideas About Stability	Embodying Stability	Reading *How Engineers Make Buildings*	Exploring Stability with Objects	Making Tall and Stable Towers	The Shape of Stable Buildings

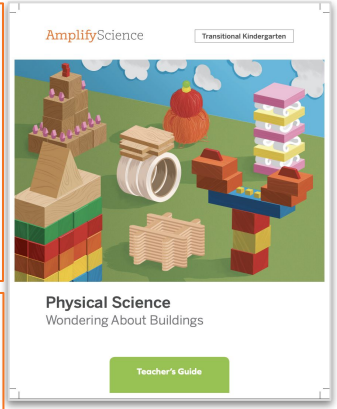
Exploration 2: What Are Stable Buildings Made Of?

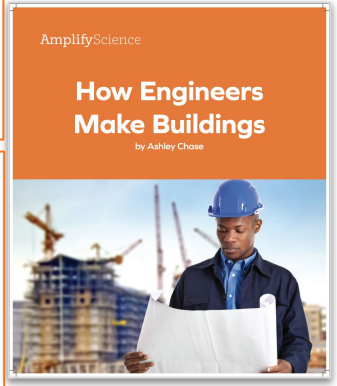
Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Considering Pieces of Buildings	Observing a Time-Lapse Video	Reading *How Engineers Make Buildings*	Comparing Pieces	Making Towers with Different Kinds of Pieces	Recording Engineer's Notes About the Pieces of Stable Buildings

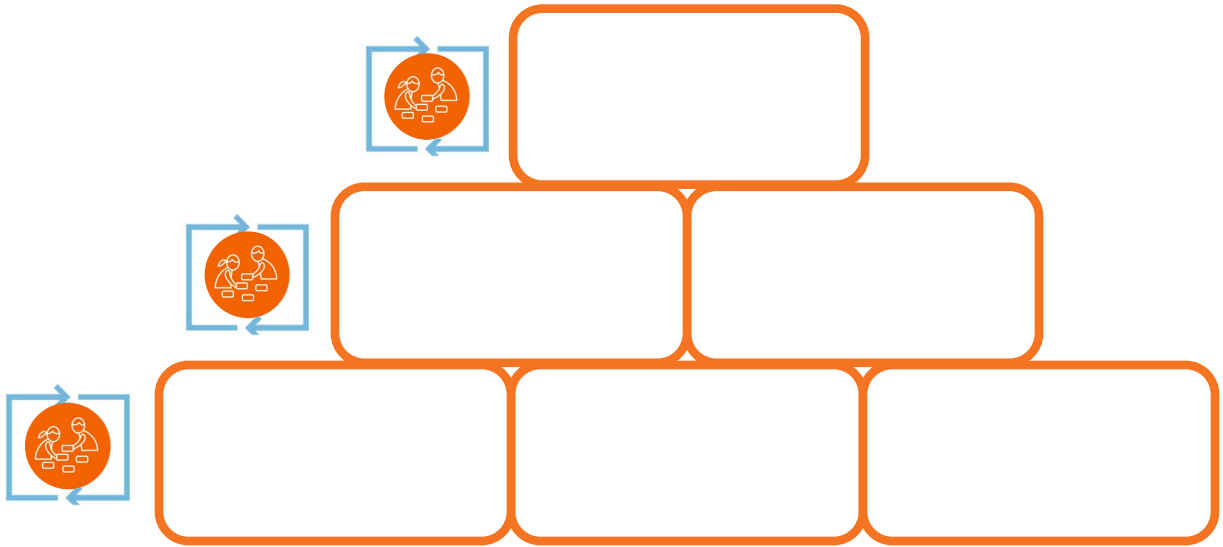
Exploration 3: How Can We Make Sure Our Buildings Are Stable?

Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Reflecting on Stable Buildings	Putting Together Ideas	Reading *How Engineers Make Buildings*	Putting Together Ideas to Make Towers	Engaging in the Design Cycle	Using Engineer's Notes to Put Together Ideas

Culminating Activity: Making a Play City

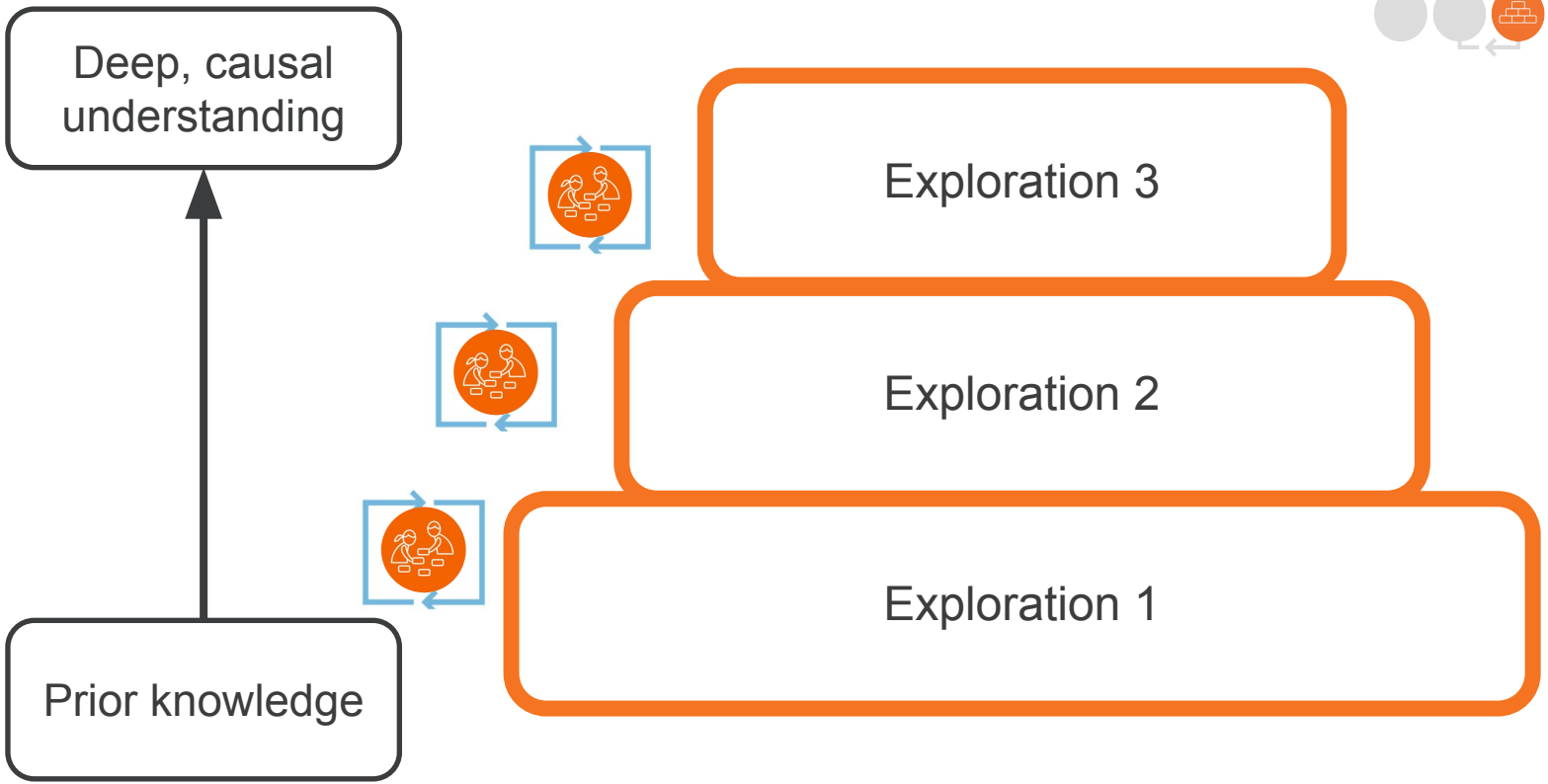






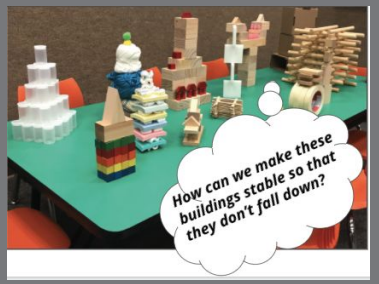
Build increasingly complex explanations

Progress Build: A unit-specific learning progression



Plan for the Day

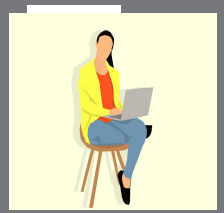
- Introduction & Framing the day



- Phenomenon-based Instruction

- **Program Essentials - TK Structure & Materials & Unit Internalization**

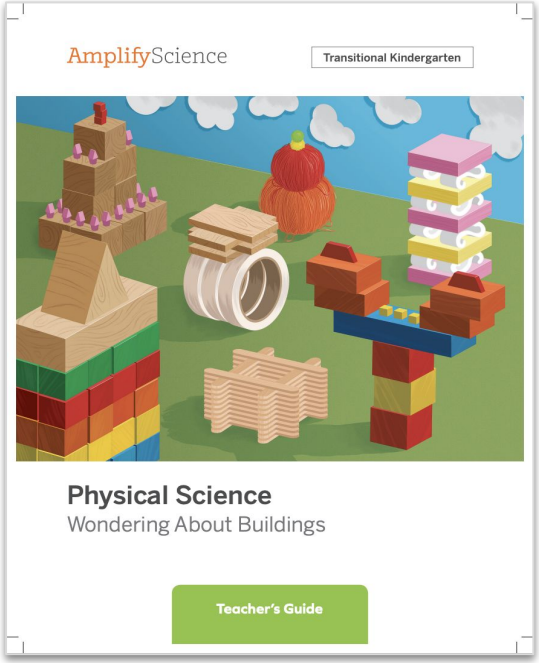
- Teaching & Learning in an Amplify Science TK Activity



- Assessment & Planning to Teach

- **Closing**

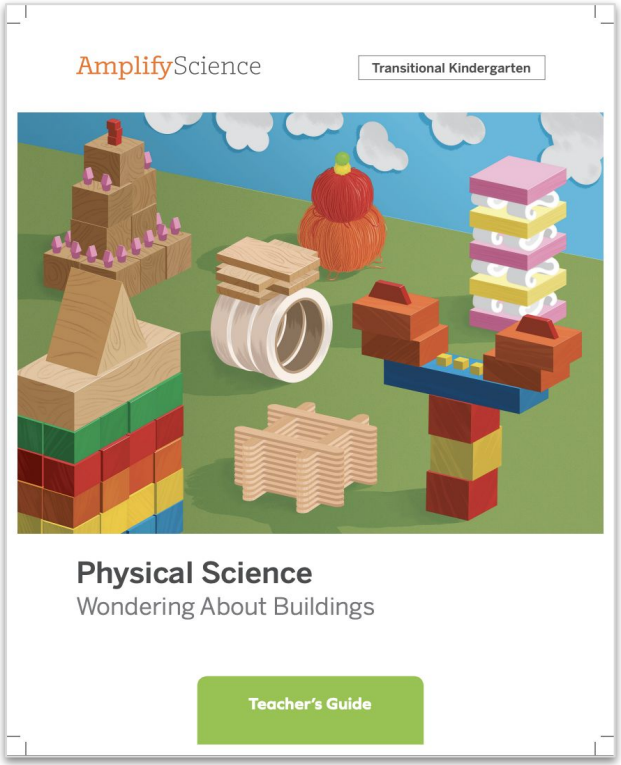
TK Resource Reference Sheet



Unit Resources guide

Unit resources	
Unit overview	Brief description of the what, the why, and the how of the unit. It also gives an overview of the structure of the unit.
Instructional resources	Includes references, flexible implementation, description of routines, assessment opportunities, and supports.
Getting Ready to Teach	Snapshot of all the things you will need to prepare ahead of time that will save you time once you get going.
Materials and Prep	What materials you need and what is provided, as well as what you need to prepare before the start of the unit.
Preparation at a Glance	What you need to get ready broken down by activity as well as how long you can expect it to take.
Lesson-level resources	
Lesson Overview	Brief description of what the activity will cover, the how and the why
Materials and Prep	Detailed instructions on how to prepare for this specific activity.
Activity Notes	The what, the why, and the how, including all steps you will go through and recommended teacher talk.
Teacher support	Instructional suggestions including extension opportunities and home connections
Flexible Implementation	Notes on how to structure the activities in the classroom
Model set ups	Set-ups for investigation materials, shared writing and shared drawings
Formative assessments	How to perform the assessment and what to look for in student performance, one per exploration

PN pg 2



Unit Overview

In the *Physical Science: Wondering About Buildings* unit, students investigate an exciting phenomenon: in a play city made by a class at another school, some buildings stayed up, while other buildings fell down. Students are challenged to create their own play city with stable buildings. In order to create this city, students must figure out what makes a building stable. First, students discover that the shape of a building affects its stability (e.g., many stable buildings have flat bottoms and are bigger at the bottom). Next, students investigate what stable buildings are made of. They figure out that buildings are made of pieces and that the kinds of pieces a building is made of can affect its stability. Students synthesize ideas about how a building's shape and the kinds of pieces used to make a building affect its stability. Students use these ideas to make stable buildings for the play city. In the course of figuring out how to create a play city with stable buildings, students are introduced to core ideas in physical science and engineering—including the observable properties of materials and the idea that objects are made of pieces. The unit includes an emphasis on designing solutions to problems by engaging in a cycle of learning and making, as engineers do. Students gather evidence for these ideas from a variety of sources, including the unit's book, hands-on experiences making buildings, kinesthetic investigations, and a time-lapse video. Students share their developing ideas through discussion, drawing, writing, movement, and activities in which they make buildings. Through the activities, students are exposed to the crosscutting concepts of *Stability and Change* and *Patterns*. The context of making buildings for a play city provides a familiar and engaging starting point for students to engage in engineering.

Guided Unit Internalization Planner

PN Page 4

Part 1: Unit-level internalization

Unit title:	Wondering About Buildings

What is the phenomenon students are investigating in your unit?

In a play city made by a class at another school, some buildings stayed up, while other buildings fell down.

Exploration Questions:	Student challenge:
1. What makes a building stable? 2. What are stable buildings made of? 3. How can we make sure our buildings are stable?	to create their own play city with stable buildings

What science ideas do students need to figure out in order to explain the phenomenon?

Students discover that the shape of a building affects its stability (e.g., many stable buildings have flat bottoms and are bigger at the bottom). They figure out that buildings are made of pieces and that the kinds of pieces a building is made of can affect its stability. Students synthesize ideas about how a building's shape and the kinds of pieces used to make a building affect its stability.

What evidence sources do students enage with across the unit?

the unit big book, hands-on experiences making buildings, kinesthetic investigations, a time-lapse video, discussion, and drawing/writing

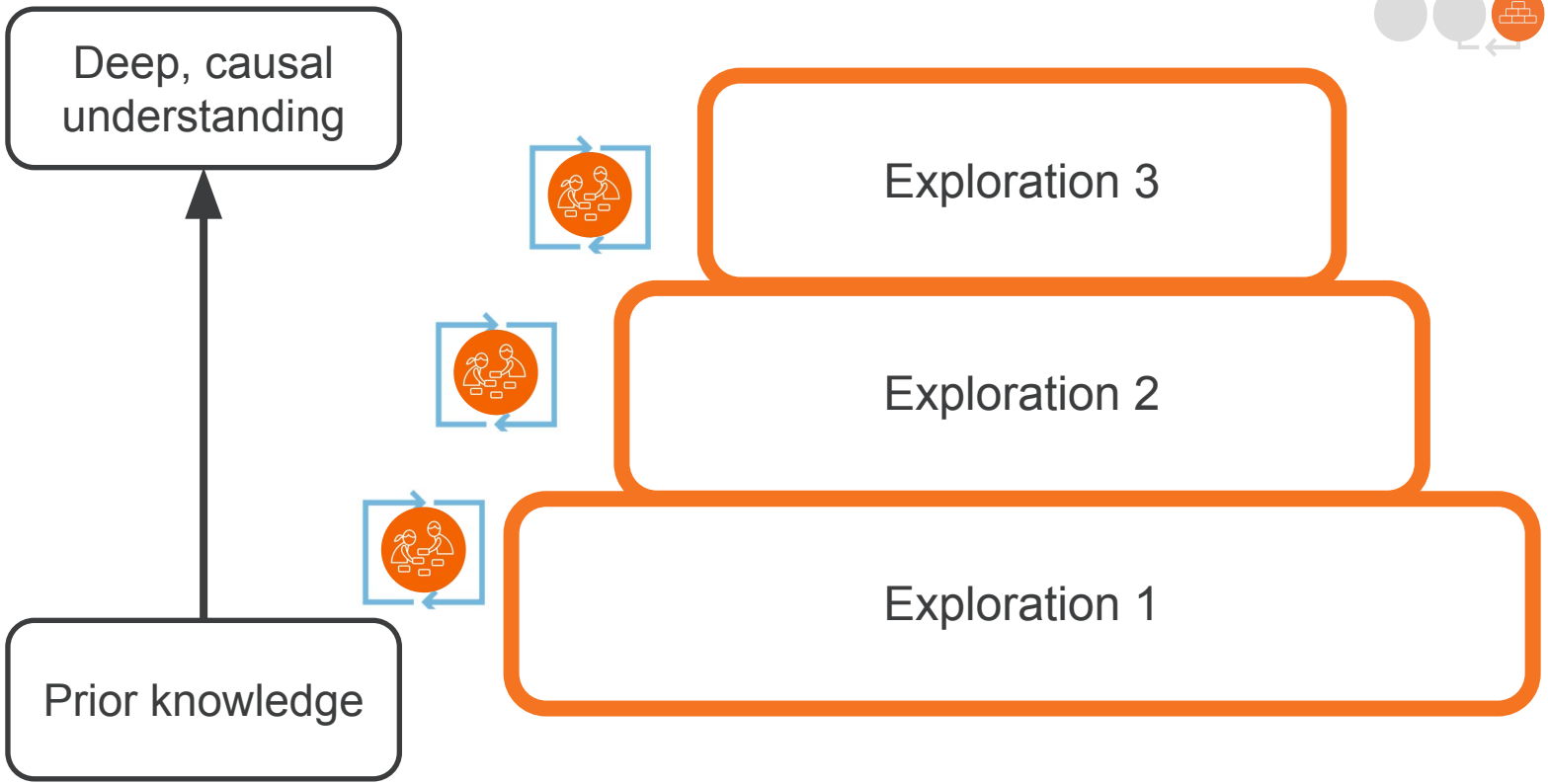
Unit Overview:

- Unit Title
- Phenomenon
- Student Challenge

Unit Structure:

- Exploration questions
- Science Ideas
- Evidence Sources

Progress Build: A unit-specific learning progression



Wondering About Buildings

Coherent Storylines

What makes a building stable?

Exploration 1

What are stable buildings made out of?

10 What Engineers Do

Exploration 2

How can we make sure that our buildings are stable?

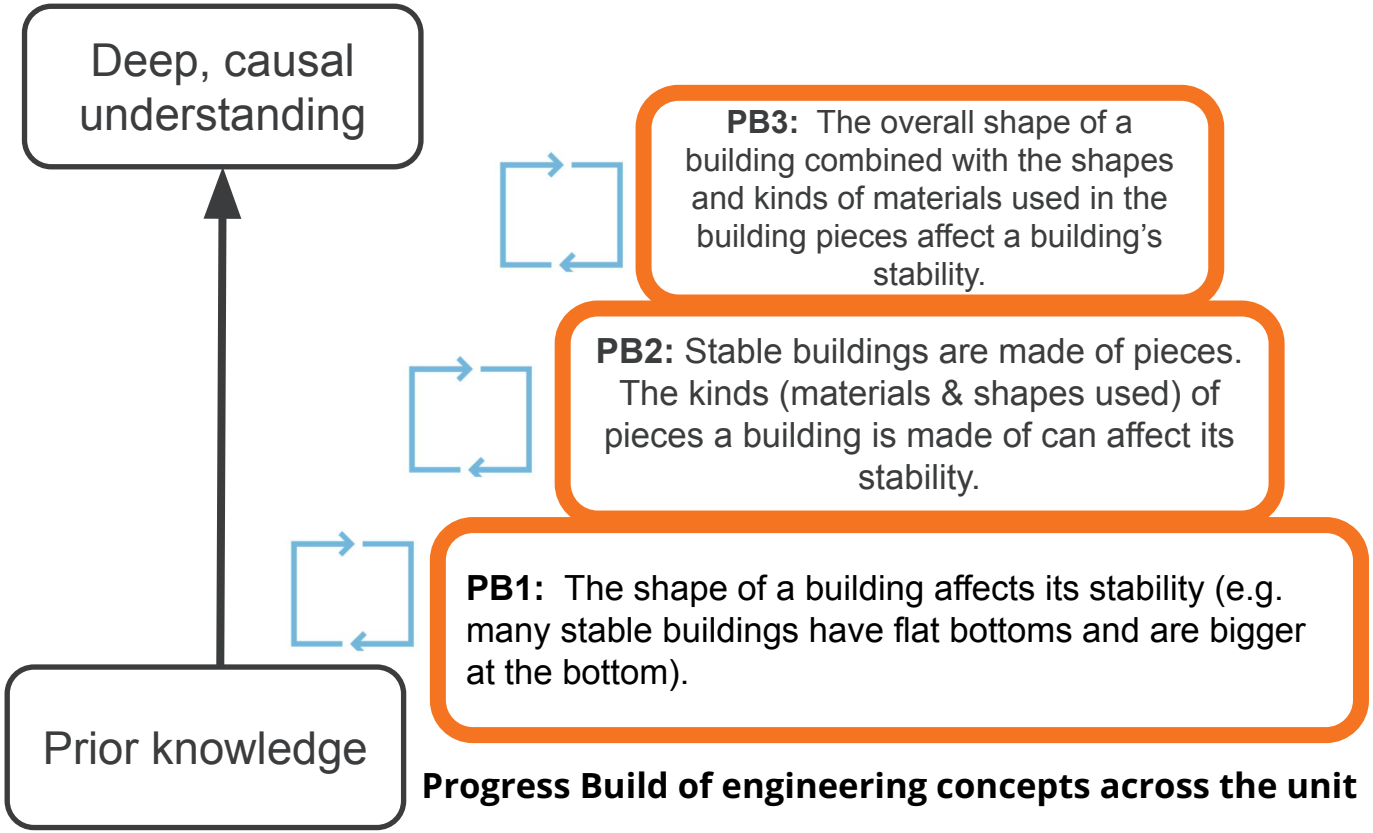
Exploration 3

Anchoring Phenomenon: Progress Build

PHENOMENON: ***What makes a building stable so it won't fall down?***

Students take on the role of engineers in order to figure out how to construct stable buildings for their play city.

1. **They investigate different shapes and figure out that the shape of a building, especially on its bottom, can affect its stability.**
2. **They investigate what stable buildings are made of; and figure out they're made of pieces that can come in different shapes and can be made of different materials.**
3. **Students think about how to combine the overall shape of buildings with the shape of their pieces and the kinds of materials used to construct more stable buildings to ensure their buildings are stable.**



Progress Build of engineering concepts across the unit

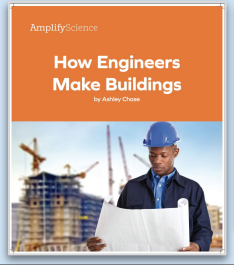
Gathering Evidence

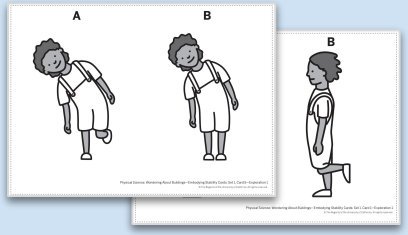
Wondering About Buildings

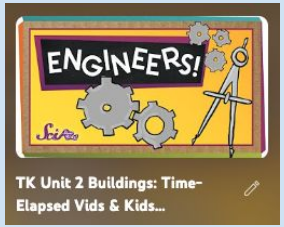
Unit Science/Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?)

Exploration 1 Question: ***What makes a building stable?***

Exploration 1 Evidence







Students learn that the shape of a building affects how stable it is. Engineers gather evidence to answer questions as they learn about the problems they are working to solve; & they draw, write & talk to share their ideas.

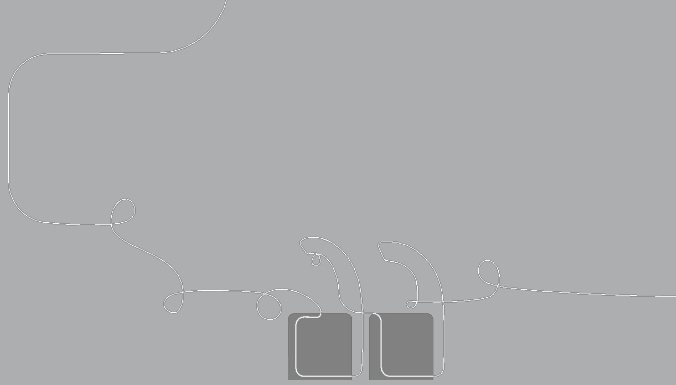
Exploration Note Catcher

Unit Name:
Flexible Implementation Structure:

FOCUS AREAS	Introductory Activity	Exploration #
Science Question		
What will students learn? (objectives)		
Key Vocabulary		
Multiple Modalities (Do, Talk, Read, Write, Visualize)		
Assessments and/or Differentiation Opportunities		

Exploration Note Catcher Unit Name: **Unit 2, Wondering About Buildings** Flexible Implementation Structure:

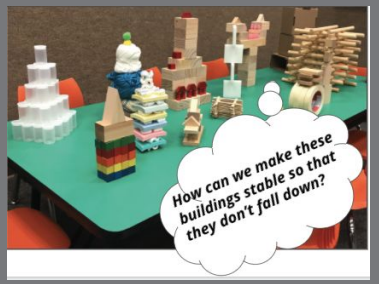
FOCUS AREAS	Introductory Activity	Exploration #1	Exploration #2	Exploration #3	Culminating Activity
Science Question	Intro students to ?: 1) How do we make stable buildings for our play city? 2) Their role as engineers.	**What makes a building stable?**	**What are stable buildings made of?**	**How can we make sure our buildings are stable?**	**Can I make a stable building for our class play city?**
What will students learn? (objectives)	**Engineers make things to solve problems.** **Engineers learn as they work to solve problems.**	The shape of a building affects how stable it is. Objects with flat bottoms are usually more stable than objects with curved bottoms. Objects that are bigger or the same size @ the bottom & the top, are usually more stable than objects that are bigger on top. Engineers gather evidence to answer questions as they learn about the problems they're working to solve. Engineers talk, draw & write to share ideas			
Key Vocabulary	**Engineer** **Stable**	**Engineer** **Stable** **Observe** **Compare** **Evidence**			
Multiple Modalities (Do, Talk, Read, Write, Visualize)	**Talking, Reading, Visualizing**	**Activity 1: Kinesthetic (body poses)** **Act. 2: Reading Big Book** **Act. 3: Kinesthetic/visual (object observations)** **Act. 4: Kinesthetic/visual (building block towers)**			
Assessments and/or Differentiation Opportunities	Observations opportunities for Concepts of Print, for comfort levels with participation, & for verbal	Act. 3 Formative Assessment Opportunity (step 9) & Culminating Act.: Shared drawing & writing, & self evaluation conversations			



Questions? Concerns? Aha's! This reminds me...

Plan for the Day

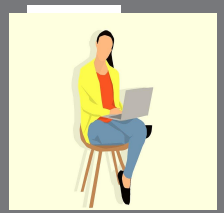
- Introduction & Framing the day



- Phenomenon-based Instruction

- Program Essentials - TK Structure & Materials & **Unit Internalization**

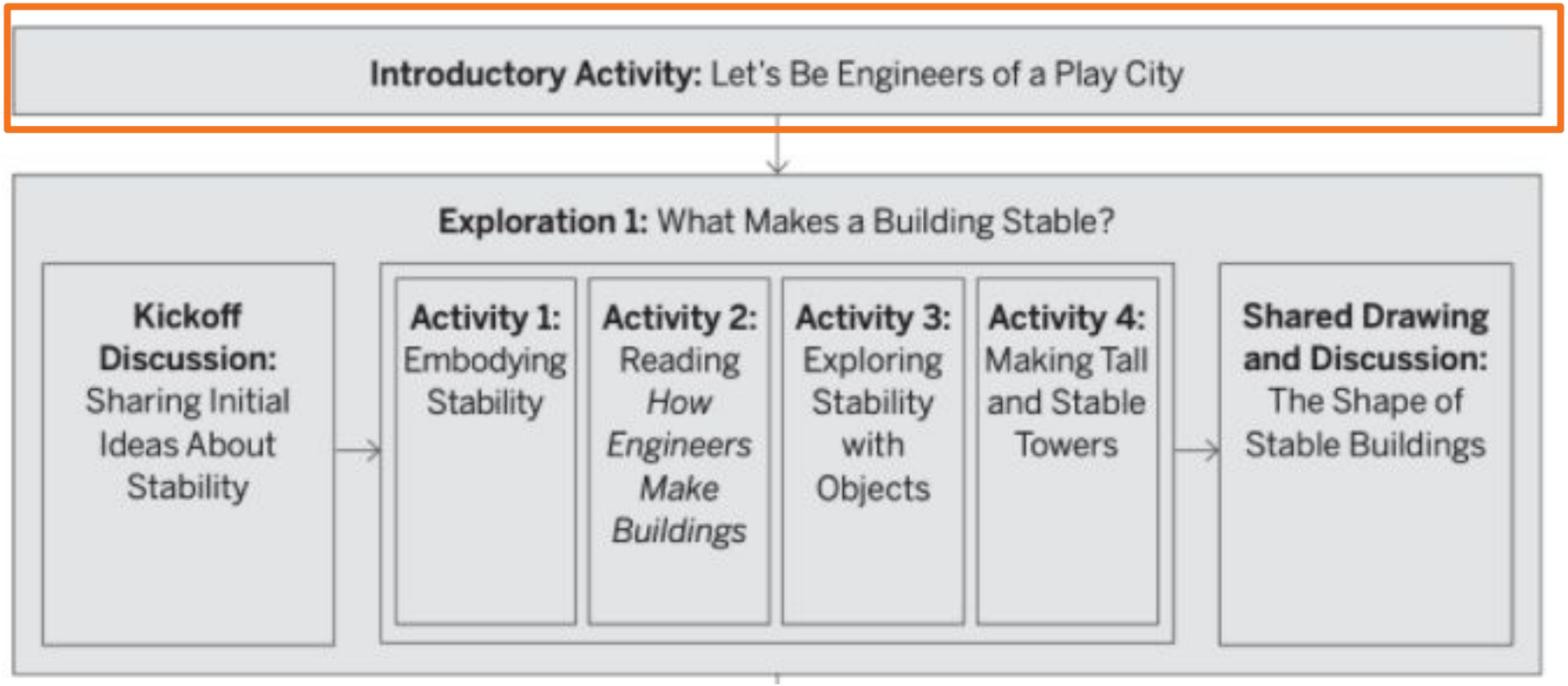
- Teaching & Learning in an Amplify Science TK Activity



- Assessment & Planning to Teach

- **Closing**

Unit Experience - Introducing the phenomenon

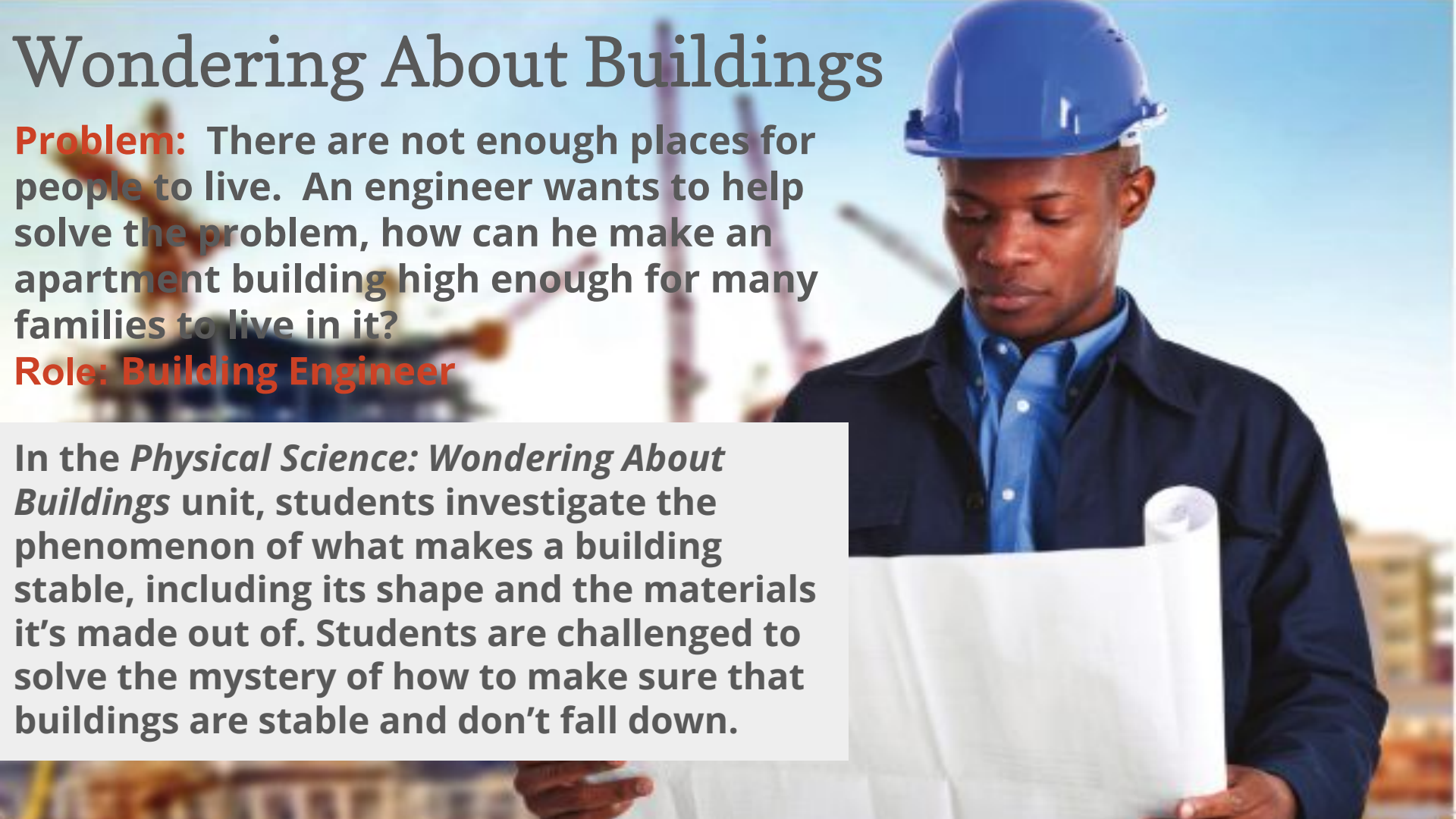


Wondering About Buildings

Problem: There are not enough places for people to live. An engineer wants to help solve the problem, how can he make an apartment building high enough for many families to live in it?

Role: Building Engineer

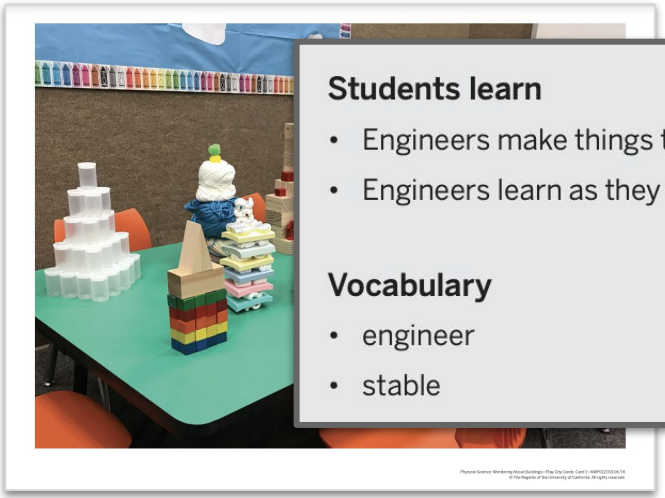
In the *Physical Science: Wondering About Buildings* unit, students investigate the phenomenon of what makes a building stable, including its shape and the materials it's made out of. Students are challenged to solve the mystery of how to make sure that buildings are stable and don't fall down.

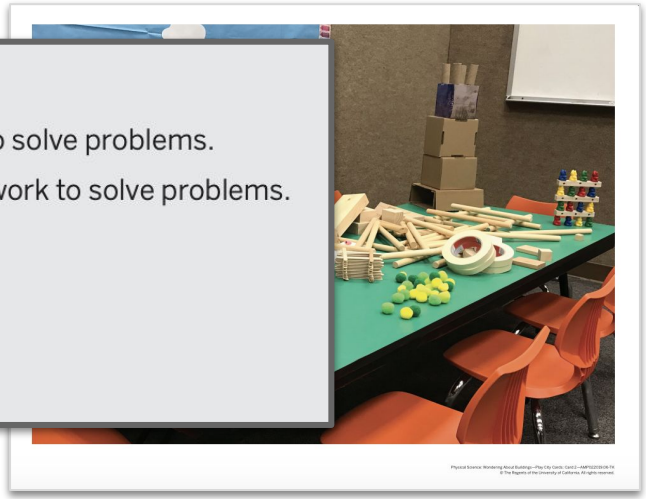


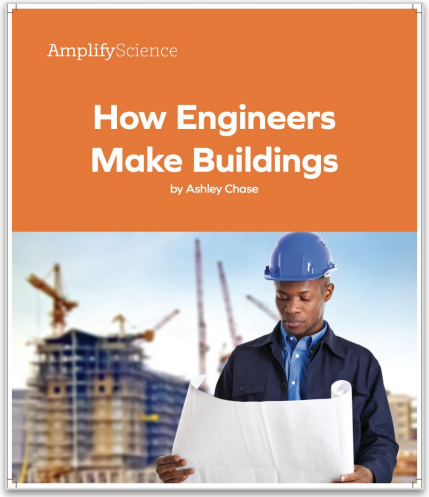
Introductory Activity: Let's Be Engineers of a Play City

What?

The teacher displays two pictures of a play city that was created by another class in which some buildings stayed up, and some fell down. The teacher also reads aloud pages 4–12 of *How Engineers Make Buildings* and introduces students to their role as engineers. Students share their initial ideas about how to make a building that stays up.







Play City Card 1

What do you remember happened to many of the buildings in the children's play city?

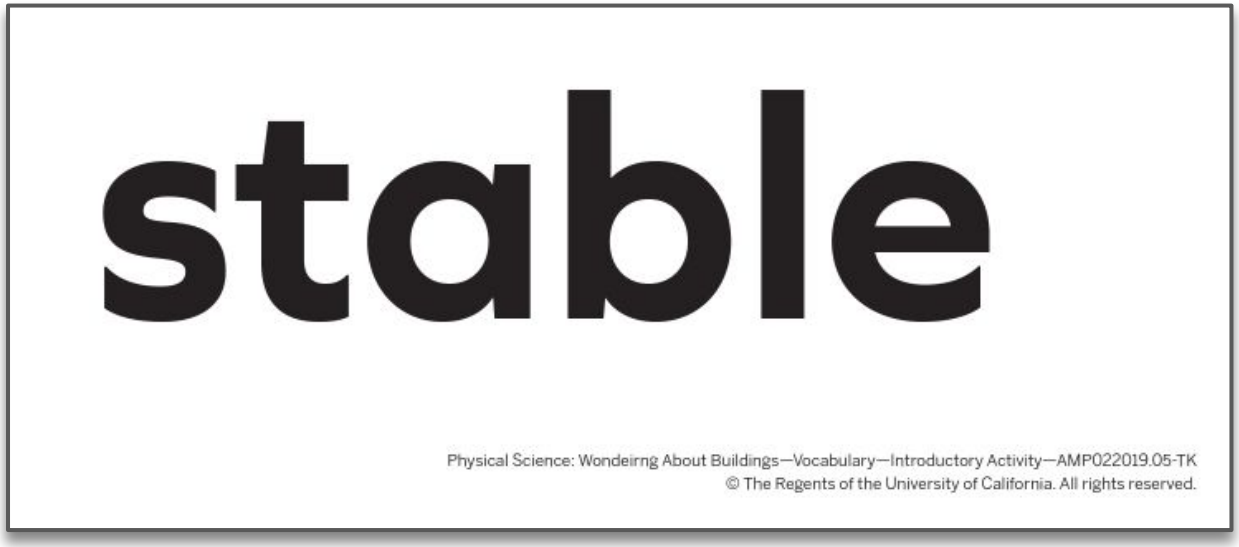
Play City Card 2

- The problem was that many of the buildings in the children's play city fell down.

- Can we help the children to figure out how to make a play city with buildings that stay up?

We can help the children whose buildings fell down by showing them how we make our own play city. Buildings in play cities sometimes fall down, but we want the buildings in our play city to stay up.
The problem we need to figure out is how to make a play city with buildings that stay up.

We don't want the buildings in our play city to fall down. We need to make stable buildings. Buildings that will stay up are called **stable** buildings



*This is the word **stable.***

Something that is **stable**, like a **stable** building, won't fall down.

Use the **vocabulary instructional routine** to introduce the word "***stable***". Then place the word on your science wall, under the word engineer.

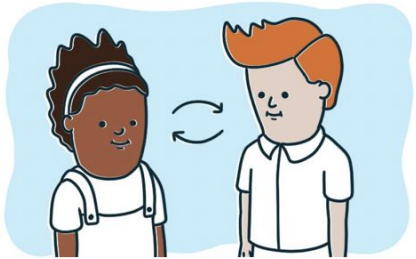
Shared Listening

1.

Partner A shares.
Partner B listens.

2.

Partner B repeats.
I heard you say...



3.

Partners switch.

Remember that engineers learn so they can help solve problems.

You and your partner will take turns sharing what you think we need to learn so we can help solve our problem.

Reflecting on the Experience

As students, we were just introduced to a **phenomenon**. Then we got started in trying to **figure it out.**

What evidence did we start to collect from the activities that we just experienced?

Multimodal Instruction

What kind of evidence have we gathered so far?

Figuring out and making sense of ideas like scientists & engineers do

Do

Talk

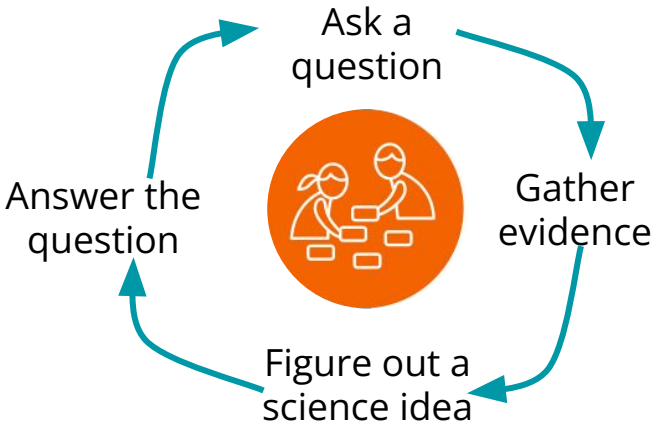
Read

Draw and write

Visualize

TK Instructional Approach

Introduction to the unit phenomenon

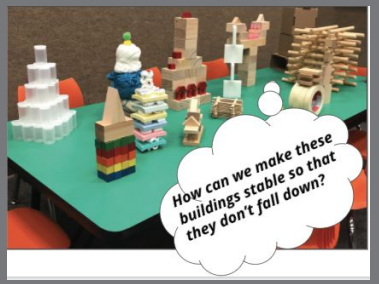


Gather evidence to figure out science and engineering ideas

Explain the phenomenon & Apply new understandings

Plan for the Day

- Introduction & Framing the day



- Phenomenon-based Instruction

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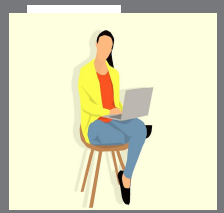


- Assessment & Planning to Teach

- **Closing**

Exploration 1 Overview

AmplifyScience

Transitional Kindergarten

Physical Science

Wondering About Buildings

Teacher's Guide

Page 8

Overview

Physical Science
Exploration 1

Exploration 1 Overview

In this Exploration, students investigate Science Question 1: *What makes a building stable?* Exploration 1 begins with the Kickoff Discussion in which students share their initial ideas in response to Science Question 1. Four activities help students gather evidence about stability and what makes buildings stable. In Activity 1, students engage in a kinesthetic activity in which they make different body poses and compare the stability of the poses. In Activity 2, students observe and discuss pictures of buildings in *How Engineers Make Buildings*. In Activity 3, students observe and compare the stability of different objects. In Activity 4, students explore more stable and less stable ways to put together blocks and then make stable towers. Exploration 1 ends with the Shared Drawing and Discussion in which the class summarizes and applies what they have learned. The purpose of Exploration 1 is for students to use science and engineering practices and ideas about stability to figure out that a building's overall shape contributes to its stability.

Students learn

- The shape of a building affects how stable the building is.
- Objects with flat bottoms are usually more stable than objects with curved bottoms.
- Objects that are bigger at the bottom, or the same size at the bottom and the top, are usually more stable than objects that are bigger at the top.
- Engineers gather evidence to answer questions as they learn about the problems they are working to solve.
- Engineers draw, write, and talk to share ideas.

Activities at a Glance

Kickoff Discussion: Sharing Initial Ideas About Stability
The teacher introduces Science Question 1: *What makes a building stable?* to motivate the activities students engage in throughout Exploration 1.

PN pg 5

Part 2: Exploration-level internalization

Exploration 1 Question:	Why are some buildings stable (they stay up and don't fall down).

What do students learn in Exploration 1?	What is the purpose of Exploration 1?
1. The shape of a building affects how stable it is. 2. Objects with bigger, flat bottoms are usually more stable than curved objects or bigger tops. 3. Engineers gather evidence to answer questions. 4. Engineers talk, draw and write to share ideas.	The purpose of Exploration 1 is for students to use science and engineering practices and ideas about stability to figure out that a building's overall shape contributes to its stability.

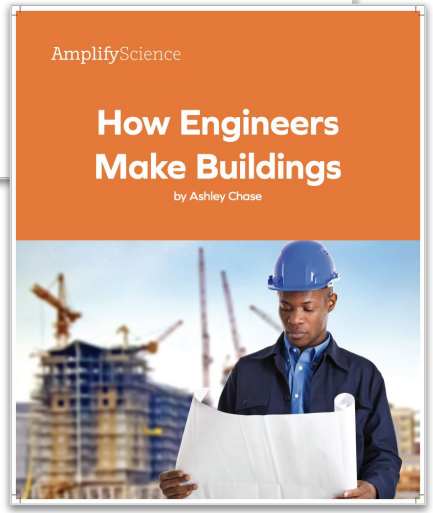
Kickoff Discussion: Sharing Initial Ideas About Stability

What?

The class reviews what they read about engineers in the first section of *How Engineers Make Buildings*. They are introduced to Science Question 1 and discuss their initial ideas in response to this question.

Science/Engineering Question 1:

What makes a building stable?

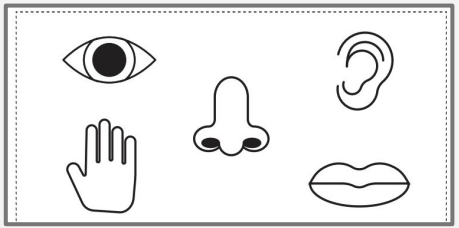


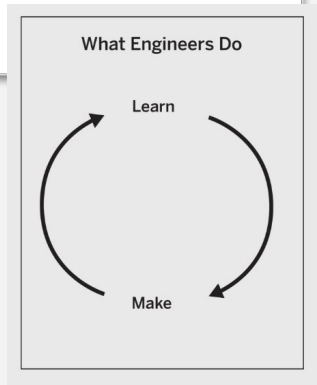
Wondering about Buildings Classroom Wall

Wondering about Buildings

Science Question 1:

What makes a building stable?





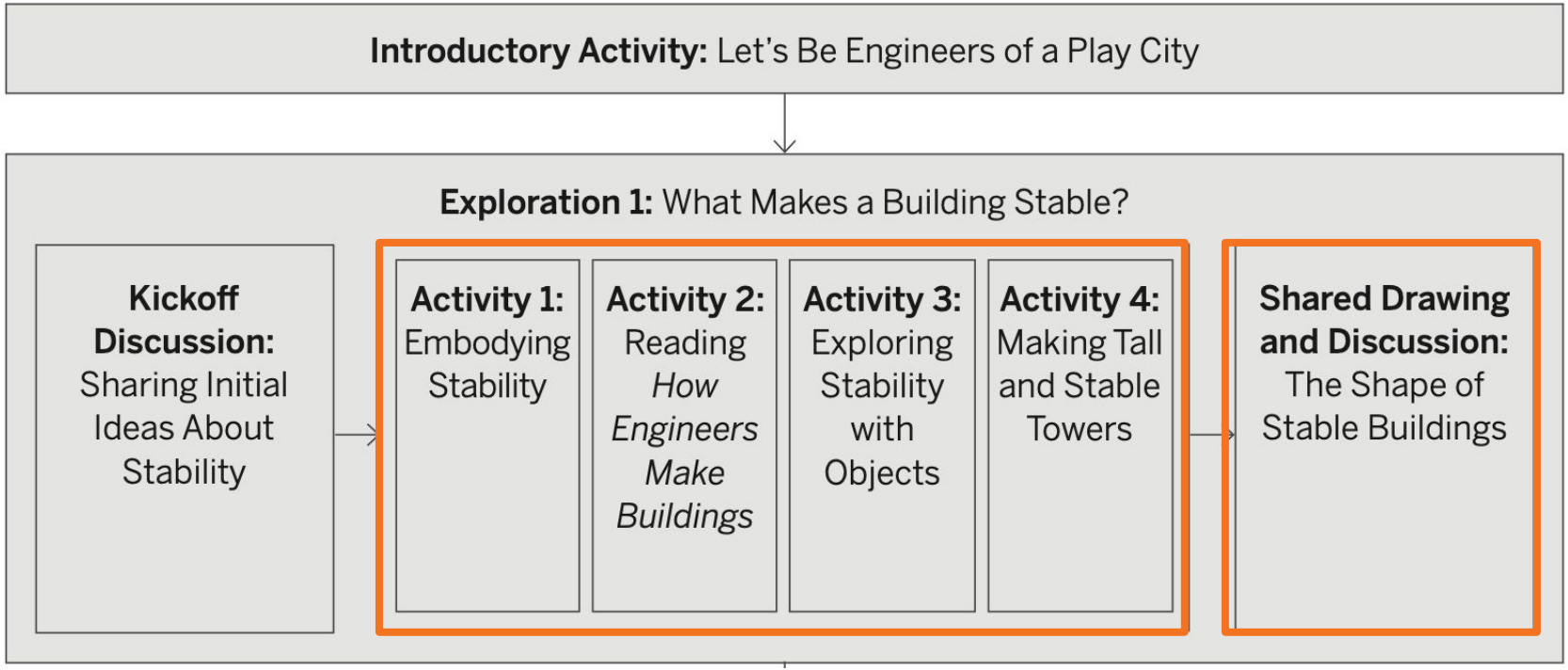
Vocabulary

engineer

observe

evidence

Unit Experience



Summary of Exploration 1

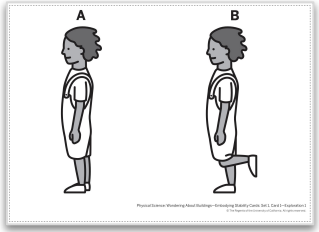
Activity 1: Embodying Stability
Students make a kinesthetic connection to stability by trying and comparing different poses they make with their bodies.

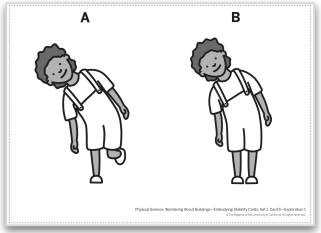
Activity 2: Reading *How Engineers Make Buildings*
The class observes and discusses pictures of different buildings in a new section of *How Engineers Make Buildings* in order to gather evidence about what stable buildings are like.

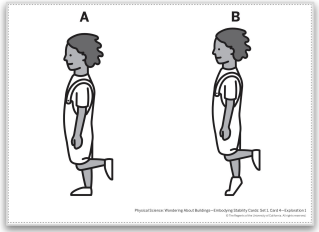
Activity 3: Exploring Stability with Objects
Students observe and compare the stability of differently shaped objects, which provides evidence that certain aspects of an object's shape contribute to its stability.

Activity 4: Making Tall and Stable Towers
Using blocks, students figure out how to make stable towers. They then use a language frame to practice sharing their ideas about characteristics of stable buildings.

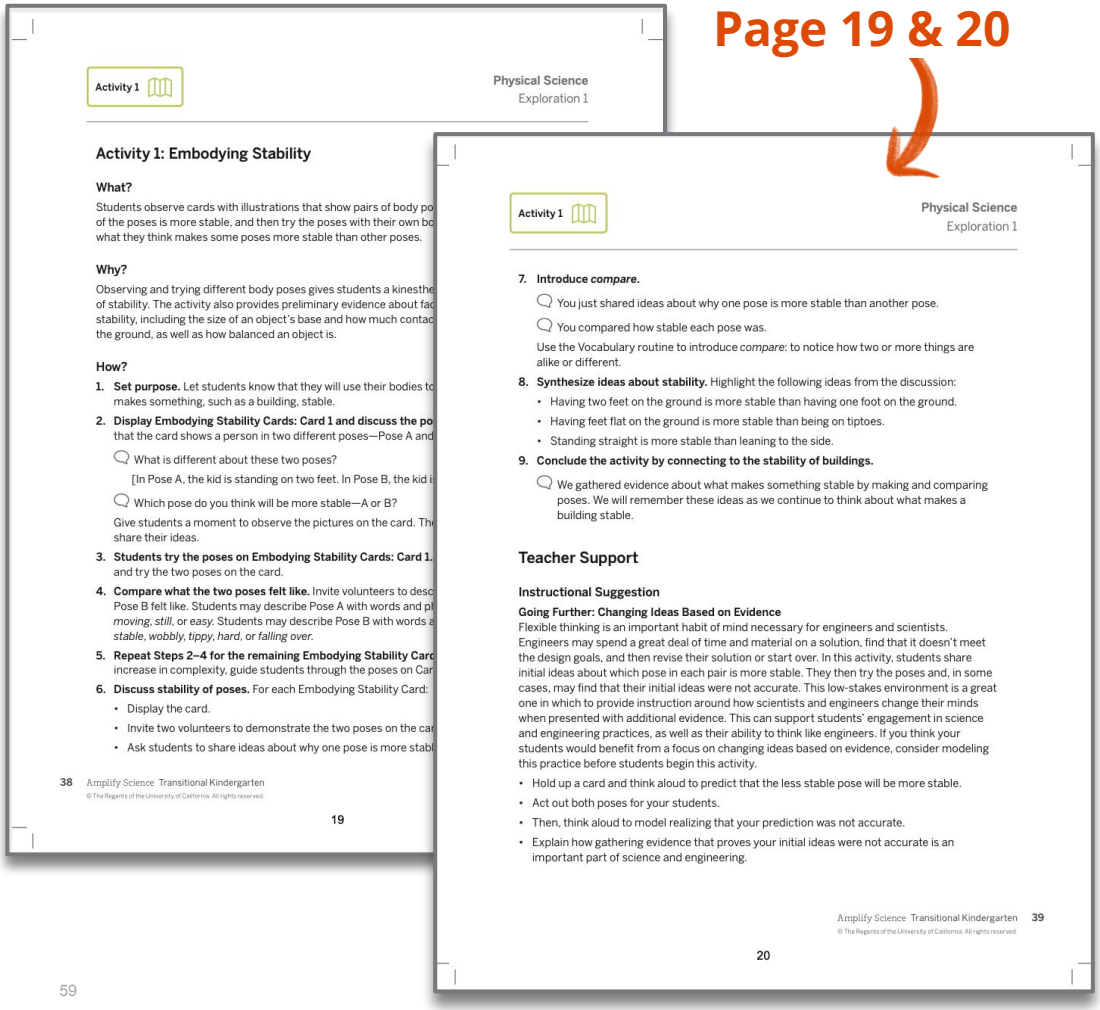
Shared Drawing and Discussion: The Shape of Stable Buildings
The class participates in a shared drawing and an accompanying discussion to consolidate and apply their understanding of Science Idea 1: *The shape of a building affects how stable the building is*.







Page 19 & 20



Activity 1

Physical Science
Exploration 1

Activity 1: Embodying Stability

What?

Students observe cards with illustrations that show pairs of body po
of the poses is more stable, and then try the poses with their own bo
what they think makes some poses more stable than other poses.

Why?

Observing and trying different body poses gives students a kinesthe
of stability. The activity also provides preliminary evidence about fac
stability, including the size of an object's base and how much contac
the ground, as well as how balanced an object is.

How?

1. **Set purpose.** Let students know that they will use their bodies to
makes something, such as a building, stable.
2. **Display Embodying Stability Cards: Card 1 and discuss the po**
that the card shows a person in two different poses—Pose A and
   - What is different about these two poses?
     [In Pose A, the kid is standing on two feet. In Pose B, the kid i
   - Which pose do you think will be more stable—A or B?

   Give students a moment to observe the pictures on the card. Th
share their ideas.
3. **Students try the poses on Embodying Stability Cards: Card 1.**
and try the two poses on the card.
4. **Compare what the two poses felt like.** Invite volunteers to desc
Pose B felt like. Students may describe Pose A with words and pl
moving, *still*, or *easy*. Students may describe Pose B with words
stable, *wobbly*, *tippy*, *hard*, or *falling over*.
5. **Repeat Steps 2–4 for the remaining Embodying Stability Card**
increase in complexity, guide students through the poses on Car
6. **Discuss stability of poses.** For each Embodying Stability Card:
   - Display the card.
   - Invite two volunteers to demonstrate the two poses on the ca
   - Ask students to share ideas about why one pose is more stabl

38 Amplify Science Transitional Kindergarten

19

Activity 1

Physical Science
Exploration 1

7. **Introduce *compare*.**
   - You just shared ideas about why one pose is more stable than another pose.
   - You compared how stable each pose was.

   Use the Vocabulary routine to introduce *compare*: to notice how two or more things are alike or different.
8. **Synthesize ideas about stability.** Highlight the following ideas from the discussion:
   - Having two feet on the ground is more stable than having one foot on the ground.
   - Having feet flat on the ground is more stable than being on tiptoes.
   - Standing straight is more stable than leaning to the side.
9. **Conclude the activity by connecting to the stability of buildings.**
   - We gathered evidence about what makes something stable by making and comparing poses. We will remember these ideas as we continue to think about what makes a building stable.

Teacher Support

Instructional Suggestion

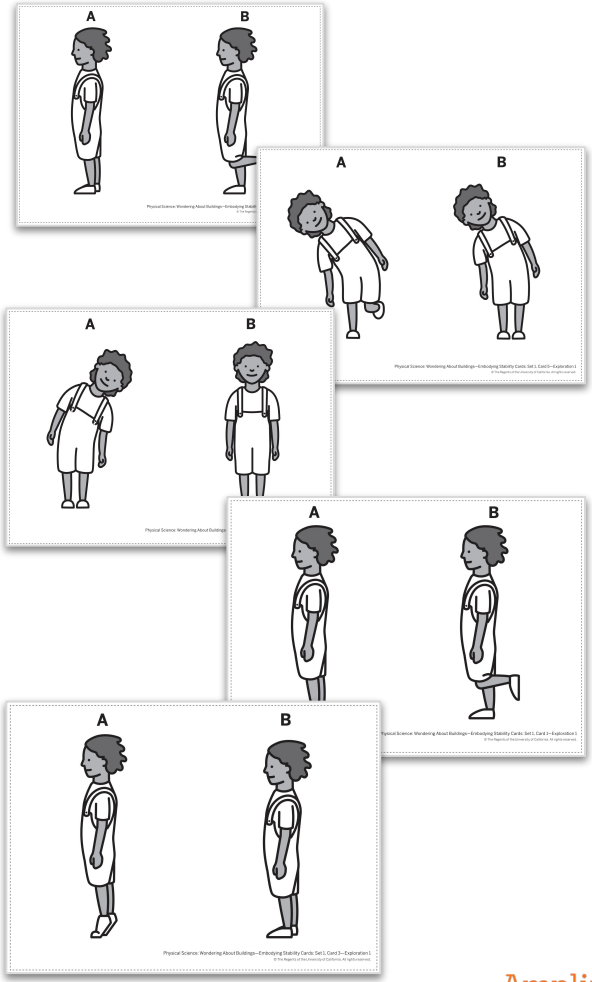
Going Further: Changing Ideas Based on Evidence

Flexible thinking is an important habit of mind necessary for engineers and scientists. Engineers may spend a great deal of time and material on a solution, find that it doesn't meet the design goals, and then revise their solution or start over. In this activity, students share initial ideas about which pose in each pair is more stable. They then try the poses and, in some cases, may find that their initial ideas were not accurate. This low-stakes environment is a great one in which to provide instruction around how scientists and engineers change their minds when presented with additional evidence. This can support students' engagement in science and engineering practices, as well as their ability to think like engineers. If you think your students would benefit from a focus on changing ideas based on evidence, consider modeling this practice before students begin this activity.

- Hold up a card and think aloud to predict that the less stable pose will be more stable.
- Act out both poses for your students.
- Then, think aloud to model realizing that your prediction was not accurate.
- Explain how gathering evidence that proves your initial ideas were not accurate is an important part of science and engineering.

Amplify Science Transitional Kindergarten 39

20



Amplify.

Activity 1

Activity 1: Embodying Stability

What?

Students observe cards with illustrations that show pairs of body poses, think about which of the poses is more stable, and then try the poses with their own bodies. The class discusses what they think makes some poses more stable than other poses.

Why?

Observing and trying different body poses gives students a kinesthetic connection to the idea of stability. The activity also provides preliminary evidence about factors that contribute to stability, including the size of an object's base and how much contact an object's base has with the ground, as well as how balanced an object is.

How?

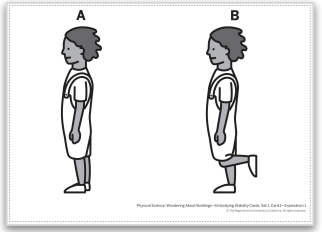
1. **Set purpose.** Let students know that they will use their bodies to learn more about what makes something, such as a building, stable.
2. **Display Embodying Stability Cards: Card 1 and discuss the poses on the card.** Point out that the card shows a person in two different poses—Pose A and Pose B.

   What is different about these two poses?

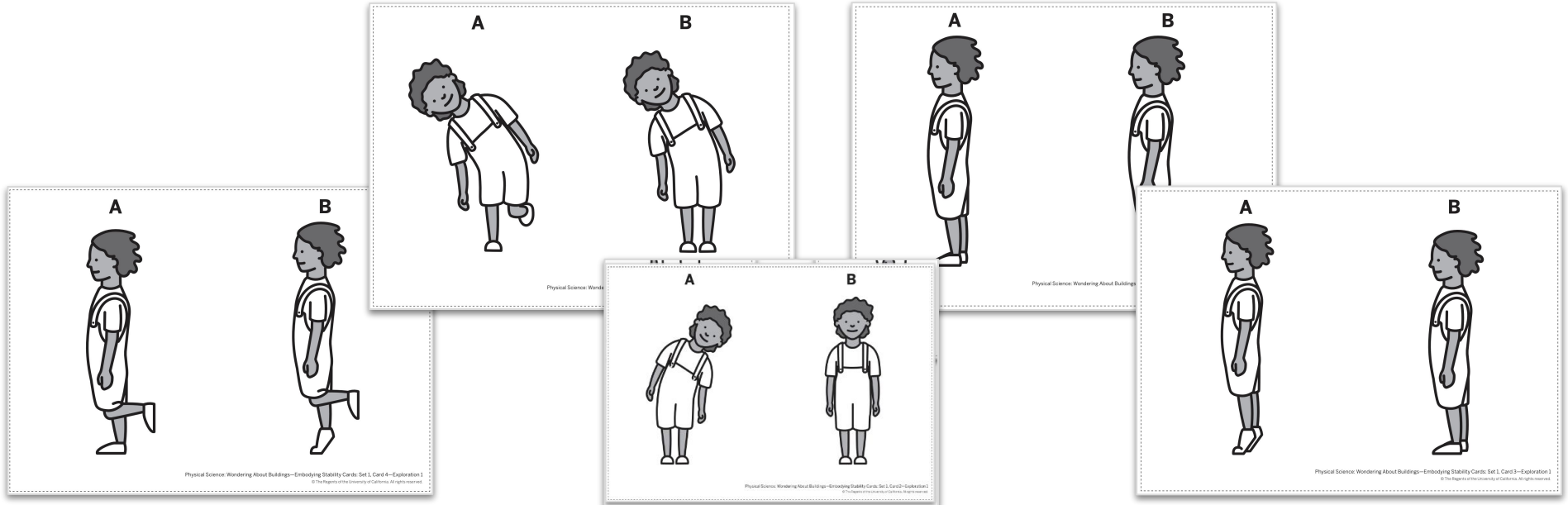
   [In Pose A, the kid is standing on two feet. In Pose B, the kid is standing on one foot.]

   Which pose do you think will be more stable—A or B?

   Give students a moment to observe the pictures on the card. Then, invite volunteers to share their ideas.
3. **Students try the poses on Embodying Stability Cards: Card 1.** Have students stand up and try the two poses on the card.
4. **Compare what the two poses felt like.** Invite volunteers to describe what Pose A and Pose B felt like. Students may describe Pose A with words and phrases such as *stable*, *not moving*, *still*, or *easy*. Students may describe Pose B with words and phrases such as *not stable*, *wobbly*, *tippy*, *hard*, or *falling over*.



5. **Repeat Steps 2–4 for the remaining Embodying Stability Cards.** Since the poses increase in complexity, guide students through the poses on Cards 2–5, in order.
6. **Discuss stability of poses.** For each Embodying Stability Card:
   - Display the card.
   - Invite two volunteers to demonstrate the two poses on the card.
   - Ask students to share ideas about why one pose is more stable than the other pose.



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   🗨 You compared how stable each pose was.

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   🗨 We gathered evidence about what makes something stable by making and comparing poses. We will remember these ideas as we continue to think about what makes a building stable.

Teacher Support

Page 21

Instructional Suggestion

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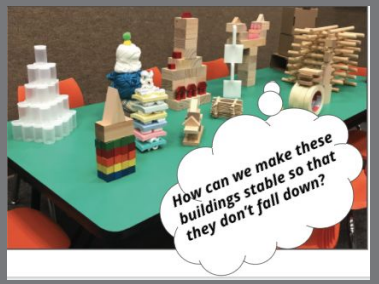
- Hold up a card and think aloud to predict that the less stable pose will be more stable.
- Act out both poses for your students.
- Then, think aloud to model realizing that your prediction was not accurate.
- Explain how gathering evidence that proves your initial ideas were not accurate is an important part of science and engineering.

Small Group Extension: Have students work in partners &/or pairs on the rug with the stability poses, practicing & discussing them, & then coming up with new ones they'd like to teach & explain to the class.

Plan for the Day

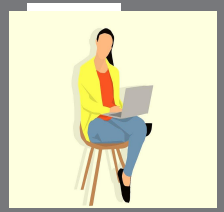
- Introduction & Framing the day



- Phenomenon-based Instruction

- Program Essentials - TK Structure & Materials & Exploration Internalization

- **Teaching & Learning in an Amplify Science TK Activity**



- Assessment & Planning to Teach

- **Closing**

Model of Exploration 1, Activity 1

As you watch the lesson, think about how the lesson can support all our different students.

We are going to use our bodies to learn more about what makes something ***stable***, like a ***stable*** *building*.

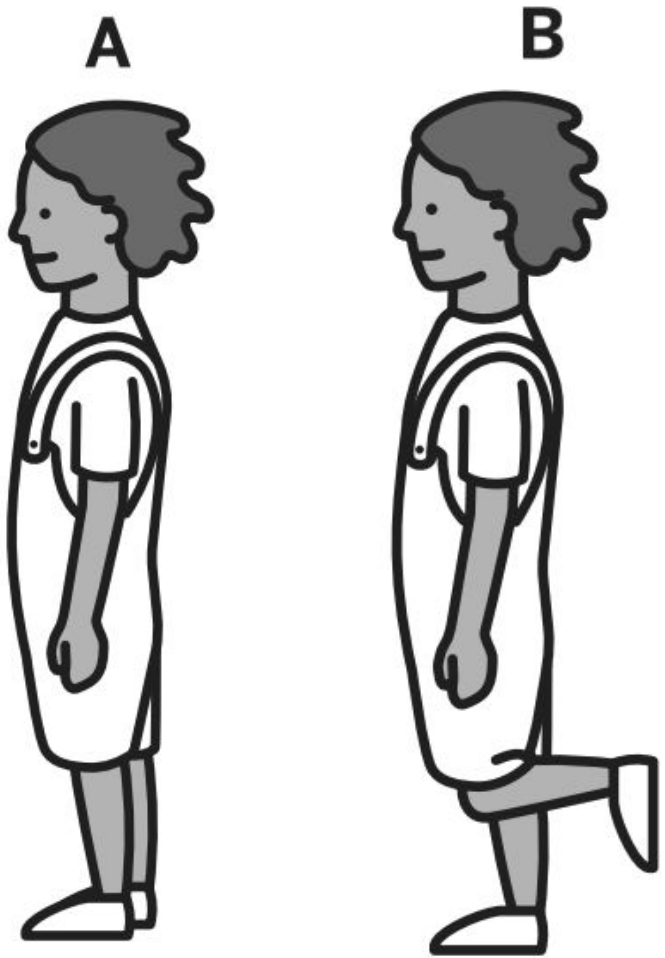
stable

What does the word stable mean again?

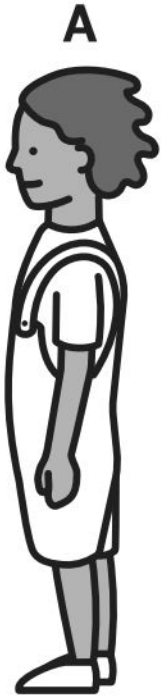
This is a person with two different poses, or pictures of how he or she is standing - Pose A and Pose B.

Which pose do you think will be more stable — the 1st pose **A** or the 2nd pose **B**?

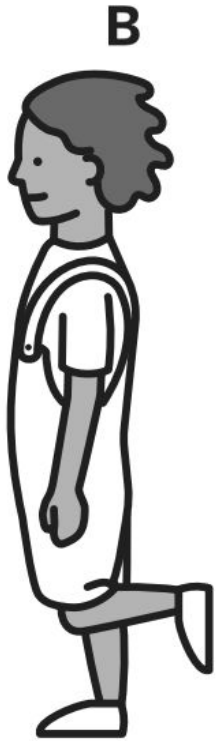
- What is different about these two different poses?
- Share your ideas.



Now let’s try it! Look at the card and lets try the poses!



Pose A
What does it feel like?



Pose B
What does it feel like?

Discussion of Stability

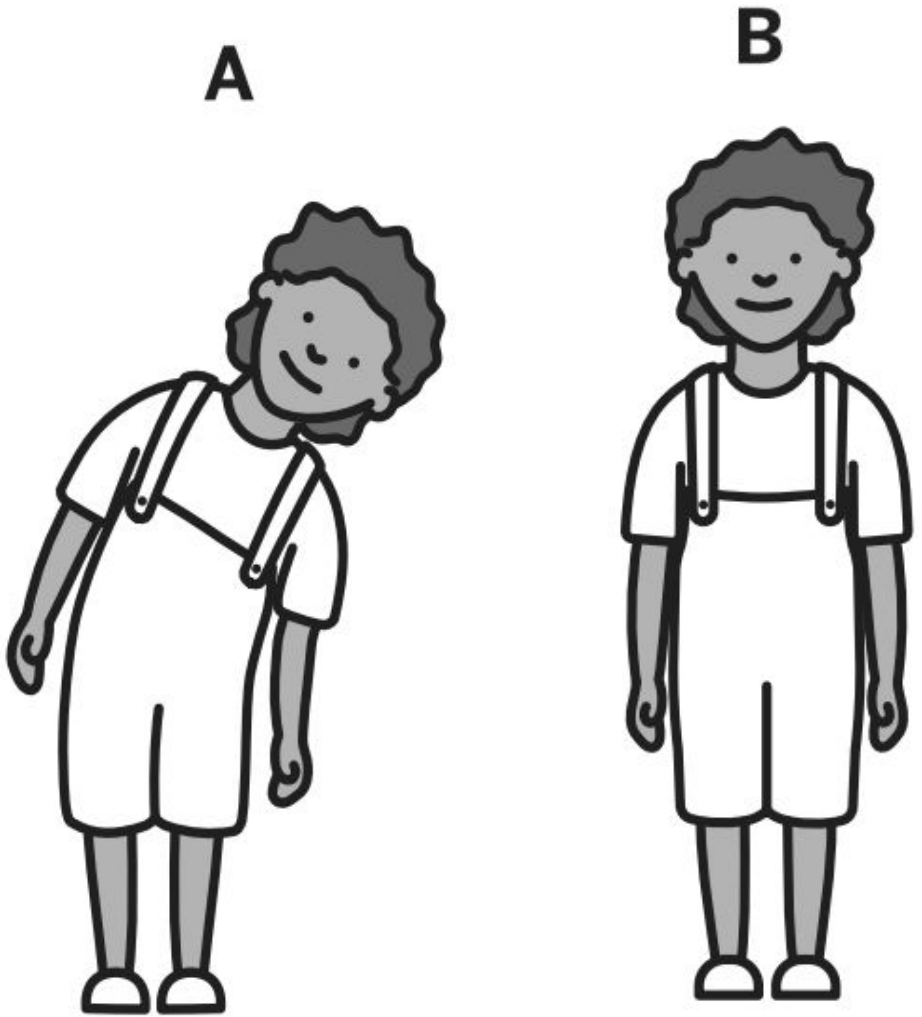
Now we will **observe** a few volunteers.

1. Display the Card
2. Invite a few volunteers to demonstrate the two poses on the card.
3. Ask students to share ideas about why one pose is more stable than the other pose.

What is different about these two poses?

Which pose do you think will be more stable —

A or B?



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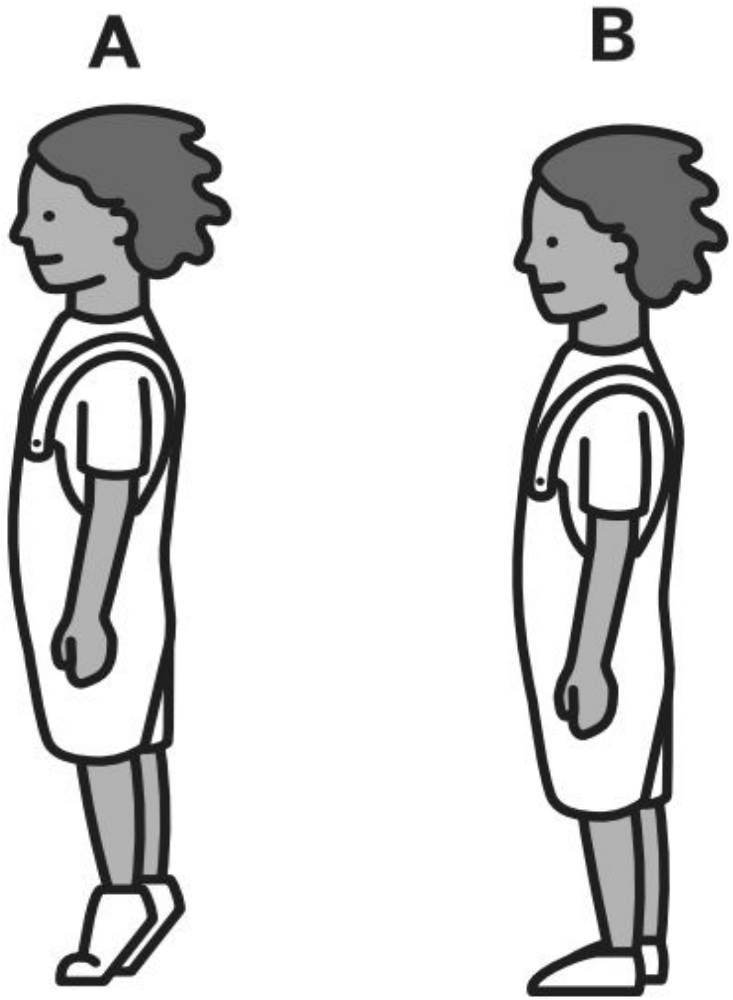

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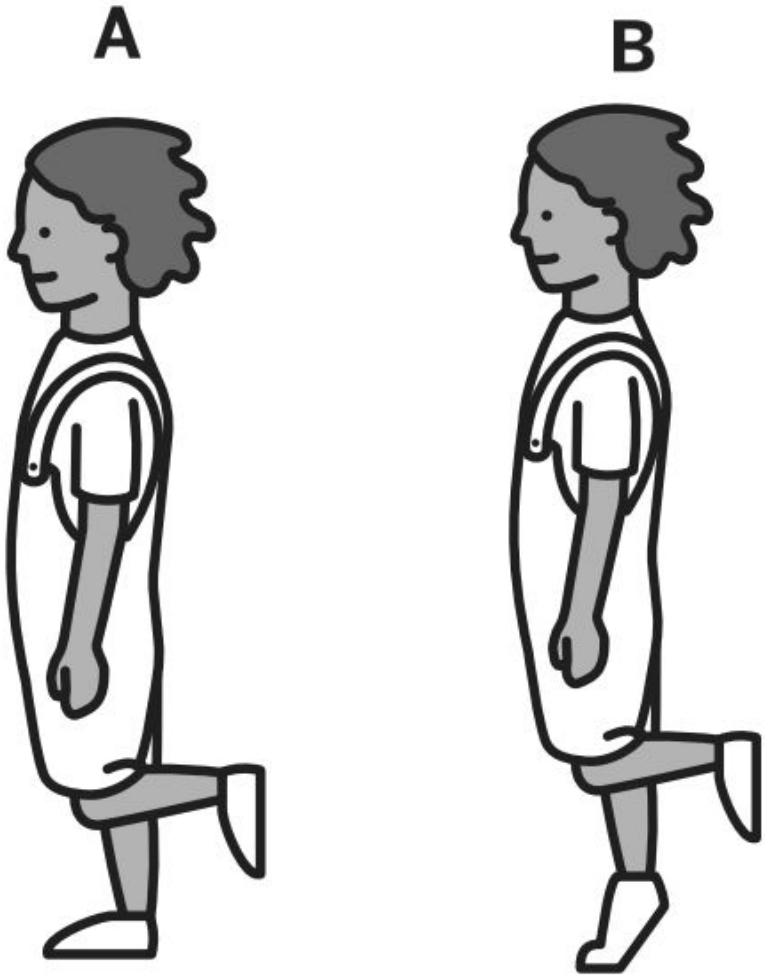
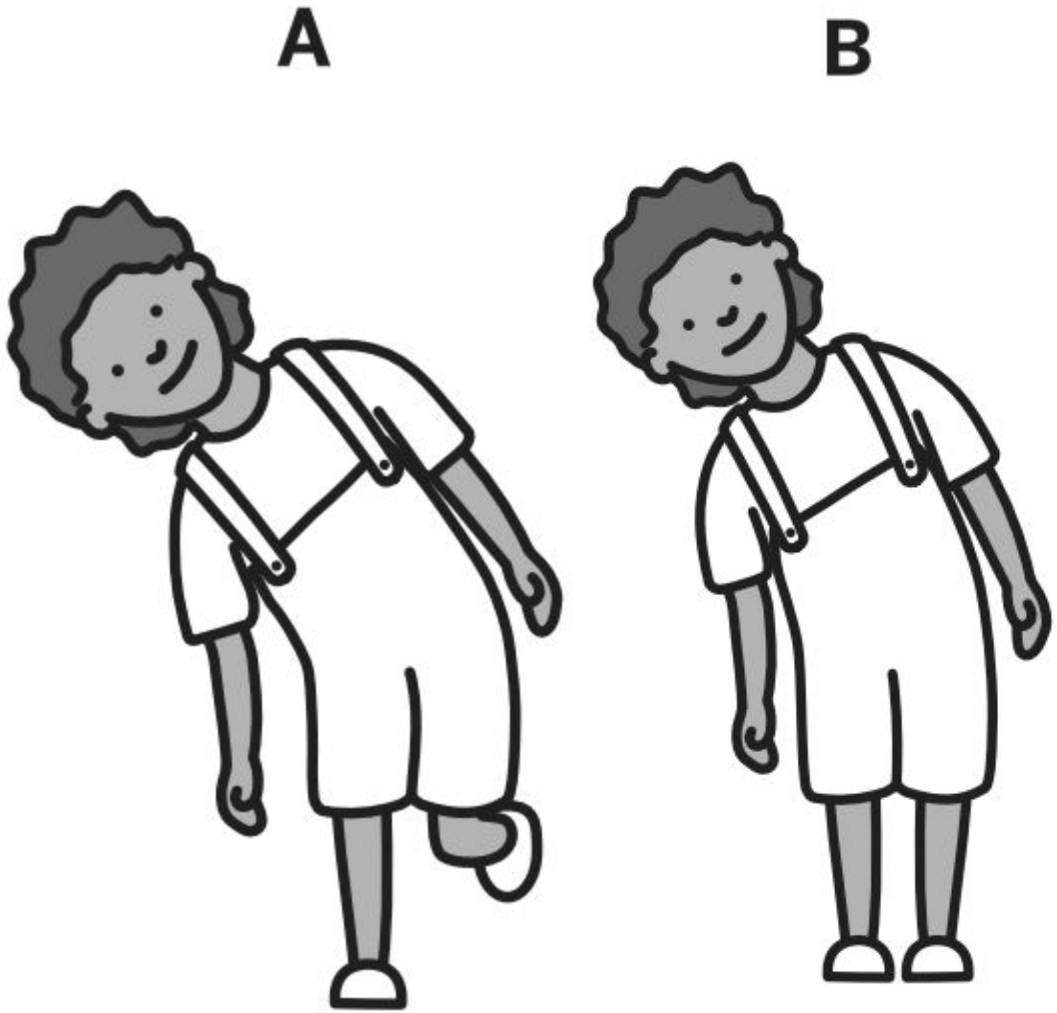
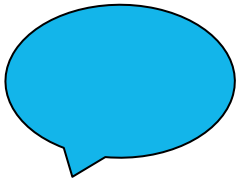


What is different about these two poses?

Which pose do you think will be more stable—

A or B?



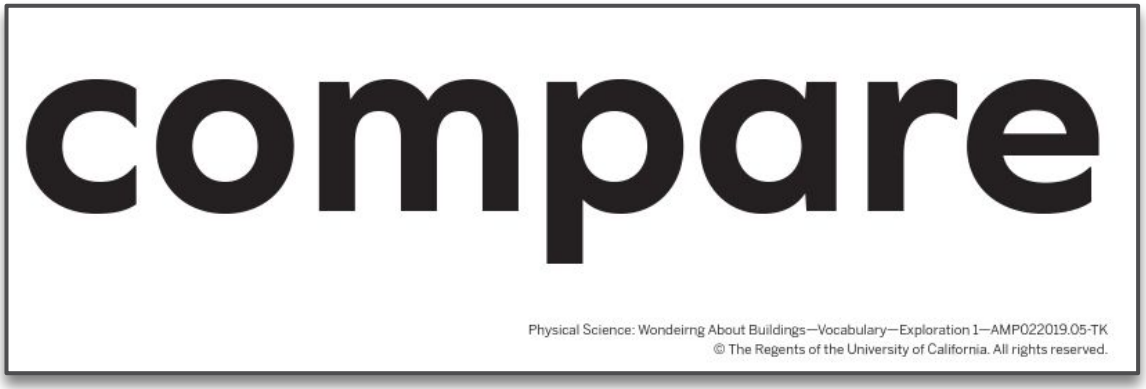


You just shared ideas about why one pose on each of our cards is more stable than the other pose.

You **compared** how stable each pose was on the cards and with your body.

This is the word ***compare.***

Compare means to notice how two or more things are alike or different.



What have we learned?

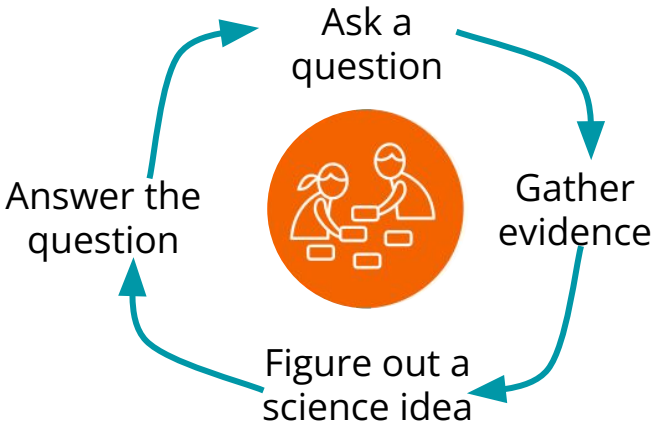
- Having two feet on the ground is more stable than having one foot on the ground.
- Having feet flat on the ground is more stable than being on tiptoes.
- Standing straight is more stable than leaning to the side.

Reflecting on the Experience

What evidence did we start to collect from Activity 1 that you just experienced?

Reflection: TK Instructional Approach

Introduction to the unit phenomenon



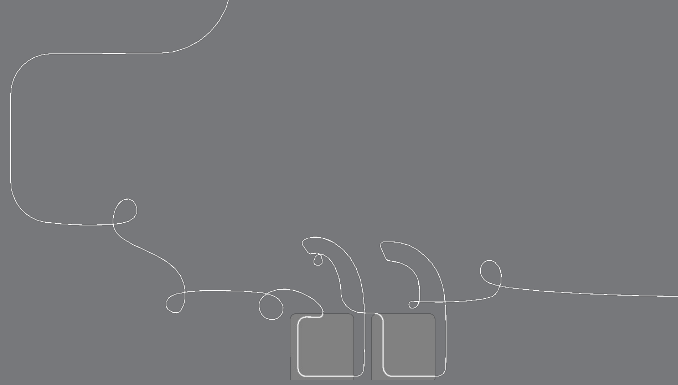
Gather evidence to figure out science and engineering ideas.

Explain the phenomenon & APPLY new understanding

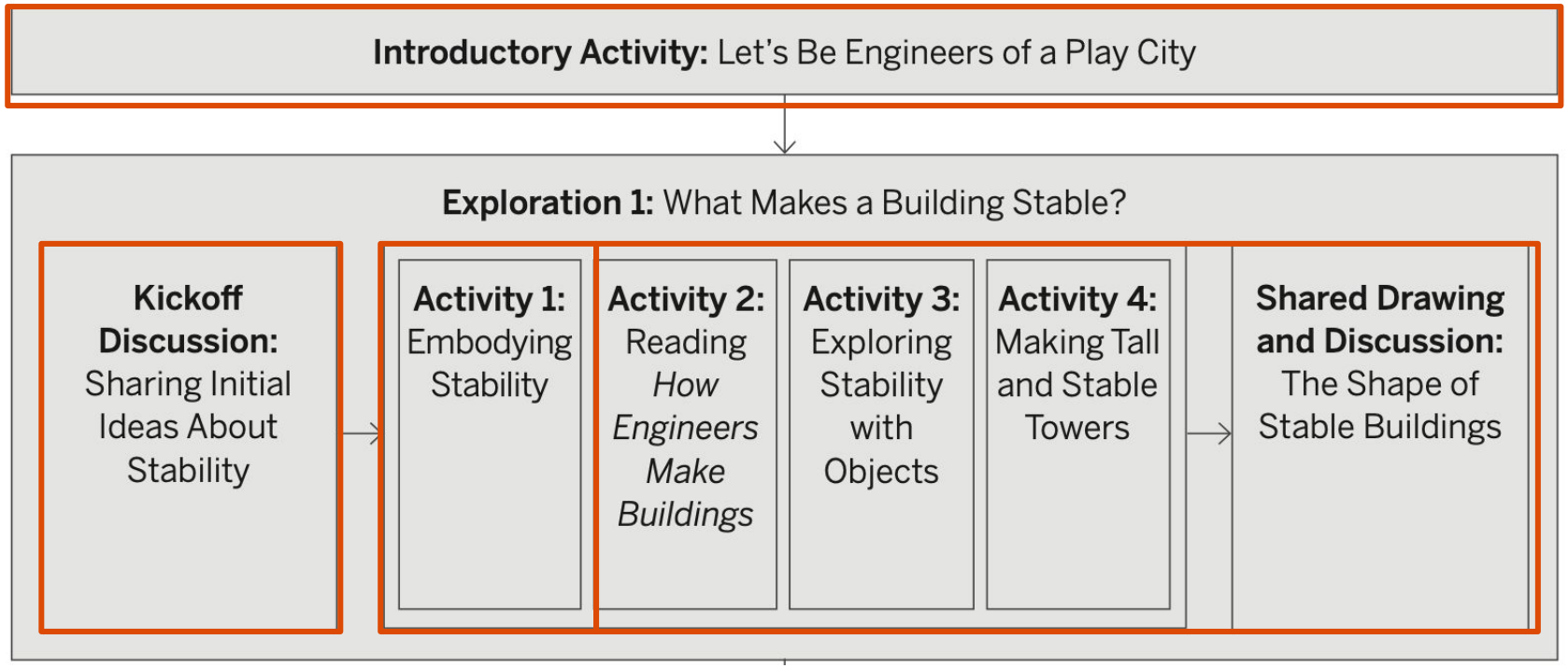
Reflection: Multimodal Instruction

Figuring out and making sense of ideas like scientists & engineers!

- Do
- Talk
- Read
- Draw & Write
- Visualize



Questions? Concerns? Aha's! This reminds me...



Planning Tasks:

- Read Activities 2, 3, 4, and the Shared Drawing and Discussion.
- Pages 21- 36 of the Participant Notebook

Activity 3: Exploring Stability with Objects

What?

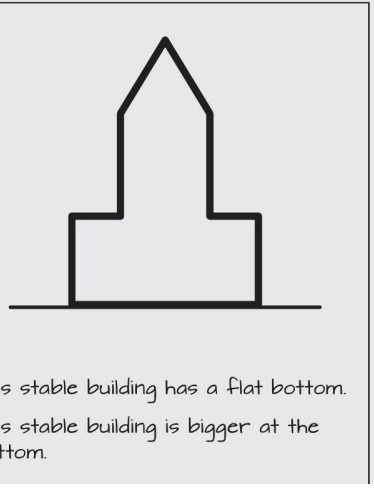
Students explore the stability of different objects. They choose two objects to compare—one that is stable, and one that is not stable. Then, students share their ideas with a partner about what makes the objects more stable or less stable. Finally, they draw their stable objects.

Why?

Comparing the stability of different objects provides evidence of characteristics that contribute to stability. The activity also offers an opportunity for students to practice making and recording observations the way that scientists and engineers do.

How?

1. **Set purpose.** Let students know that they will work with different objects to try to learn more about what makes a building stable.
2. **Display objects.** Explain that students will observe everyday classroom objects to explore how stable they are.



This stable building has a flat bottom.

This stable building is bigger at the bottom.

Activity 3: Observing Recording Stability with Objects

TG pg 44-47

This is the word **stable**.

Stable means not likely to move or change.

We will be engineers and **observe** our objects to see how **stable** they are.

Instructional Suggestion

What One Teacher Did: Three-Dimensional Paper Shapes

One teacher supplemented classroom objects with three-dimensional paper shapes by cutting and folding paper into shapes that were different from the shapes of the classroom objects (e.g., paper cones, pyramids, and more complex shapes). If you'd like to supplement the objects you found with paper shapes, conduct an image search on the Internet by using the term "3-D paper shapes template" to find templates. Then, print the templates and cut, fold, and tape together the paper to form the shapes.

Instructional Suggestion

What One Teacher Did: Venn Diagram with Realia

One teacher added an additional wrap-up to this activity by [illegible] hula hoops. This teacher had students bring some of the [illegible] In one hoop, students placed objects that seemed to be consistently stable (e.g., a cube-shaped block); in the other hoop, students placed objects that seemed to be consistently not stable (e.g., a ball); and in the crossover middle section, students placed objects that seemed stable some of the time and not stable at other times (e.g., a cone that is stable when it is pointed up but not stable when it is pointed down). The class discussed characteristics of the objects in each category, focusing on how flat sides contribute to an object's stability.

Extension Activities
TG pages 47

Recording: Engineer's Notebook pages

- Whole class
- Small groups
- Writing Center
- Partners
- Tubs of different kinds of small objects, blocks, etc. for student experimentation

PN pg 39 TG pg 58

Activity 4: Making Models - Tall and Stable Towers

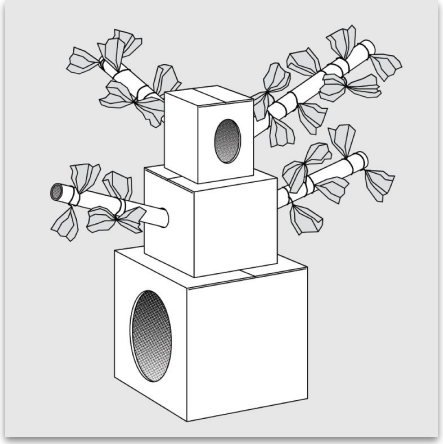
This is the word ***model***.

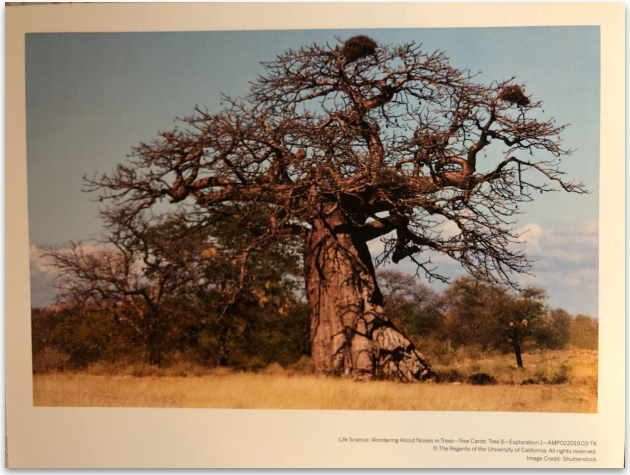
Engineers make ***models*** to show their ideas.

A model is similar to the real thing but not exactly the same.

This is the tree model from "Noisy Trees"

How can we make a model of a tower?

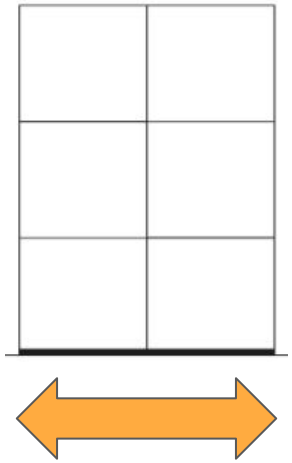


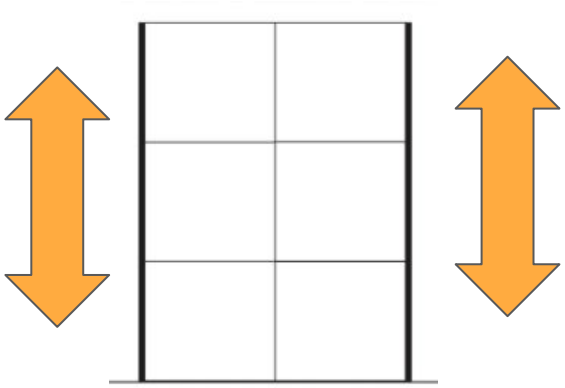


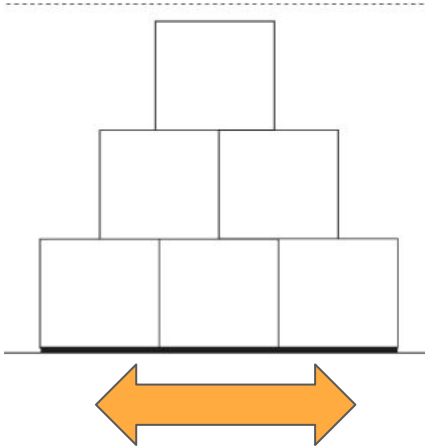
Framing the student investigation:

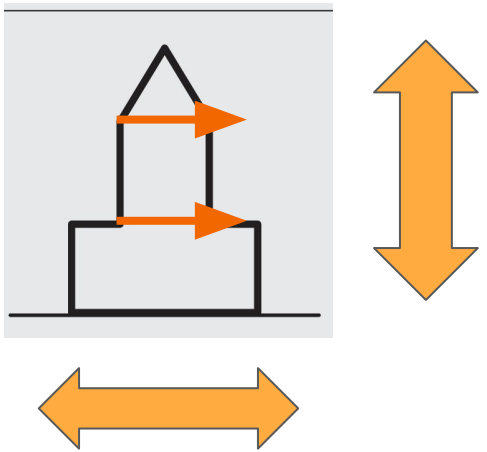
We can use blocks to make our own model of a tower.

The blocks will be similar to real building construction materials, but not the same.









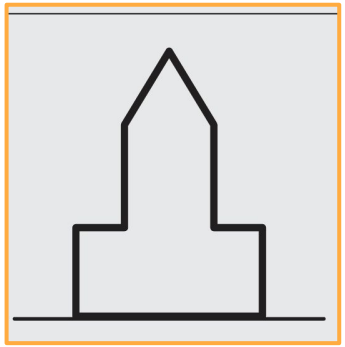
Keep the Conversation & Towers Building:

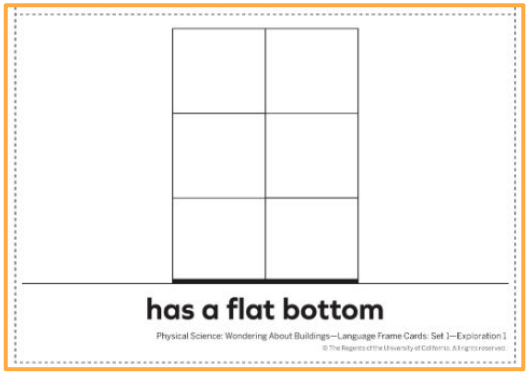
- What helped your tower to stand, a flat bottom or a curved bottom?
- What helped your tower to balance, a bigger top or a bigger bottom?
- What are the sides of your tower like? Are the the same or different?
- What else did you do that helped your tower become stable?

This stable building _____ .

has

does not have

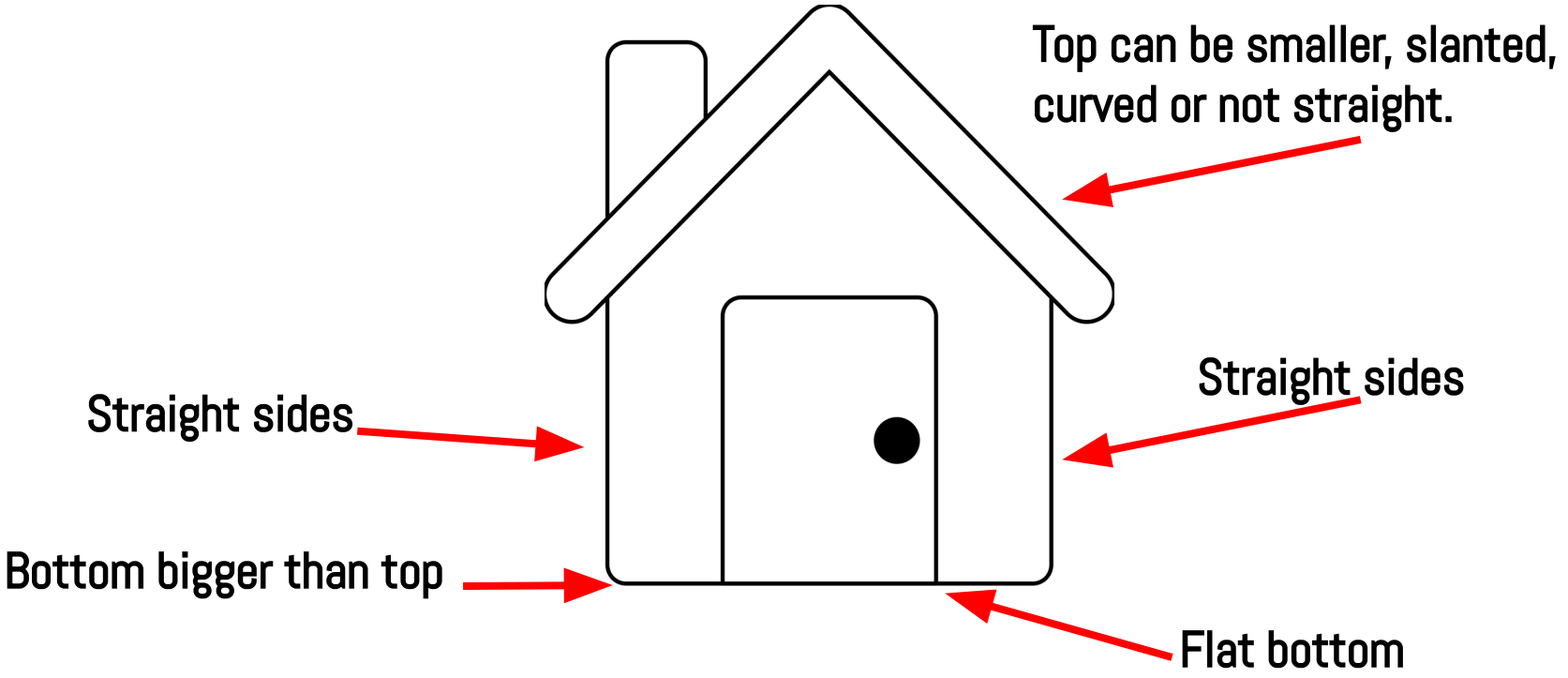




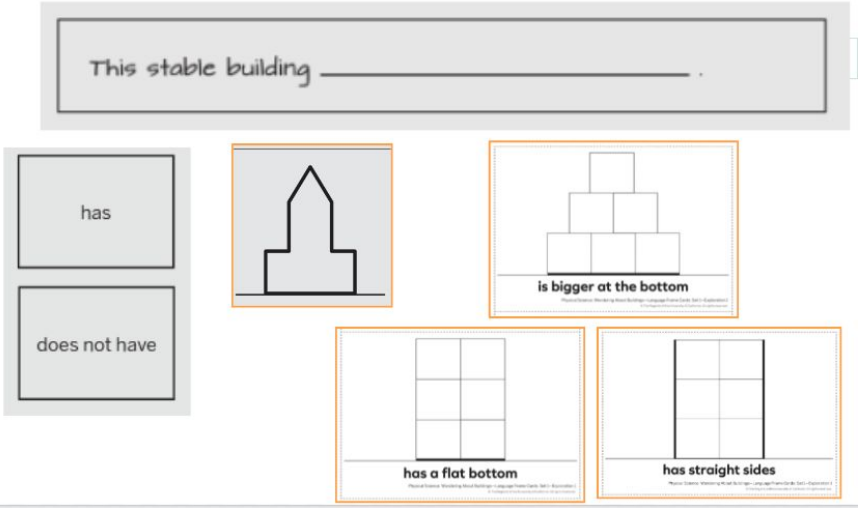
- We have figured out that the shape of a building affects how stable it is.
- Objects with bigger, flat bottoms are usually more stable than curved objects or ones with larger tops.

People make different kinds of buildings, like schools, houses, apartments, and farms, for different things. Every kind of building needs to be stable.

Shared Drawing & Writing



Shared Speaking & Writing



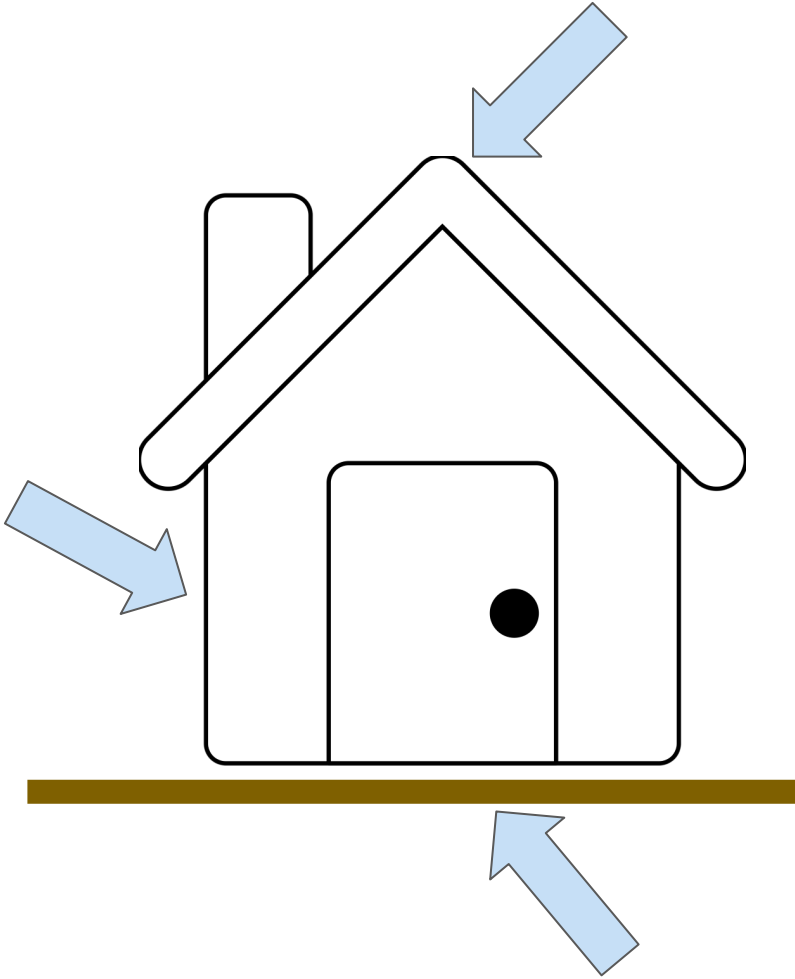
- This building is stable because it has a flat bottom.
- This building is stable because it's bottom is larger than its top.
- This building is stable because it has straight sides.

Use the Language Frame to summarize what students have learned so far.
Then add info to the drawing.

Science-Engineering Question 1:
What makes a building stable?

- We observed that the shape of a building affects its stability.

- We can say that stable buildings generally have flat bottoms, the bottoms are larger or bigger than their tops, and they have some straight sides.



Exploration 2
Kickoff Discussion

TG pg 72

Questions?

When engineers answer one question, that often leads them to ask more questions.

What new questions do you have about buildings?

The engineer in our story wonders about what to construct, or make the apartment building out of.

We are TK Engineers. When engineers wonder about things, they ask questions about them.

What materials can the engineer use to construct or make the building with?

I think we may have figured out a new question to help the engineer with his stable apartment building mystery!

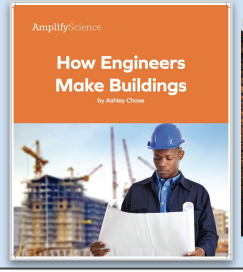
Science-Engineering Question 2: What are stable buildings made out of ?

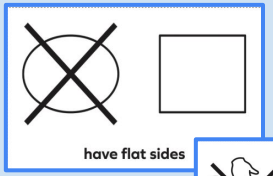
Wondering About Buildings: Gathering Evidence

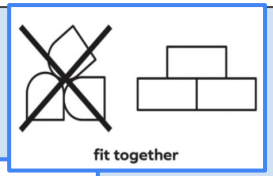
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

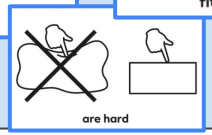
Exploration 2 Question: **what are stable buildings constructed or made with?**

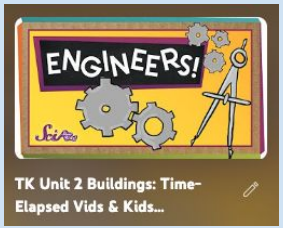
Exploration 2 Evidence





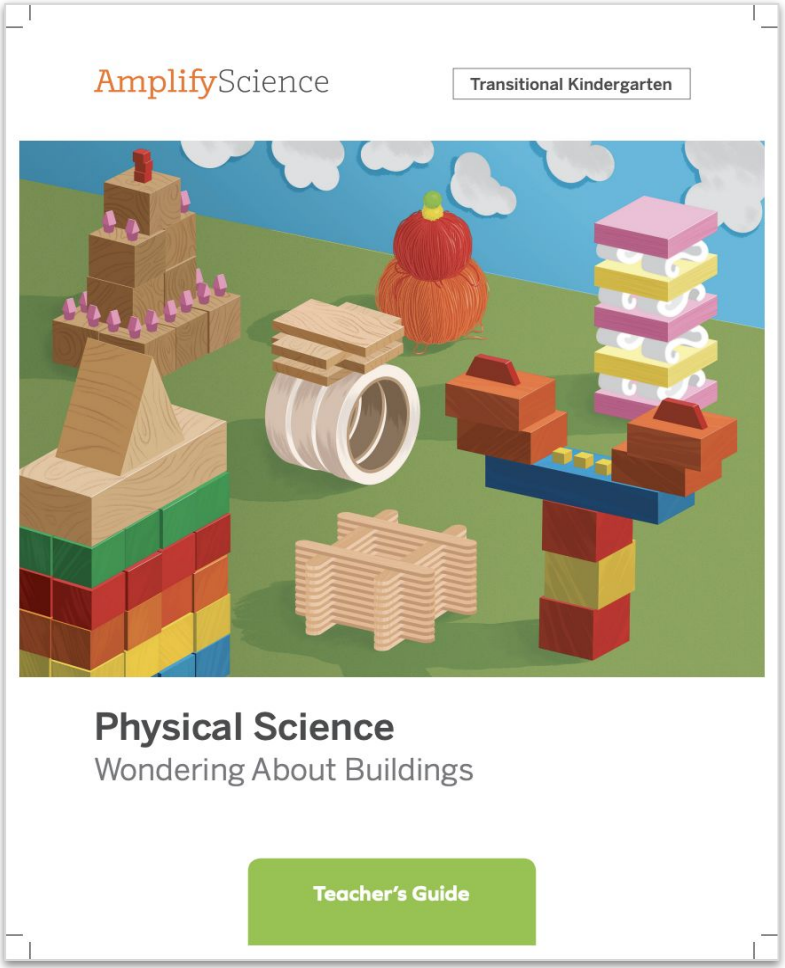


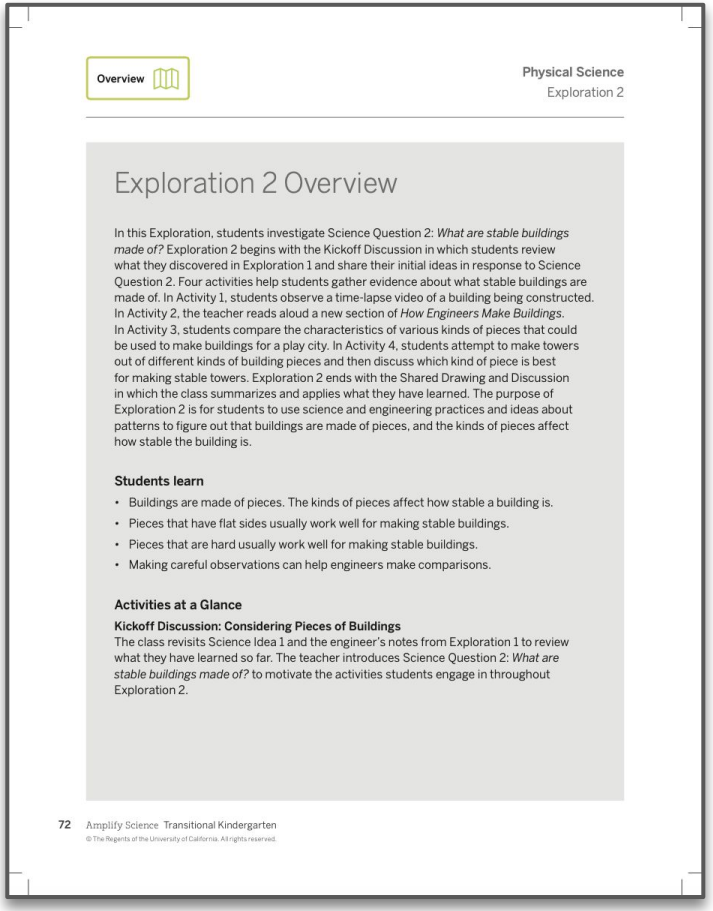




Buildings are made of pieces. The kinds of pieces affect how stable a building is. Pieces that have flat sides usually work well for making stable buildings. Pieces that are hard usually work well for making stable buildings. Making careful observations can help engineers make comparisons.

Exploration 2 Overview





Overview

Physical Science
Exploration 2

Exploration 2 Overview

In this Exploration, students investigate Science Question 2: *What are stable buildings made of?* Exploration 2 begins with the Kickoff Discussion in which students review what they discovered in Exploration 1 and share their initial ideas in response to Science Question 2. Four activities help students gather evidence about what stable buildings are made of. In Activity 1, students observe a time-lapse video of a building being constructed. In Activity 2, the teacher reads aloud a new section of *How Engineers Make Buildings*. In Activity 3, students compare the characteristics of various kinds of pieces that could be used to make buildings for a play city. In Activity 4, students attempt to make towers out of different kinds of building pieces and then discuss which kind of piece is best for making stable towers. Exploration 2 ends with the Shared Drawing and Discussion in which the class summarizes and applies what they have learned. The purpose of Exploration 2 is for students to use science and engineering practices and ideas about patterns to figure out that buildings are made of pieces, and the kinds of pieces affect how stable the building is.

Students learn

- Buildings are made of pieces. The kinds of pieces affect how stable a building is.
- Pieces that have flat sides usually work well for making stable buildings.
- Pieces that are hard usually work well for making stable buildings.
- Making careful observations can help engineers make comparisons.

Activities at a Glance

Kickoff Discussion: Considering Pieces of Buildings
The class revisits Science Idea 1 and the engineer's notes from Exploration 1 to review what they have learned so far. The teacher introduces Science Question 2: *What are stable buildings made of?* to motivate the activities students engage in throughout Exploration 2.

72 Amplify Science Transitional Kindergarten

Page 5a

Page 5b

Part 2: Exploration-level internalization

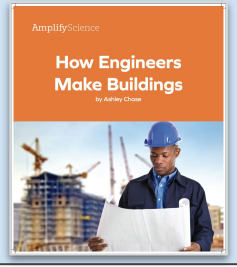
Exploration 2 Question:	What are stable buildings made of?
What do students learn in Exploration 2?	What is the purpose of Exploration 2?
Buildings are made of pieces. The kinds of pieces affect how stable a building is. Buildings that have flat sides usually work well for making stable buildings. Pieces that are hard usually work well for making stable buildings. Making careful observations can help engineers make comparisons.	The purpose of Exploration 2 is for students to use science and engineering practices and ideas about patterns to figure out that buildings are made of pieces, and the kinds of pieces affect how stable the building is.

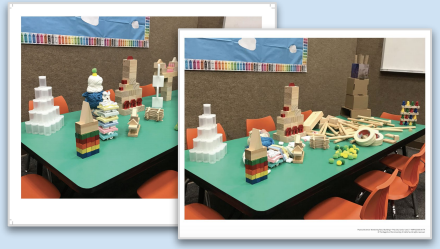
Wondering About Buildings: Gathering Evidence

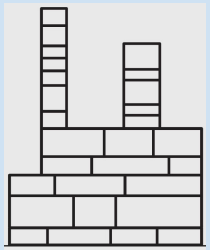
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

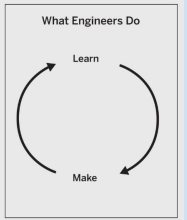
Exploration 3 Question: ***How can we make sure our buildings are stable?***

Exploration 3 Evidence



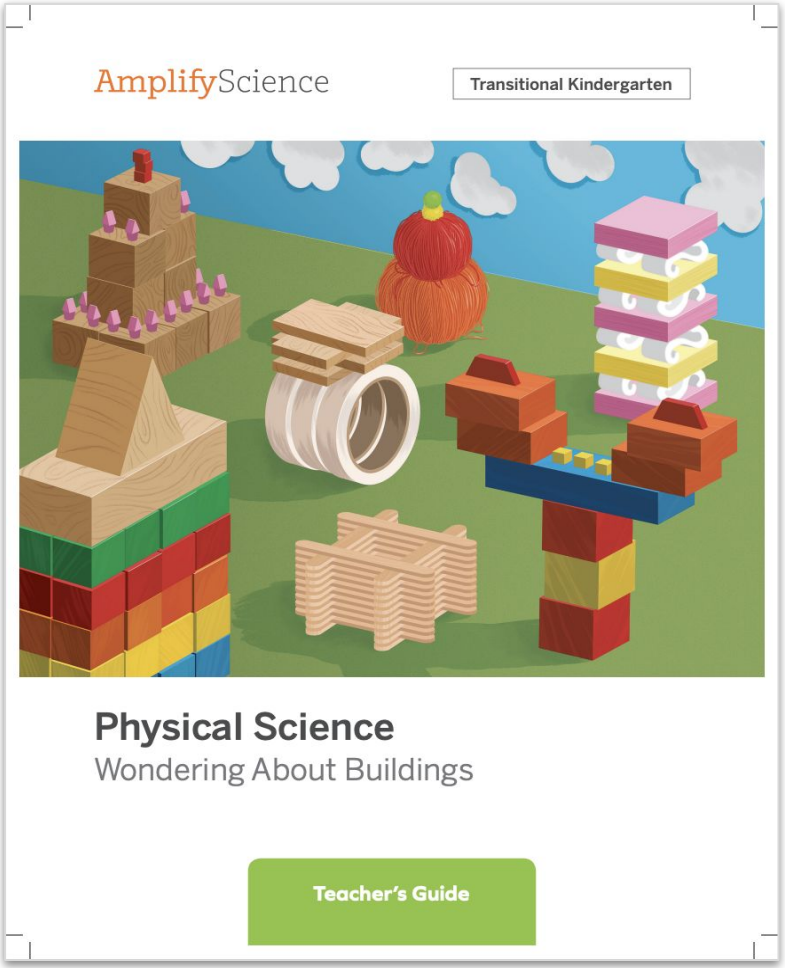


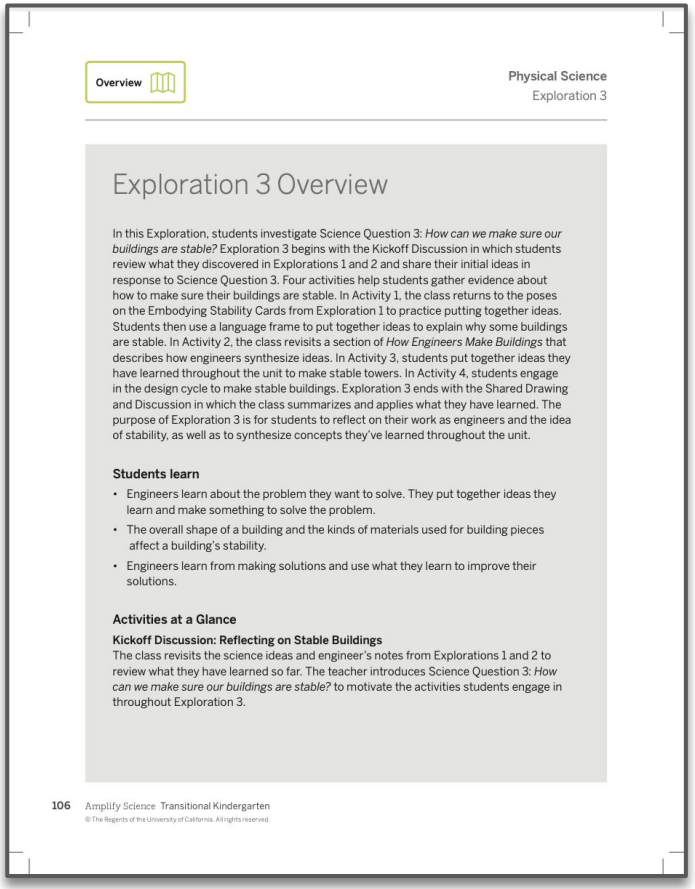




Students synthesize ideas about how a building's shape and the kinds of pieces used to make a building affect its stability. Engineers use their observations to analyze and design solutions to problems. Then they try out their solutions, and can refine or change their solutions.

Exploration 3 Overview





Overview

Physical Science
Exploration 3

Exploration 3 Overview

In this Exploration, students investigate Science Question 3: *How can we make sure our buildings are stable?* Exploration 3 begins with the Kickoff Discussion in which students review what they discovered in Explorations 1 and 2 and share their initial ideas in response to Science Question 3. Four activities help students gather evidence about how to make sure their buildings are stable. In Activity 1, the class returns to the poses on the Embodying Stability Cards from Exploration 1 to practice putting together ideas. Students then use a language frame to put together ideas to explain why some buildings are stable. In Activity 2, the class revisits a section of *How Engineers Make Buildings* that describes how engineers synthesize ideas. In Activity 3, students put together ideas they have learned throughout the unit to make stable towers. In Activity 4, students engage in the design cycle to make stable buildings. Exploration 3 ends with the Shared Drawing and Discussion in which the class summarizes and applies what they have learned. The purpose of Exploration 3 is for students to reflect on their work as engineers and the idea of stability, as well as to synthesize concepts they've learned throughout the unit.

Students learn

- Engineers learn about the problem they want to solve. They put together ideas they learn and make something to solve the problem.
- The overall shape of a building and the kinds of materials used for building pieces affect a building's stability.
- Engineers learn from making solutions and use what they learn to improve their solutions.

Activities at a Glance

Kickoff Discussion: Reflecting on Stable Buildings
The class revisits the science ideas and engineer's notes from Explorations 1 and 2 to review what they have learned so far. The teacher introduces Science Question 3: *How can we make sure our buildings are stable?* to motivate the activities students engage in throughout Exploration 3.

106 Amplify Science Transitional Kindergarten

Page 5c

Page 5d

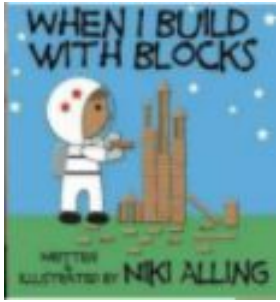
Part 2: Exploration-level internalization

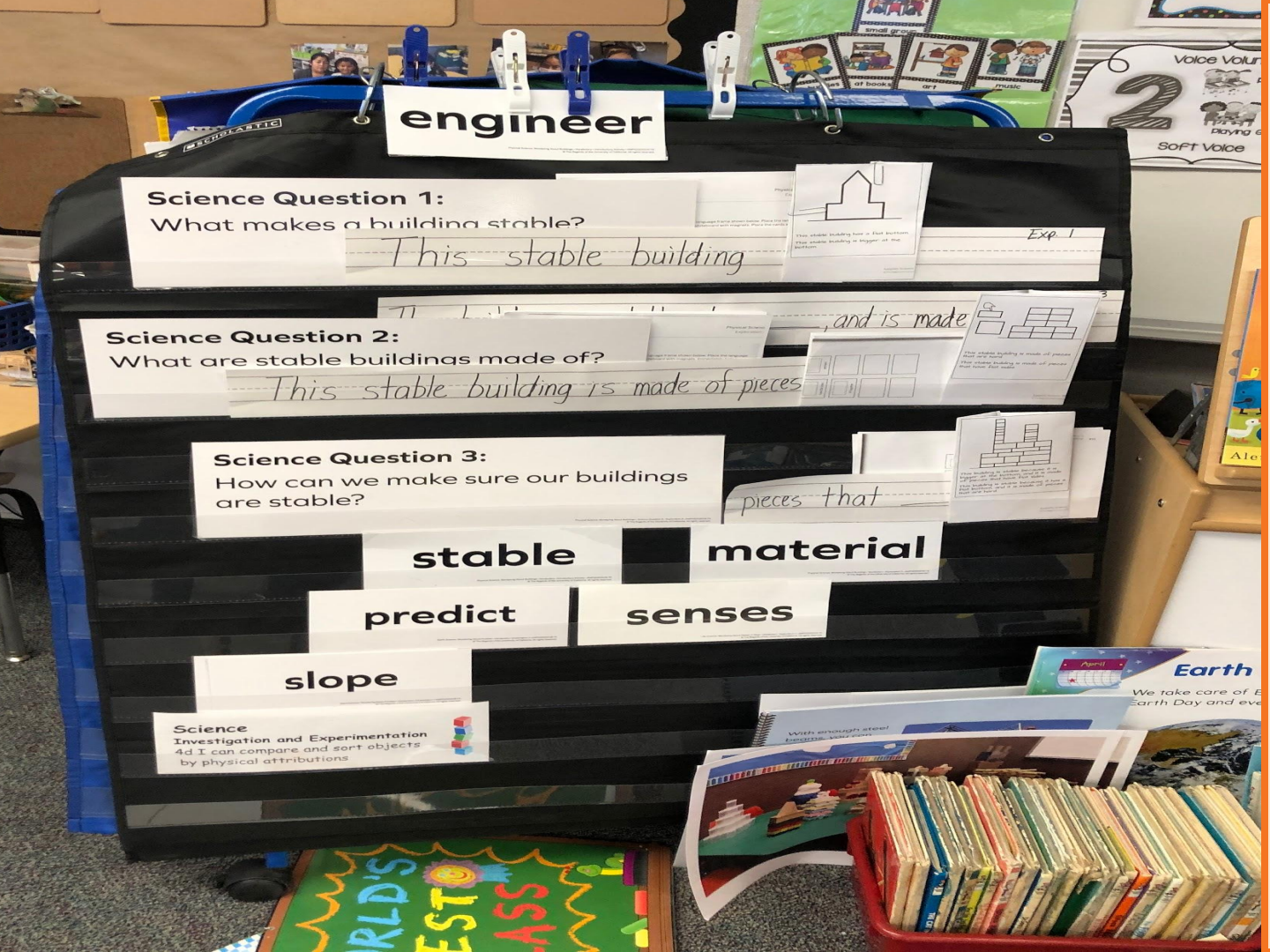
Exploration 3 Question:	How can we make sure our buildings are stable?
What do students learn in Exploration 3?	What is the purpose of Exploration 3?
Engineers learn about the problem they want to solve. They put together ideas they learn and make something to solve the problem. The overall shape of a building and the kinds of materials used for building pieces affect the building's stability. Engineers learn from making solutions and use what they learn to improve their solutions.	The purpose of exploration 3 is for students to reflect on their work as engineers and the idea of stability, as well as to synthesize concepts they've learned throughout the unit.

Interdisciplinary Connections

How can you connect to...

- Reading
- Language Development
- Writing
- Math
- Social Studies
- Art
- Dramatic Play/Music/Socio-Emotional





Engineering/ Science Wall On a pocket chart!

- Vocabulary
- Engineering & Science Questions/ Concepts
- Real Engineers
- Language Frames
- Big Book & Related Literature

Students working with different kinds of building materials. What physical properties are they figuring out?

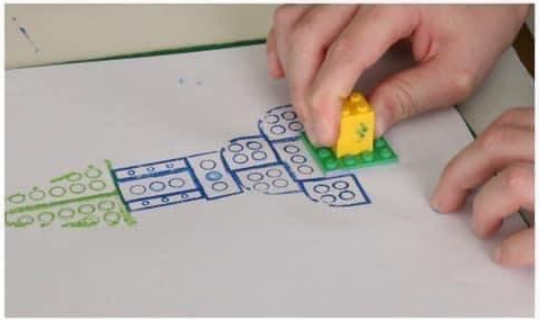
Students working with different kinds of building materials. What physical properties are they figuring out?

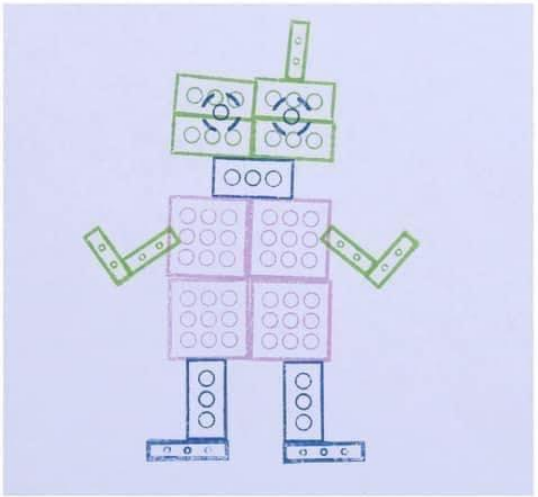
REAL TK EXAMPLES: Read & Discuss Slide & related ?s:

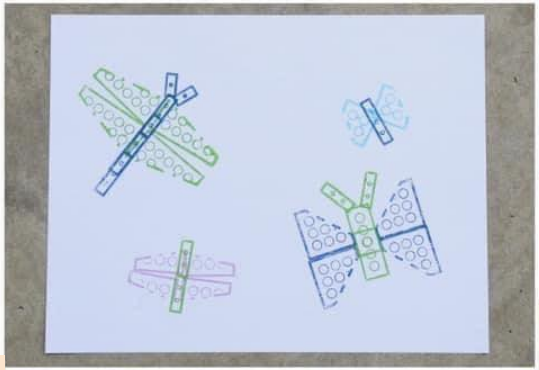
More wonderful Activity Examples from our Pilot Teachers!

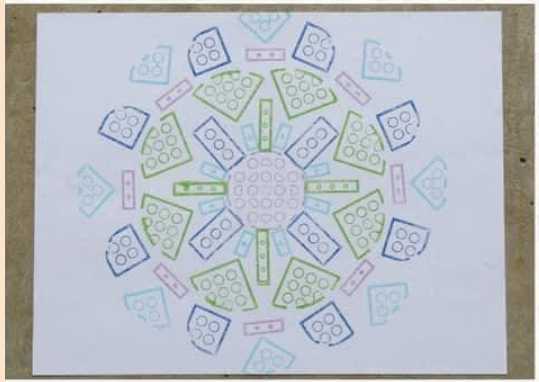
- *How would these kinds of Activities help in our Differentiation for our students across the Explorations of the Unit?*
- *What will we add to them to provide more scaffolding & support during in-person instruction?*

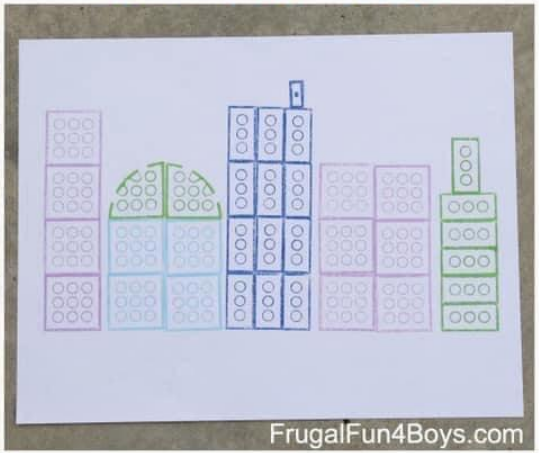
Students working with different kinds of building materials. What physical properties are they figuring out?











Art Projects:

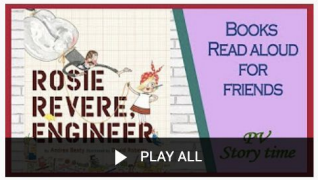
- **Crayon & water color wash collage of buildings & vehicles for City Mural.**
- **Using leggo and shape pieces as stamps to create buildings and other designs.**

Collaborative Resources

Through working with real Amplify Science TK teachers, JoAnna, our TK expert, has put together some collaborative resources that connect to each of our TK units!

If you find new books or songs to use with the unit, please email suggestions to jchocooj@amplify.com so she can add them to our collaborative playlists.

Resource	Description
TK Unit 2 Buildings: ReadAlouds	Read-Aloud links for Fiction & Non-Fiction related literature to the *Wondering about Buildings* Unit. Different versions/readers of several books so you can pick the ones that match your class' & student's needs.
TK Unit 2 Building & Construction Songs	A playlist of songs that have connections to the themes in *Wondering about Buildings.* Songs in English and Spanish. Different versions of several songs so you can pick the ones that match your class' & student's needs.
TK Unit 2 Building Videos	A playlist of time-elapsed videos of construction, tallest building comparisons and other engineering-related videos.



TK Unit 2 Buildings: ReadAlouds

28 videos • 3 views • Updated today

Public

Read-Alouds of both fiction & nonfiction, classics & modern, to correlate with Amplify Science TK Unit 2 "Wondering About Buildings". Different versions/readers of several books so you can pick the ones that match your class' & student's needs.

JoAnna Chocooj

TK Unit 2 Buildings - Songs

22 videos • No views • Updated today

Public

Songs & chants, to correlate with Amplify Science TK Unit 2 "Wondering About Buildings". Different versions several songs so you can pick the ones that match your class' & student's needs.

TK Unit 2 Buildings: Time-Elapsed Vids & Kids Engineering

ACTIVITIES NOTE-CATCHERS

- Do one note-catcher for each of the 3 Explorations in the unit.
- Identify any scaffolding, support, related pre-activities or extensions that you would do for each of the 4 Activities.
- Put related Art, Math, Language Arts or free-choice centers on the back of the page.
- Keep in a unit binder for easy reference - add any implementation notes or ideas - and have for available for future reference/next year's implementation.

ACTIVITY Center Notes

UNIT: #1 #2 # 3 NAME: Wondering About Buildings EXPLORATION: # 1 #2 # 3

Use this organizer to record notes on how to structure the Activities in your classroom for each Exploration. Decide where/how you will set up the stations (part of LA or Math, or general Learning Centers? Part of Free Choice Centers?), ideas for visual arts & music, extension & home opportunities

Center 1: Embodying Stability

Live: show pose cards & practice poses together

Watch vids of classmates' poses & try making them together.

Discuss/chart by stable or unstable & why

Home:

Email/send home copies of cards for students to try with their families

Have students make at least 1 new unstable pose, & one new stable pose. Have a family member take a photo to share with class.

Have a family member make a short vid clip of their pose demonstrations - & have them explain

Center 2: BigBook How Engineers Make Building

Read book live, synchronous online

Record read aloud for students to listen to - weekly assignment of listening to section @ least once by self & once w/family member?

Amplify link for 2nd read aloud, so they hear 2+ Reader versions of story sections.

Download photos of buildings to share, or Print out photos from TK Unit 2 Image LINKS doc.

TK Planning Notebook

Variety of classroom objects (Float or Sink tub?)

Items that stack, roll, slide, are light or heavy (Measurement tub objects?)

Send home lil bags of objects?

Live: Or model live with demo of classroom objects - & ask them to collect a set at home.

Model making observations of different objects - get feedback from students, then model drawing & labeling in 'Engineer's notebook'

Home: Make assignment for them to do the same w/their object set @ home, foto or vid clip to explain & share their examples with class.

Center 4: Constructing Tall & Stable Towers

Small wooden math cubes

Pattern blocks

Large wooden blocks

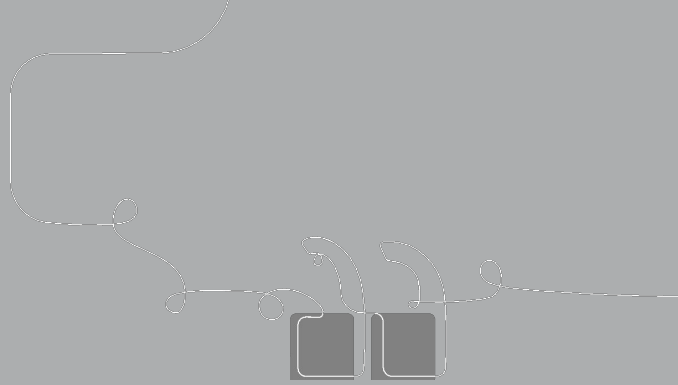
Duplos and Legos

Lincoln Logs

Live: model activity & take suggestions from students for what block to put where.

Use LANGUAGE FRAMES/practice with live to make explanations.

Home: have students build towers, then photo or vid clip explaining what they built & how they did it - why its stable.



Questions? Concerns? Aha's! This reminds me...

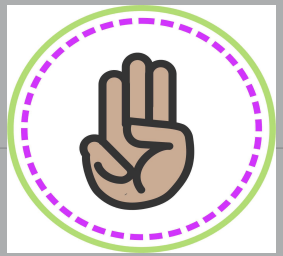
How are you feeling so far?

Overarching Goals

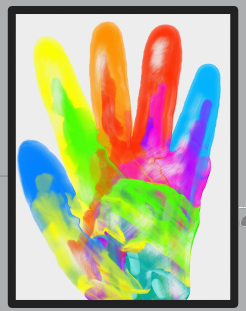
By the end of this workshop, you will be able to:

- Outline the upcoming lessons in TK Unit 2, *Wondering About Puddles*
- Understand & plan for assessments and next steps

I'm still not sure how this all works...



I understand it in general, but I'll need to dig deeper….



I'm ready to teach someone else about this!

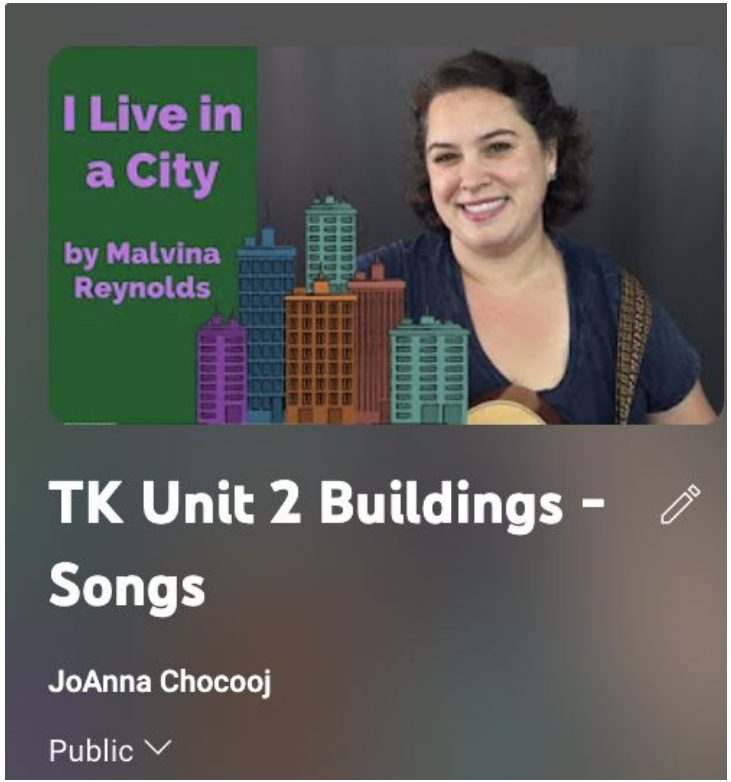
How High Can You Stack? | Engineering for Kids

SciShow Kids • 425K views • 5 years ago

Stretch or Lunch Break

___ mins

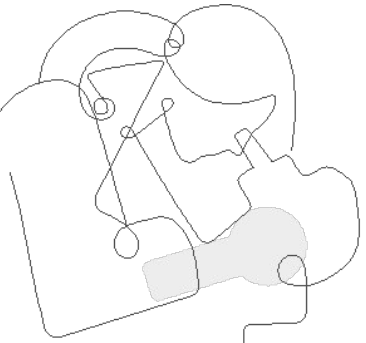
[5 minute timer](#) - ***or play some songs from playlist!***
[TK Unit 2 Building & Construction Songs](#)



Amplify Science

Unit 2: *Wondering About Buildings* & Assessment - Part 2

Grade TK



LAUSD, CA
1/28/23

PLPG CERTIFIED PROVIDER

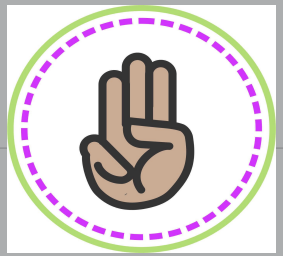
Welcome Back! How are you feeling so far?

Overarching Goals

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

- **Outline the upcoming lessons in TK Unit 2, *Wondering About Buildings***
- **Understand & plan for assessments and next steps**

I'm still not sure how this all works...



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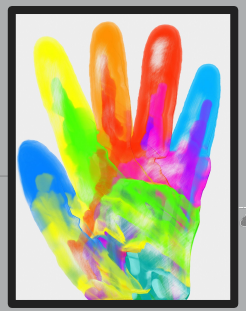
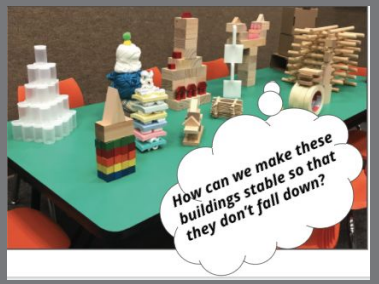


I'm ready to teach someone else about this!

Plan for the Day

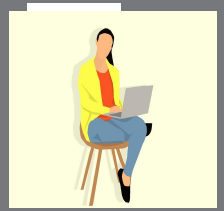
- Introduction & Framing the day



- Phenomenon-based Instruction

- Program Essentials - TK Structure & Materials & Exploration Internalization

- Teaching & Learning in an Amplify Science TK Activity



- **Assessment & Planning to Teach**

- **Closing**

Assessments in TK

PN pg 56

Assessment Opportunities

Formative & Embedded Assessments

- **1 per Exploration** (Unit 2: 1, 3.9; 2, 3.11; 3, 3.8)
- **Look for:**
  - Ability to answer Exploration Science Questions
  - Express understanding of Science Ideas
  - Demonstrate Science Practices

End-of Unit Culminating-Summative Assessments

- Look for :
  - Students ability to reflect on and apply their learning

Assessment System - Unit 2

Grade TK Key assessment types

- **Embedded Assessment** opportunities throughout the Activities (lessons)
- **One Formative Assessment** opportunity in each Exploration to assess students' progress toward answering the science questions & understanding the science ideas
- At end of 3rd Exploration, the Unit Culminating Activity has a paired **Self-Assessment** where students reflect on new ideas they have developed & encourages ownership of their learning.
- Students also create their own individual **Student Page** for the final classbook project of the **Culminating Activity**, where they draw & write (labels or dictation) their important takeaways of the Unit. Formative again, & also can be considered **Summative**.

Formative Assessments

Exploration One: Activity 3 (3.9)
Students compare objects. They share their ideas about their object;s shape to its stability. They share their observations about about object properties like flat or curved bottom, size of tops compared to bottoms, etc.Teacher listens for their understanding & their development of the engineering ideas.

Exploration Two: Activity 3 (3.11)
Students choose and compare building pieces as examples that they think will make buildings less stable or more stable. Students describe or show partners how the pieces will work. Teacher listens for students referring specific features of the pieces & forming connections between them to explain their thinking.

Exploration Three: Activity 3 (3.8)
Students choose pieces from various materials to make towers into stable shapes of their own design. Teacher listens for students' explanation of their design features for showing understanding of the engineering ideas contributing to building stability.

Wondering About Buildings

Analyze the unit structure document.

- ***What do you anticipate students will know and be able to do at the end of each Exploration?***

Science Question 1:
What makes a building stable?

Science Question 2:
What are stable buildings made of?

Science Question 3:
How can we make sure our buildings are stable?

Physical Science: Wondering About Buildings

Introductory Activity: Let's Be Engineers of a Play City

Exploration 1: What Makes a Building Stable?

Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Sharing Initial Ideas About Stability	Embodying Stability	Reading *How Engineers Make Buildings*	Exploring Stability with Objects ★	Making Tall and Stable Towers	The Shape of Stable Buildings

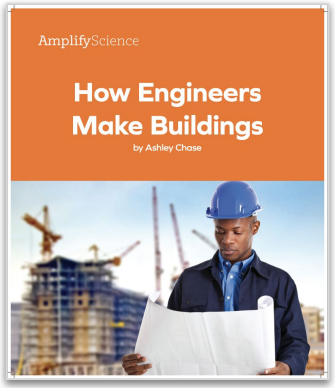
Exploration 2: What Are Stable Buildings Made Of?

Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Considering Pieces of Buildings	Observing a Time-Lapse Video	Reading *How Engineers Make Buildings*	Comparing Pieces ★	Making Towers with Different Kinds of Pieces	Recording Engineer's Notes About the Pieces of Stable Buildings

Exploration 3: How Can We Make Sure Our Buildings Are Stable?

Kickoff Discussion:	Activity 1:	Activity 2:	Activity 3:	Activity 4:	Shared Drawing and Discussion:
Reflecting on Stable Buildings	Putting Together Ideas	Reading *How Engineers Make Buildings*	Putting Together Ideas to Make Towers ★	Engaging in the Design Cycle	Using Engineer's Notes to Put Together Ideas

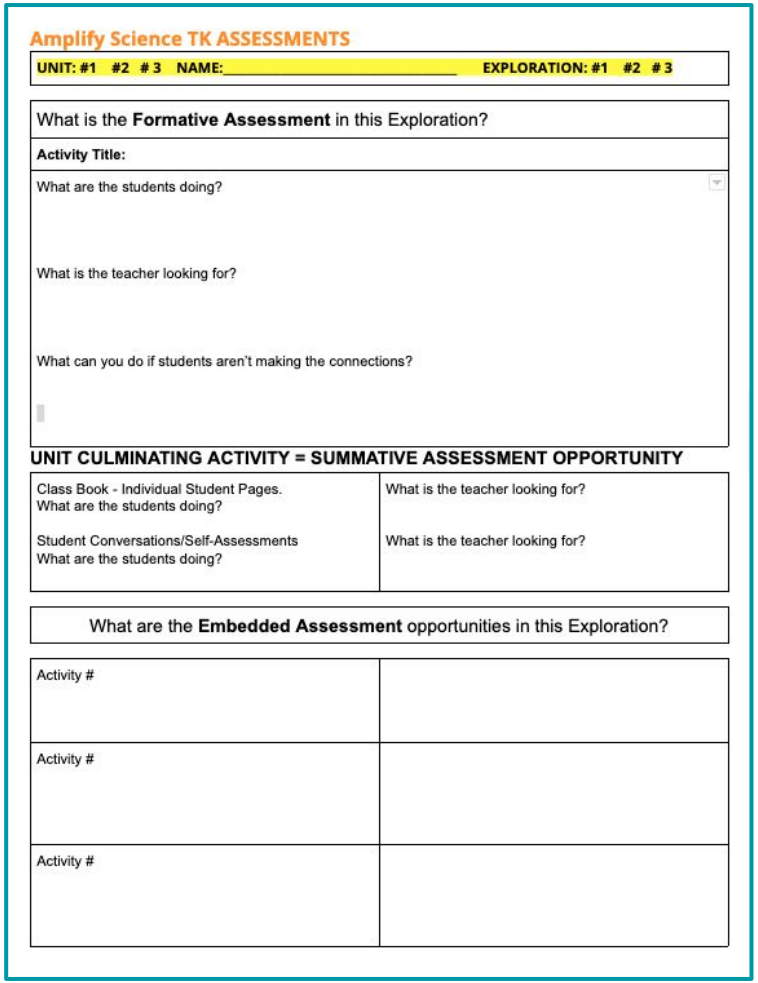
Culminating Activity: Making a Play City



PB1: The shape of a building affects its stability (e.g. many stable buildings have flat bottoms and are bigger at the bottom).

PB2: Stable buildings are made of pieces. The kinds (materials & shapes used) of pieces a building is made of can affect its stability.

PB3: The overall shape of a building combined with the shapes and kinds of materials used in the building pieces affect a building's stability.



Amplify Science TK ASSESSMENTS

UNIT: #1 #2 #3 NAME:_____ EXPLORATION: #1 #2 #3

What is the **Formative Assessment** in this Exploration?

Activity Title:

What are the students doing?

What is the teacher looking for?

What can you do if students aren't making the connections?

UNIT CULMINATING ACTIVITY = SUMMATIVE ASSESSMENT OPPORTUNITY

Class Book - Individual Student Pages. What are the students doing?	What is the teacher looking for?
Student Conversations/Self-Assessments What are the students doing?	What is the teacher looking for?

What are the **Embedded Assessment** opportunities in this Exploration?

Activity #	
Activity #	
Activity #	

Collaboration/Planning:

Assessments

TK Planning Notebook

Questions to answer:

- What is the formative assessment in this Exploration?
- What assessment opportunities are embedded in the Activity?
- What evidence can I collect of student progress and understanding?
- How could I use this information to inform my instruction?

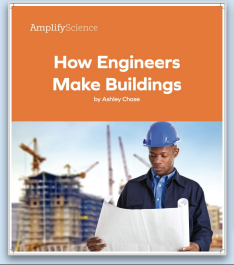
Gathering Evidence

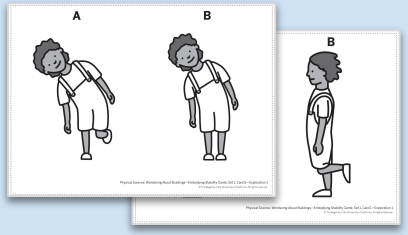
Wondering About Buildings

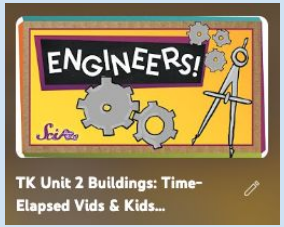
Unit Science/Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?)

Exploration 1 Question: ***What makes a building stable?***

Exploration 1 Evidence







Students learn that the shape of a building affects how stable it is. Engineers gather evidence to answer questions as they learn about the problems they are working to solve; & they draw, write & talk to share their ideas.

Formative Assessment

TG pg 45 PN pg 26

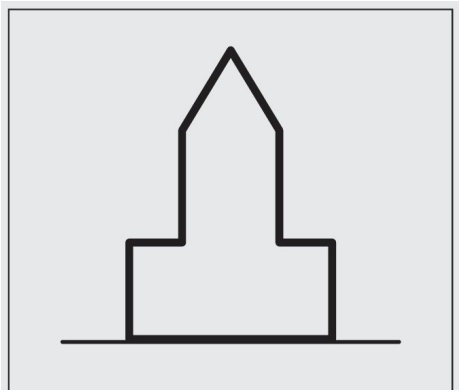
Exploration 1 Activity 3.9

Look for

- Students who are developing an understanding of Science & Engineering Idea 1: the shape of a building affects how stable it is.
- Students will be able to explain how the shape of a building helps it's stability (stay up) so it doesn't fall down.

What types of back pocket questions might you use to elicit this from students?

What do you see notice about the bottom or base of the buildings?
Are they they curved or flat on the bottom?
Are they bigger or smaller than the tops?
How do you think this helps the building to be stable?



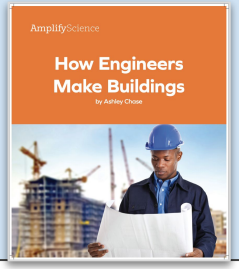
Let's take a look at your building model again: What shape is your base, the building bottom?
Is the top larger or smaller than the bottom?

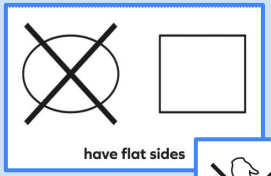
Wondering About Buildings: Gathering Evidence

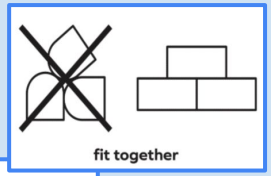
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

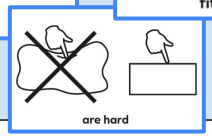
Exploration 2 Question: **what are stable buildings constructed or made with?**

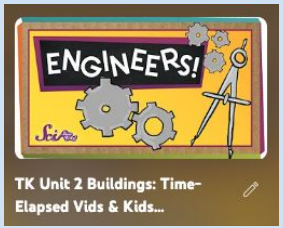
Exploration 2 Evidence











Buildings are made of pieces. The kinds of pieces affect how stable a building is. Pieces that have flat sides usually work well for making stable buildings. Pieces that are hard usually work well for making stable buildings. Making careful observations can help engineers make comparisons.

Formative Assessment

TG pg 61 PN pg 41

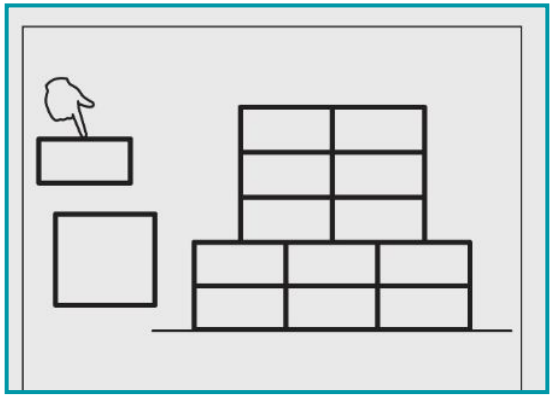
Exploration 2 Activity 3.11

Look for

- Students who are developing an understanding of Science & Engineering Idea 1: Buildings are made of pieces. The kinds of pieces - their shapes and what they are made of - affect how stable a building is
- Students will be able to explain how a buildings pieces contribute or don't help a building stability.

What types of back pocket questions might you use to elicit this from students?

What kinds of building materials do you see in the photos?
How do they fit together?
How does this help the building stand up?



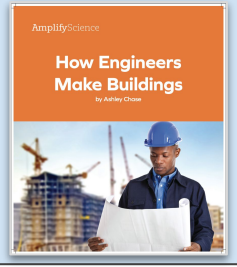
Let's take a look at your building again. How do the pieces fit together? What are they made out of? Are they hard or soft?

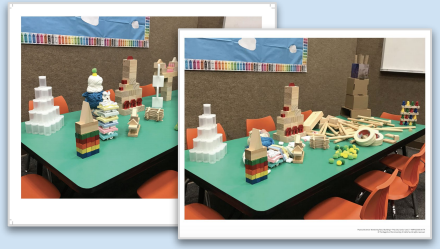
Wondering About Buildings: Gathering Evidence

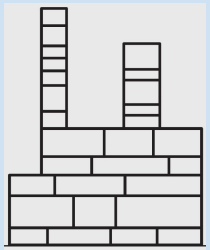
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

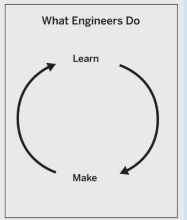
Exploration 3 Question: ***How can we make sure our buildings are stable?***

Exploration 3 Evidence









Students synthesize ideas about how a building's shape and the kinds of pieces used to make a building affect its stability. Engineers use their observations to analyze and design solutions to problems. Then they try out their solutions, and can refine or change their solutions.

Formative Assessment

TG pg 45 PN pg 26

Exploration 3 Activity 3.8

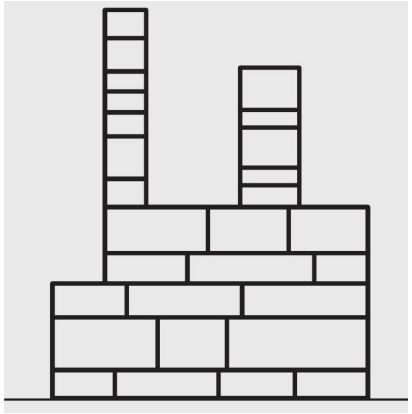
Look for

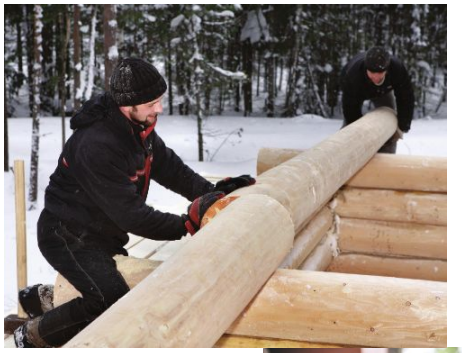
- Students who are developing an understanding of Science & Engineering Idea 3: use what we know about the stability properties to design stable buildings.
- Students will be able to explain how the various stability properties - shape of a building, materials it's made out of, how it's pieces fit together, all work together to help it's stability (stay up) so it doesn't fall down.

What types of back pocket questions might you use to elicit this from students?

How do you think this property of _____ helps the building to be stable?

Why do you think that is?





What would happen if you changed this _____ property of your building? How could we try different ways to compare what happens to its stability?

Formative Assessment - tracking data

Partner Discussions: Shared-Listening Routines & small or whole group discussions.

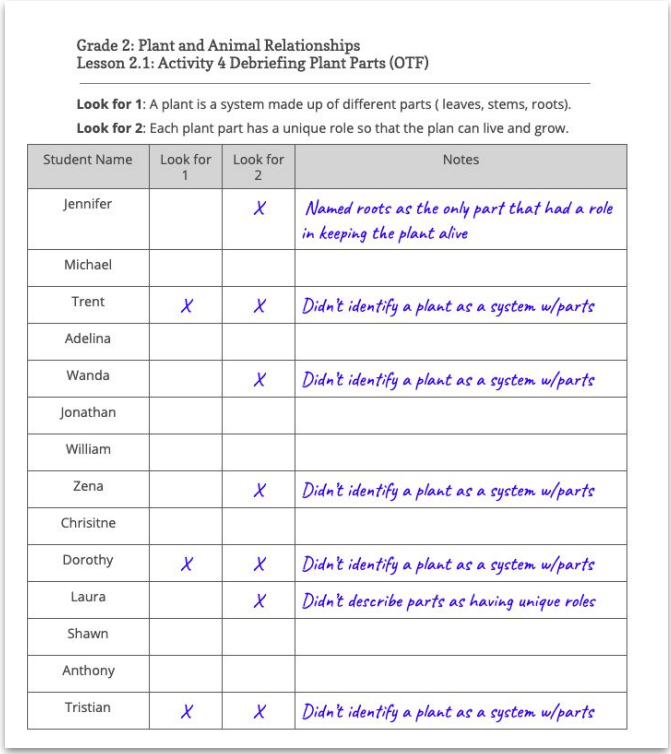
Shared Listening: What do you observe about this stable building? Will this piece help your building be more stable? How?

Look for how students **communicate** their ideas with their partners. Consider the following:

- Do students clearly share their ideas with their partners?
- Do students refer to specific features they observe in the pictures or their buildings?
- Do students provide a rationale for their ideas?

*Students who are **developing facility with communicating like engineers and scientist will clearly share their ideas, refer to specific features of the pictures or their design, and/or provide a rationale** for their thinking.*

What might you do to draw students' attention to details that they haven't noticed yet?



Grade 2: Plant and Animal Relationships
Lesson 2.1: Activity 4 Debriefing Plant Parts (OTF)

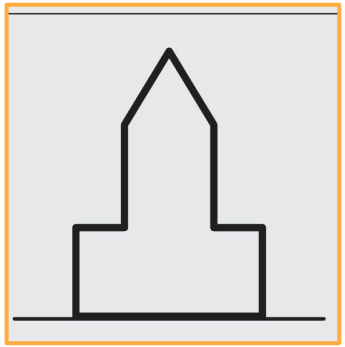
Look for 1: A plant is a system made up of different parts (leaves, stems, roots).
Look for 2: Each plant part has a unique role so that the plan can live and grow.

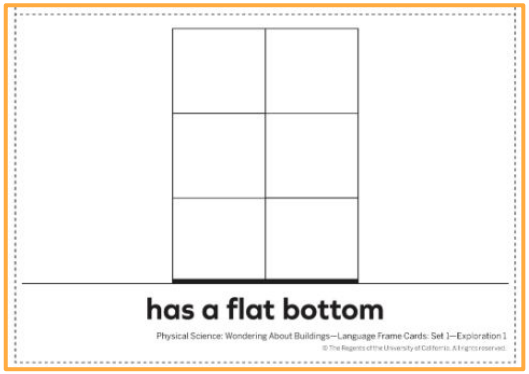
Student Name	Look for 1	Look for 2	Notes
Jennifer		X	Named roots as the only part that had a role in keeping the plant alive
Michael			
Trent	X	X	Didn't identify a plant as a system w/parts
Adelina			
Wanda		X	Didn't identify a plant as a system w/parts
Jonathan			
William			
Zena		X	Didn't identify a plant as a system w/parts
Chrisitne			
Dorothy	X	X	Didn't identify a plant as a system w/parts
Laura		X	Didn't describe parts as having unique roles
Shawn			
Anthony			
Tristian	X	X	Didn't identify a plant as a system w/parts

This stable building _____ .

has

does not have



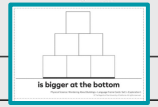


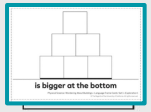
Language Frames Build Unit 2

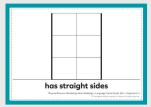
Language Frame 1

On one or two sentence strips, write the language frame shown below. Place the l
frame in a pocket chart or attach it to a whiteboard with magnets. Place the cards
pocket chart beneath the language frame. Make sure the cards are turned over s
are not revealed to students until you discuss them in Activity 4. Place several ha
of paper in the pocket chart for any additional language frame cards you may nee
create during Activity 4.

This stable building _____ .



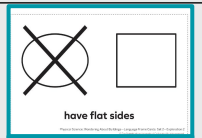


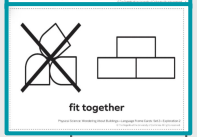


Language Frame 2

On one or two sentence strips, write the language frame shown below. Place the langu
frame in a pocket chart or attach it to a whiteboard with magnets. Immediately before
Activity 4, place the cards in the pocket chart beneath the language frame. Make sure
the cards are turned over so they are not revealed to students until you discuss them i
Activity 4. Place several blank half-sheets of paper in the pocket chart for any addition
language frame cards you may need to create during Activity 4.

This stable building is made of pieces that _____ .



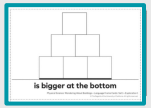


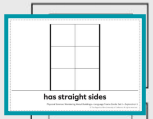
are hard

Language Frame 3

On one or two sentence strips, write the language frame shown below. Place the language frame in a pocket chart or attach it to a whiteboard with magnets. Place the cards from Explorations 1 and 2 in the pocket chart beneath the language frame.

The building is stable because it _____ , and it is made of pieces that _____ .





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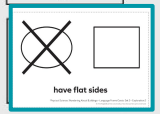

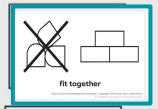

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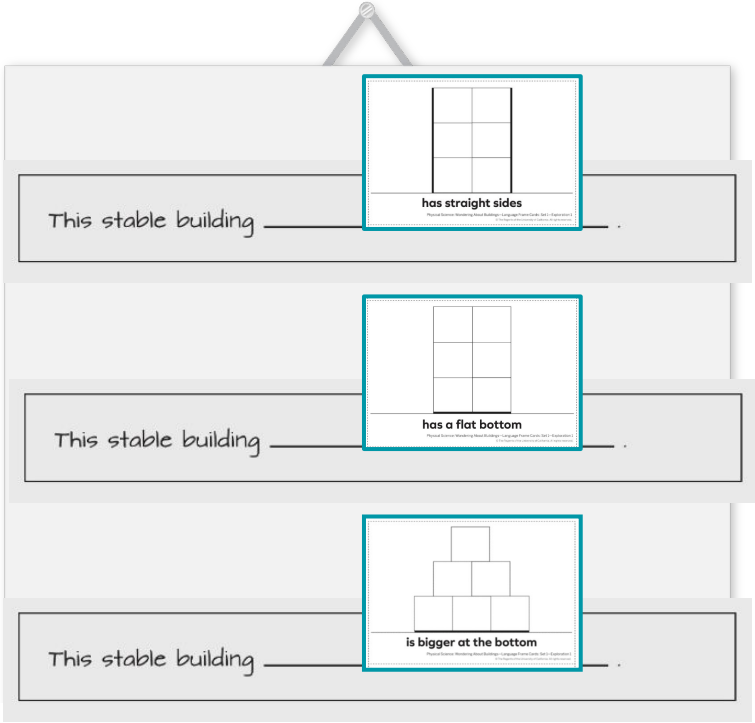
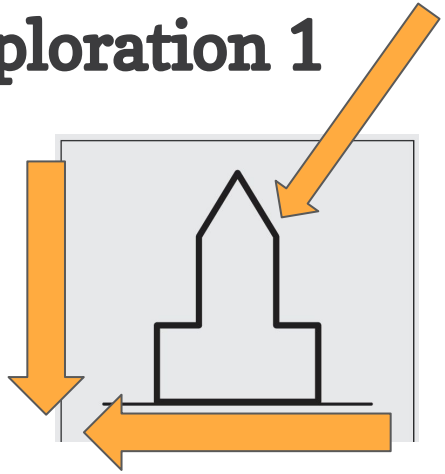
Unit 2 Shared Drawing & Writing Build - Exploration 1

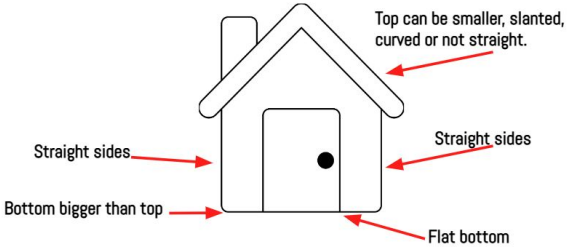
Engineering & Science Question 1: *What are stable buildings made out of?*



STABLE BUILDINGS:

- This stable building has a flat bottom.
- This stable building as some straight sides.
- This stable building is smaller on top.
- This stable building has a larger or bigger bottom.





Engineering & Science Idea 1:

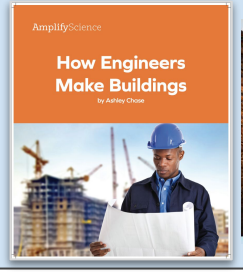
The shape of a building or structure will affect how stable it is.

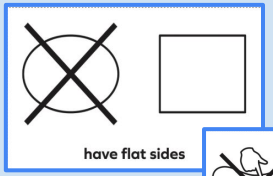
Wondering About Buildings: Gathering Evidence

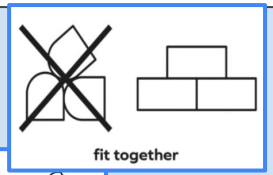
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

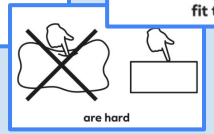
Exploration 2 Question: **what are stable buildings constructed or made with?**

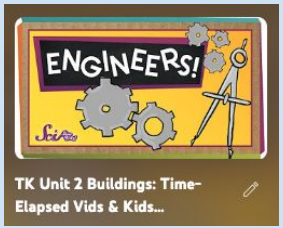
Exploration 2 Evidence











Buildings are made of pieces. The kinds of pieces affect how stable a building is. Pieces that have flat sides usually work well for making stable buildings. Pieces that are hard usually work well for making stable buildings. Making careful observations can help engineers make comparisons.

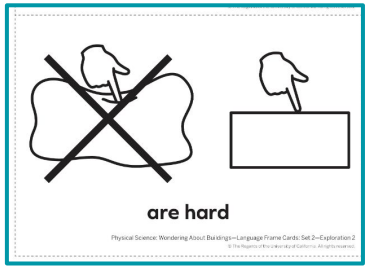
Formative Assessment

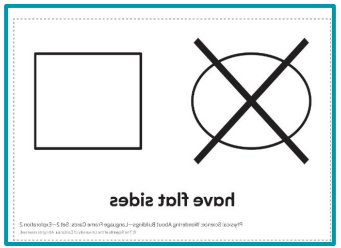
Unit 2 Exploration 2 Activity 3

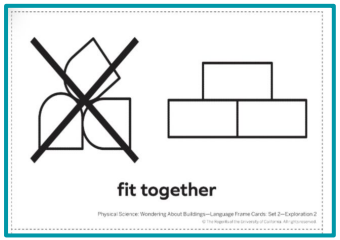
TG pg 102 Step 10

Shared-Listening Routine:

How do your building pieces help make your tower more stable or less stable?







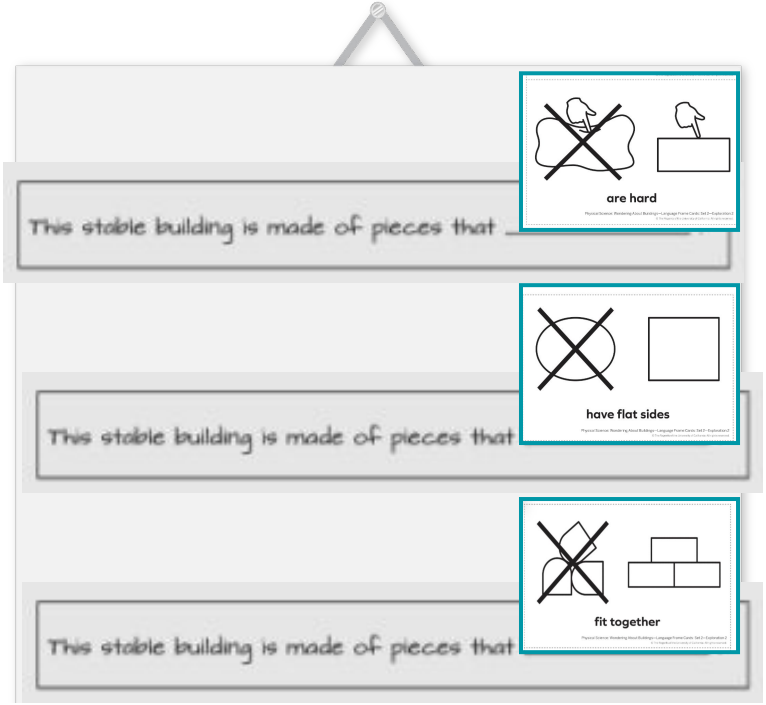
Look for students who connect relevant characteristics of a piece to the piece's potential for making a stable building, e.g. a piece may be helpful because it is hard, not soft, or because it has some flat sides, not curved or irregular shaped.

Students are *not* expected to understand how the physical properties of their pieces affect stability. However, students may be starting to formulate a **connection between** the the physical properties of the pieces that are used and building stability**.**

Students learn that the properties of the pieces that they use will affect the stability of their structure or building.

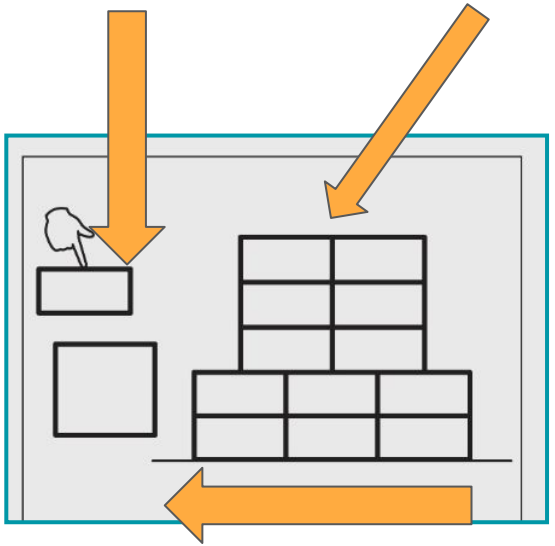
Unit 2 Shared Drawing & Writing Build - Exploration 2

Engineering & Science Question 1: *What are stable buildings made out of?*



STABLE BUILDINGS:

- This stable building is made of pieces that are hard.
- This stable building is made of pieces that have flat sides.
- This stable building is made of pieces that fit together.



Engineering & Science Idea 2:

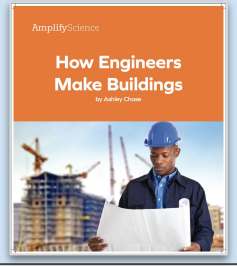
Buildings are made of pieces. The kinds of pieces affect how stable a building is.

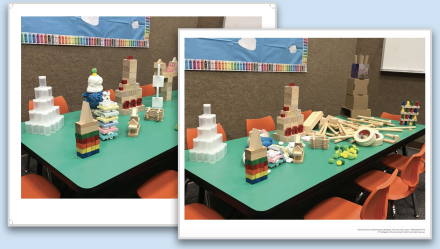
Wondering About Buildings: Gathering Evidence

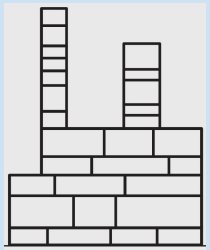
Unit Science-Engineering Question*: Something Puzzling About Buildings*
(what makes some buildings stable, & others fall down?

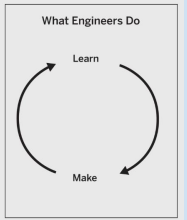
Exploration 3 Question: ***How can we make sure our buildings are stable?***

Exploration 3 Evidence









Students synthesize ideas about how a building's shape and the kinds of pieces used to make a building affect its stability. Engineers use their observations to analyze and design solutions to problems. Then they try out their solutions, and can refine or change their solutions.

Formative Assessment

TG pg 47 PN pg 27

Partner Discussions: Shared-Listening Routines
EMBEDDED: all Activities where students are sharing together with each other in partners or groups.

Look for how students **communicate** their ideas with their partners. Consider the following:

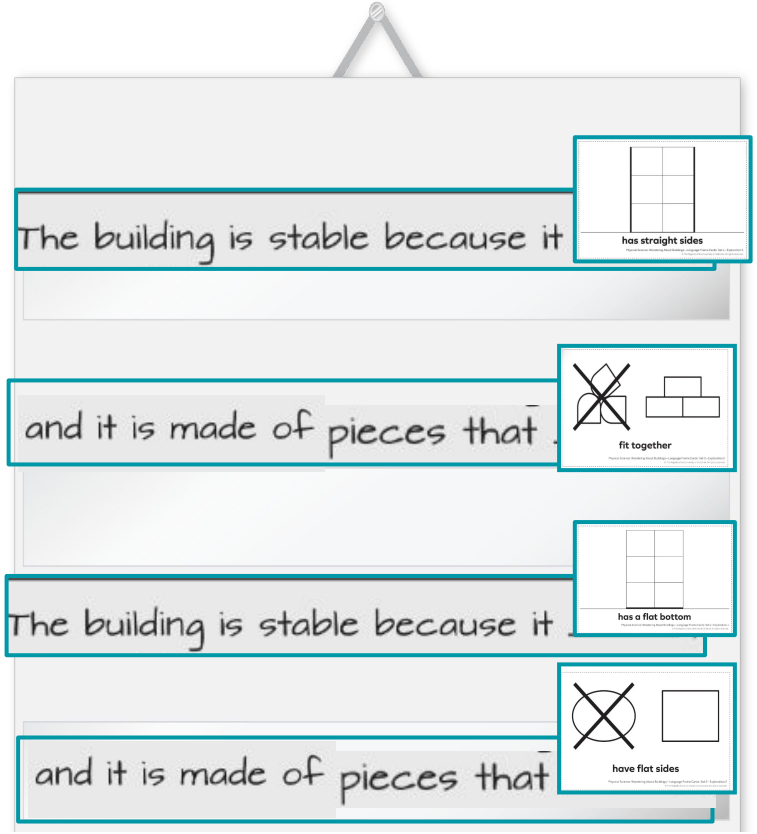
- Do students clearly share their ideas with their partners?
- Do students refer to specific features they observe in the pictures or in their designs?
- Do students provide a rationale for their ideas?

*Students who are **developing facility with communicating like engineers and scientist will clearly share their ideas, refer to specific features of the pictures or their design, and/or provide a rationale** for their thinking.*

A building or structure's shape and the properties of its pieces will affect its stability.

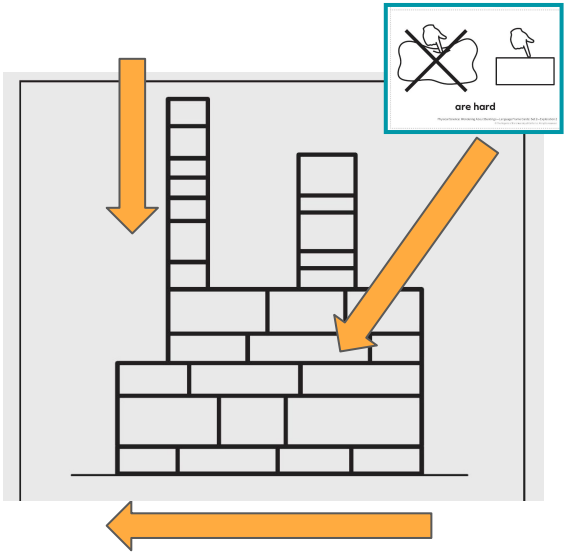
Unit 2 Shared Drawing & Writing Build - Exploration 3

Engineering & Science Question 1: *What are stable buildings made out of?*



STABLE BUILDINGS:

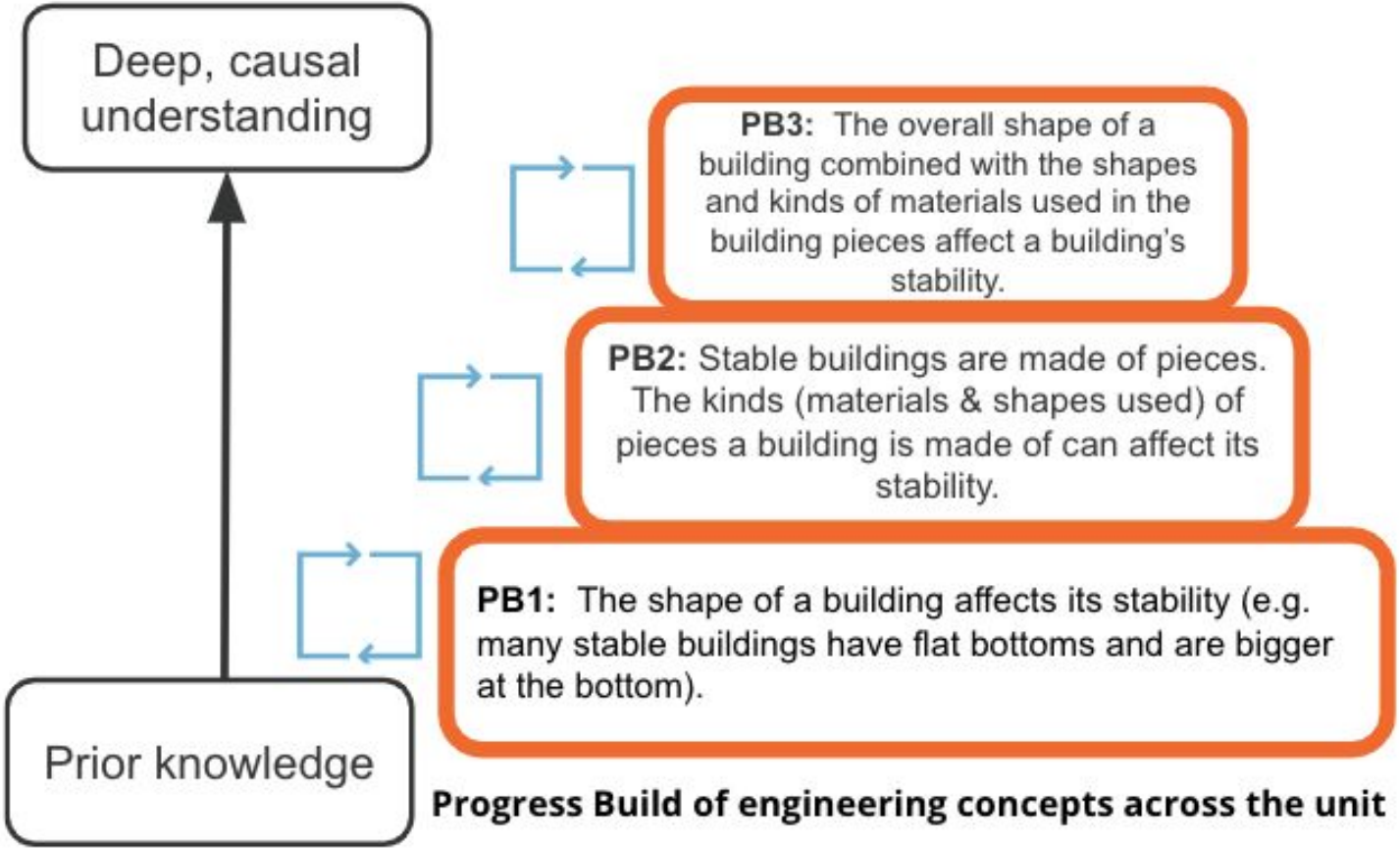
- This building is stable because it is bigger at the bottom, and it is made of pieces that have flat sides.
- This building is stable because it has a flat bottom, and it is made of pieces that are hard.



Engineering & Science Idea 3:

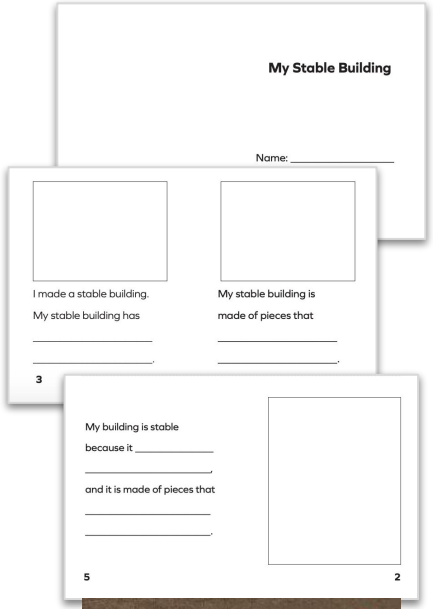
A building's shape and the kinds of pieces used to make a building combine together to affect its stability.

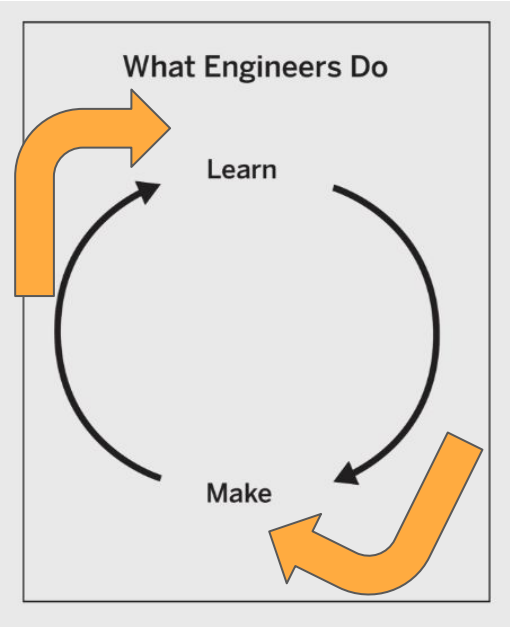
Progression of Science Concepts in *Wondering About Buildings*

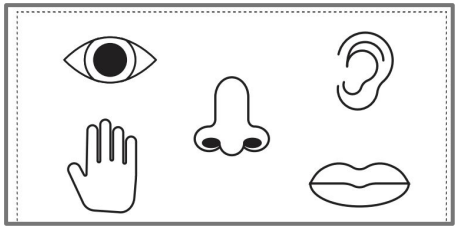


Culminating Activities - Summative Assessments

- Self-Reflection Student Conversations:
  - Work as Engineers
  - Unit Engineering & Science Concepts Content
- Optional: Home Connection Minibooks (do first in class &/or @ home, to share with families
- Class-project: Students construct their own stable buildings to contribute to the class's play city.
- Ask students to present their building to small group &/or whole class & explain why their building is stable, & what building materials they used
- Post photos & vids in class gallery or school website
- Invite other classes to "tour" TK building/city gallery







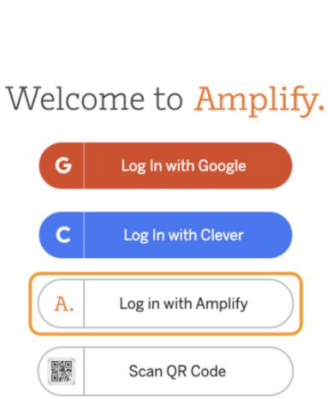
Amplify Science TK Program Hub Resources

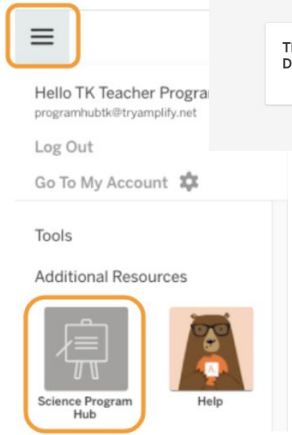
Amplify Science TK Resources

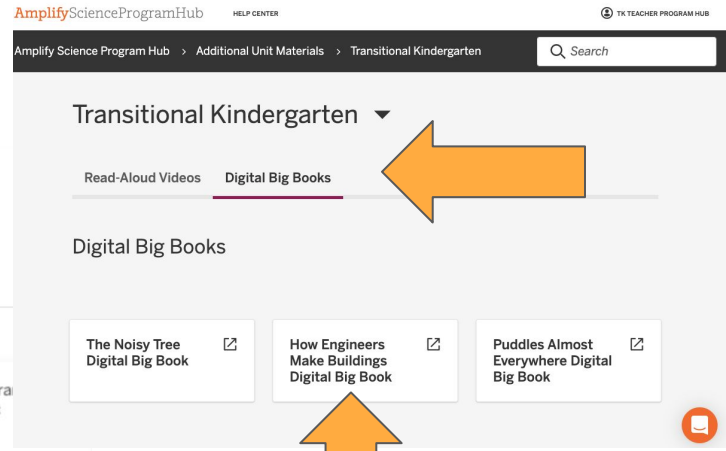
Accessing Digital Books and Read Alouds

1. Go to learning.amplify.com
2. Click "Log in with Amplify"
   a. Username: programhubTK@tryamplify.net
   b. Password: Amplify Number1

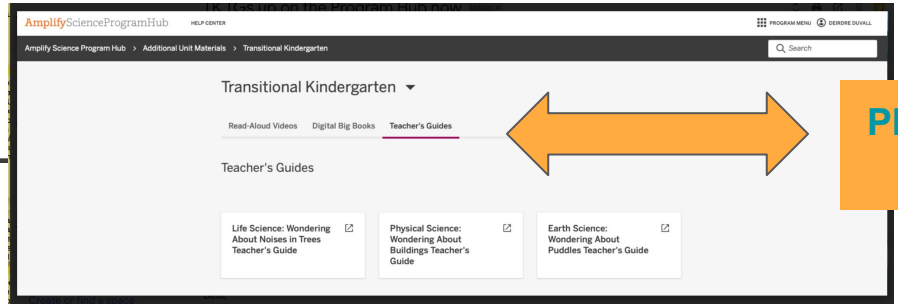
3. Use the Global Navigation Bar to open the Science Program Hub
4. From the Program Hub> Open Additional Unit Resources
5. Click on Transitional Kindergarten
6. Explore the Read- Aloud videos and Digital Big Books





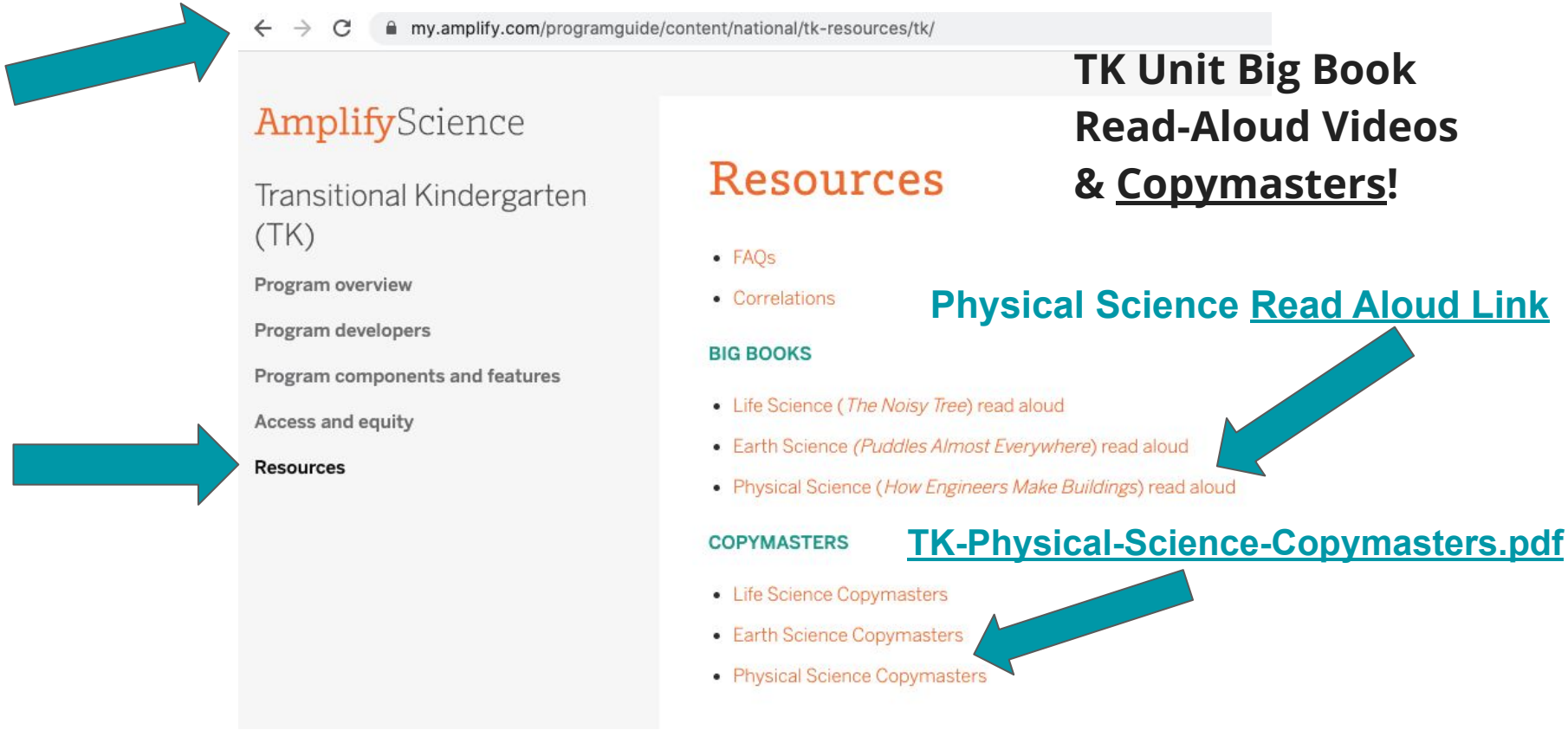


Digital PAGE-TURNER PDFs of unit big books that can be projected for lesson focus on images, vocabulary, etc.



PDFs of ALL 3 Unit TGs!

TK Program Overview Website



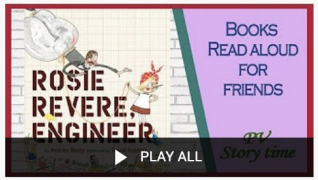
https://my.amplify.com/programguide/content/national/tk-resources/tk/

Collaborative Resources

Through working with real Amplify Science TK teachers, JoAnna, our TK expert, has put together some collaborative resources that connect to each of our TK units!

If you find new books or songs to use with the unit, please email suggestions to jchocooj@amplify.com so she can add them to our collaborative playlists.

Resource	Description
TK Unit 2 Buildings: ReadAlouds	Read-Aloud links for Fiction & Non-Fiction related literature to the *Wondering about Buildings* Unit. Different versions/readers of several books so you can pick the ones that match your class' & student's needs.
TK Unit 2 Building & Construction Songs	A playlist of songs that have connections to the themes in *Wondering about Buildings.* Songs in English and Spanish. Different versions of several songs so you can pick the ones that match your class' & student's needs.
TK Unit 2 Building Videos	A playlist of time-elapsed videos of construction, tallest building comparisons and other engineering-related videos.



TK Unit 2 Buildings: ReadAlouds

28 videos • 3 views • Updated today

Public

Read-Alouds of both fiction & nonfiction, classics & modern, to correlate with Amplify Science TK Unit 2 "Wondering About Buildings". Different versions/readers of several books so you can pick the ones that match your class' & student's needs.

JoAnna Chocooj

TK Unit 2 Buildings - Songs

22 videos • No views • Updated today

Public

Songs & chants, to correlate with Amplify Science TK Unit 2 "Wondering About Buildings". Different versions several songs so you can pick the ones that match your class' & student's needs.

TK Unit 2 Buildings: Time-Elapsed Vids & Kids Engineering

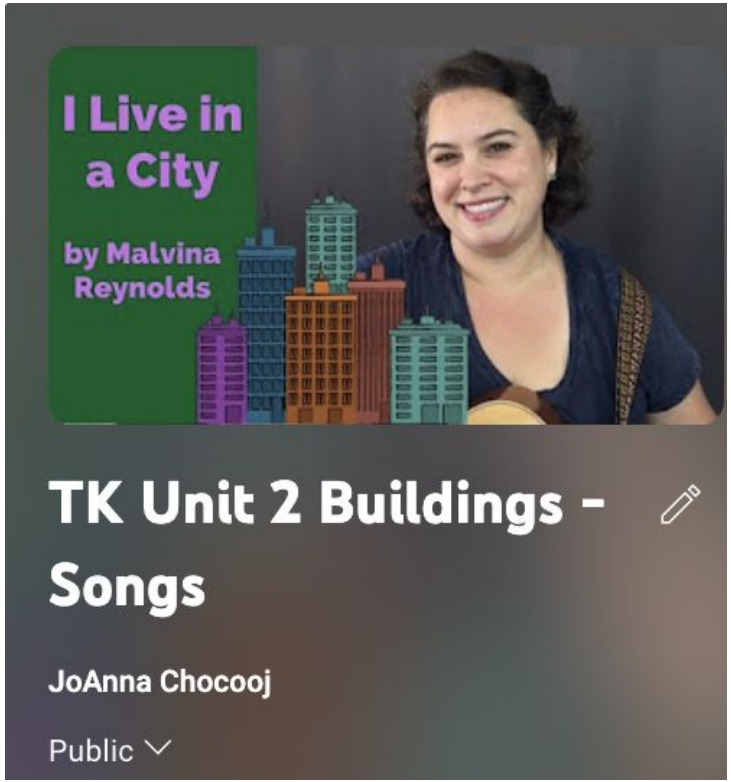
How High Can You Stack? | Engineering for Kids

SciShow Kids • 425K views • 5 years ago

Planning Time

____ mins

[5 minute timer](#) - ***or play some songs from playlist!***
[TK Unit 2 Building & Construction Songs](#)



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


Thank
you

THE EXPERT IN ANYTHING WAS ONCE A BEGINNER