Amplify Science

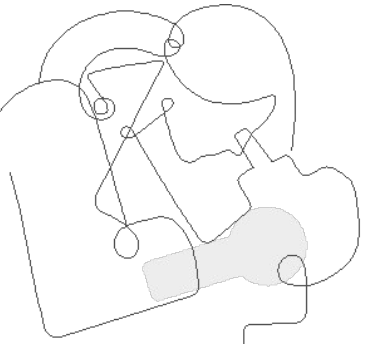
The Assessment System

Grade 5, Unit 2: Modeling Matter

Part 3

Strengthen workshop

School/District Name
Date
Presented by Your Name



PLPG CERTIFIED PROVIDER

Amplify's Purpose Statement

Dear teachers,

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

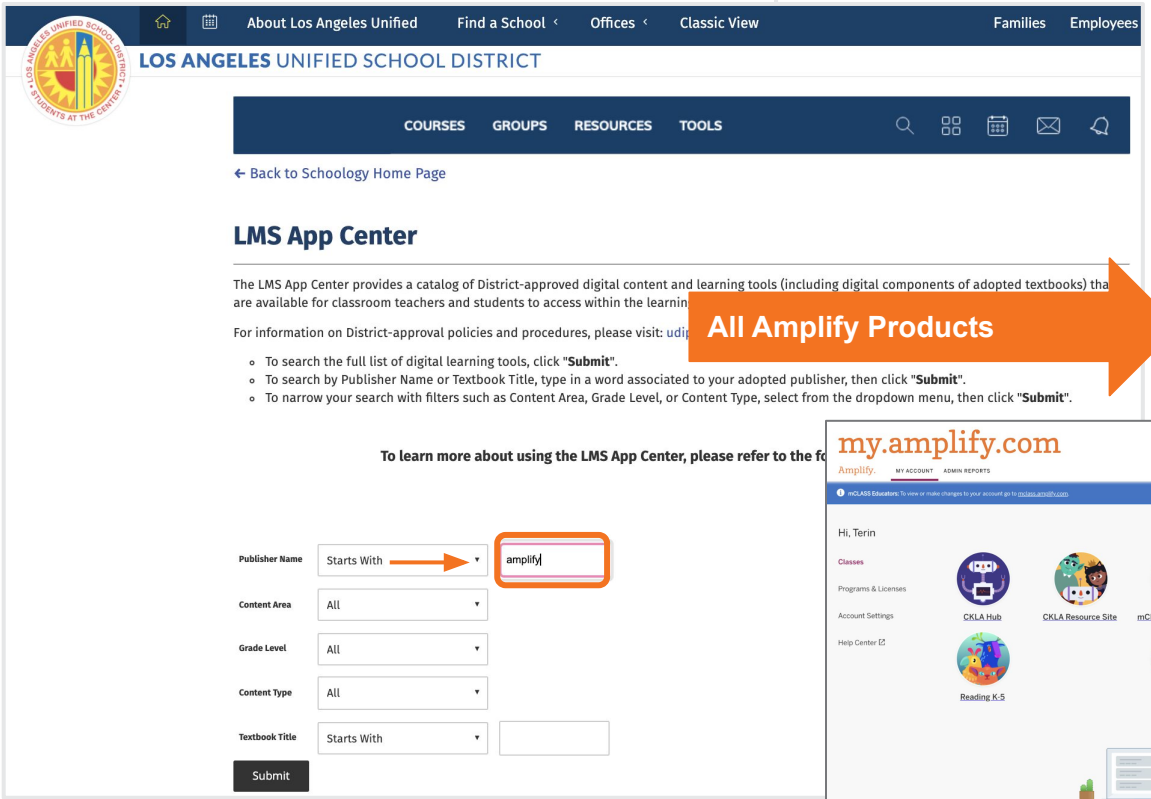
We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

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

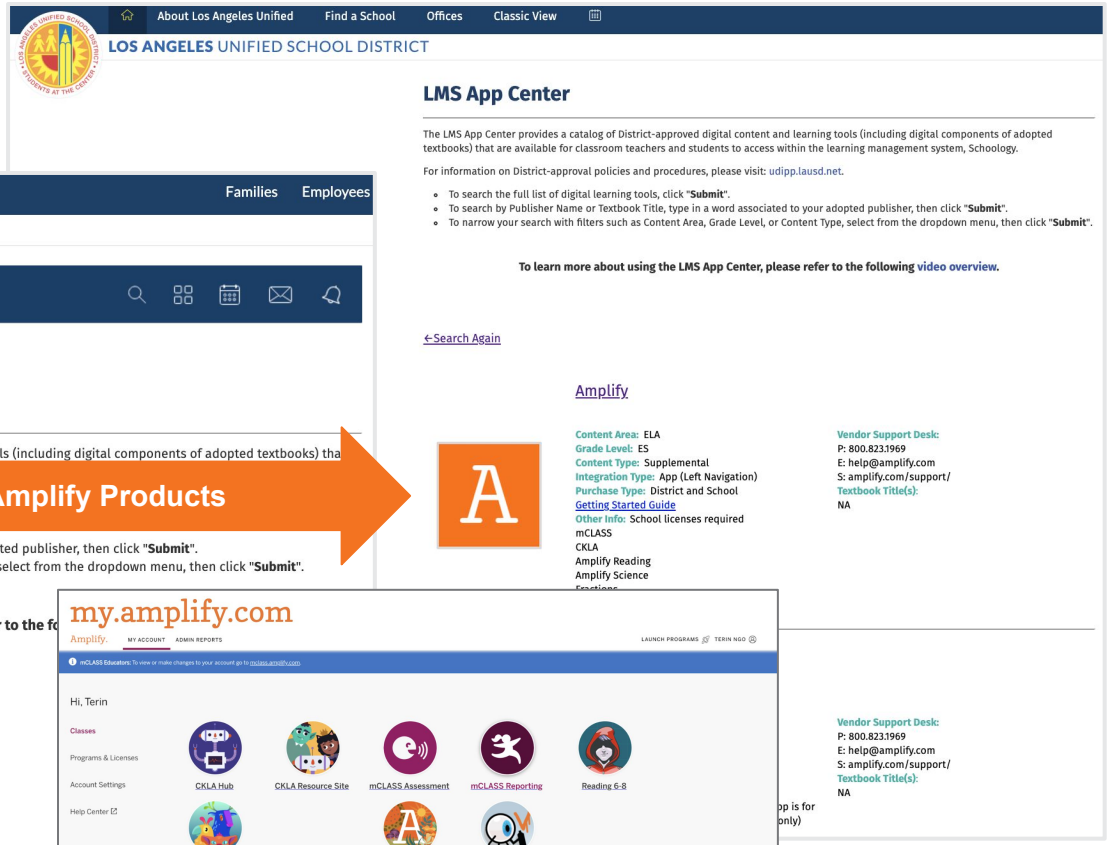
We share your goal of **inspiring all students to think deeply, creatively, and for themselves.**

Sincerely,
Amplify

Schoology



All Amplify Products



Join Amplify Science Schoology Group

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

Navigation Temperature Check

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

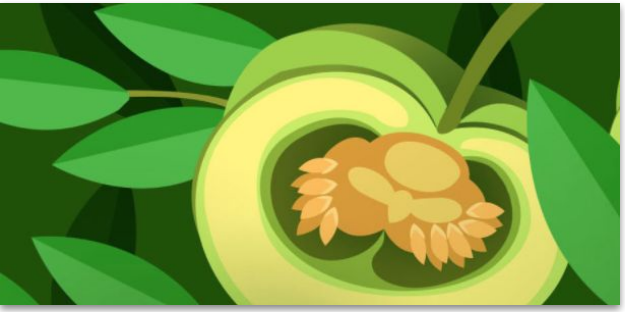
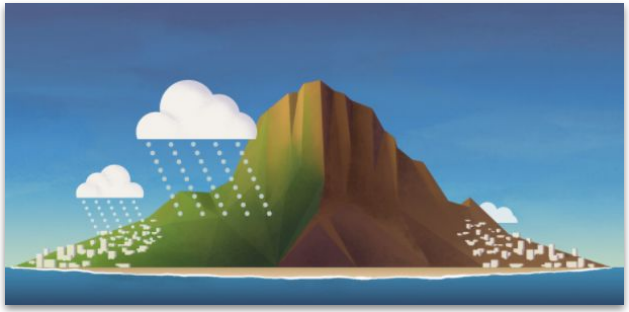
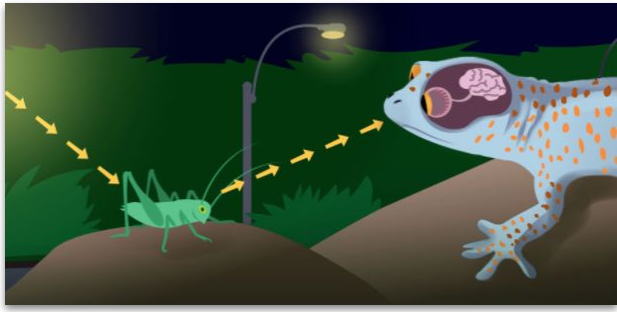
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable

Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Overarching goals

- Describe the structure and purpose of the Amplify Science Assessment System
- Plan for the strategic use of assessment resources to analyze and respond to student work

Norms: Establishing a culture of learners

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

Opening reflection

Why do we assess our students?

What is **challenging** about assessing our students?

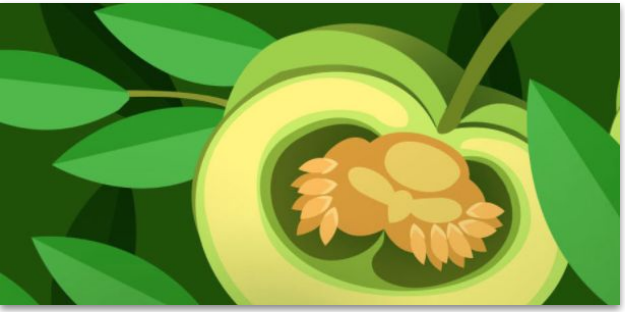
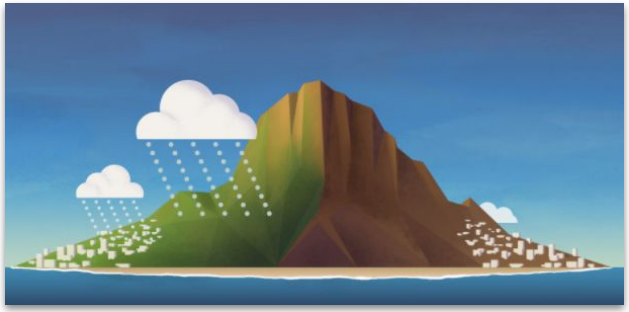
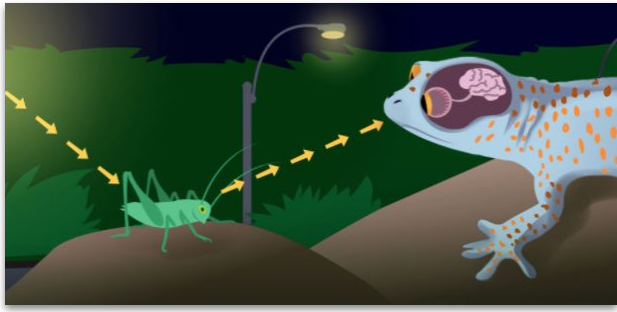
Participant Notebook

http://bit.ly/3VpDp0t

Opening Reflection: Assessment

Why do we assess our students?

Why do we assess our students?

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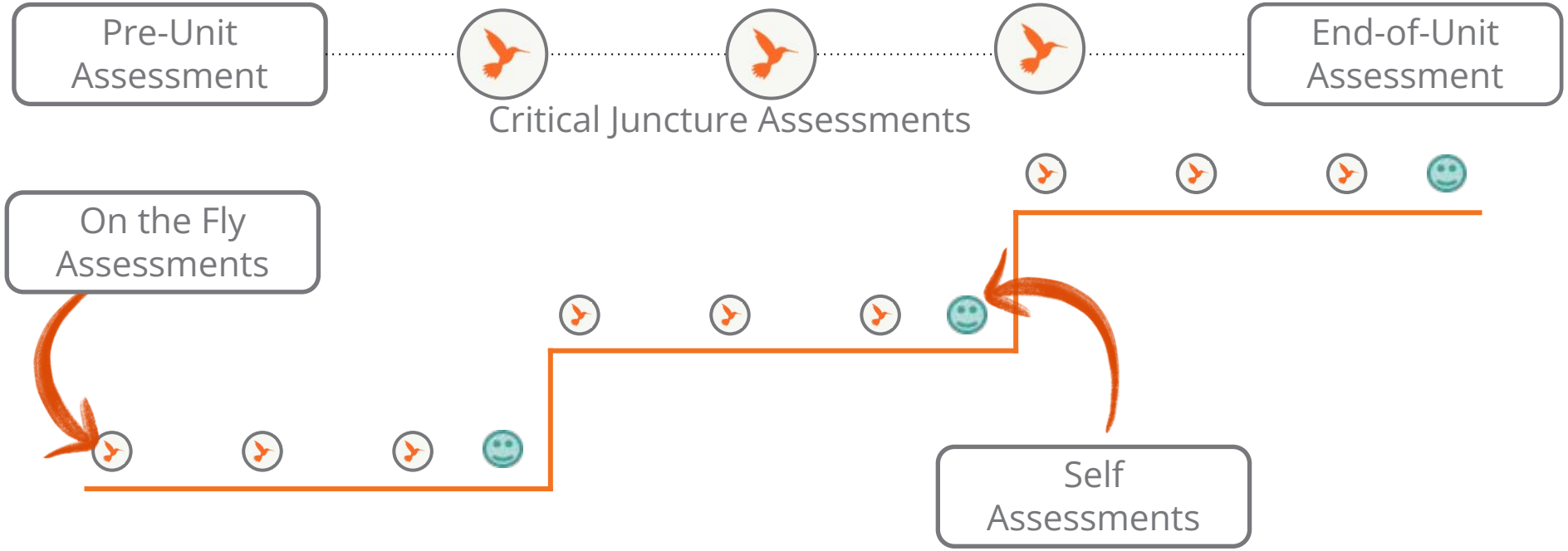
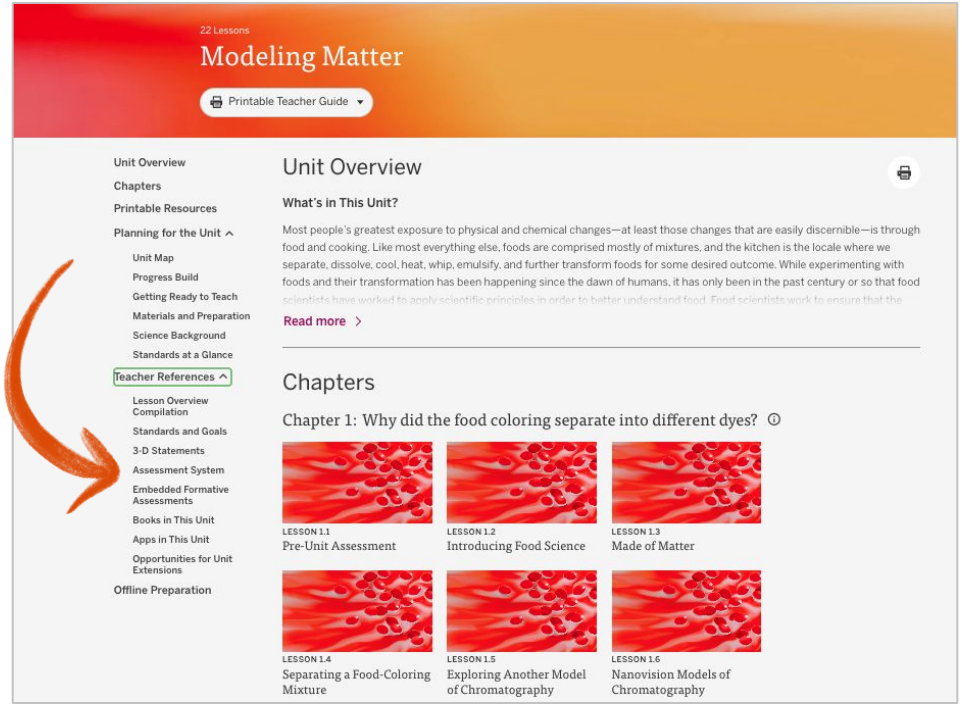
K-5 Assessment System

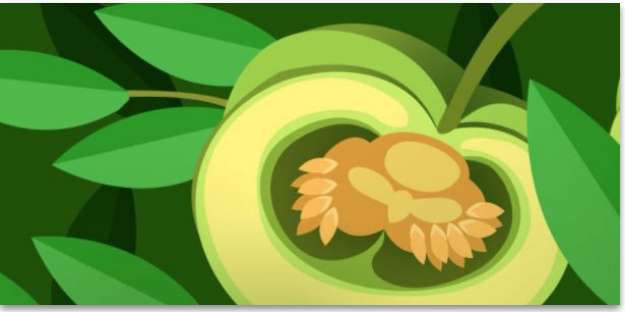
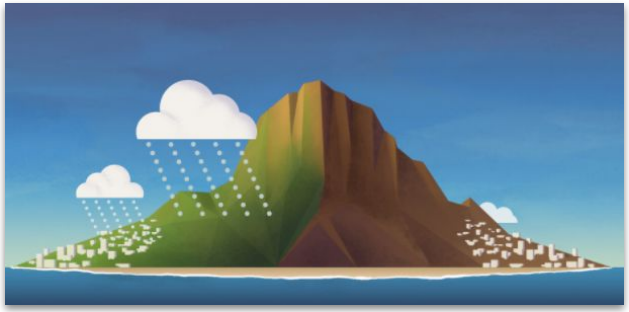
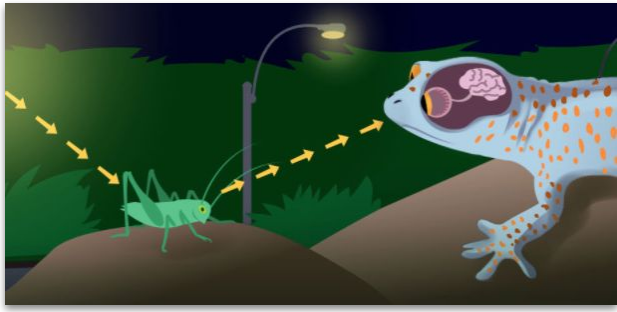


Assessment System Document

Modeling Matters



Questions?

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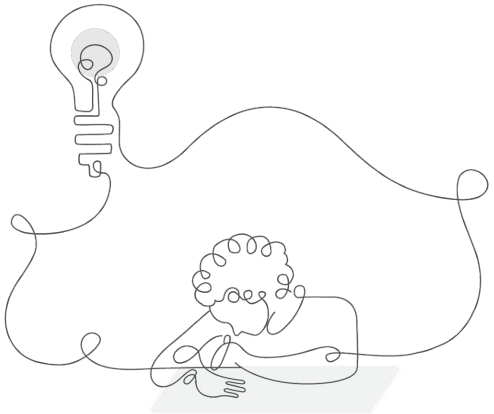
Reviewing the unit phenomenon

Modeling Matter

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



Modeling Matter

Problem: Why is the food coloring from Good Food Production, Inc. not exactly the same as Red Dye #75 and may include a harmful dye?

Role: Food Scientists

Students engage in two investigations, one to identify a potentially hazardous food dye in a mixture, and the other to create a good-tasting and visually appealing salad dressing that does not separate into layers and contains no sediment.

Modeling Matter

Unit Question:

What happens when two substances are mixed together?

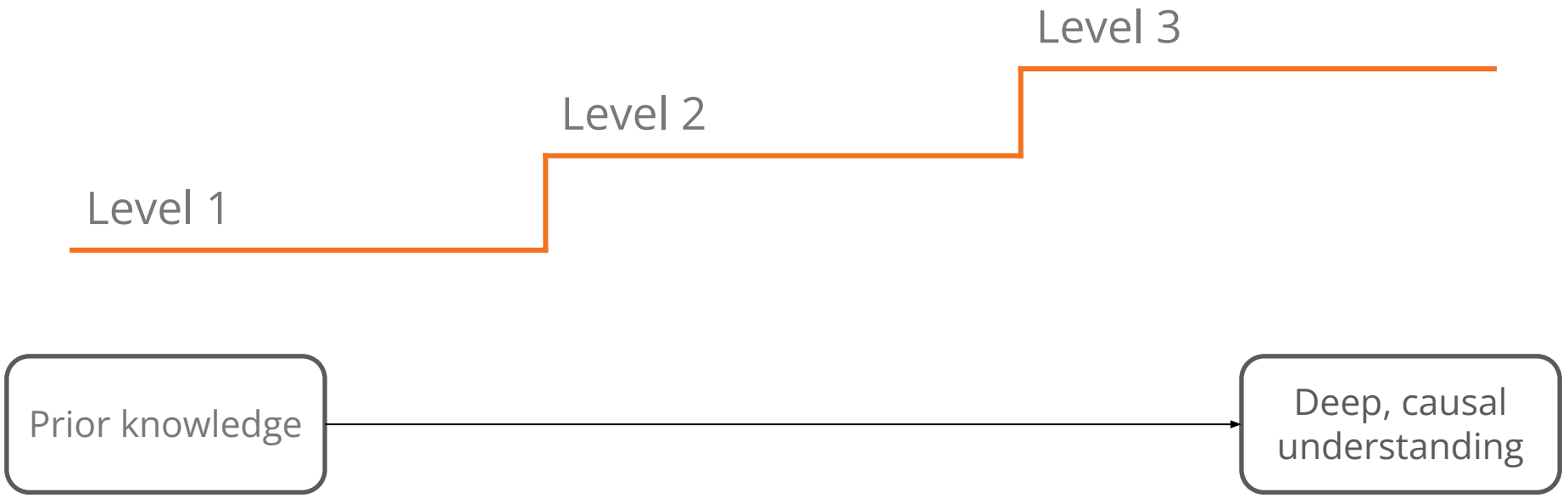
Students will understand that there is a connection between the observable properties of materials and the properties of the molecules of which those materials are composed. They will also be able to explain a variety of things that can happen when two substances are mixed, at both the observable scale and the nanoscale.

Explaining the phenomenon: Science Concepts

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

Progress Build

A unit-specific learning progression

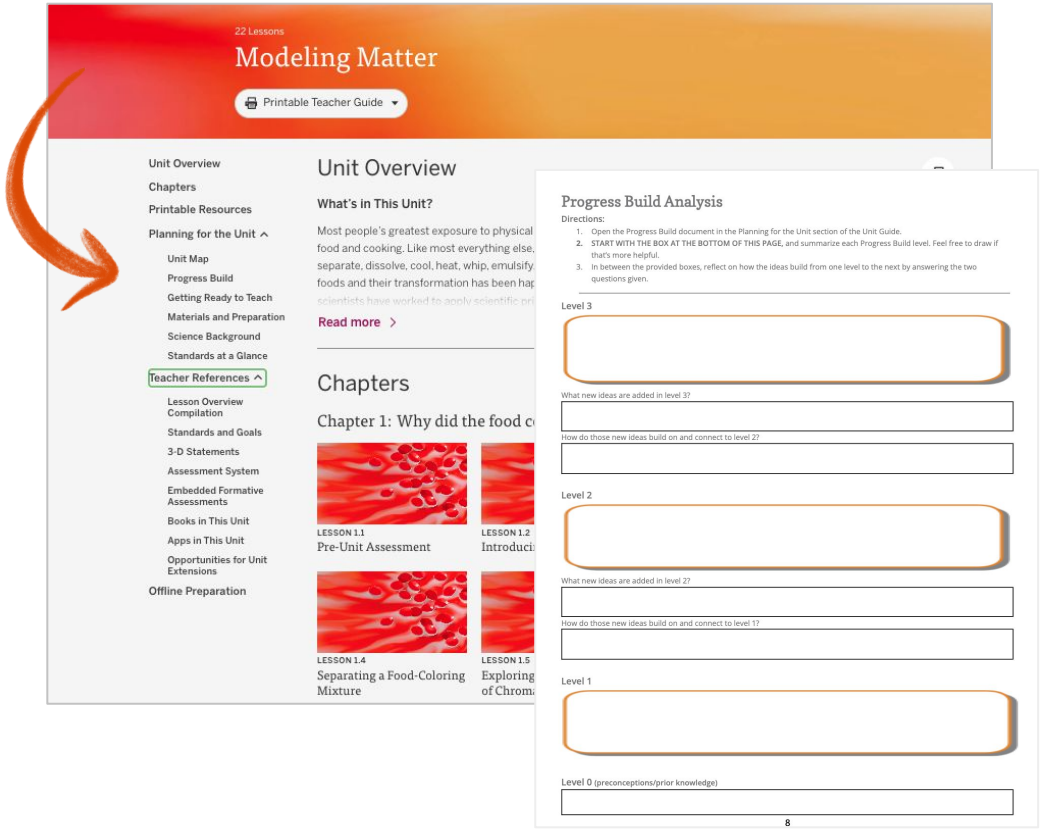


Progress Build analysis

Work time

Read and analyze your unit's Progress Build.

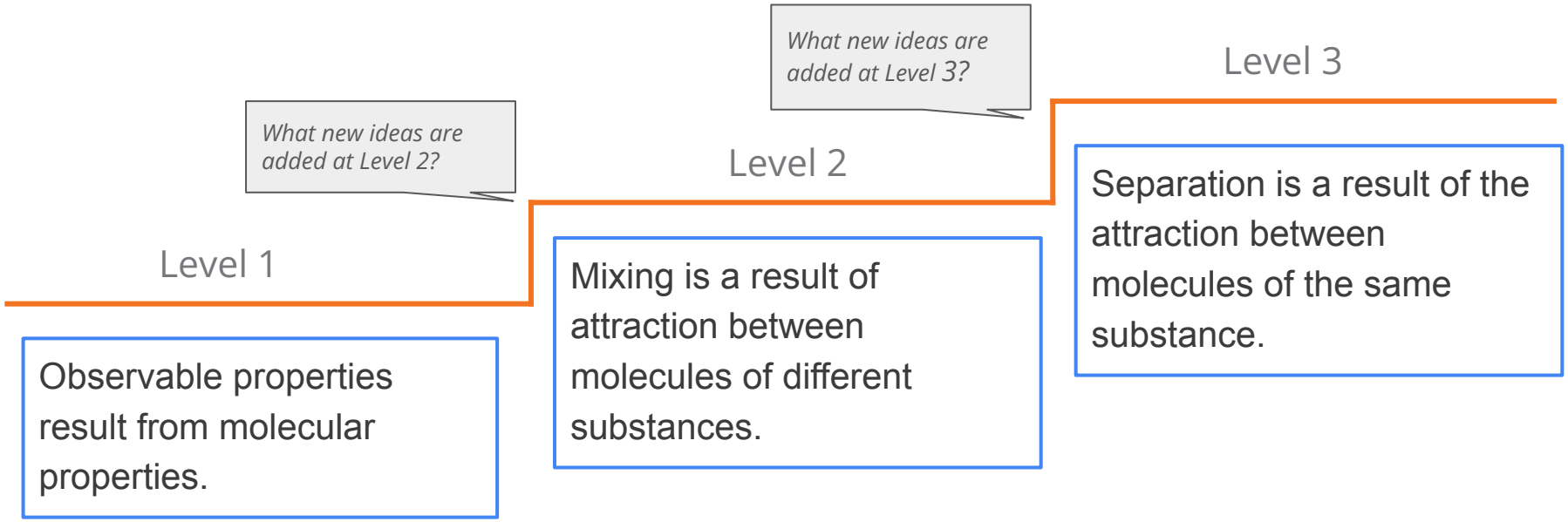
Pg. 7, 8



Progress Build

Modeling Matter

Assumed prior knowledge (preconceptions): Students are likely to have encountered the idea that matter is made up of particles that are too small to see individually. They will also likely recognize that there exist different materials that have different characteristics.

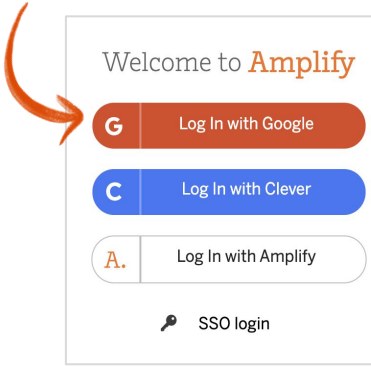


Logging in (demo account)

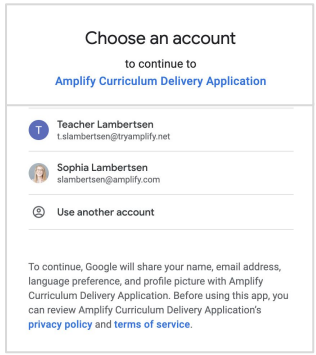
Safari or Chrome

1. Go to **learning.amplify.com**
2. Select **Log in with Google**
3. If you're already logged in with other Google accounts, click **Use another account**
4. Enter teacher demo account credentials
   - xxxxxxx@pd.tryamplify.net
   - Password: xxxx

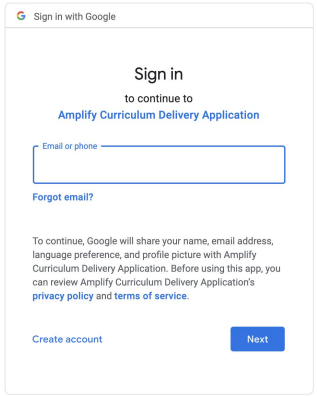
Steps 1-2

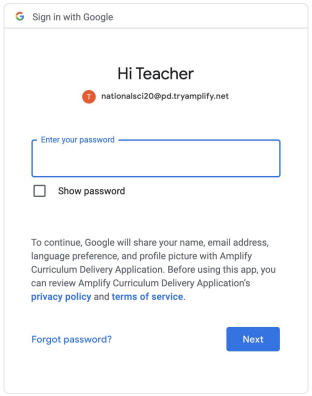


Step 3



Step 4





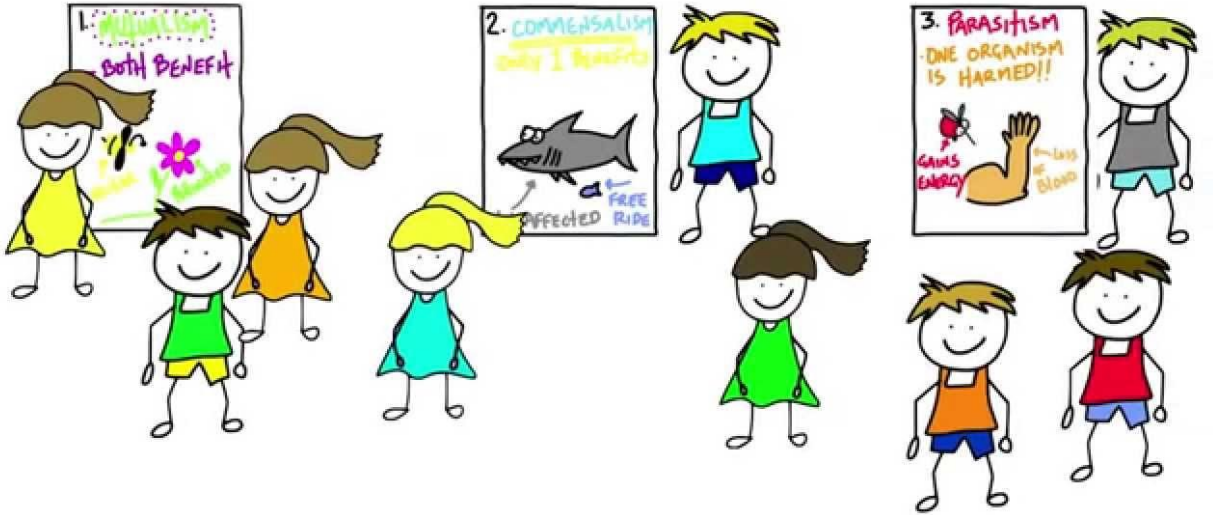
Progress Build analysis

Group work time

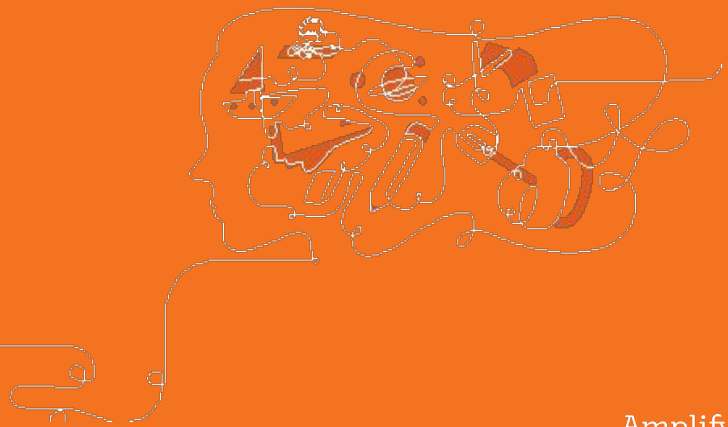
- With your group or partner, create a visual representation of one level of the progress build.

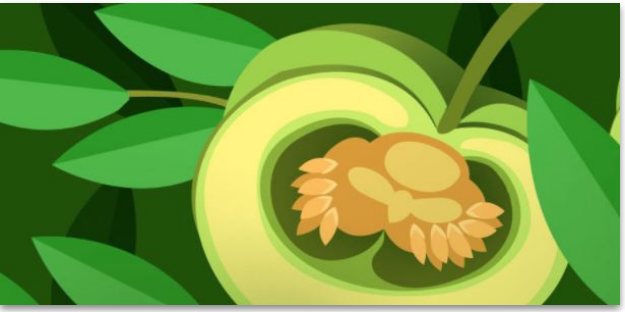
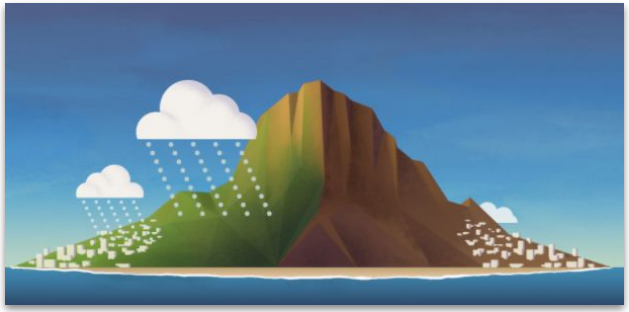
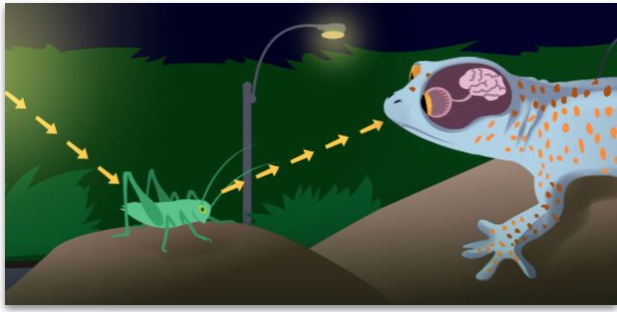
Progress Build analysis

Gallery Walk



Break



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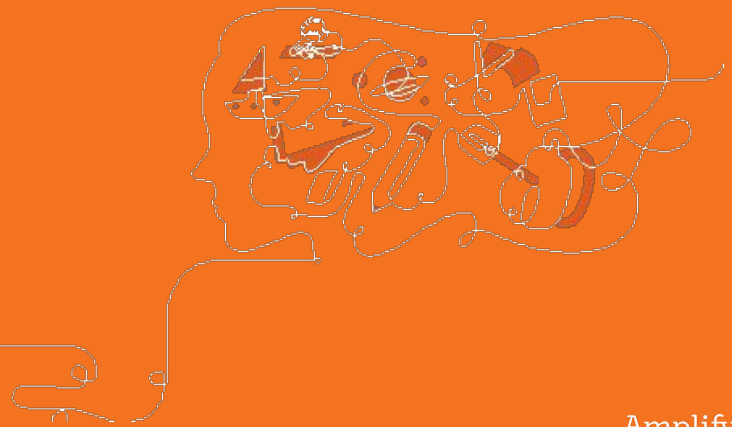
Pre-Unit Assessment



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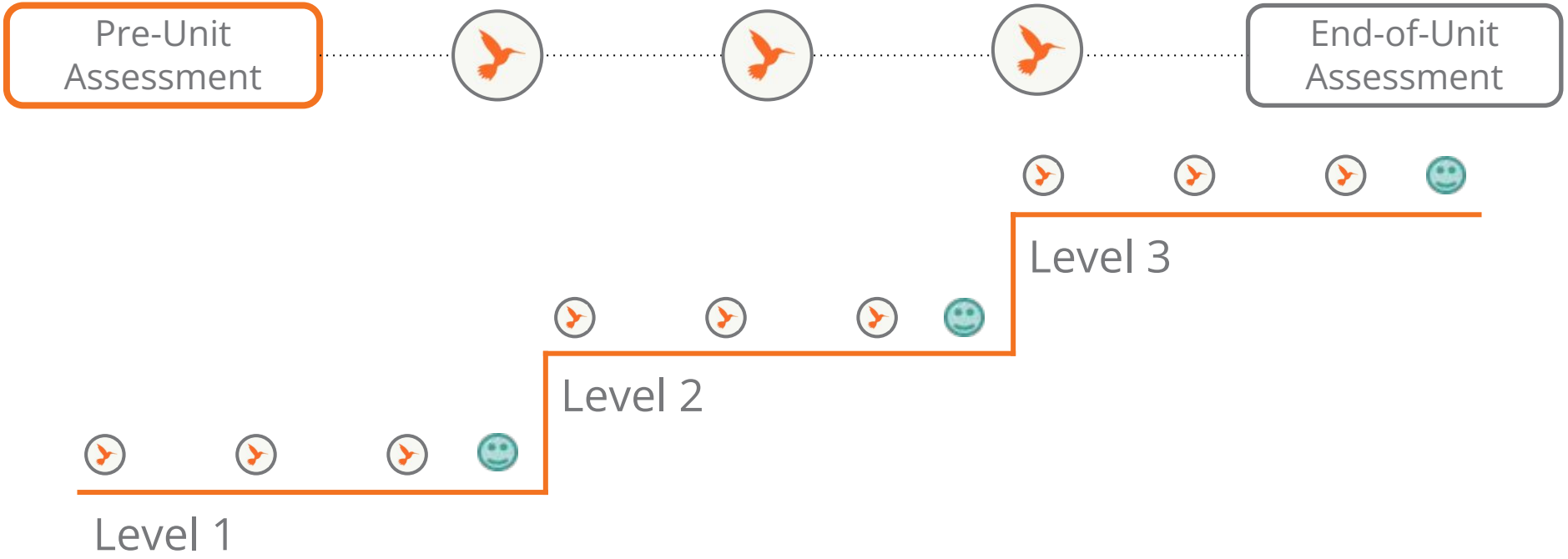

Progress Build

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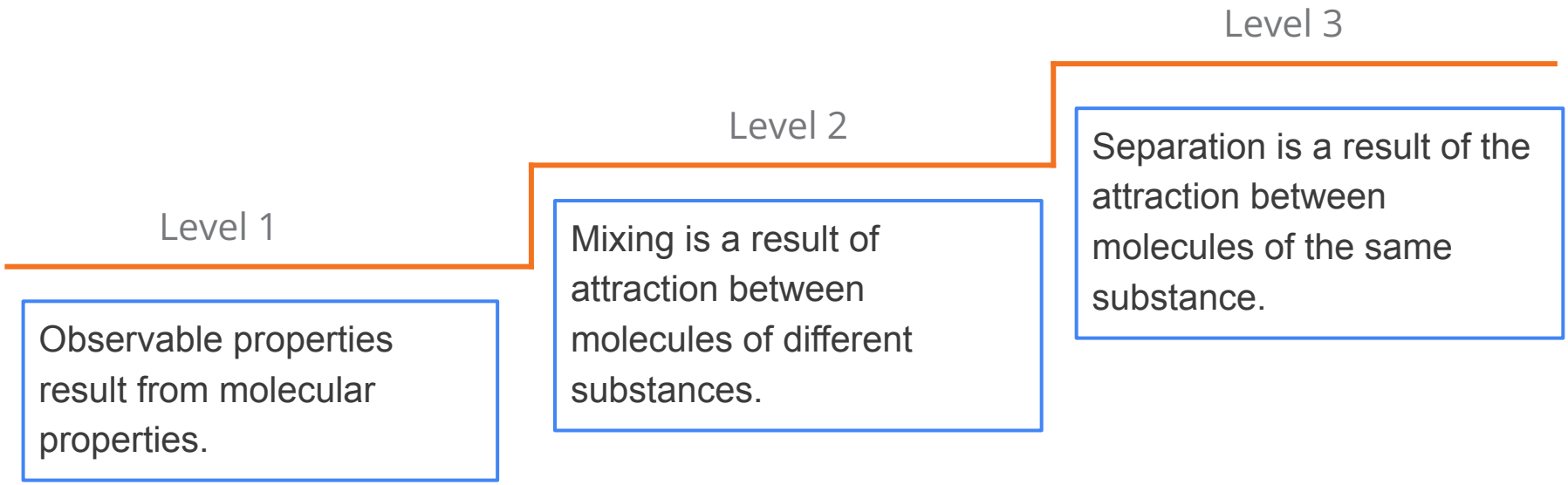
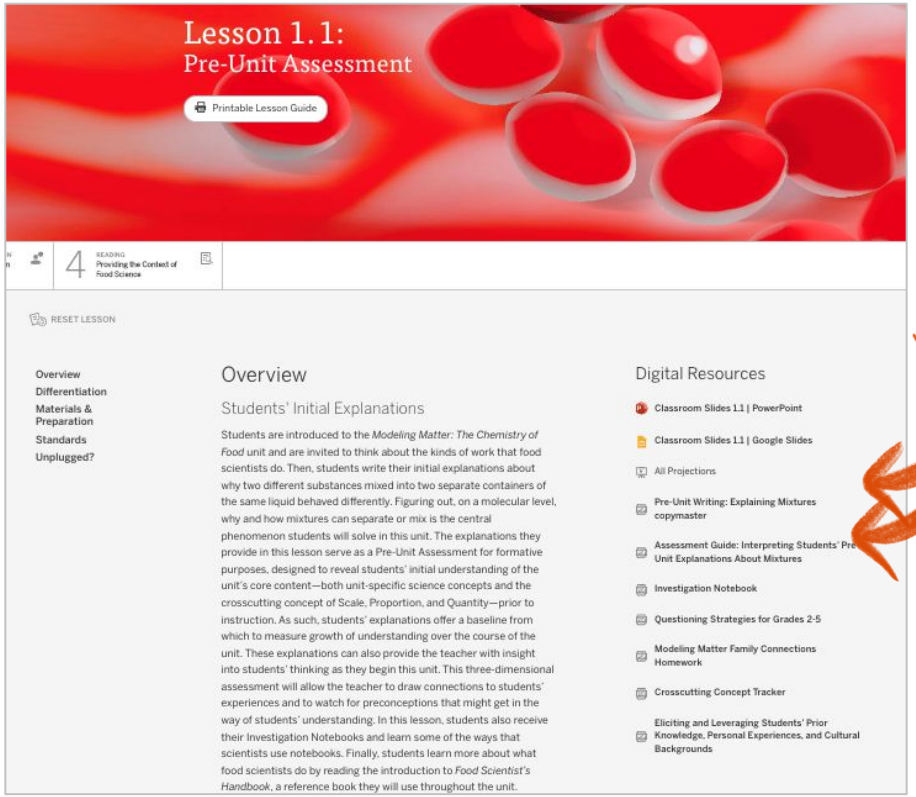


Pre-Unit Assessment

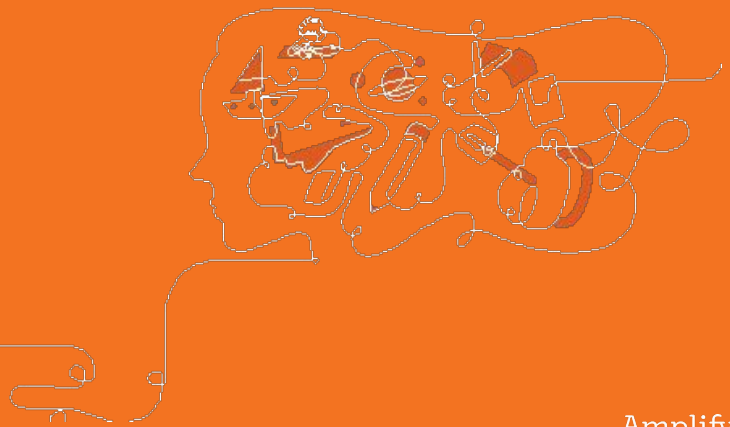
Lesson 1.1

Locate the Assessment Guide in Lesson 1.1 of your unit and skim it.

Open up the classroom slides and see how the pre-unit assessment is embedded in the lesson.



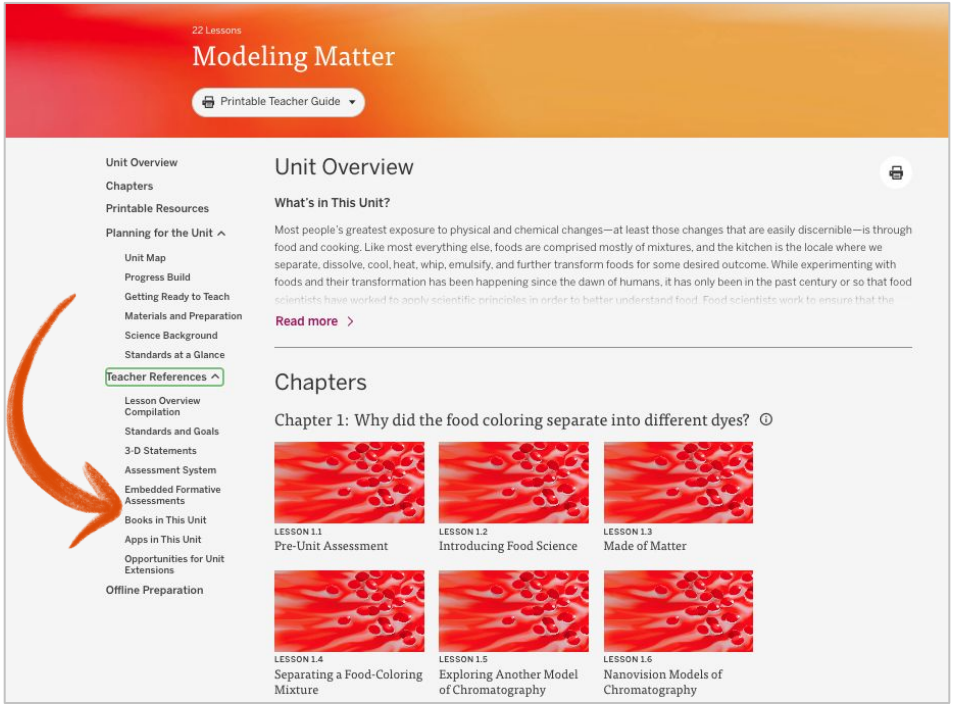
Formative Assessments



K-5 Assessment System

Formative Assessment Document

Modeling Matters



On-the-Fly Assessments

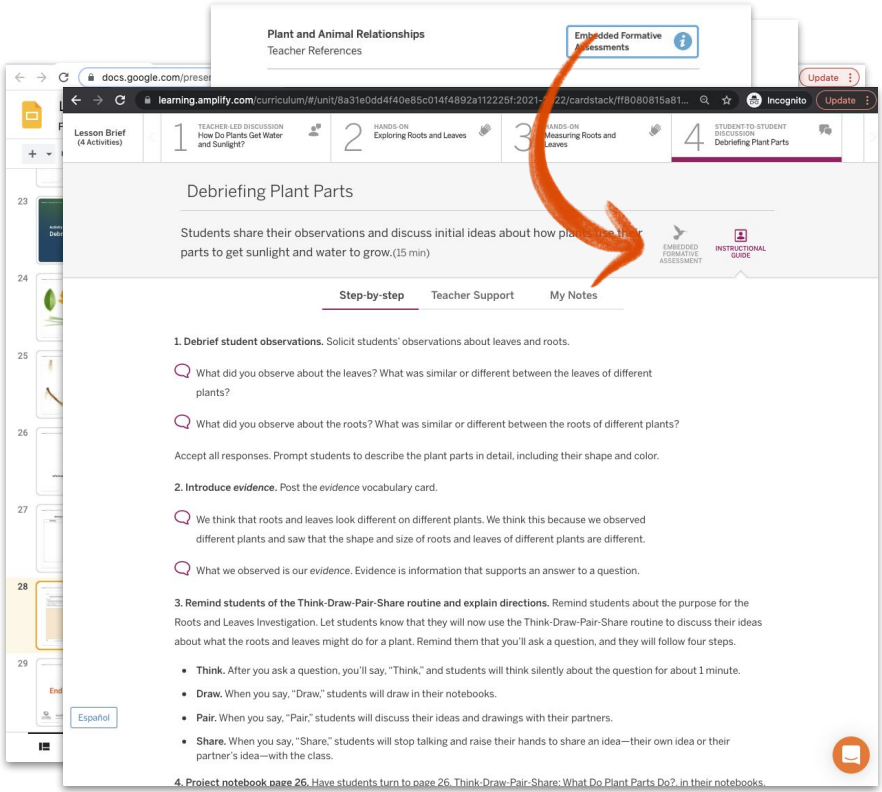
- Track student progress within a Progress Build level
- Embedded into instruction
- Assessment resource includes “Look for” and “Now what”
- Incremental build towards the Critical Juncture

Formative assessment information

Locating assessment resources

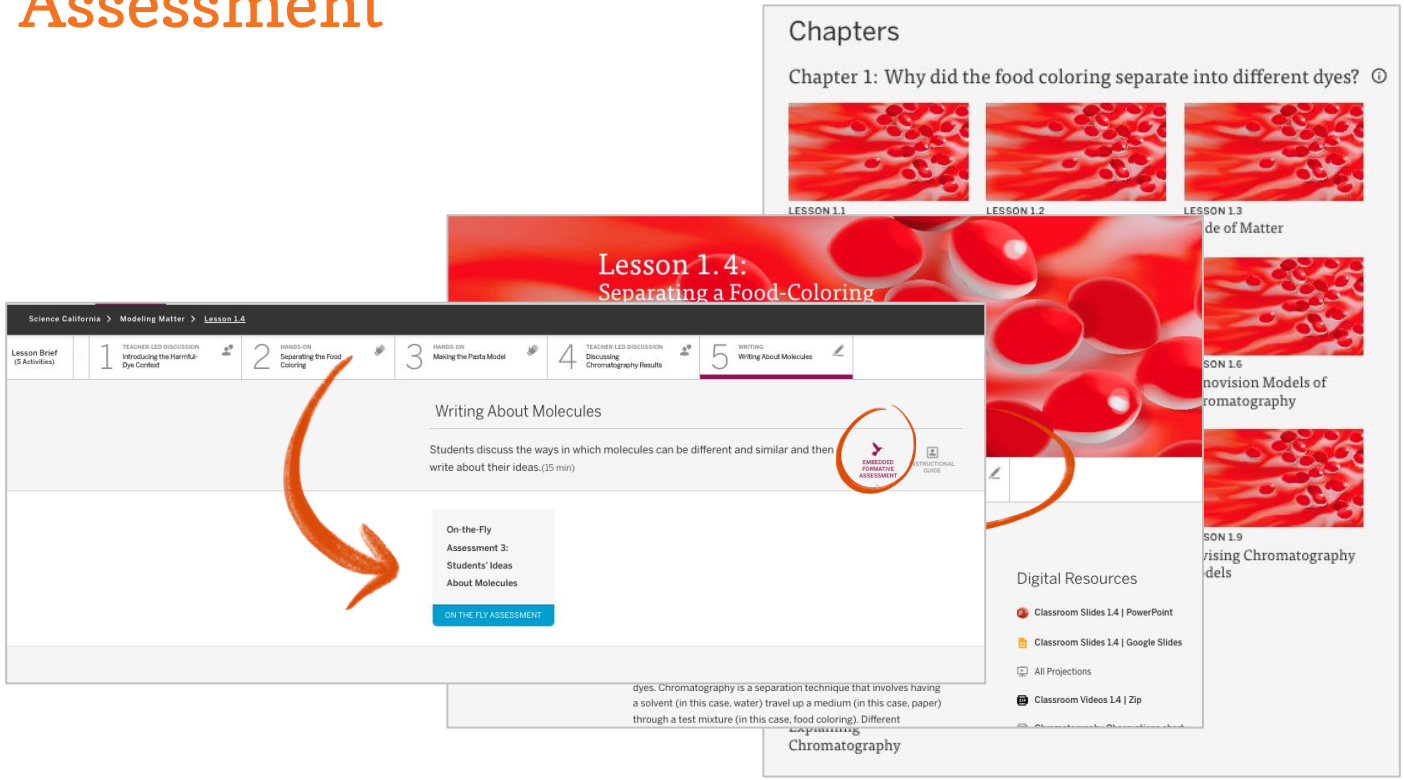
Full text of assessment

- Embedded Formative Assessments document
- Instructional guide
- Classroom Slides notes



On The Fly Assessment

Lesson 1.4



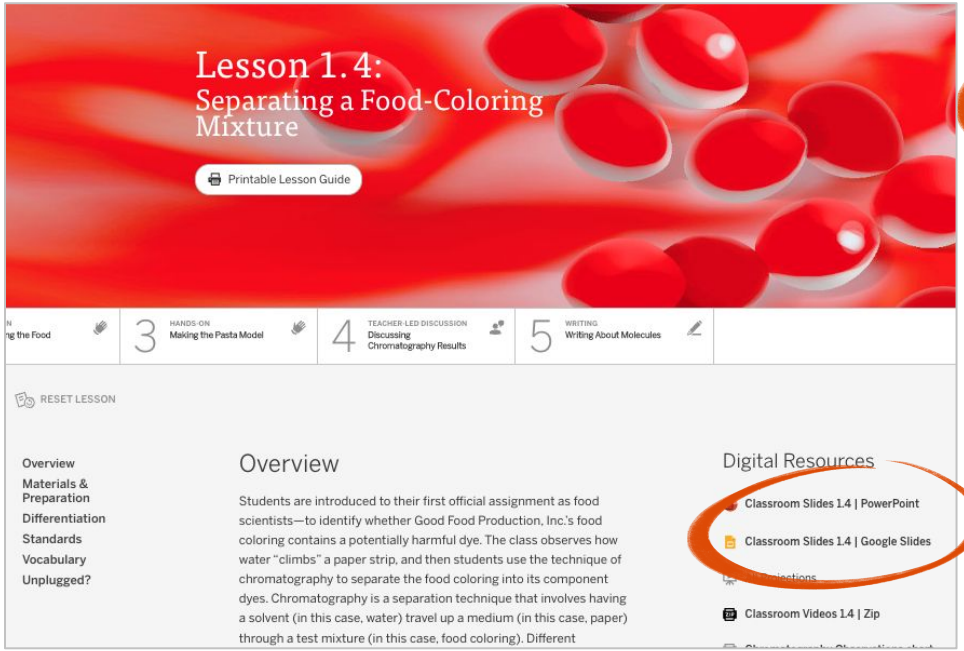
Embedded Formative Assessment
On-the-Fly, Lesson 1.4

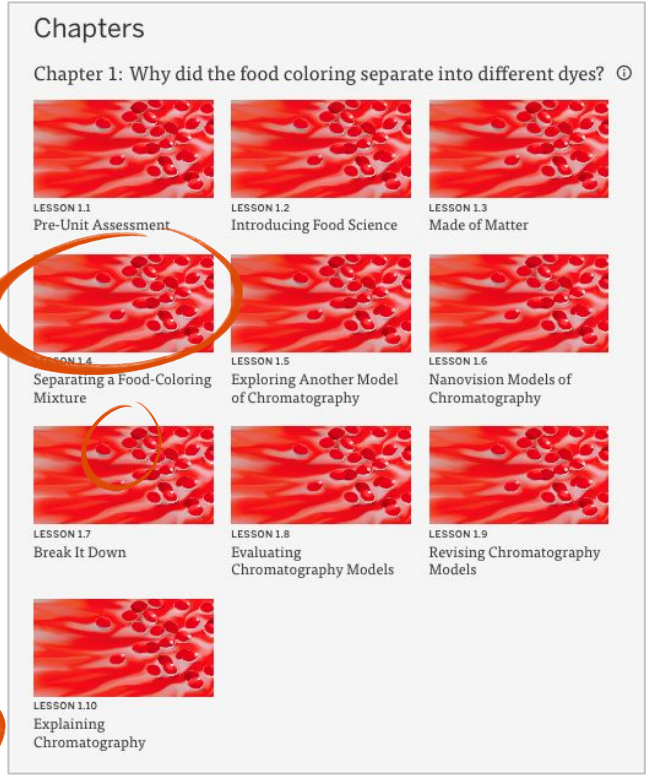
Look for: Some students may express alternate conceptions about molecules. For example, it is common for students to think that molecules are shaped exactly like some of the models they've seen, or that molecules have different colors. Make a note of any students who seem to have these ideas based on the Shared Listening discussion as well as on their written responses.

Now what? When a student expresses an incorrect idea, there is no need to correct or contradict. Instead, ask that student to describe evidence that supports his view. Then, ask students who have other ideas to describe what they think happened and elicit how their evidence supports their ideas. A major goal of the unit is for students to revise their ideas about molecules as they gather more information and evidence. Therefore, you can make note of students' alternate conceptions but resist the natural temptation to correct students at this point.

Classroom slides

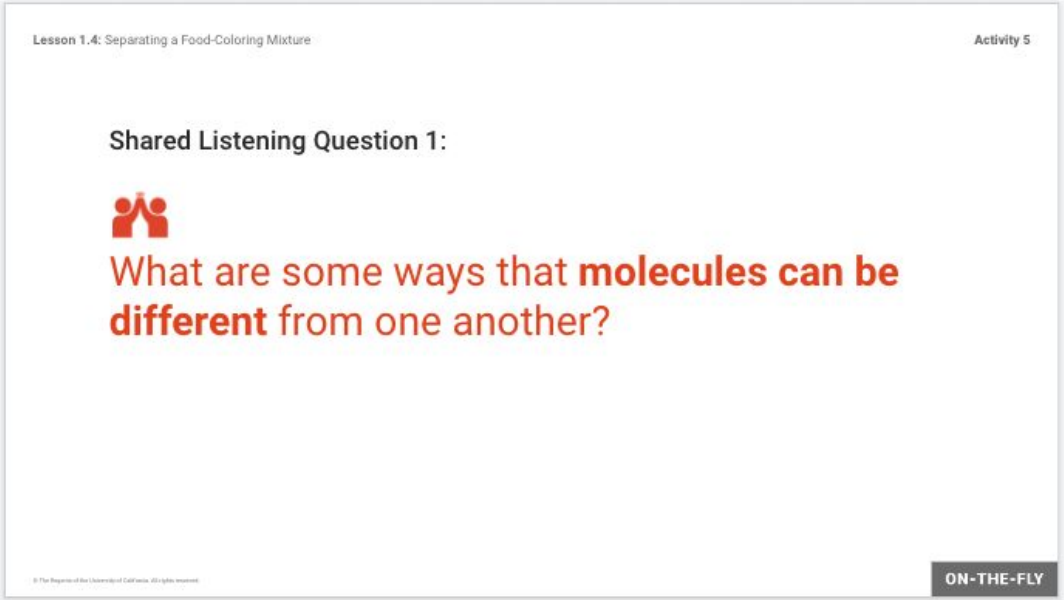
Lesson 1.4





Shared Listening Question 1:

What are some ways that **molecules can be different** from one another?



On-the-Fly Assessment 3:

Students' Ideas About Molecules

Look for: Some students may express alternative conceptions about molecules. For example, it is common for students to think that molecules are shaped exactly like some of the models they've seen, or that molecules have different colors. Make a note of any students who seem to have these ideas based on the Shared Listening discussion as well as on their written responses.

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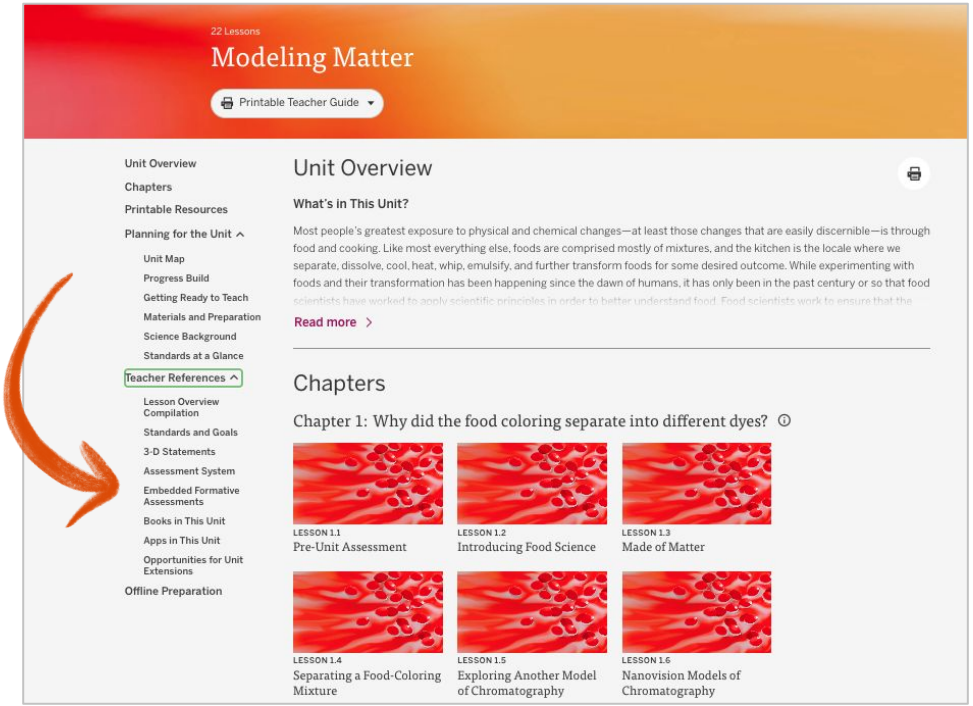
On the Fly Assessment

Work time

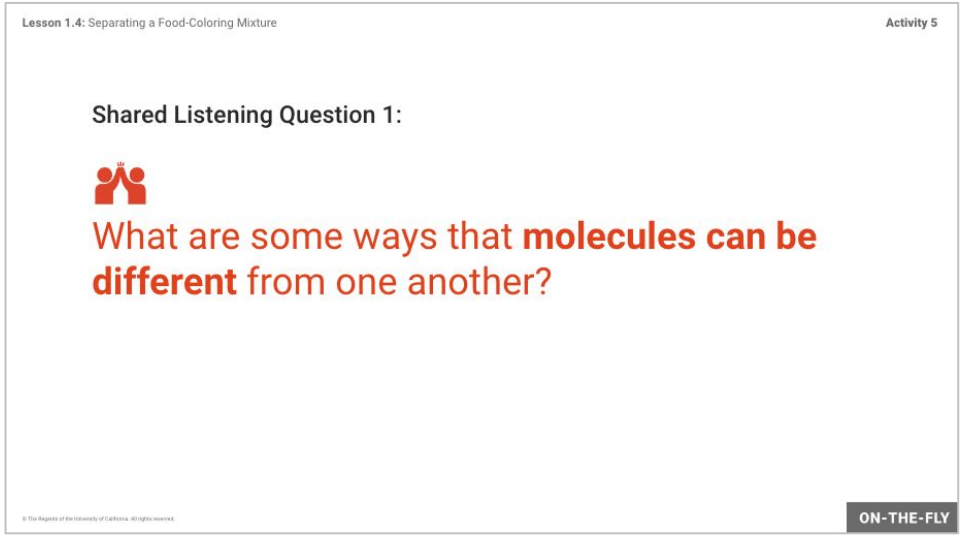
- Explore the On-the- Fly Assessments



Example assessment (On-the-Fly, Lesson 1.4)

Reflection

- What **data** can a teacher collect from this activity?
- What can a teacher **do** with this information?



Formative Assessment Resource

Lesson 1.4, Activity 5

On-the-Fly Assessment 3: Students' Ideas About Molecules

Look for 1

Look for 2

Look for: Some students may express **alternate conceptions about molecules**. For example, it is common for students to think that molecules are shaped exactly like some of the models they've seen, or that molecules have different colors. Make a note of any students who seem to have these ideas based on the Shared Listening discussion as well as on their written responses.

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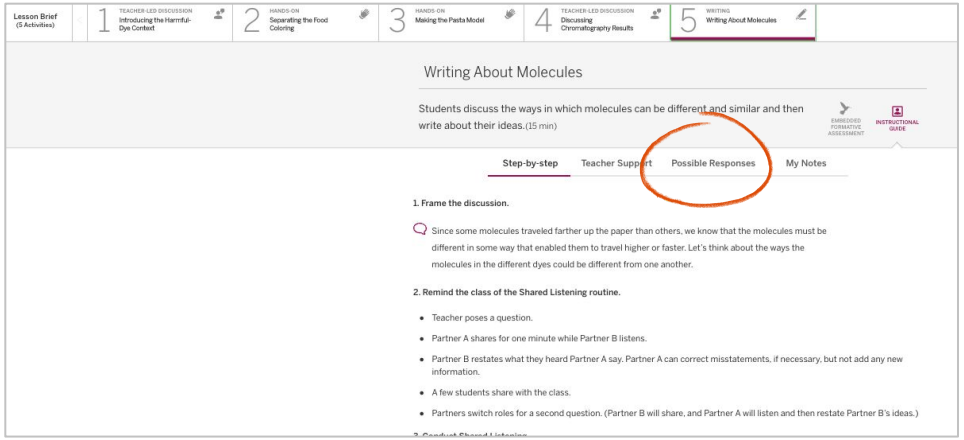
Formative assessment information

Possible student responses

- Within assessments:
  - “Look fors” (OtF)
  - “Assess Understanding” (CJ)
- Possible responses within the Instructional Guide
- Digital resources
  - Assessment Guides
  - Teacher References

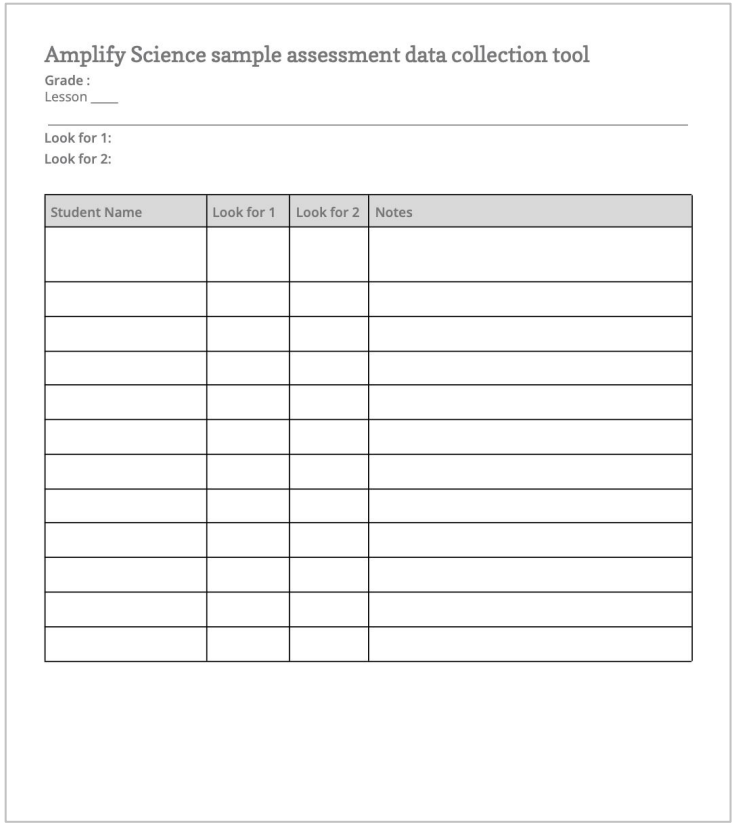


Classroom connection

Collecting formative assessment data

Plan ahead for what you're looking and listening for.

Create a system that's easy for you to use.



Amplify Science sample assessment data collection tool

Grade :
Lesson ____

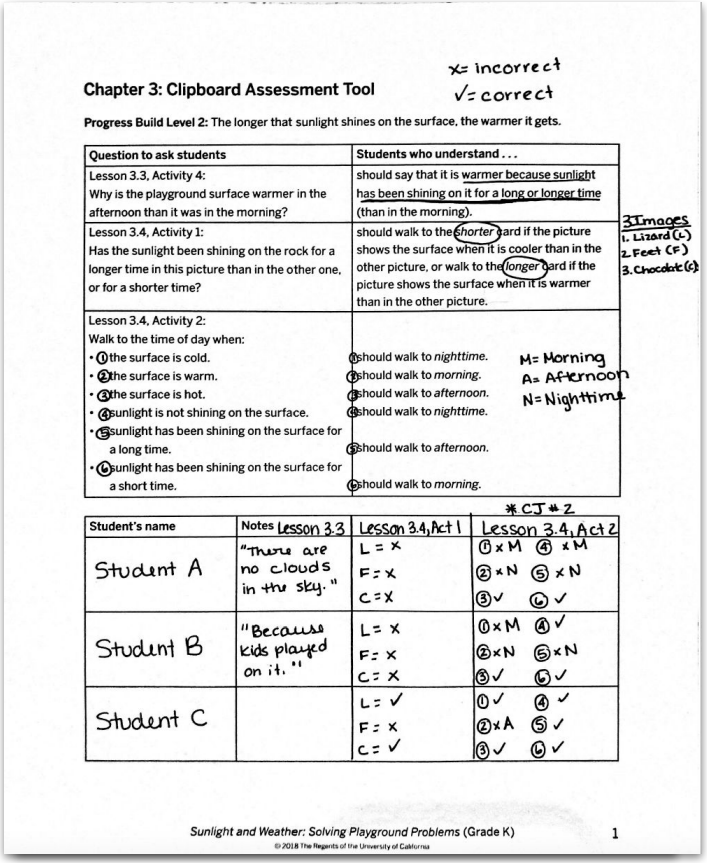
Look for 1:
Look for 2:

Student Name	Look for 1	Look for 2	Notes

Pgs. 14-15

K-1 Clipboard Assessment Tool

The Clipboard Assessment Tool offers a support for collecting data for the On-the-Fly and Critical Juncture Assessments that align to each Progress Build level in the unit.



x= incorrect
✓= correct

Chapter 3: Clipboard Assessment Tool

Progress Build Level 2: The longer that sunlight shines on the surface, the warmer it gets.

Question to ask students	Students who understand . . .
Lesson 3.3, Activity 4: Why is the playground surface warmer in the afternoon than it was in the morning?	should say that it is warmer because sunlight has been shining on it for a long or longer time (than in the morning).
Lesson 3.4, Activity 1: Has the sunlight been shining on the rock for a longer time in this picture than in the other one, or for a shorter time?	should walk to the *shorter* card if the picture shows the surface when it is cooler than in the other picture, or walk to the *longer* card if the picture shows the surface when it is warmer than in the other picture.
Lesson 3.4, Activity 2: Walk to the time of day when: • ① the surface is cold. • ② the surface is warm. • ③ the surface is hot. • ④ sunlight is not shining on the surface. • ⑤ sunlight has been shining on the surface for a long time. • ⑥ sunlight has been shining on the surface for a short time.	① should walk to *nighttime*. ② should walk to *morning*. ③ should walk to *afternoon*. ④ should walk to *nighttime*. ⑤ should walk to *afternoon*. ⑥ should walk to *morning*.

3 Images
1. Lizard (L)
2. Feet (F)
3. Chocolate (C)

M= Morning
A= Afternoon
N= Nighttime

* CJ # 2

Student's name	Notes Lesson 3.3	Lesson 3.4, Act 1	Lesson 3.4, Act 2
Student A	"There are no clouds in the sky."	L = x F = x C = x	① x M ④ x M ② x N ⑤ x N ③ ✓ ⑥ ✓
Student B	"Because kids played on it."	L = x F = x C = x	① x M ④ ✓ ② x N ⑤ x N ③ ✓ ⑥ ✓
Student C		L = ✓ F = x C = ✓	① ✓ ④ ✓ ② x A ⑤ ✓ ③ ✓ ⑥ ✓

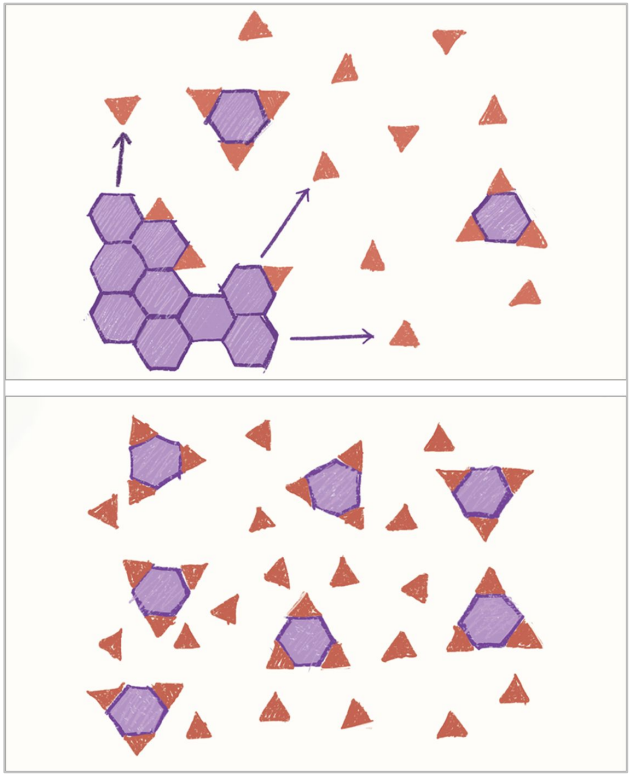
Sunlight and Weather: Solving Playground Problems (Grade K) 1

Additional formative assessment information

On-the-Fly Assessments

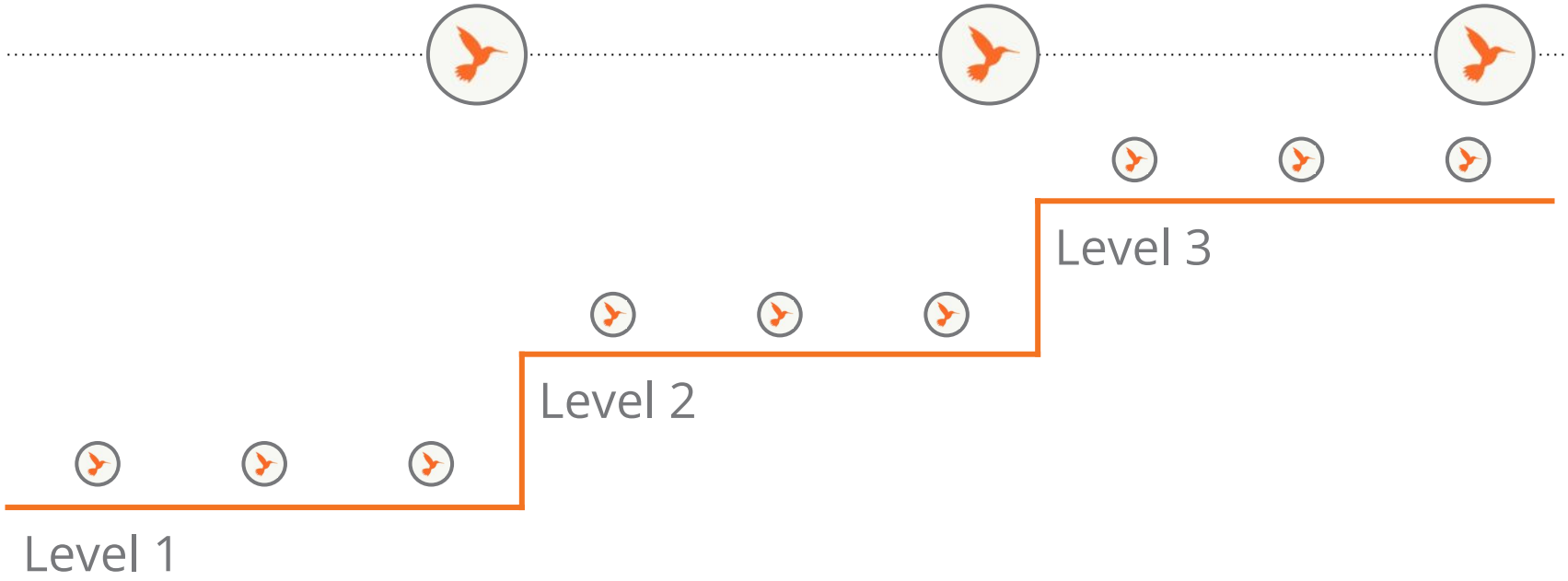
In addition to assessing concepts in the Progress Build, some On-the-Fly Assessments provide data about:

- Science and Engineering Practices
- Crosscutting Concepts
- Literacy skills
- Student collaboration



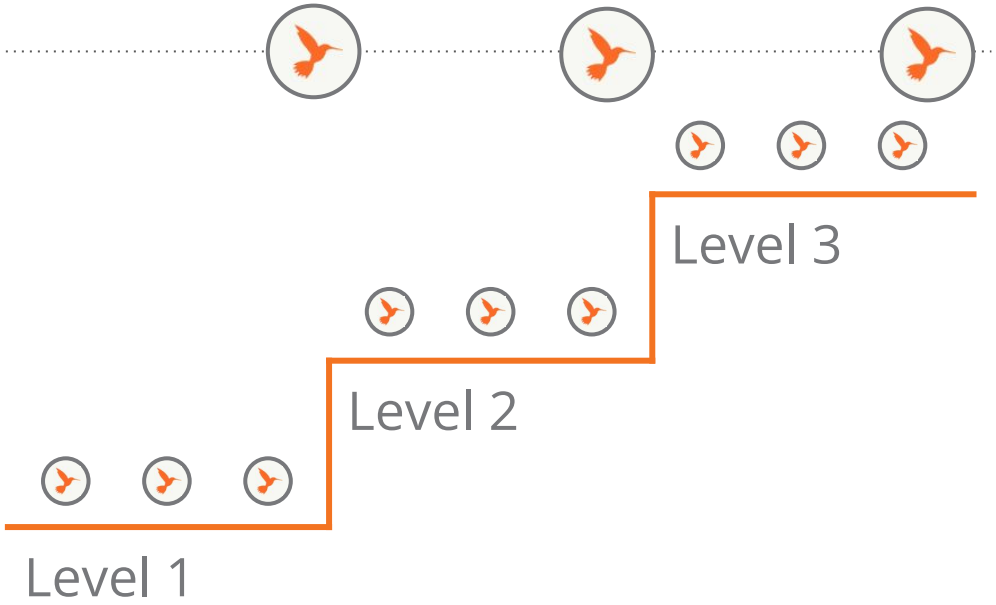
Questions?

Critical Juncture Assessments

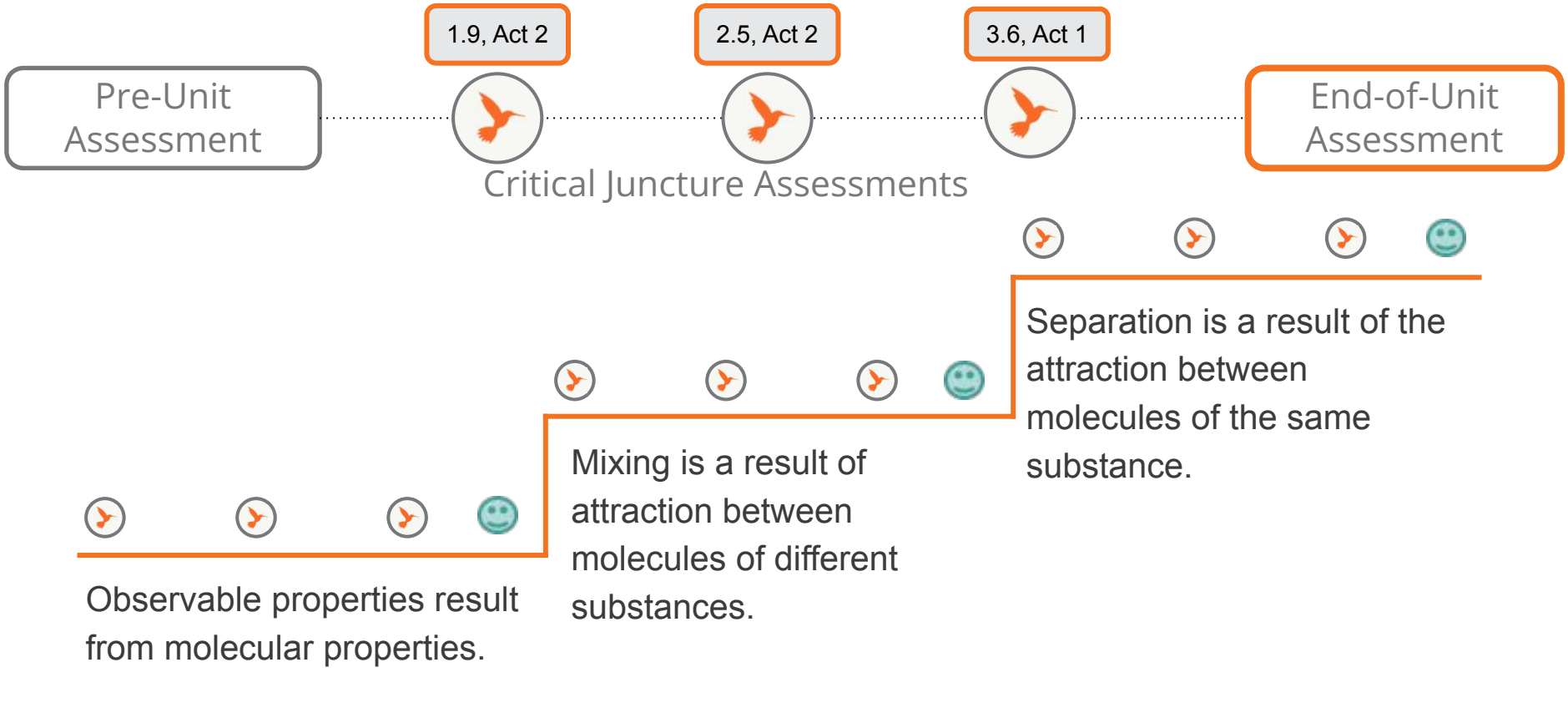


Critical Juncture Assessments

- Track student progress between Progress Build levels
- Embedded into instruction
- Assessment resource includes “Assess Understanding” and “Tailor Instruction”

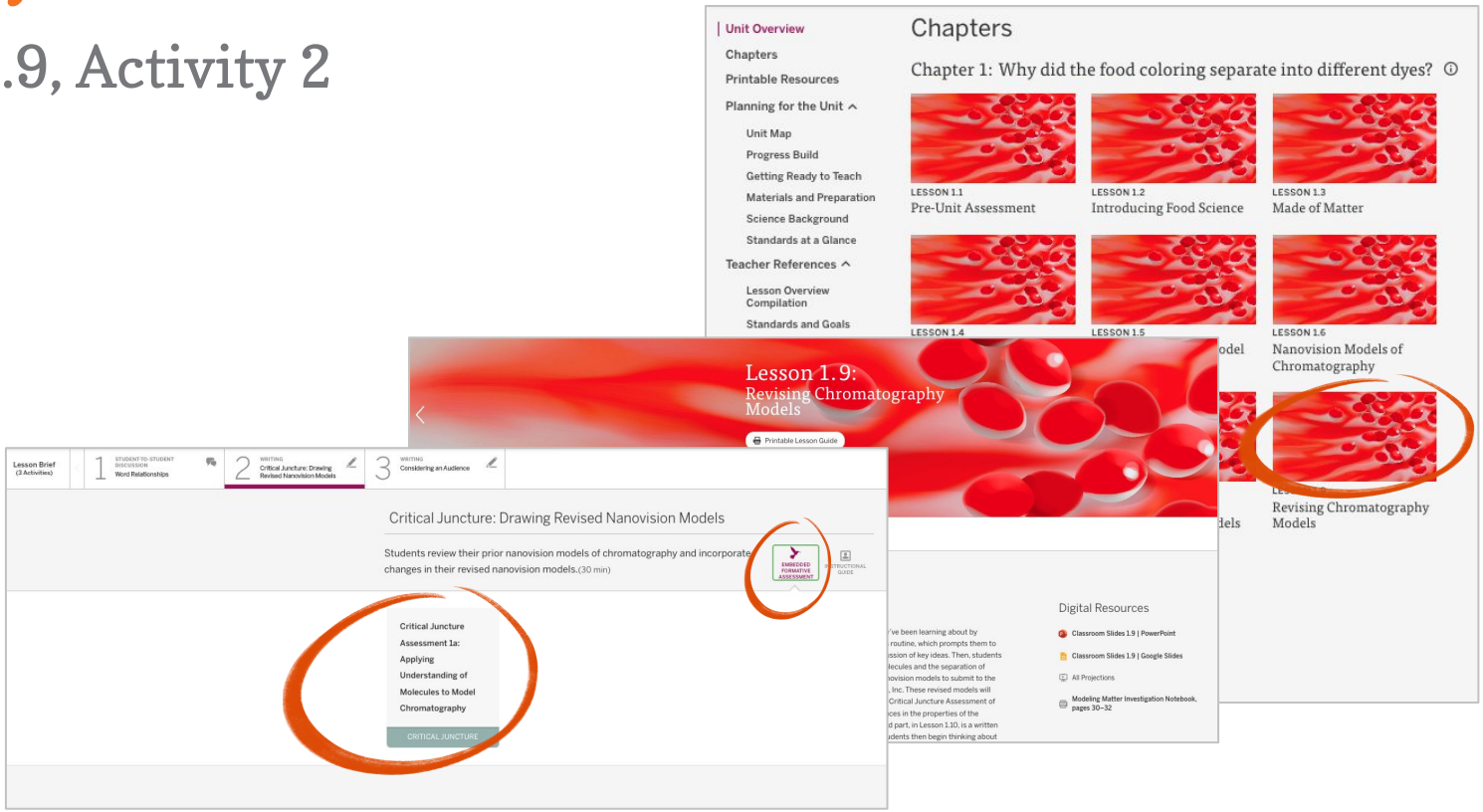


K-5 Assessment System



Critical Juncture Assessment

Lesson 1.9, Activity 2



Embedded Formative Assessment

Critical Juncture Lesson 1.9

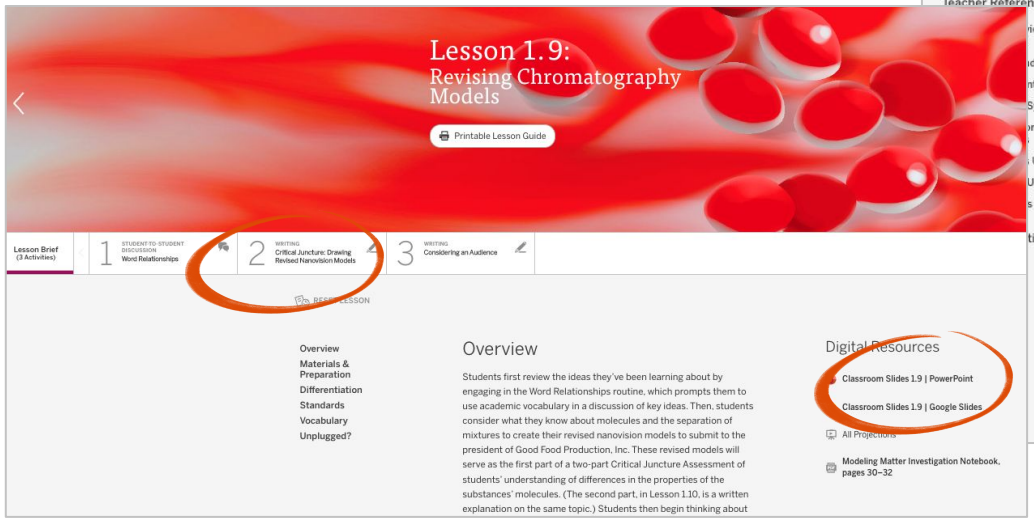
Critical Juncture Assessment 1a: Applying Understanding of Molecules to Model

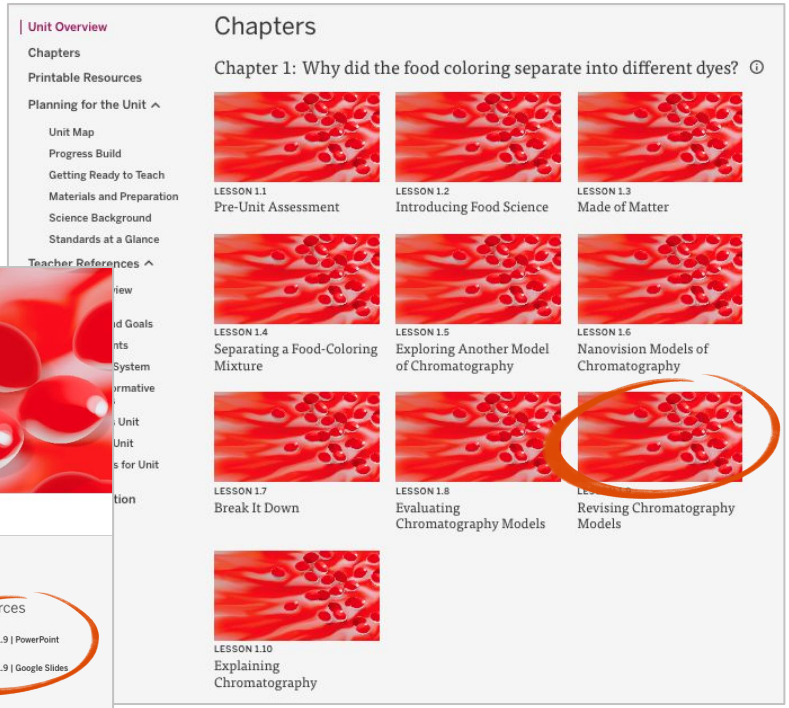
Tailor instruction: Students will have two opportunities to show understanding of these two ideas—different substances are made of different molecules, and molecules have properties that determine the distance traveled in chromatography—in this lesson (their revised nanovision models of chromatography) and again in Lesson 1.10 with their written scientific explanations. If a large portion of the class does not show an understanding of the two ideas in either their drawn models or in their written explanations, refer to the ideas for tailoring instruction in Critical Juncture Assessment 1b: Explaining Chromatography (in Lesson 1.10).

notebook), focusing on whether students included these two elements.

Critical Juncture Assessment

Lesson 1.9, Activity 2

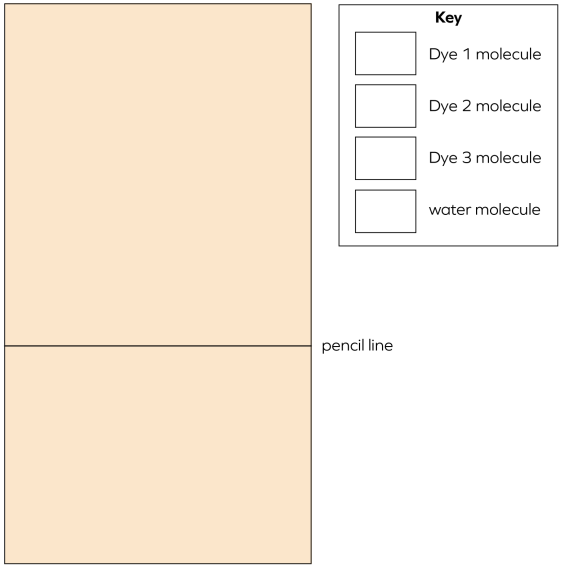




Name: _____ Date: _____

Revised Nanovision Model of Chromatography

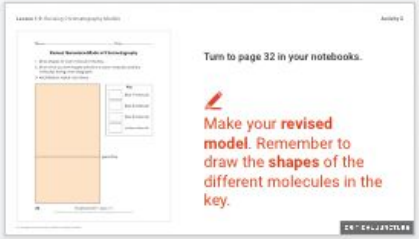
1. Draw shapes for each molecule in the Key.
2. Draw what you think happened with the water molecules and dye molecules during chromatography.
3. Add labels to explain your ideas.



32 Modeling Matter—Lesson 1.9

Turn to page 32 in your notebooks.

Make your **revised model**. Remember to draw the **shapes** of the different molecules in the key.



👉**Teacher action:**

Read the directions on the notebook page out loud. As students work, circulate and remind students to make sure that their models explain what they think happened. Encourage them to add labels as needed. Note that this is the first part of a two-part assessment. You will use students' models, as well as the explanations they will write in the next lesson, as a Critical Juncture Assessment.

Critical Juncture Assessment 1a:

Applying Understanding of Molecules to Model Chromatography

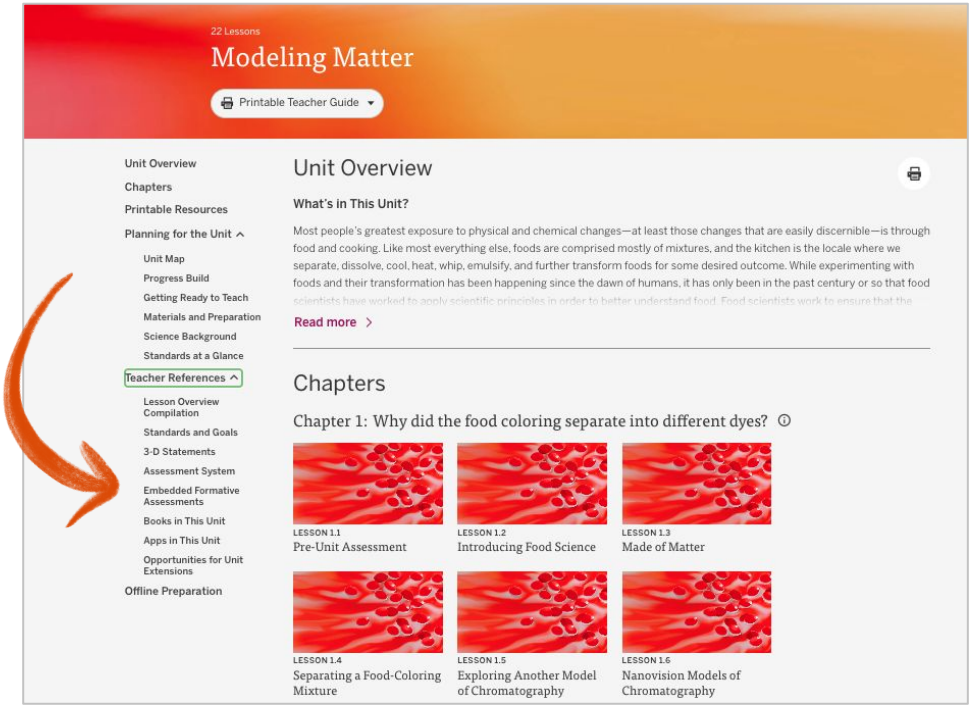
Assess understanding: Students' final nanovision models provide an opportunity to assess their understanding of different substances as made of unique molecules and of molecules' properties as determining substances' observable behavior. In their models, students should 1) represent the molecules of the different-colored dyes as different from one another (e.g., the red dye molecules should be shown as different from the yellow dye molecules) and 2) show and describe differences in the molecules' size and/or strength of attraction to the paper as determining how far they travel (e.g., smaller molecules or more weakly attracted molecules travel farther). After class, review students' revised models of chromatography (page 32, Revised Nanovision Model of Chromatography, in the notebook), focusing on whether students included these two elements.

Tailor instruction: Students will have two opportunities to show understanding of these two ideas—different substances are made of different molecules, and molecules have properties that determine the distance traveled in chromatography—in this lesson (their revised nanovision models of chromatography) and again in Lesson 1.10 with their written scientific explanations. If a large portion of the class does not show an understanding of the two ideas in either their drawn models or in their written explanations, refer to the ideas for tailoring instruction in Critical Juncture Assessment 1b: Explaining Chromatography (in Lesson 1.10).

Formative Assessments

Work time

- Explore the Critical Juncture Assessments

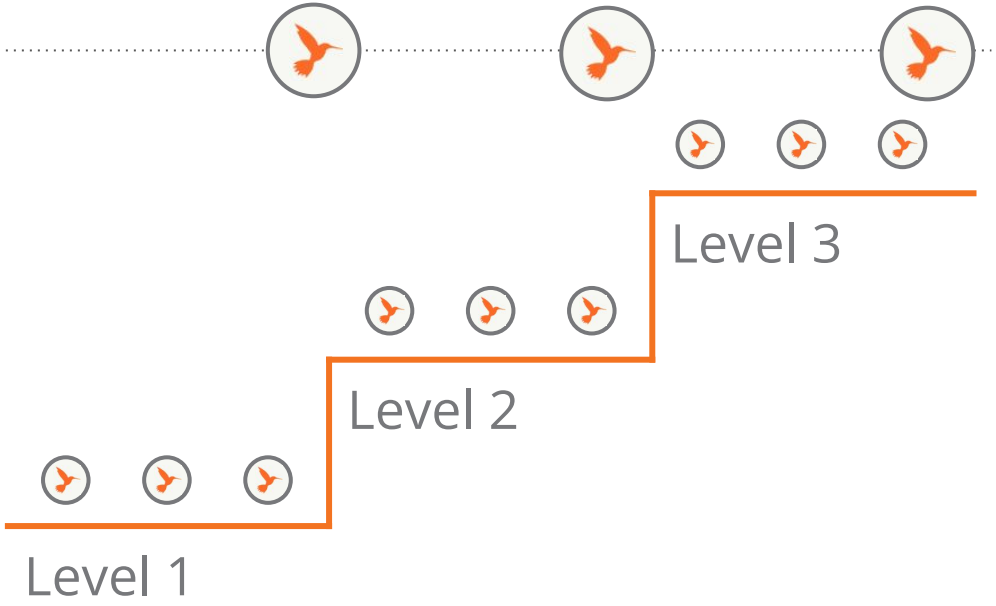


Embedded formative assessments

Reflection

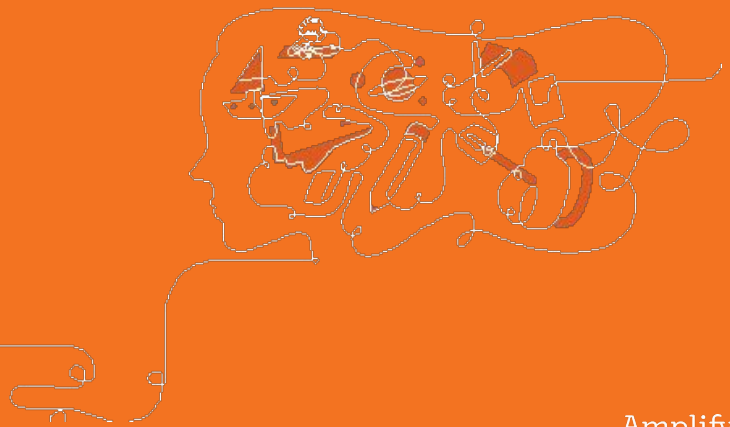
In 1-2 sentences, describe the relationship among:

- Progress Build
- On-the-Fly Assessments
- Critical Juncture Assessments

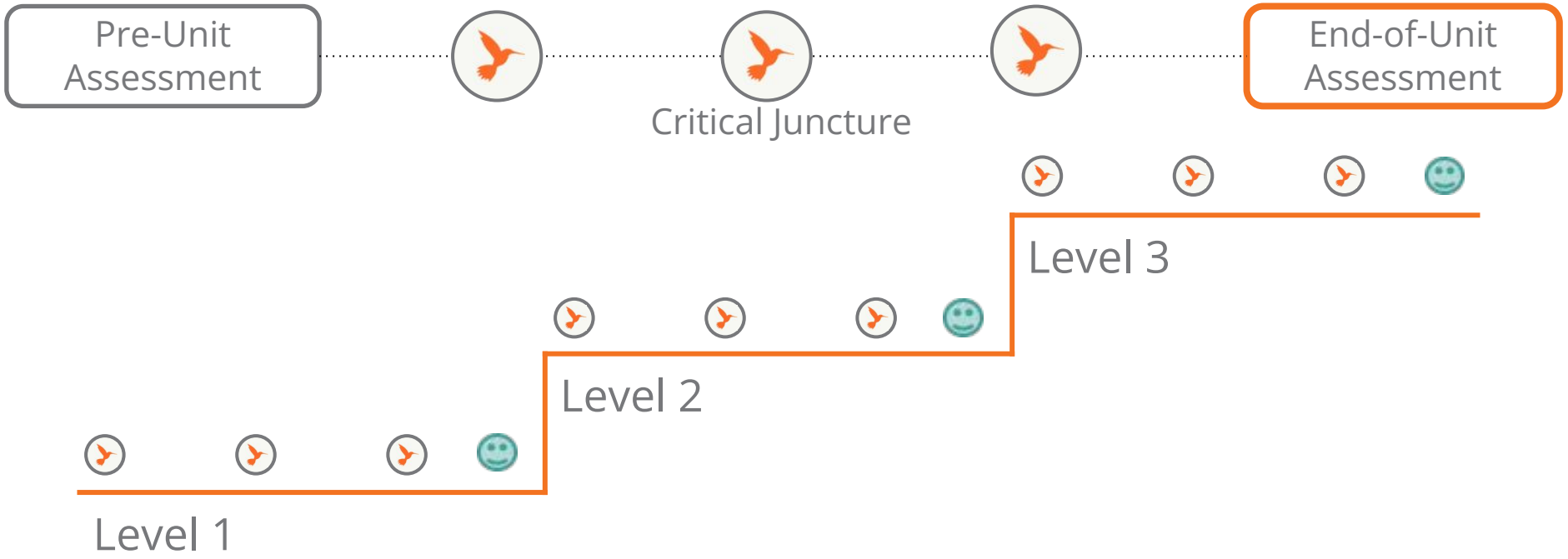


Questions?

End-of-Unit Assessment



K-5 Assessment System



End-of-Unit Assessment

3-dimensional assessment opportunity

- Summative assessment of mastery of science concepts
- Formative assessment of Science and Engineering Practices

End of Unit Assessments

What are students being asked to do?

Why do the oil and vinegar separate into layers when they are stirred together, but completely mix when lecithin is stirred in?

Problems with Good Food Production, Inc.'s New Salad Dressing

We do not want our salad dressing to separate

We do not want sediments in our salad dressing.

3 Dimensional Learning

The assessment task in this lesson provides guidance for assessing student understanding of the following standards:

Science and Engineering Practices

- Practice 6: Constructing Explanations and Designing Solutions
  - CEDS-E1: Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).
- Practice 8: Obtaining, Evaluating, and Communicating Information
  - INFO-E5: Communicate scientific and/or technical information orally and/or in written formats, including various forms of media and may include tables, diagrams, and charts.

Disciplinary Core Ideas

- PS1.A: Structure and Properties of Matter:
  - PS1.A-E1: Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means... (5-PS1-1)
  - PS1.A-E3: Measurements of a variety of properties can be used to identify materials.

Crosscutting Concept

- Scale, Proportion, and Quantity
  - SPQ-E1: Natural objects and/or observable phenomena exist from the very small to the immensely large or from very short to very long time periods.

End of Unit Assessmemt Rubric

Pg..
12=-16

Question: Why do the oil and vinegar separate into layers when they are stirred together, but completely mix when lecithin is stirred in?

Rubric 1: Assessing Students' Performance of the Practices of Constructing Explanations and Obtaining, Evaluating, and Communicating Information

Rubric 1 focuses on the first two criteria (causal and explanatory, clear and well-organized) and is designed to monitor and support students as they develop dexterity with the *practice* of constructing explanations. For each criterion, levels are described to monitor students' progress by indicating the degree to which students can independently demonstrate fluency with the scientific practice. Importantly, practices develop through regular opportunities for performance across multiple units, and mastery of the practice is outside the scope of a single unit. Thus, this rubric is intended to guide formative feedback to students rather than assign summative grades. It features targeted questions a teacher may use to assess a student's written work and provides specific feedback for future encounters with the practice.

Note that while the examples provided in this rubric accurately reflect the science concepts in the unit, students may provide alternate accounts that, if causal and explanatory in nature, still represent productive moves toward developing the practice of constructing a scientific explanation.

Rubric 1: Assessing Students' Performance of the Practices of Constructing Explanations and Obtaining, Evaluating, and Communicating Information

Criteria	Description of level	Level
Causal and explanatory Does the explanation go beyond, or add to, what can be observed to explain the non-mixing and mixing of the ingredients?	The writing does not go beyond, or add to, what was observed to explain *why* the ingredients sometimes separated and sometimes mixed together. Possible feedback: *You described what the salad dressing looked like when the ingredients were stirred together, but why did they sometimes separate and sometimes mix? What causes ingredients to separate or to mix together?*	0
	The writing goes beyond describing the observable interactions of the ingredients to propose: • why the oil and vinegar initially separated, but the addition of the lecithin resulted in mixing (e.g., that the mixing was caused by molecules getting mixed up). OR • why different molecules interact in different ways (e.g., different molecules are more attracted or less attracted to one another and to molecules of other ingredients). Possible feedback: *You gave a partial explanation (e.g., that the mixing was caused by molecules getting mixed up), but can you explain more fully why that happened (e.g., why molecules interact differently with and without lecithin)?*	1

(continued on next page)

Rubric 2: Assessing Students' Understanding of Science Ideas Encountered in the Unit

Rubric 2 considers whether students' explanations are consistent with the relevant science ideas that students have encountered in the unit. This rubric may be used summatively by tallying the points for each science idea demonstrated, as described on the next page.

Rubric 2: Assessing Students' Understanding of the Science Ideas Encountered in the Unit

Criteria	Questions to keep in mind	Score
Grounded in evidence Is the explanation *consistent* with the relevant science ideas that students have experienced so far? (Note that students need not explicitly cite classroom examples or data, as long as their descriptions are consistent with the science ideas learned.)	Does the student show understanding that substances are made of particles that are too small to be seen? (1 point) Evidence could include: • The explanation describes that vinegar, oil, and lecithin are all made of molecules. • The explanation uses interactions of individual molecules to account for the mixing or separation of ingredients.	
	Does the student show understanding that the particles that make up materials have properties that explain why ingredients sometimes mix? (1 point) Evidence could include: • The explanation describes mixing as a result of a high attraction between the molecules of two or more substances. • The explanation describes that because lecithin molecules are highly attracted to both oil molecules and vinegar molecules, all three kinds of molecules will stay together (mix).	
	Does the student show understanding that the particles that make up materials have properties that explain why ingredients sometimes separate? (1 point) Evidence could include: • The explanation describes that oil and vinegar separated because the vinegar molecules were not highly attracted to the oil molecules, but they were highly attracted to other vinegar molecules.	
	Total (0–3)	

Rubric 3: Assessing Students' Understanding of the Crosscutting Concept of Scale, Proportion, and Quantity

Rubric 3 considers how well students are able to apply the crosscutting concept of Scale, Proportion, and Quantity to a specific phenomenon. This rubric may be used summatively by tallying the points for each application demonstrated, as described on the next page.

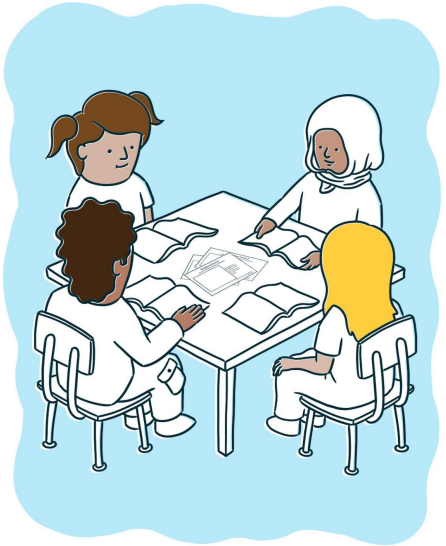
Rubric 3: Assessing Students' Understanding of the Crosscutting Concept of Scale, Proportion, and Quantity

Criteria	Questions to keep in mind	Score
Grounded in evidence Does the explanation use changes that happen at one scale to account for something that can be observed at another scale?	Does the explanation recognize that objects can exist at the observable scale and also at a scale that is too small to be observed with the naked eye? (1 point)	
	Does the explanation account for the observable separation or mixing of ingredients by describing interactions of particles that are too small to be observed with the naked eye? (1 point)	
	Total (0–2)	

End-of-Unit Assessment

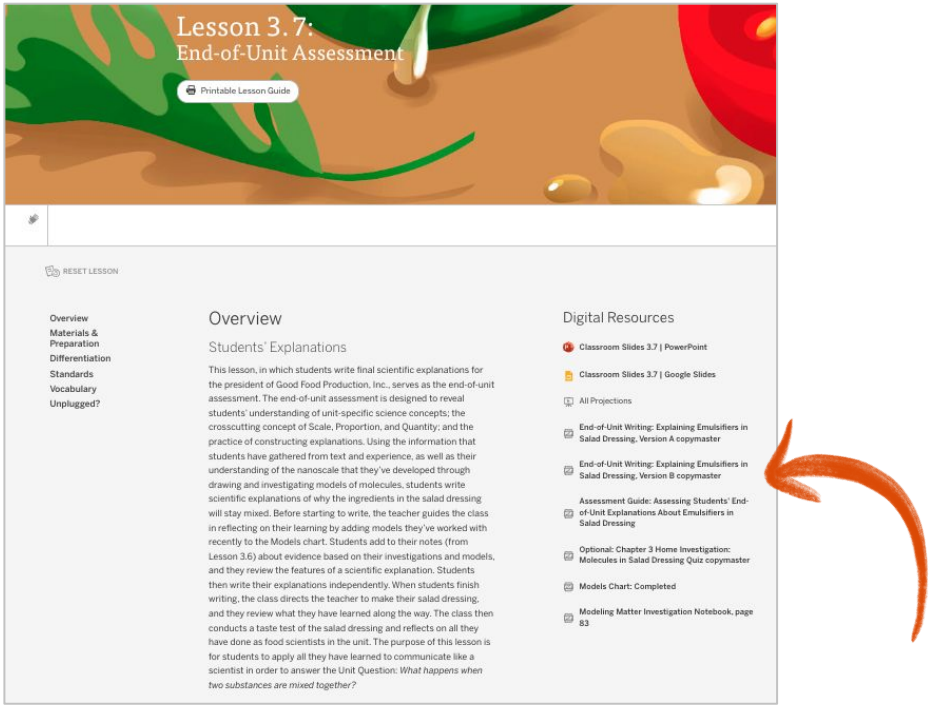
Work time

- Open your Participant Notebook to page 12.
- Score the three student responses (page 16) with rubrc 2 only (science ideas).
- Come together with your group and discuss your scores.
- Share out



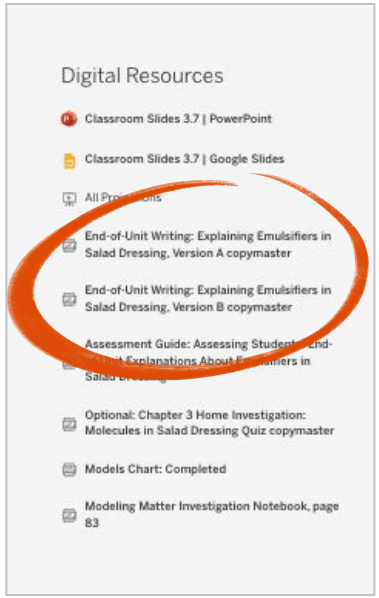
End-of-Unit Assessment

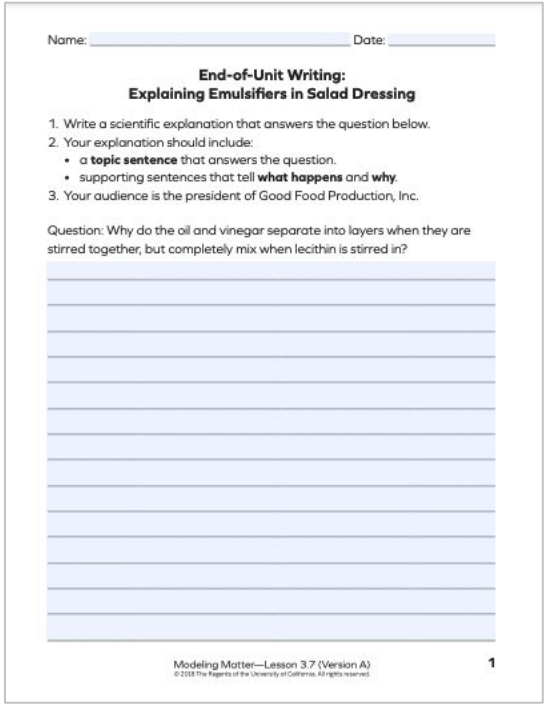
- Go to the The **End-of-Unit Writing** and the **End-of Unit Assessment Guide** on the lesson page
- Compare your scores with the student responses in the guide.
- Discuss with your group if there were any differences.



End-of-Unit Assessment

Form A and B





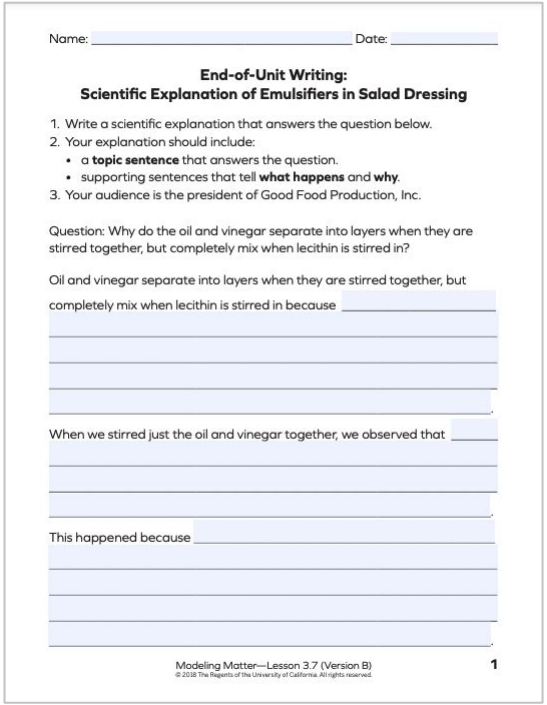
Name: _____ Date: _____

End-of-Unit Writing:
Explaining Emulsifiers in Salad Dressing

1. Write a scientific explanation that answers the question below.
2. Your explanation should include:
   - a **topic sentence** that answers the question.
   - supporting sentences that tell **what happens** and **why**.
3. Your audience is the president of Good Food Production, Inc.

Question: Why do the oil and vinegar separate into layers when they are stirred together, but completely mix when lecithin is stirred in?

Modeling Matter—Lesson 3.7 (Version A) 1



Name: _____ Date: _____

End-of-Unit Writing:
Scientific Explanation of Emulsifiers in Salad Dressing

1. Write a scientific explanation that answers the question below.
2. Your explanation should include:
   - a **topic sentence** that answers the question.
   - supporting sentences that tell **what happens** and **why**.
3. Your audience is the president of Good Food Production, Inc.

Question: Why do the oil and vinegar separate into layers when they are stirred together, but completely mix when lecithin is stirred in?

Oil and vinegar separate into layers when they are stirred together, but completely mix when lecithin is stirred in because _____

When we stirred just the oil and vinegar together, we observed that _____

This happened because _____

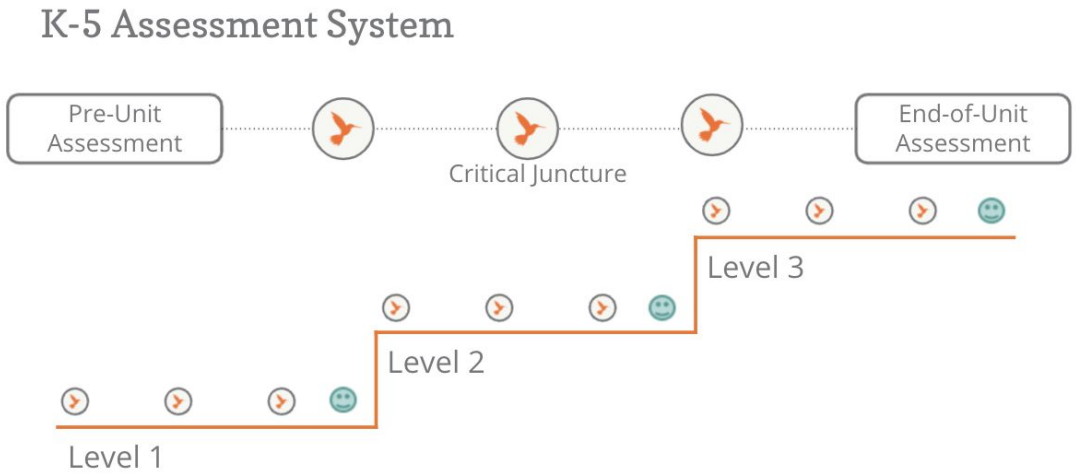
Modeling Matter—Lesson 3.7 (Version B) 1

Assessment System

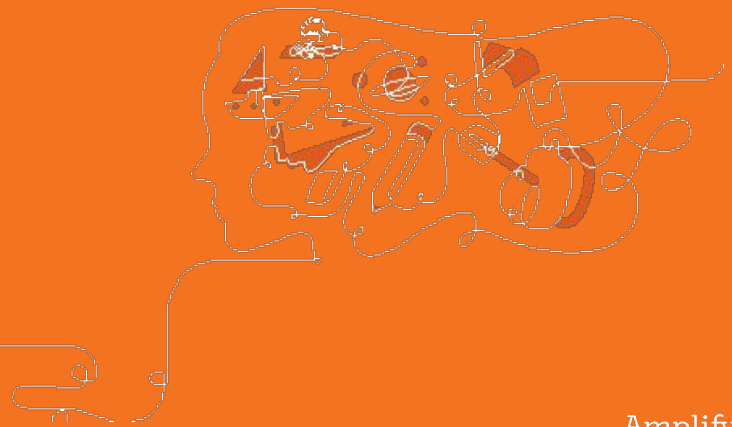
Reflection

How do the Progress Build and assessments work as a **system**?

What are the benefits of this system for students? For teachers?



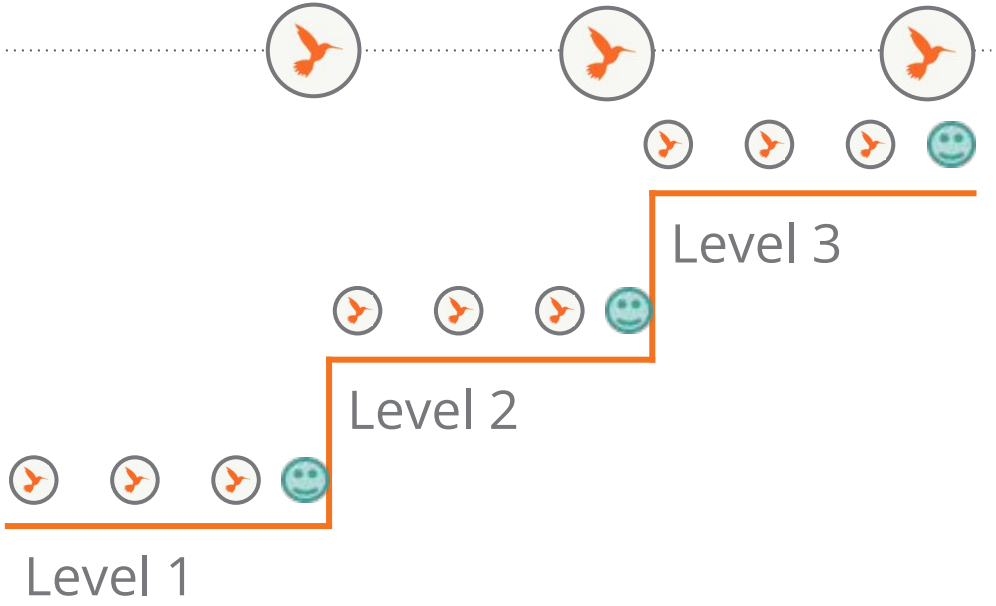
Lunch Break



Additional formative assessment information

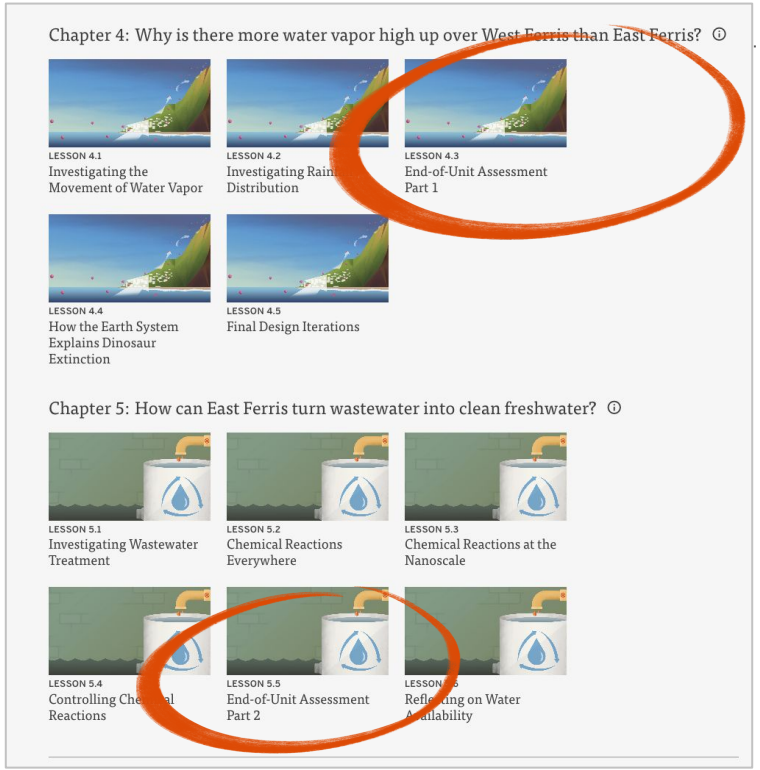
Student Self-Assessments

- End of each chapter
- Grades K-1: Pair Share activity
- Grades 2-5: Independent Investigation Notebook activity



Additional assessment information

End of Unit Assessments

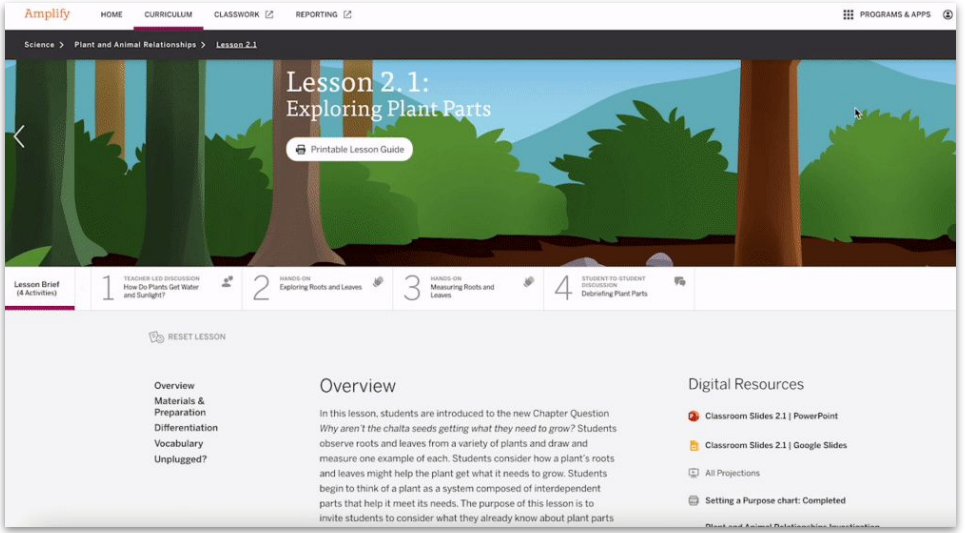


Questions?

Resources for NGSS progress monitoring

NGSS Benchmark assessments

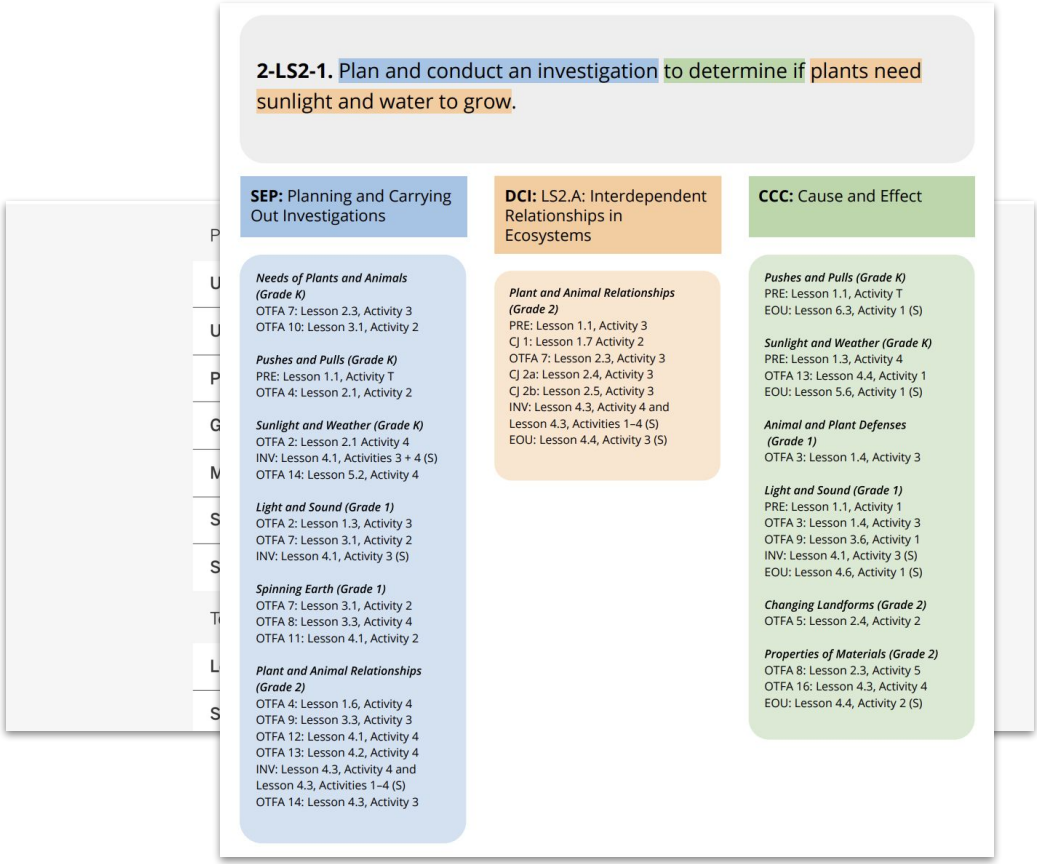
- Accessible in the Global Navigation menu
- Grades 3-5
- 4 assessments per grade



Resources for NGSS progress monitoring

3D Assessment Objectives

- Located in the Unit Guide
- Identifies where each dimension of the target Performance Expectations are assessed in the unit, in the grade, or in the grade-band.



2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

SEP: Planning and Carrying Out Investigations

Needs of Plants and Animals (Grade K)
OTFA 7: Lesson 2.3, Activity 3
OTFA 10: Lesson 3.1, Activity 2

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
OTFA 4: Lesson 2.1, Activity 2

Sunlight and Weather (Grade K)
OTFA 2: Lesson 2.1 Activity 4
INV: Lesson 4.1, Activities 3 + 4 (S)
OTFA 14: Lesson 5.2, Activity 4

Light and Sound (Grade 1)
OTFA 2: Lesson 1.3, Activity 3
OTFA 7: Lesson 3.1, Activity 2
INV: Lesson 4.1, Activity 3 (S)

Spinning Earth (Grade 1)
OTFA 7: Lesson 3.1, Activity 2
OTFA 8: Lesson 3.3, Activity 4
OTFA 11: Lesson 4.1, Activity 2

Plant and Animal Relationships (Grade 2)
OTFA 4: Lesson 1.6, Activity 4
OTFA 9: Lesson 3.3, Activity 3
OTFA 12: Lesson 4.1, Activity 4
OTFA 13: Lesson 4.2, Activity 4
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
OTFA 14: Lesson 4.3, Activity 3

DCI: LS2.A: Interdependent Relationships in Ecosystems

Plant and Animal Relationships (Grade 2)
PRE: Lesson 1.1, Activity 3
CJ 1: Lesson 1.7 Activity 2
OTFA 7: Lesson 2.3, Activity 3
CJ 2a: Lesson 2.4, Activity 3
CJ 2b: Lesson 2.5, Activity 3
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
EOU: Lesson 4.4, Activity 3 (S)

CCC: Cause and Effect

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
EOU: Lesson 6.3, Activity 1 (S)

Sunlight and Weather (Grade K)
PRE: Lesson 1.3, Activity 4
OTFA 13: Lesson 4.4, Activity 1
EOU: Lesson 5.6, Activity 1 (S)

Animal and Plant Defenses (Grade 1)
OTFA 3: Lesson 1.4, Activity 3

Light and Sound (Grade 1)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 9: Lesson 3.6, Activity 1
INV: Lesson 4.1, Activity 3 (S)
EOU: Lesson 4.6, Activity 1 (S)

Changing Landforms (Grade 2)
OTFA 5: Lesson 2.4, Activity 2

Properties of Materials (Grade 2)
OTFA 8: Lesson 2.3, Activity 5
OTFA 16: Lesson 4.3, Activity 4
EOU: Lesson 4.4, Activity 2 (S)

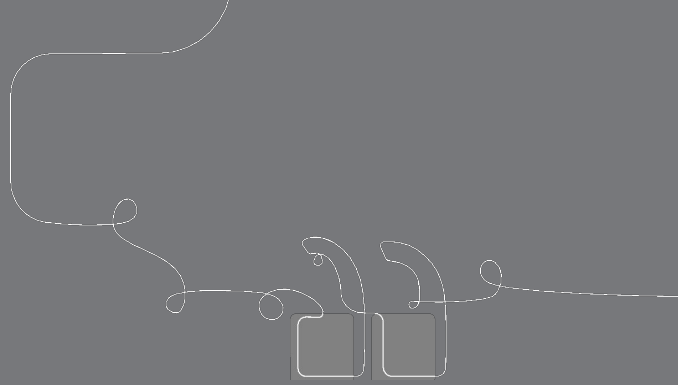
Generating grades

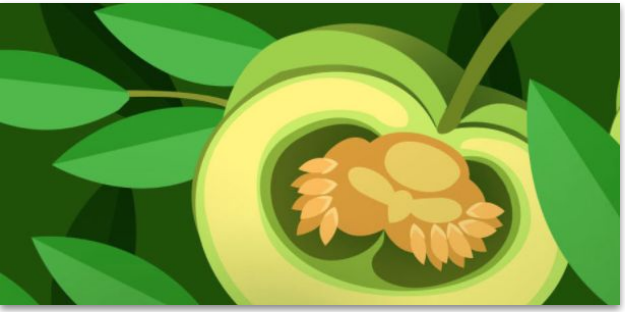
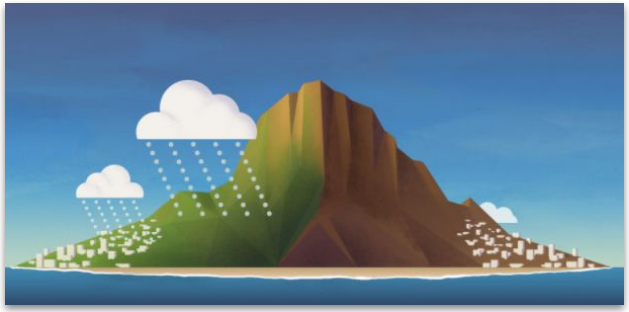
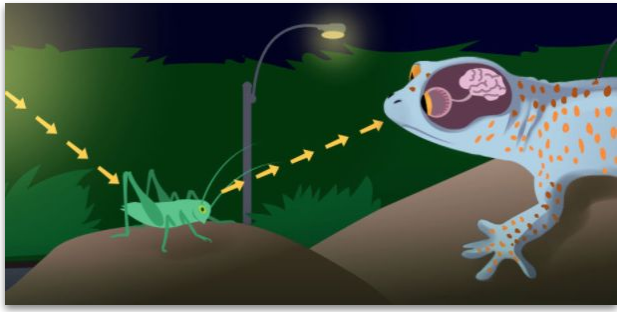
Group collaborative discussion

What are your district's grading requirements for science?

How will you use Amplify Science assessments to generate grades?

Questions?



Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

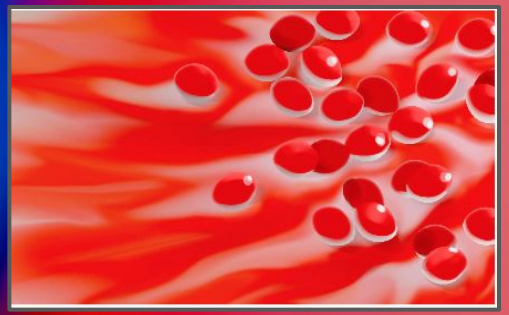
Modeling Matter

Problem: Why is the food coloring from Good Food Production, Inc. not exactly the same as Red Dye #75 and may include a harmful dye?

Role: Food Scientists

engage in two investigations, one to identify a potentially hazardous food dye in a mixture, and the other to create a good-tasting and visually appealing salad dressing that does not separate into layers and contains no sediment.

Coherent Storylines



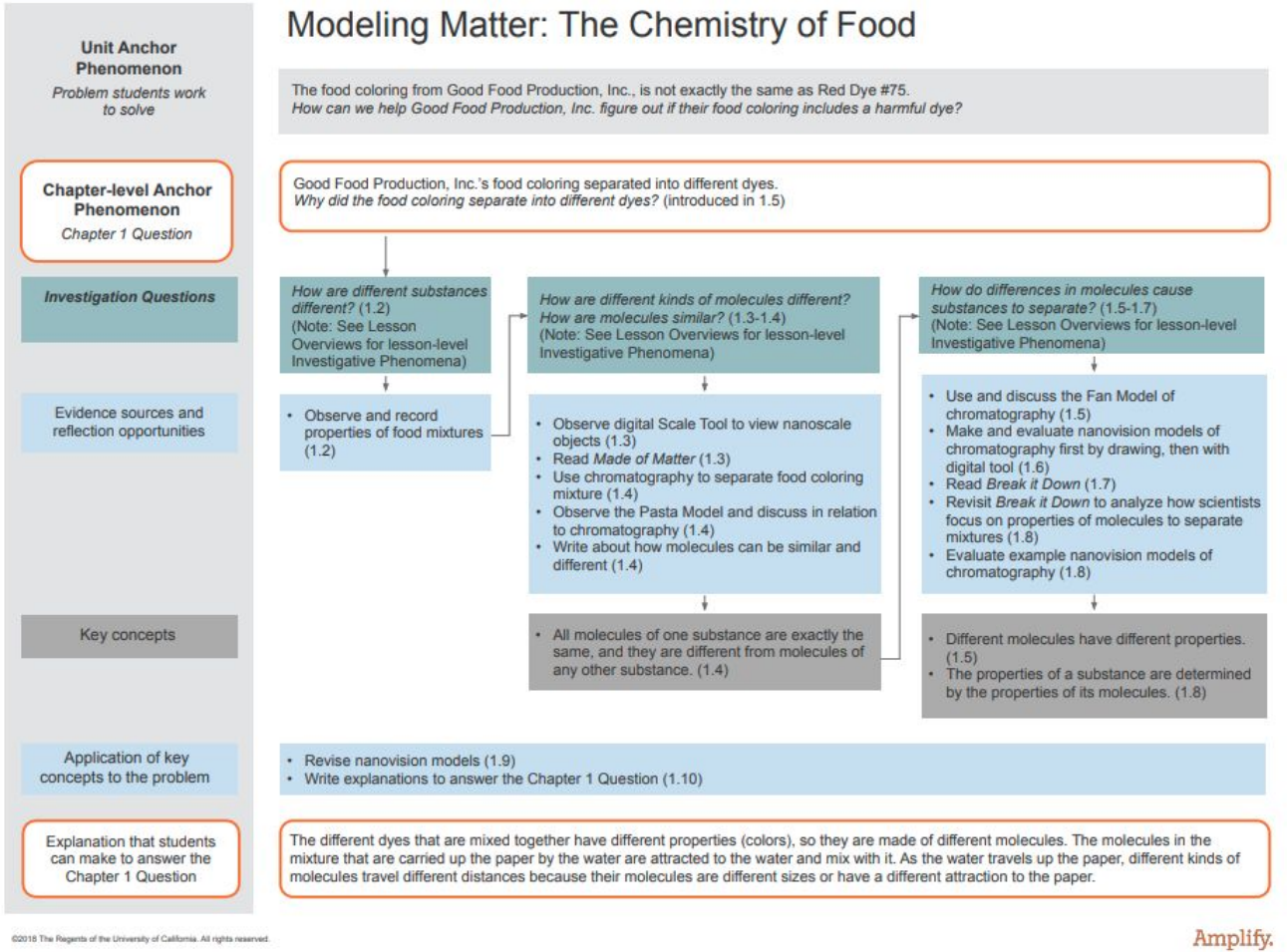
Why did the food coloring separate into different dyes?

Why do some salad dressings have sediments, and others do not?

Why can salad-dressing ingredients separate again after being mixed?

Coherence Flowchart

Chapter 1



Amplify.

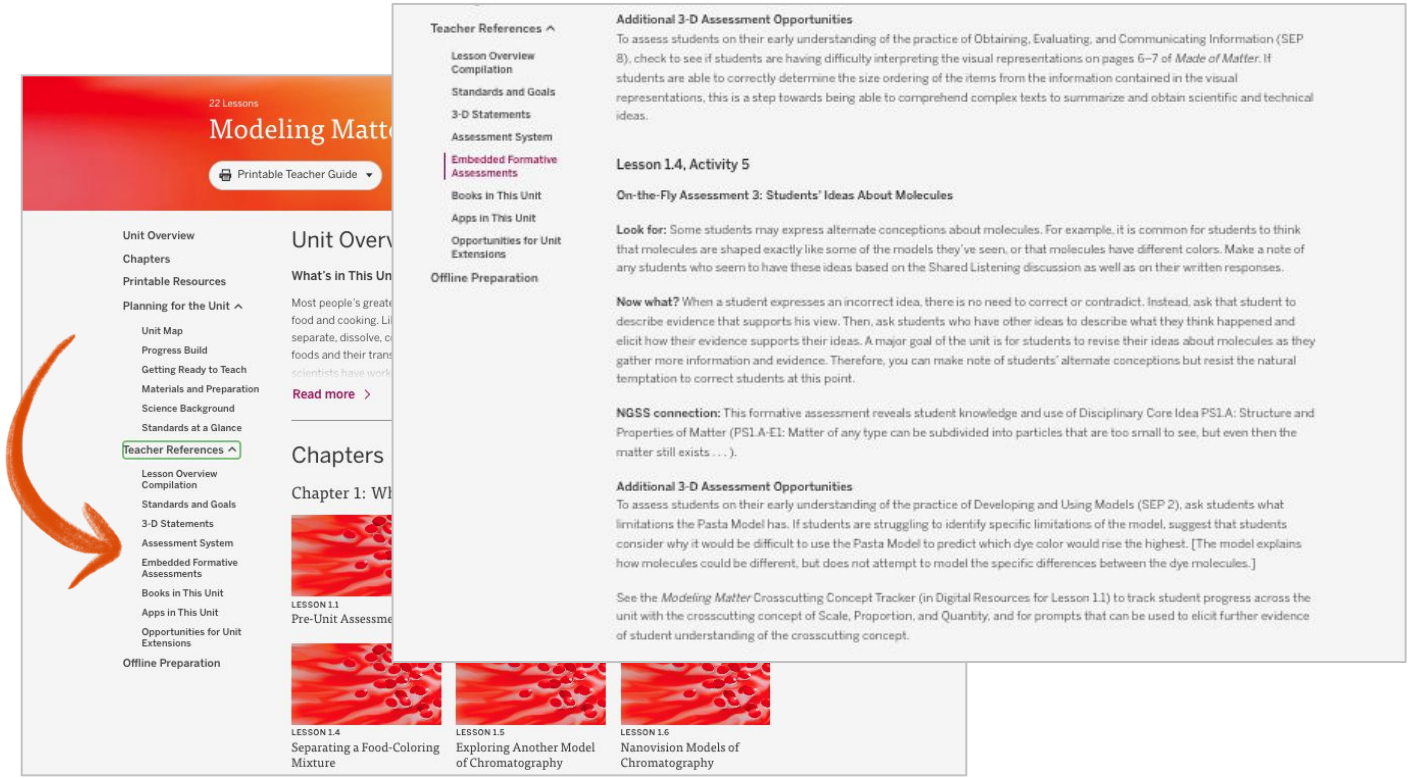
Modeling Matter

Leading up to our model lesson

Modeling Matter

Model lesson 1.4

Embedded Formative Assessments



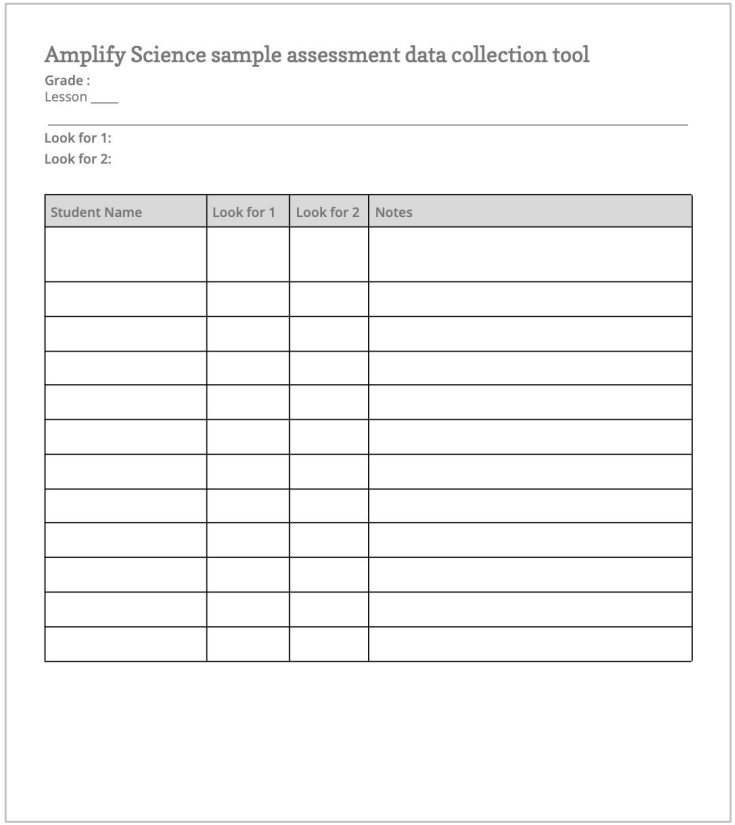
Amplify.

Classroom connection

Collecting formative assessment data

Plan ahead for what you're looking and listening for.

Create a system that's easy for you to use.



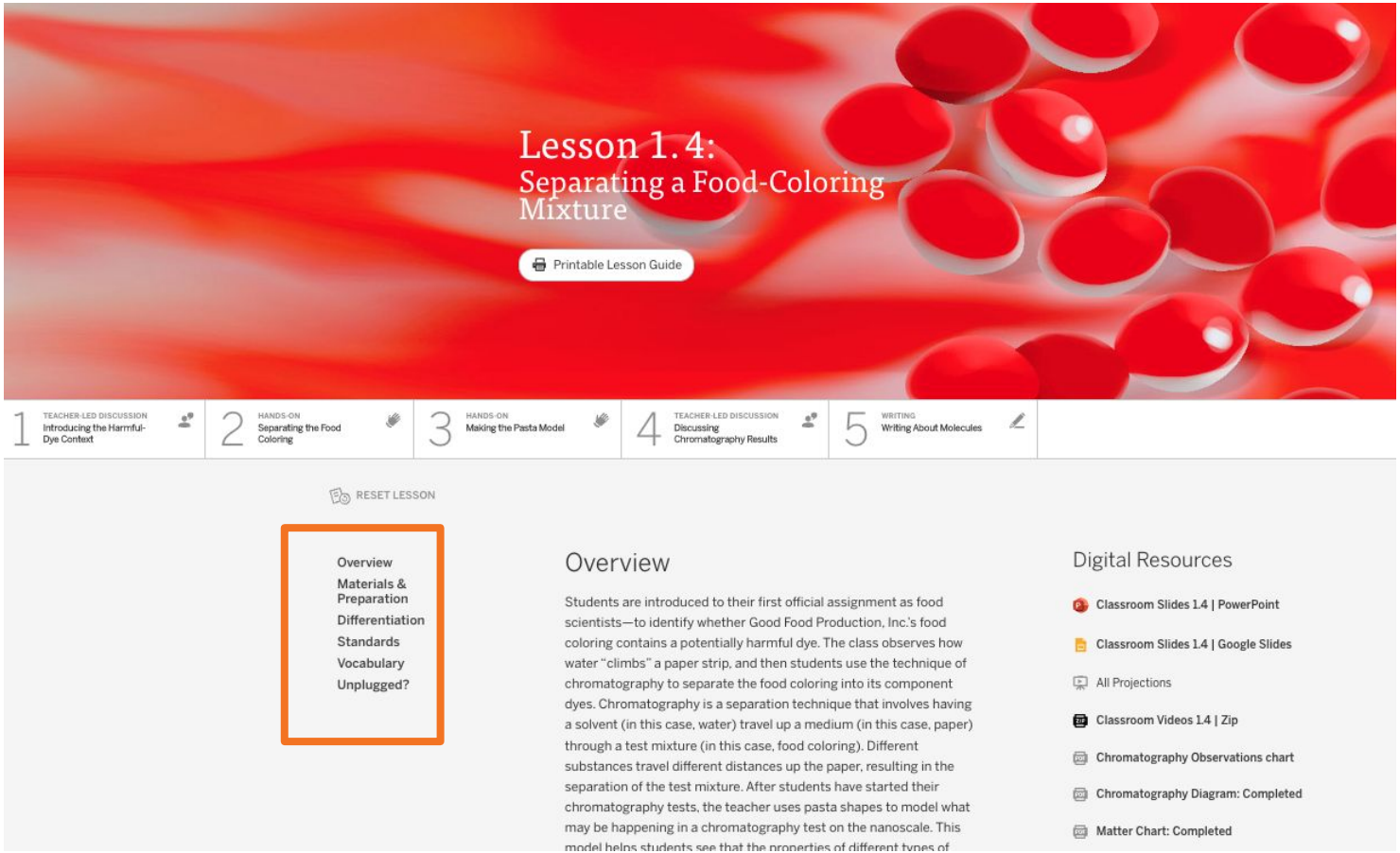
Amplify Science sample assessment data collection tool

Grade :
Lesson ____

Look for 1:
Look for 2:

Student Name	Look for 1	Look for 2	Notes

The Lesson Brief



Patterns of Earth and Sky

Materials for Lesson 1.5

For the Class:

Materials & Preparation

For the Classroom Wall

- key concept: *All molecules of one substance are exactly the same, and they are different from molecules of any other substance.*
- Matter chart
- Properties of Matter chart

For Each Group of Four Students

- 1 tray*
- 2 large plastic cups
- 2 prepared strips of chromatography paper
- 2 pencils*
- 2 small pieces of masking tape*
- 4 small pieces of clear tape*
- 1 pair of scissors*

For the Class

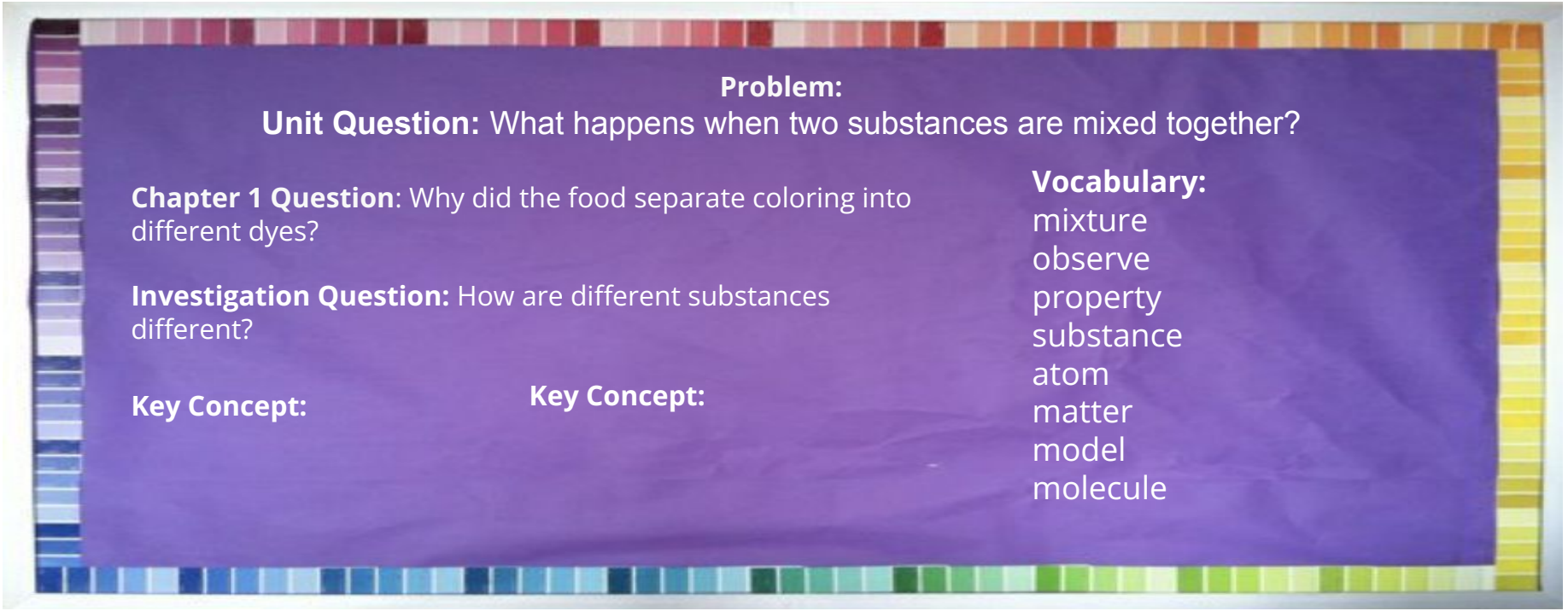
- 1 strip of chromatography paper
- 3 bottles of food coloring (red, blue, yellow)
- 5 large plastic cups
- 1 small plastic cup
- large pasta (penne or shells)
- small pasta (orzo)
- medium pasta (elbow macaroni)
- 1–2 toothpicks*
- 2 sheets of chart paper*
- 1 sheet of paper towel*
- 1 large clear container with lid (at least 16 oz.)*
- pitcher*
- water*
- marker*
- masking tape*
- clear tape*
- 1 pencil*
- 1 pair of scissors*

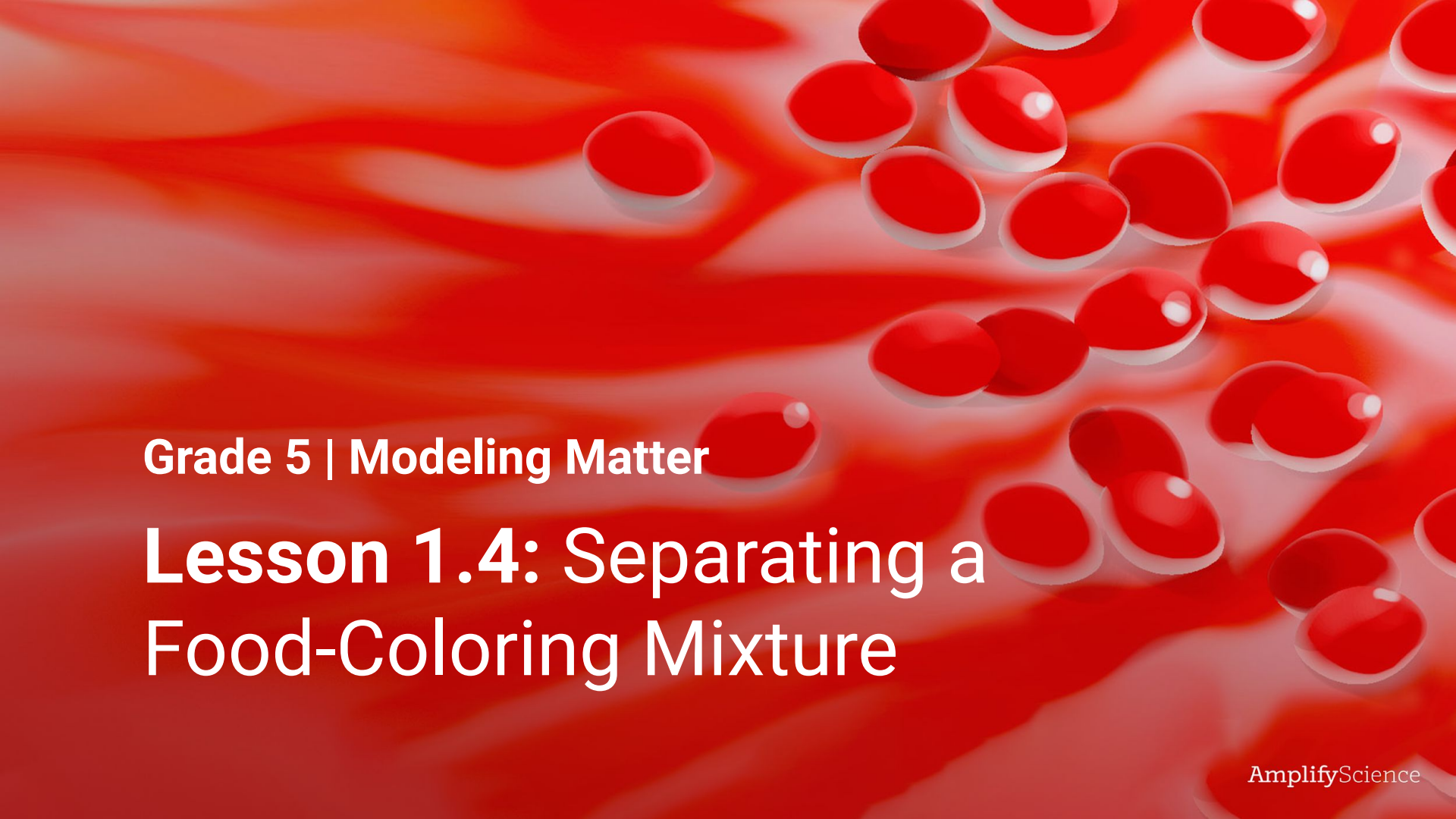
Modeling Matter

Classroom Wall

Partner Reading Guidelines

1. Sit next to your partner and place the book between you.
2. Take turns reading.
3. Read in a quiet voice.
4. Be respectful and polite to your partner.
5. Ask your partner for help if you need it. Work together to make sure you both understand what you read.





Grade 5 | Modeling Matter

Lesson 1.4: Separating a Food-Coloring Mixture

AmplifyScience

5 MIN

Activity 1

Introducing the Harmful-Dye Context

To: Food Science Lab
From: Lauren Harold, President, Good Food Production, Inc.
Subject: Test for Harmful Food Dye

Good Food Production, Inc.

Dear Food Scientists,

Customers are concerned about food products that contain Red Dye #75. Some people believe that Red Dye #75 causes health problems in children. Good Food Production, Inc. wants to make sure our customers are safe!

We need to test the food coloring that's used in many of our products to see if it might contain red food dye, so we know if we need to submit it for further testing. Please determine whether our food coloring is a pure substance or whether it is a mixture. If it is a mixture, please determine whether red dye is part of the mixture.

Sincerely,
Lauren Harold, President
Good Food Production, Inc.

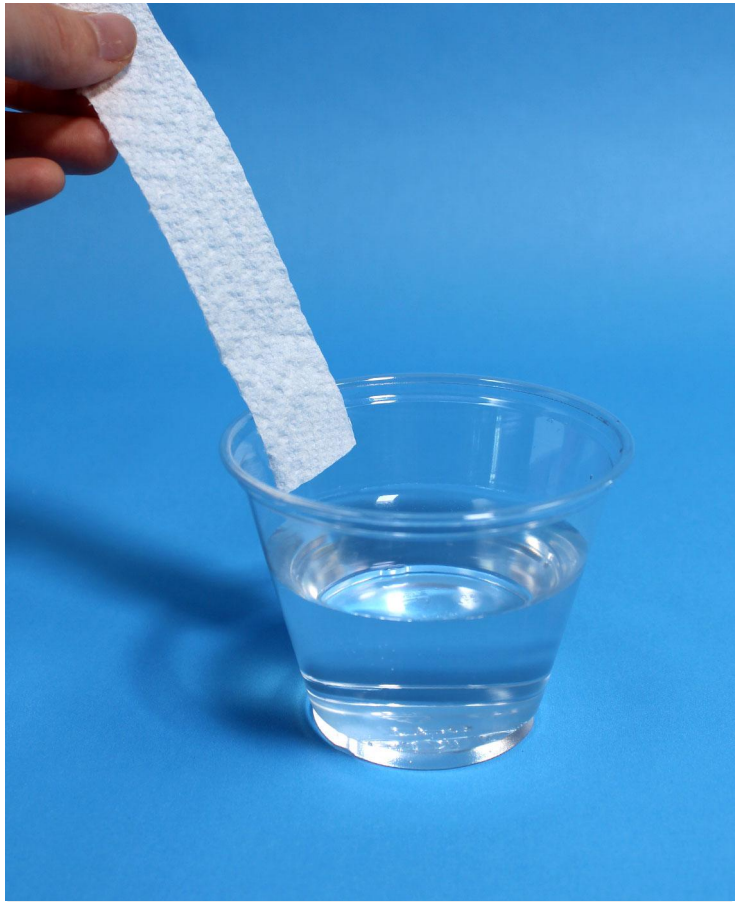
This is the food dye that might be harmful, Red Dye #75.

This is the **food coloring** that Good Food Production, Inc. uses in many of its products.

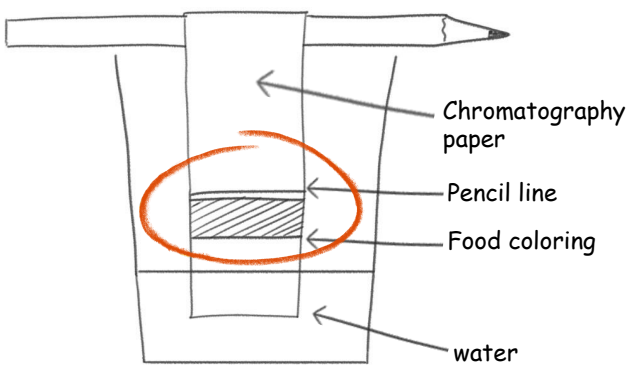
We will **test to find out if it is a mixture** that could contain Red Dye #75.

Activity 2

Separating the Food Coloring



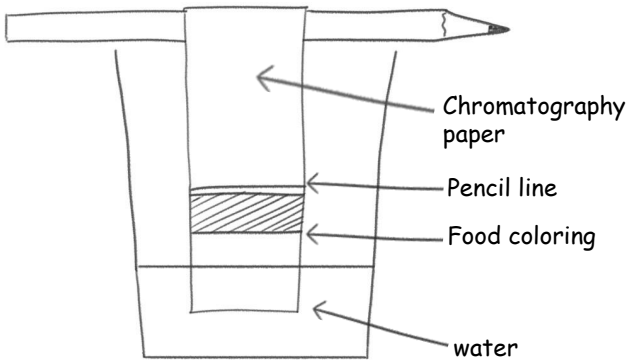
Let’s take a look at something that is part of the **chromatography test**, which we’ll use to investigate the food coloring.



In **chromatography,** a paper strip is dipped into water, as we just saw.

In a chromatography **test**, however, the paper also has a test mixture on it.

Chromatography Diagram



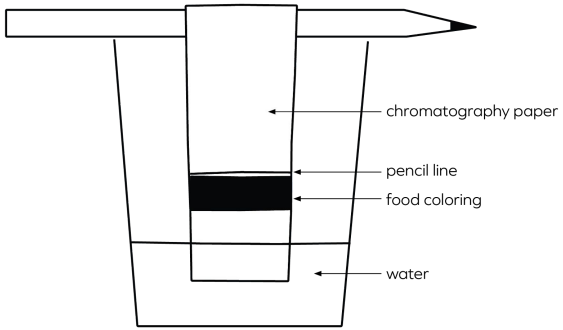
You will hang the paper strip so the bottom touches the water.

What do you **predict** will happen?

Name: _____ Date: _____

Using Chromatography to Separate a Mixture

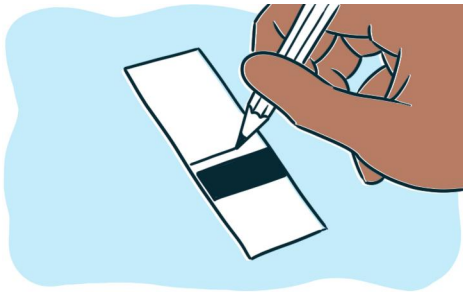
1. **Draw a pencil line.** On the paper strip, draw a pencil line along the top edge of the food coloring.
2. **Attach the paper strip so it hangs in the water, but the food coloring is still above the water.** Tape the top of the paper strip to a pencil. The bottom of the paper strip should just touch the water in the cup, and the food coloring should remain above the water.
3. **Start the chromatography test by hanging the paper strip in the water.** Place the pencil across the top of the cup.



Turn to page 9 in your notebooks.

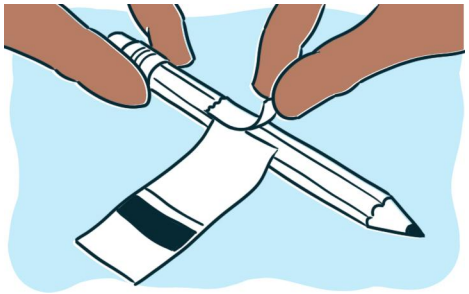
Let’s review the directions.

Chromatography Test



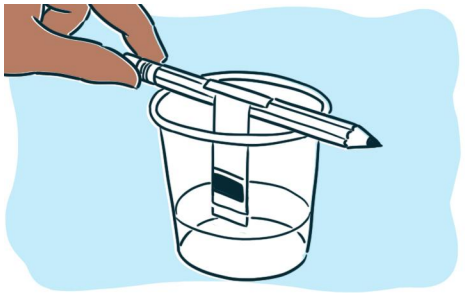
Step 1

Draw a pencil line.



Step 2

Tape the top of the paper strip to a pencil so that the paper strip will hang in the water, with the food coloring still above the water.



Step 3

Place the pencil across the top of the cup to begin the test.

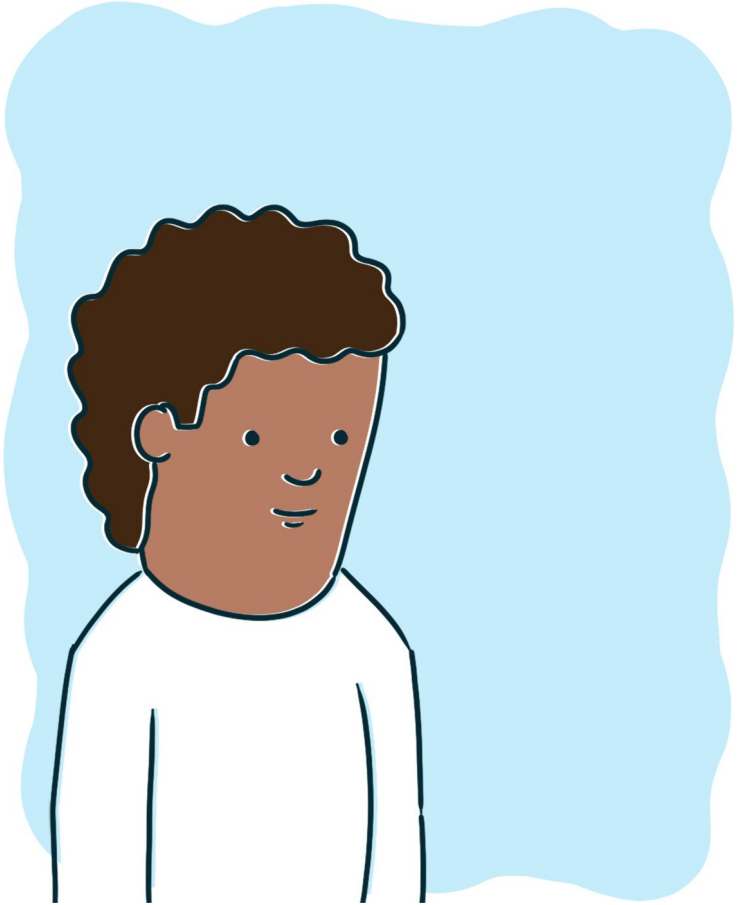
10 MIN

Activity 3

Making the Pasta Model

While we wait, let's look at a **model** to help us understand how chromatography works.

In this model, each cup contains a different **substance**.



Today you will pretend to have nanovision goggles.

Put on your imaginary **nanovision goggles** to make things look billions of times larger than they really are.

In this model, each piece of pasta represents a molecule.

What do you notice about the **molecules**?

Let's think about the substances in our model one substance at a time.

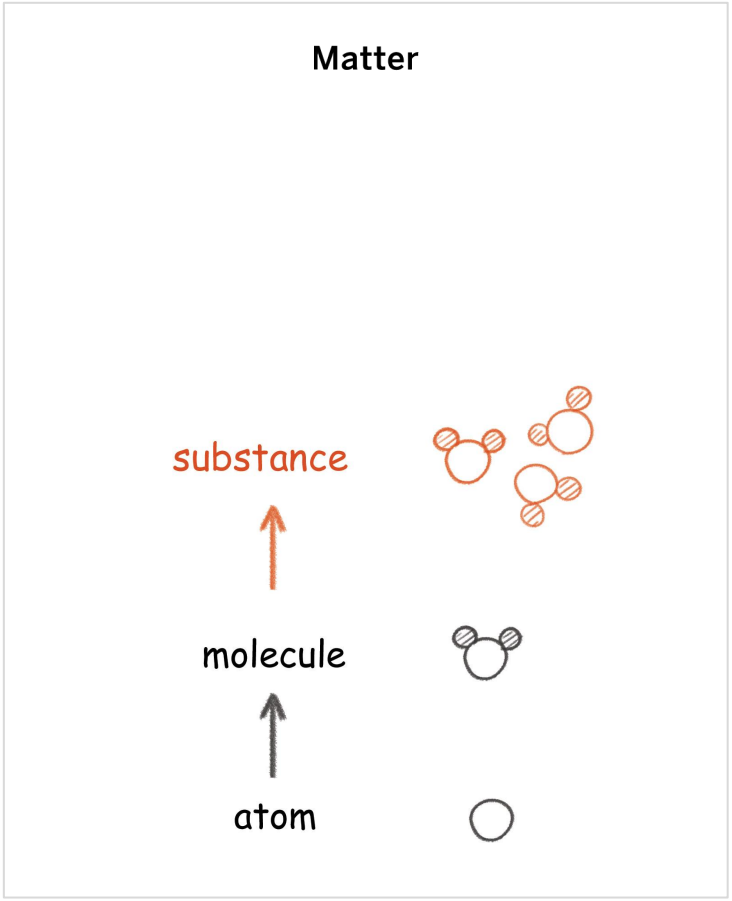
Are the molecules of this substance **the same or different**?

Key Concept

All molecules of one substance are exactly the same, and they are different from molecules of any other substance.

Remember that we are investigating these questions:

How are different kinds of molecules different? How are molecules similar?



We can add **substance** to our chart.

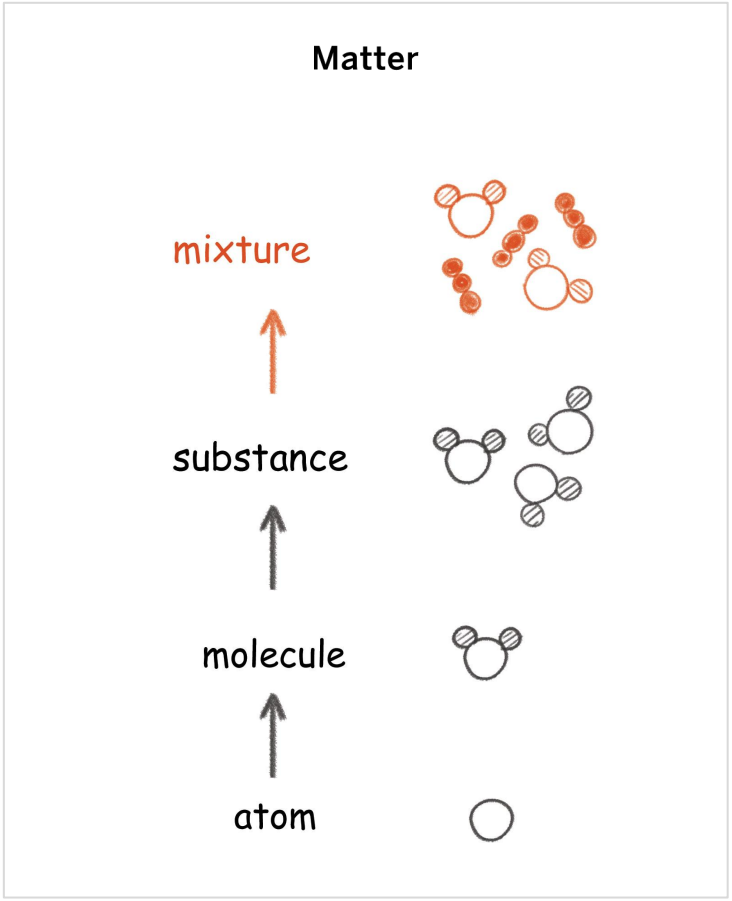
As we just noted in our key concept, all **molecules of one substance are exactly the same**.

Pasta Model: Making a Mixture

Step 1
Three volunteers will pick up the cups of pasta representing each of the substances in our model.

Step 2
The volunteers will pour all three cups of pasta into the container at the same time so all the pasta types mix together.

Step 3
Let’s observe the mixture we have created.



Mixtures are made out of different substances and include **more than one kind of molecule**.

Let's update our chart again.

How could we **separate the mixture** in our model back into three separate substances?

Let's try shaking the container to separate the mixture.

Observe what happens when the container is shaken.

What was it about the **molecules** in the pasta mixture that allowed the mixture to **separate** when the container was shaken?

Properties of substances	Properties of molecules
color	shape
smell	size
texture	

We just figured out that **molecules have properties**.

Let’s add what we’ve learned to our chart about properties.

15 MIN

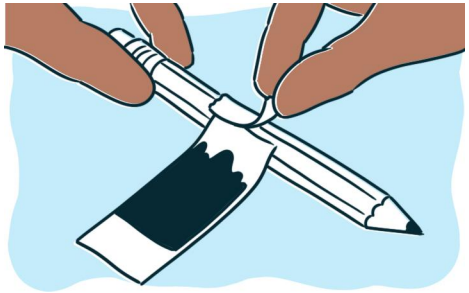
Activity 4

Discussing Chromatography Results

Finishing the Chromatography Tests

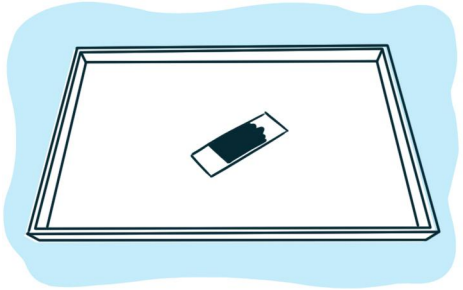
Step 1

Lift the paper strip out of the cup.



Step 2

Carefully **remove the tape** holding the paper to the pencil.



Step 3

Let the strip dry by leaving it on your tray.

Chromatography Observations

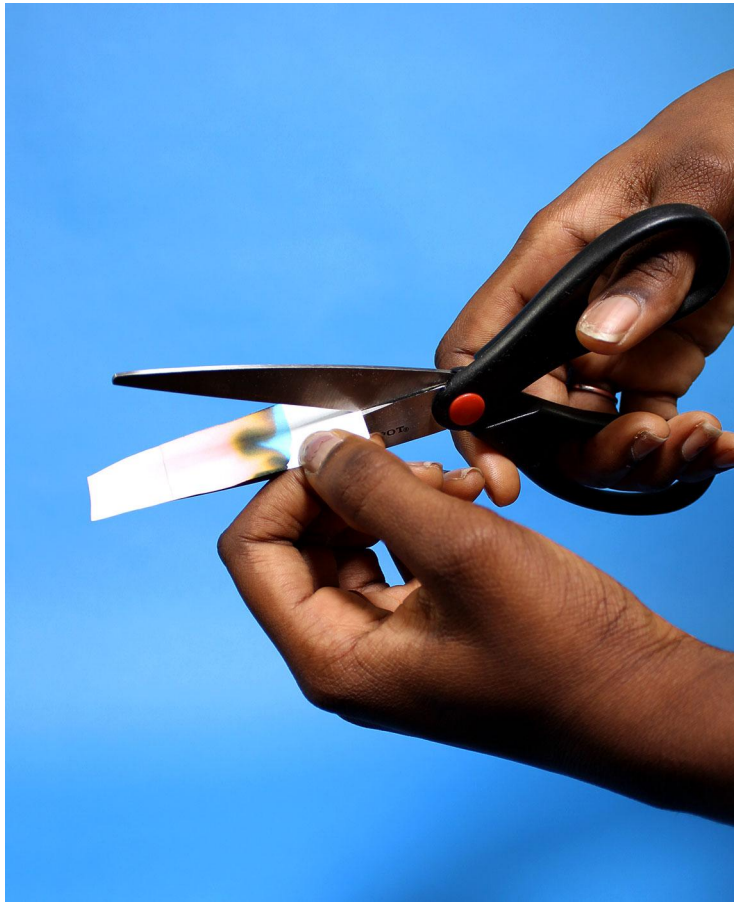
We can use this chart to record what you observed.

What happened in the chromatography test?

What **colors** of dye do you see in your chromatography strip?

Based on these observations, was the food coloring a **substance or a mixture**?

Is it possible that the harmful Red Dye #75 is in the food coloring mixture?



Cut your chromatography strip in half. Each partner gets half.

Tape your half to page 9 in your notebook.

Activity 5

Writing About Molecules

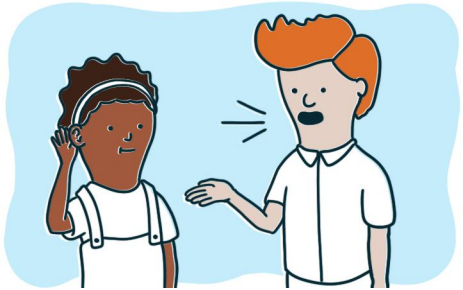
Remember that we are investigating these questions:

How are different kinds of molecules different? How are molecules similar?

Shared Listening

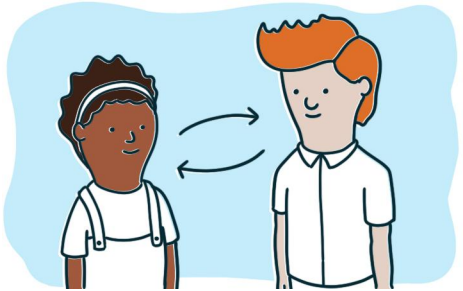
Step 1

I will ask a question. **Partner A shares** for one minute while **Partner B listens.**



Step 2

Partner B restates what they heard Partner A say. **Partner A can correct misstatements,** if necessary, but not add any new information.



Step 3

Partners switch roles for the second question. (Partner B will share and Partner A will listen, then restate Partner B's ideas.)

Shared Listening Question 1:

What are some ways that **molecules can be different** from one another?

Shared Listening Question 2:

What are some ways that **molecules can be similar** to one another?

Name: _____ Date: _____

Writing About Molecules

How are different kinds of molecules different? How are they similar? Explain how you know. What is your evidence?

_____

_____

_____

_____

_____

_____

Turn to page 10 in your notebooks.

Record your ideas about how molecules are similar and different.

End of Lesson

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UNIVERSITY OF CALIFORNIA, BERKELEY

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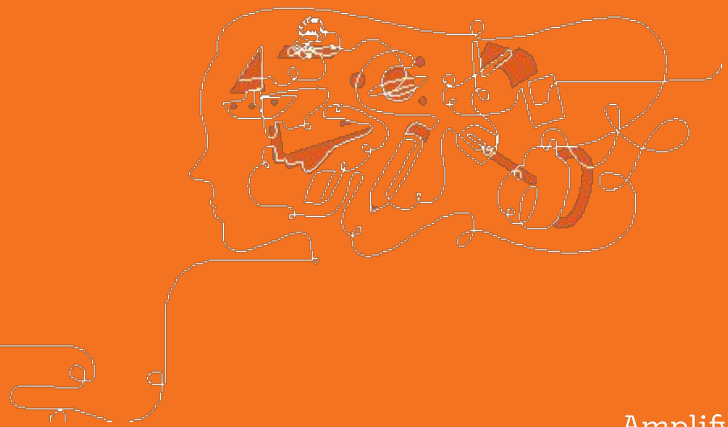
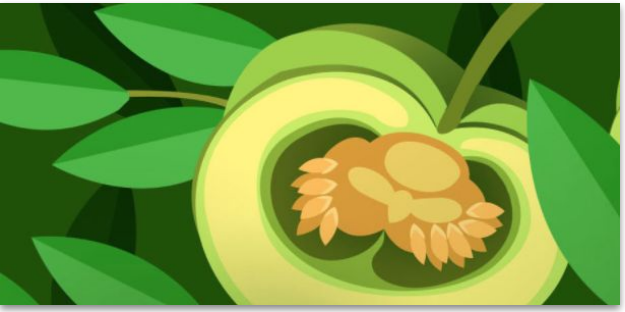
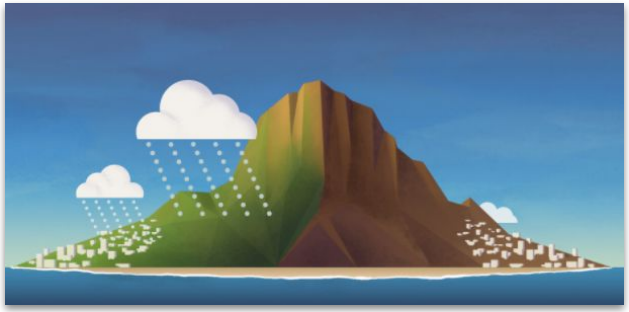
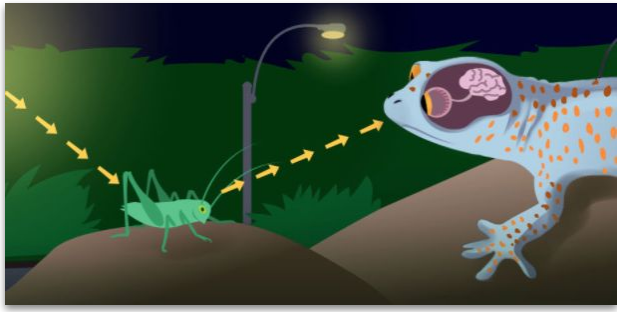
Break



Plan for the day

- Introduction
- Assessment System
- Progress Build
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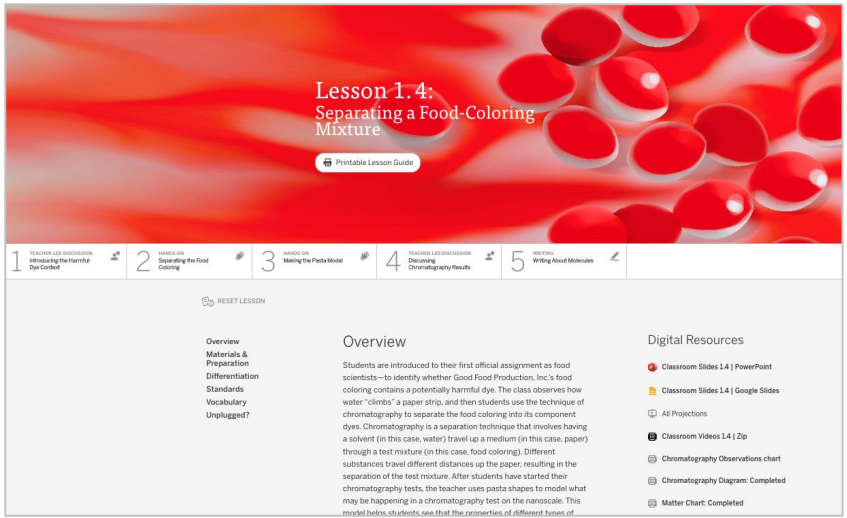
- Model Lesson
- Planning
- Closing

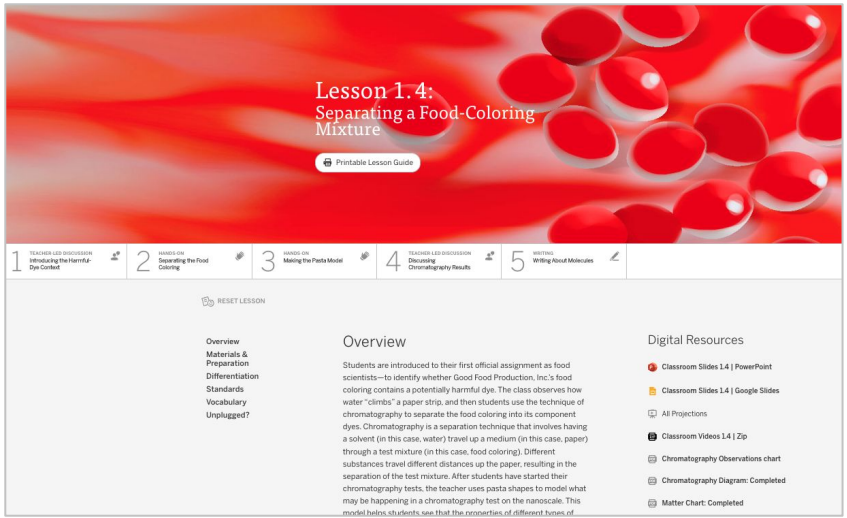
Work time - Planning

- Navigate to a lesson that you'll be teaching in the upcoming week that has a formative assessment opportunity (you might want to refer to the **Embedded Formative Assessment or Assessment System** documents on the Unit Landing Page)
- Review the assessment type and guidance



Work time - Planning

- Download and review the classroom slides
- Read the unit overview
- Read the Materials and Prep
- Read the differentiation
- Prepare any data collectors or assessment materials needed.

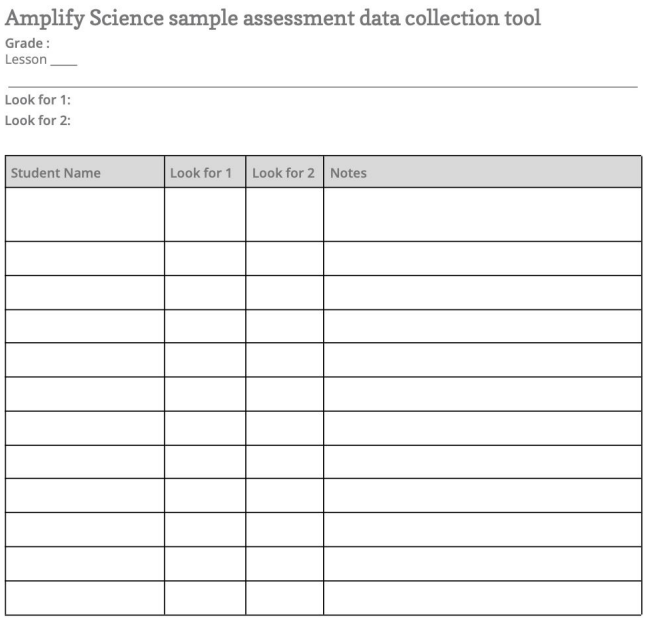


Work time - Planning

Pg. 17=18

Be prepared to share out the:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections



Amplify Science sample assessment data collection tool

Grade :
Lesson ____

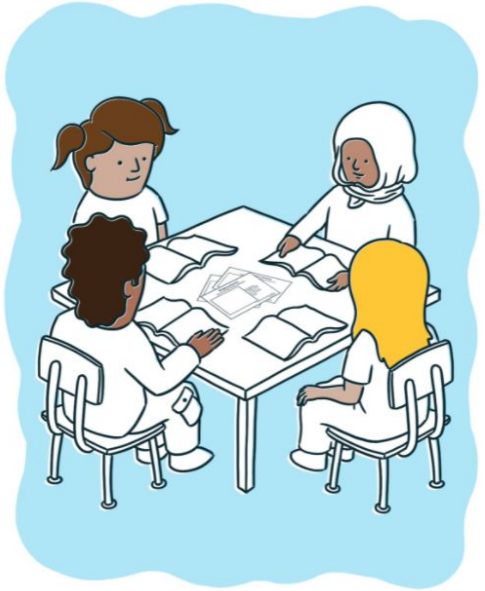
Look for 1:
Look for 2:

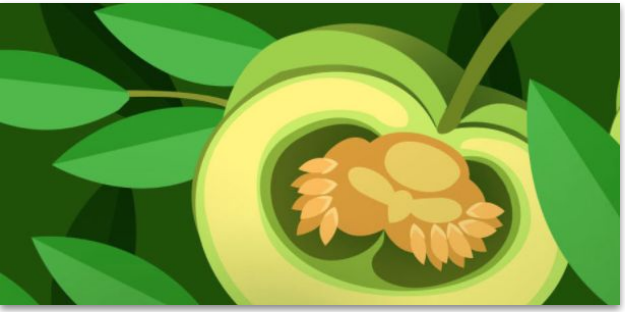
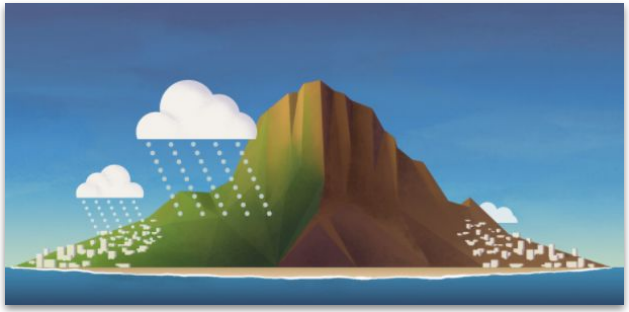
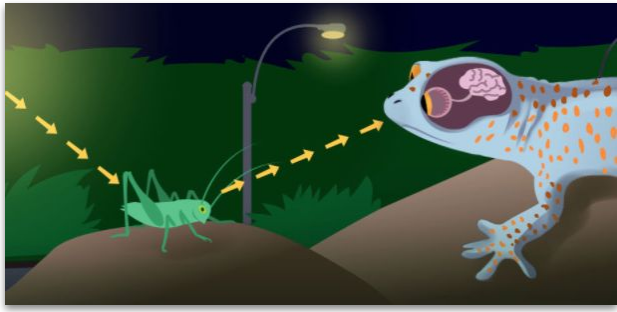
Student Name	Look for 1	Look for 2	Notes

Share Out

Share:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections



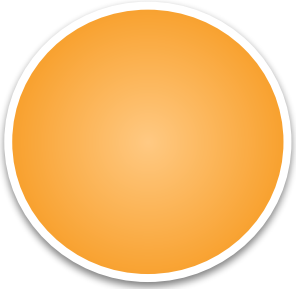
Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Closing reflection

Based on our work today, share:

1-3 big points you're taking away from this session

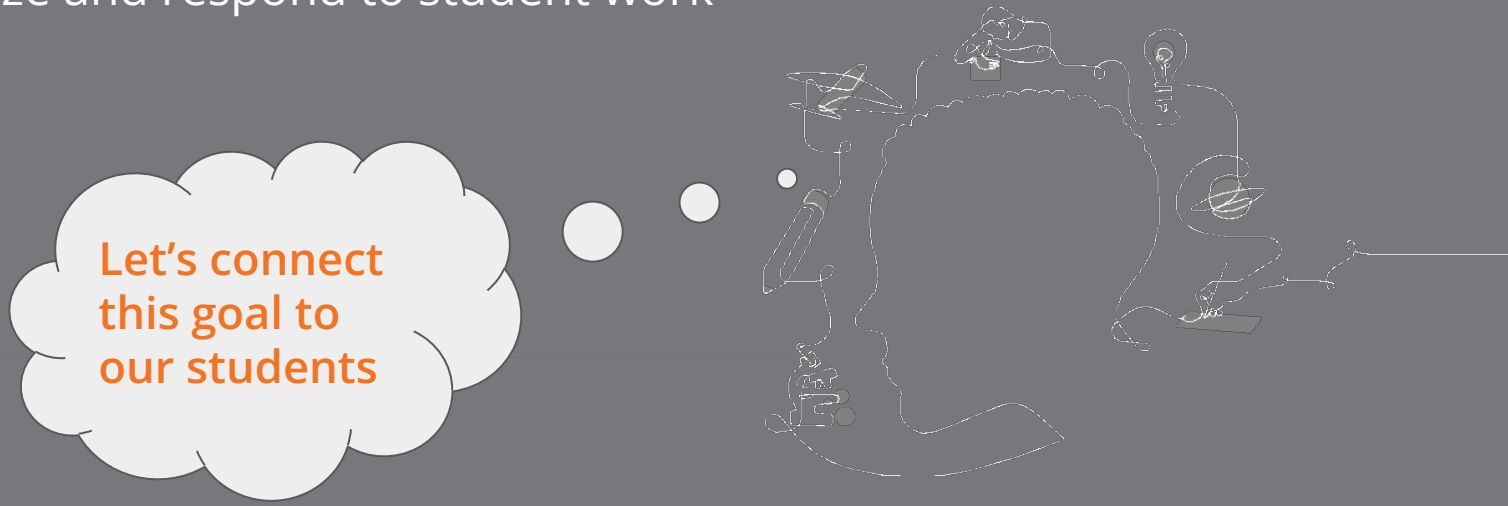


A question or topic that's still circling in your mind

Something that's "squaring" (resonating) with you from this session

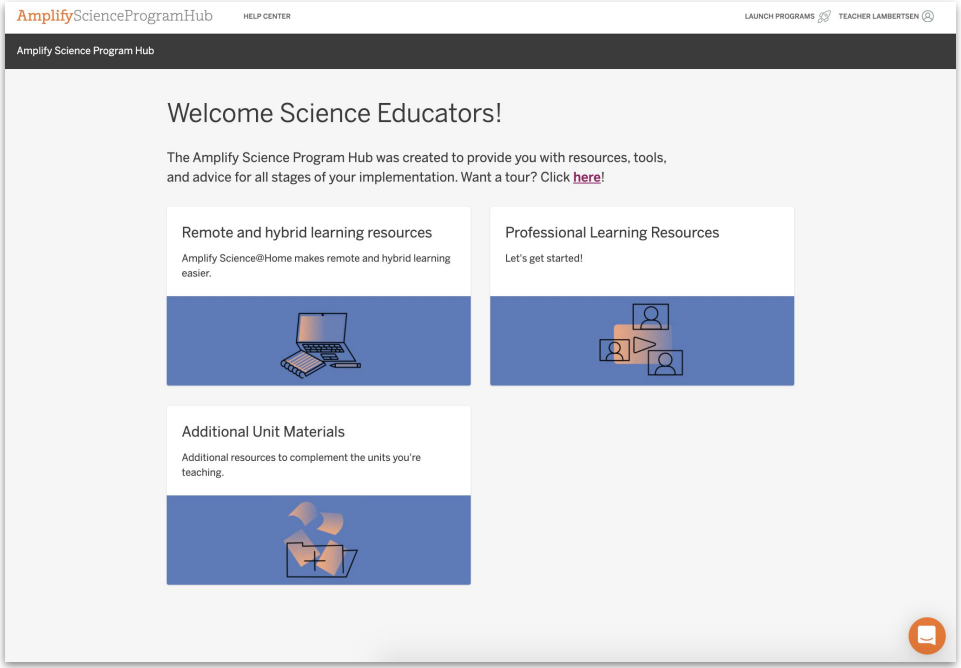
Overarching goals

- ☑ Describe the structure and purpose of the Amplify Science Assessment System
- ☑ Plan for the strategic use of assessment resources to analyze and respond to student work



Program Hub

- Unit overview videos
- Planning tools
- Remote and hybrid learning resources.



Additional resources and ongoing support

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support.

Amplify Chat