Louisiana Believes

Distance Learning Support for OpenSciEd Grade 7
Unit 7.4 Matter Cycling and Photosynthesis

This resource is designed to support teachers in implementing distance learning for OpenSciEd Grade 7 Unit 7.4, Unit 5 in the Louisiana Guide to Piloting OpenSciEd. It is intended as a supporting document and should be used in conjunction with the OpenSciEd Unit 7.4 Unit Resources. The resources contained in this document have been adapted from OpenSciEd with permission under Creative Commons 4.0 licensing.

The OpenSciEd Remote Learning Resources linked below contain detailed information about adapting specific routines to a remote learning environment and a wide variety of options including those for students who do not have internet access:

- Fostering Productive Norms
- Anchor Phenomenon Routine
- Navigation Routine
- Supporting Discourse
- Problematizing Routine

This guidance document is considered a "living" document as we believe that teachers and other educators will find ways to improve the document as they use it. Please send feedback to STEM@la.gov so that we may use your input when updating this guide.

Updated November 17, 2020

DEPARTMENT of EDUCATION
louisiana Believes

Norming Language	
Term	**Description**
Virtual Class Pre-Work	Assignments that students should do prior to virtual class meetings in order to be prepared to engage in discussions, there may be multiple assignments throughout a given lesson
Virtual Class Post-Work	Assignments designed for students to apply learning from virtual class meetings, there may be multiple assignments throughout a given lesson
Virtual Class	Live sessions with students through any digital conferencing platform, teachers may choose to allow students without internet to call in during these sessions and record virtual class sessions to share with those who cannot join
Thinking Deeper Documents	Progress trackers for students to use throughout each lesson to record and revise their thinking about science concepts related to the phenomenon; contain assignments for students to complete before, during, and after virtual classes, discussion boards, and home investigations
Lesson Slideshows	Lesson progression specific to each lesson used to guide student work; used during pre-work, post-work, virtual classes, home investigations, and discussion boards; can be shared with students in their entirety at the beginning of the lesson or broken into small portions and shared as needed
Discussion Boards	Assignments designed for students to share ideas and engage in discussion with one another over time rather than a live environment; students will use their Thinking Deeper Documents to brainstorm prior to submitting; teachers may choose to allow students without internet to text in responses and may screenshot/download and share portions of or full discussions via text (ex. through apps like Remind)
Home Investigations	Investigations with readily available materials designed for students to perform at home; teachers may choose to substitute videos or photos of data collection for students who cannot complete investigations at home

Lesson Set Overview: Lessons 1, 2, 3, 4, 5, 6, 7, 8

Lesson Set 1: Lessons 1-8		
Provided Resources Students Will Need	**Additional Resources Students Will Need**	**Additional Materials for Students Without Internet Access**
Lesson Slideshows for each lesson: L1, L2, L3, L4, L5, L6, L7, L8 **Thinking Deeper Documents for each lesson:** Lesson 1 TDD, Lesson 2 TDD, Lesson 3 TDD, Lesson 4 TDD, Lesson 5 TDD, Lesson 6 TDD, Lesson 7 TDD, Lesson 8 TDD **Additional Documents:** Lesson 4: Comparing and Critiquing arguments about Water in Plants Lesson 8: Individual Midpoint Assessment Optional: Sample Parent Letter	**Teacher Made Resources:** Lesson 1: • DQB assignment, Consensus Model, Driving Question Board Lesson 2: • Potential Candidates assignment, Potential Candidates chart - *made with student submissions* Lesson 3: • Consensus Model, Potential Candidates chart, Revising Potential Candidates Discussion Board Lesson 4: • Consensus Model, Potential Candidates chart Lesson 6: • Investigation B Data sharing assignment Lesson 7: • Chloroplast Consensus Model Lesson 8: • Initial Models from Lesson 1, Thinking Deeper Documents from previous Lessons **Home Investigation Materials:** Lesson 1: Maple syrup, Maple water *(see safety information and alternative assignment)* Lesson 5: Spinach leaves, Magnifying lenses *(see option for substituting live demonstration)*	**Prior to Lesson**: Lesson 1: Maple Tree Tapping video Lesson 2: Hydroponic System setup video Lesson 5: Chloroplasts in Action video Lesson 6: Chloroplast Simulation **After Lesson Completion:** Discussion Board (Lessons 3, 6) Virtual Class recordings (Lessons 1, 2, 4, 5, 6, 7, 8)

Students should ideally join VIRTUAL CLASS on the following days:

Day 2 - Lesson 1 | Day 5 - Lesson 2 | Day 7 - Lesson 4 | Day 9 - Lesson 5

Day 10 - Lesson 6 | Day 12 - Lesson 7 | Day 13 - Lesson 8

Formative and Summative Assessment Opportunities:

Lesson 2: Progress Tracker - TDD
Lesson 4: Comparing and Critiquing arguments about Water in Plants
Lesson 6: Progress Tracker - TDD
Lesson 8: Individual Midpoint Assessment

Lesson Set Overview: Lessons 9, 10, 11, 12, 13, 14, 15

Lesson Set 2: Lessons 9-15		
Provided Resources Students Will Need	**Additional Resources Students Will Need**	**Additional Materials for Students Without Internet Access**
Lesson Slideshows for each lesson: L9, L10, L11, L12, L13, L14, L15 **Thinking Deeper Documents for each lesson:** Lesson 9 TDD, Lesson 10 TDD, Lesson 11 TDD, Lesson 12 TDD, Lesson 13 TDD, Lesson 14 TDD, Lesson 15 TDD **Additional Documents:** Lesson 11: Maple Tree through the Seasons Explanation Lesson 12: One of the readings (Sugar reading, Agave Syrup reading, High Fructose Corn Syrup reading, Honey reading, Sucralose reading, Stevia reading) Lesson 14: Story of an Atom Assessment Lesson 15: Peer Feedback Guidelines Reference, Whale Fall Task Optional: Sample Parent Letter	**Teacher Made Resources** Lesson 9: • Discussion Board assignment (DQB), Discussion Board assignment Lesson 10: • Conditions Chart, Investigation Data Table, Discussion Board assignment Lesson 11: • Discussion Board assignment, Lesson 10 TDD (Human Cell Model), Consensus Model: Human cell Lesson 12: • Breakfast or lunch foods poster from Lesson 1, Discussion Board assignment Lesson 14: • Thinking Deeper Documents from lesson 9-13, Discussion Board assignment, Class Consensus Model Lesson 15: • Whale Fall Notice/Wonder chart	**Prior to Lesson**: Lesson 9: Maple Tree Tapping video Lesson 10: Secondhand Data for Leaves in the Dark handout Lesson 11: Sprouting seed video, How Do Plant (And Animal) Cells Use Food?, Backyard Time Lapse video, Maple Tree Time Lapse video Lesson 12: Making Sap into Syrup video, How Corn Syrup is Made video, How Flour is Made video, Where else does our food come from?, Nutrition Labels: What is in Food?, Chicken and Cow Diets Lesson 13: Reference Data from Food handout, Organisms that use food that doesn't get eaten, Pumpkin decomposing, Kebabs decomposing, Mushrooms growing on a tree Lesson 15 - Whale Fall video **After Lesson Completion:** Discussion Boards (Lessons 9, 10, 11, 12, 14) Virtual Class recordings (Lesson 10, 11, 12, 13, 14, 15)

Students should ideally join VIRTUAL CLASS on the following days:

Day 2 - Lesson 10 | Day 4 - Lesson 11 | Day 7 - Lesson 12 | Day 9 - Lesson 12

Day 11 - Lesson 13 | Day 14 - Lesson 14 | Day 14 - Lesson 15

Formative and Summative Assessment Opportunities:

Discussion Boards: Lessons 9, 10, 11, 12, 14
Lesson 11: Assessment Maple Tree through the Seasons Explanation
Lesson 14: Assessment Story of an Atom Assessment
Lesson 15: Assessment Whale Fall Task

Lesson 1 (3 days) - Anchoring Phenomenon

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Maple syrup and Maple sap [water} (these are not included in the kits and will need to be obtained by the school district and distributed to students prior to the lesson.) **Safety:** Be sure to check for any food allergies to maple syrup or sugar intolerance and that you are using 100% maple syrup and sap. Follow your school's policy for safe food handling. Wear gloves when packaging to send home. NOTE: If there are allergy concerns or distributing materials is not possible, consider providing videos like the examples provided: Kids Tasting Maple Syrup, Maple Water Review
- Maple Tree Tapping video
- DQB assignment - *teacher made*
- Consensus Model - *after completion*
- Driving Question Board - *after completion*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Maple syrup and Maple sap [water} (these are not included in the kits and will need to be obtained by the school district and distributed to students prior to the lesson.) **Safety:** Be sure to check for any food allergies to maple syrup or sugar intolerance and that you are using 100% maple syrup and sap. Follow your school's policy for safe food handling. Wear gloves when packaging to send home. NOTE: If there are allergy concerns or distributing materials is not possible, consider providing videos like the examples provided: Kids Tasting Maple Syrup, Maple Water Review
- Maple Tree Tapping video
- DQB assignment - *teacher made*
- Consensus Model - *after completion*
- Driving Question Board - *after completion*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 2

Lesson 1 (3 days) - Anchoring Phenomenon

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (10 min) EXPLORE THE FOOD WE ATE TODAY Slides A - D	1. Distribute maple syrup and maple water prior to lesson or provide video links for students in the lesson slideshow. 2. Share Lesson Slideshow with students. 3. Share Thinking Deeper Document with students.	VIRTUAL CLASS PRE-WORK: 1. Identify foods eaten recently and sort them into categories. 2. Make observations about Maple syrup.
Part 2 (10 min) WHERE DOES MAPLE SYRUP COME FROM? Slides E-F		VIRTUAL CLASS PRE-WORK: 1. Record noticings and wonderings about the video showing where maple syrup comes from. 2. Identify patterns from tasting Maple syrup and watching the video.
Part 3 (5 min) TASTE MAPLE SAP Slide H		VIRTUAL CLASS PRE-WORK: 1. Record noticings and wonderings after tasting Maple sap.
Part 4 (7 min) RECALL WHAT HAPPENS TO THE FOOD WE EAT Slide I-J		VIRTUAL CLASS PRE-WORK: 1. Describe the process of food breaking down as it travels through our body. 2. Identify that food molecules are atoms of certain basic elements.

Part 5 (11 min) PREDICT WHICH FOOD MOLECULES ARE IN PLANTS	*Addressed in Day 2 Virtual Class*	
Part 6 (10 min) READ ABOUT BREAKFAST FOOD AROUND THE WORLD Slide K		VIRTUAL CLASS PRE-WORK: 1. Read about what kids eat for breakfast around the world. 2. Categorize the food and make predictions about what food molecules might be found in them.

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 7-12 (50 min) NAVIGATION INVESTIGATE WHAT IS IN FOOD THAT COMES FROM PLANTS DEVELOP INITIAL MODELS OF HOW PLANTS GET FOOD MOLECULES COMPARE INITIAL MODELS OF HOW PLANTS GET FOOD MOLECULES DEVELOP A CONSENSUS MODEL OF HOW PLANTS GET FOOD MOLECULES Slides L-R	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) VIRTUAL CLASS: 1. Categorize foods listed in day one and predict what food molecules are in foods that come from plants. 2. Discuss predictions of food molecules in plants. 3. Investigate what's in the foods we eat that come from plants. 4. Class discussion of related phenomena, students record ideas on Thinking Deeper Document. 5. Create and share initial models. Models may be shared in breakout rooms, through a sharing app such as Jamboard, or in the whole group. 6. Develop a consensus model. Draw electronically on a whiteboard app and screen share or draw on chart paper to display on camera. 7. Post/share consensus model with students to reference throughout the unit.	
Part 13 (2 min) NAVIGATION: RECORD NEW QUESTIONS Slide S		VIRTUAL CLASS POST-WORK: 1. Record new questions based on Consensus model work

Day 3		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 14 (7 min) DEVELOP QUESTIONS FOR THE DRIVING QUESTION BOARD Slide T		VIRTUAL CLASS PRE-WORK: 1. Review models. 2. Review noticings and wonderings. 3. Review Related Phenomena. 4. Brainstorm how and why questions related to how food molecules and plants.
Part 15 (23 min) BUILD THE DRIVING QUESTION BOARD Slide T	1. Create and assign the DQB assignment for students to submit questions. 2. Review submitted questions and create DQB. 3. Post/share DQB with students to reference throughout the unit (Padlet, Jamboard, or similar tools will allow students to interact with the DQB in subsequent lessons).	VIRTUAL CLASS PRE-WORK: 1. Choose one question and submit it to the teacher.
Part 16 (15 min) DEVELOP IDEAS FOR INVESTIGATIONS Slide V		VIRTUAL CLASS POST-WORK: 1. Record the kind of investigations we could or would need to perform to collect data to answer the questions from the DQB.

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Lesson 2 (2 days) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Potential Candidates assignment - *teacher made*
- Potential Candidates chart - *teacher made with student submissions*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Hydroponic System setup video
- Potential Candidates assignment - *teacher made*
- Potential Candidates chart - *teacher made with student submissions*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 2

Lesson 2 (2 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (6 min) NAVIGATION Slides A-B	1. Share Lesson Slideshow with students. 2. Share Thinking Deeper Document with students.	VIRTUAL CLASS PRE-WORK: 1. Review what we agreed on in the last class from our consensus model using the Progress Tracker. 2. Reflect on how plants get food.
Part 2 (7 min) EXPLORE PLANTS GROWING IN CLASS Slides C-D		VIRTUAL CLASS PRE-WORK: 1. Examine pictures of plants growing in a hydroponic system and answer questions about them.
Part 3 (5 min) CREATE OUR LIST OF CANDIDATES Slide E	1. Create an assignment for students to submit their potential candidates. 2. Compile student submissions on a chart to share with students during the Virtual Class.	VIRTUAL CLASS PRE-WORK: 1. Create a list of candidates for the source of food molecules in plants. 2. Submit one candidate to the teacher for inclusion on the Potential Candidates chart.
Part 4 (10 min) ANALYZE THE HYDROPONIC SYSTEM Slide F	*Soil elimination is addressed in the Virtual Class*	VIRTUAL CLASS PRE-WORK: 1. Make observations of the hydroponic system in preparation for a discussion about eliminating soil as a candidate.

Part 5 (7 min) ANALYZE THE HYDROPONIC PLANT SET UP Slide G-H		VIRTUAL CLASS PRE-WORK: 1. Analyze the hydroponic plant system to consider adding plant food as a potential candidate.
Part 6 10 min) INVESTIGATE HYDROPONIC PLANT FOOD Slides I - K		VIRTUAL CLASS PRE-WORK: 1. Analyze food molecules to determine what they are made of. 2. Reflect on how we might determine if hydroponic plant food is the source of food molecules. 3. Examine the hydroponic plant food label to determine whether it is a source for food molecules.

<table>
<tr><th colspan="3">Day 2</th></tr>
<tr><th rowspan="2">Lesson Components</th><th colspan="2">Distance Learning Plan</th></tr>
<tr><th>Teacher</th><th>Student</th></tr>
<tr><td>Part 7 - 9 (45 min)

NAVIGATION
INVESTIGATE HYDROPONIC PLANT FOOD WITH FOOD INDICATORS
BUILDING UNDERSTANDINGS
DISCUSSION ABOUT WHETHER FOOD MOLECULES ARE FOUND IN HYDROPONIC PLANT FOOD SOLUTION

Slides L - Q</td><td colspan="2">*Teachers build in reviewing norms and setting expectations as needed for Virtual Class.
*The slide deck includes optional slides (20-23) that provide references for the results portion of the investigation.
Prior to Virtual Class, the teacher should:
1. Prepare for the class investigation prior to the lesson. Teachers may choose to conduct and record the investigation prior to the lesson.

VIRTUAL CLASS:
1. Discuss list of candidates for the source of food molecules in plants.
2. Share ideas about testing hydroponic plant food.
3. Design an investigation to determine if hydroponic plant food is the source of food molecules.
4. Carry out student designed investigations on live stream or recorded video.
5. Make sense as a class of what the results of the food indicator experiments.
6. Update our Progress Trackers with information about whether the below the surface inputs were the source of food molecules.</td></tr>
<tr><td>Part 10 (5 min)
EXIT TICKET: FOOD MOLECULES FROM BELOW SURFACE INPUTS
Slide R</td><td></td><td>VIRTUAL CLASS POST-WORK:
1. Identify other possible sources for food molecules in plants.</td></tr>
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Lesson 3 (1 day) - Problematizing

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Consensus Model
- Potential Candidates chart from Lesson 2
- Revising Potential Candidates Discussion Board - *teacher made*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Consensus Model
- Potential Candidates chart from Lesson 2
- Revising Potential Candidates Discussion Board - *teacher made*
- Discussion Board - *after completion*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- None

Lesson 3 (1 day) - Problematizing

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (5 min) NAVIGATION Slide A	1. Share Lesson Slideshow with students. 2. Share Thinking Deeper Document with students.	VIRTUAL CLASS PRE-WORK: 1. Review Consensus model to find above surface inputs.
Part 2 (6 min) DISCUSS WHAT WE ALREADY KNOW ABOUT LIGHT Slide B		VIRTUAL CLASS PRE-WORK: 1. Students will review prior knowledge of light and list this information in their Thinking Deeper Document.
Part 3 (7 min) DISCUSS WHAT WE ALREADY KNOW ABOUT THE COMPOSITION OF AIR Slide C-D		VIRTUAL CLASS PRE-WORK: 1. Students will review prior knowledge of air and list this information in their Thinking Deeper Document. 2. Students will analyze the chemical composition of air to determine if food molecules are present.
Part 4 (9 min) PROBLEMATIZE CANDIDATE SOURCES FOR PLANT FOOD MOLECULES Slide E		VIRTUAL CLASS PRE-WORK: 1. Students will reflect upon the current question of study and identify possible sources for further investigation.

Part 5 (9 min) LOOK FOR PATTERNS BETWEEN CANDIDATES AND FOOD MOLECULES FOR PARTS OF FOOD MOLECULES Slide F		VIRTUAL CLASS PRE-WORK: 1. Students will analyze the chemical composition of food molecules with a goal of identifying patterns between candidates.
Part 6 (3 min) REVISE OUR CANDIDATES LIST TO "PARTS" OF FOOD MOLECULES Slide G	1. Ensure students have access to the potential candidates chart created in Lesson 2. 2. Create a Discussion Board assignment (question stream, shared document, ect.) for students to submit their ideas for revising the potential candidates chart. 3. Review student submission, facilitate discussion as needed, and revisit in Virtual Class if needed.	DISCUSSION BOARD: 1. Students will identify 2 candidates that could move to a different part of the Potential Candidates chart and share their ideas on the Discussion Board.
Part 7 (3 min) REVISE CONSENSUS MODEL TO INCLUDE CONFIRMED INPUTS Slide H		VIRTUAL CLASS PRE-WORK: 1. Students will identify inputs for confirmation. 2. Students will identify methods to represent inputs.
Part 8 (3 min) NAVIGATION: WHERE DO WE GO NEXT? Slide I		VIRTUAL CLASS POST-WORK: 1. Students will answer questions that facilitate the navigation to the next lesson.

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Lesson 4 (2 days) – Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Consensus Model
- Potential Candidates chart from Lesson 2
- Lesson 4 Assessment: Comparing and Critiquing arguments about Water in Plants

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Consensus Model
- Potential Candidates chart from Lesson 2
- Lesson 4 Assessment: Comparing and Critiquing arguments about Water in Plants
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 4 (2 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (5 min) NAVIGATION Slide A	1. Share Lesson Slideshow with students 2. Share Thinking Deeper Document with students	VIRTUAL CLASS PRE-WORK: 1. Students develop reasons to investigate air around plants.
Part 2 -3 (30 min) PLANNING AND INVESTIGATING ABOVE THE SURFACE SOURCES MAKE SENSE OF RESULTS IN A WHOLE-CLASS BUILDING UNDERSTANDINGS DISCUSSION Slides B-K	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Prepare for the class investigation prior to the lesson. Teachers may choose to conduct and record the investigation prior to the lesson. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) VIRTUAL CLASS: 1. Review consensus model to identify above surface inputs. 2. Review light and air knowledge from previous units. 3. Revise Potential Candidates list based on Discussion Board responses from Lesson 3. 4. Revise Consensus Model. 5. Brainstorm how to figure out if parts of food molecules are entering the plant through the air. 6. Monitor carbon dioxide and water levels within a closed system for 10–15 minutes and record patterns. 7. Discuss the “Making sense” questions from the previous activity. 8. Motivate a desire to see whether other gases are changing around the plant. 9. Provide feedback to student claims in a whole class discussion or in breakout rooms if possible. *(Students will complete the assessment as virtual class post-work)*	

Part 4 (10 min) COMPARE AND CRITIQUE ARGUMENTS ABOUT THE ROLE OF WATER Slides L-M	1. Assign Lesson 4 Assessment: Comparing and Critiquing arguments about Water in Plants	VIRTUAL CLASS POST-WORK: 1. Complete an assessment where they provide feedback to three different claims about what happens to water inside plants.

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 5 (5 min) NAVIGATION Slide N		VIRTUAL CLASS POST-WORK: 1. Revisit the idea of wanting to know if other gases in the air are going into or out of the plant.
Part 6 (20 min) ANALYZE AND INTERPRET SECONDHAND DATA Slides O -R		VIRTUAL CLASS POST-WORK: 1. Evaluate second hand data produced by other students who measured carbon dioxide, water, oxygen, and light. 2. Analyze and interpret these data using the I2 strategy and discuss patterns.
Part 7 (15 min) CONSENSUS DISCUSSION ABOUT SECONDHAND DATA Slides S -T	*Addressed in Virtual Class.*	VIRTUAL CLASS POST-WORK: 1. Use evidence from both sessions to argue about which gases in the air we think are inputs and which we think are outputs.
Part 8 (5 min) NEXT STEPS Slide U		VIRTUAL CLASS POST-WORK: 1. Record ideas for how to investigate how gases are getting into and out of plants.

Return to Lesson Set Overview

Lesson 5 (1 day) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Spinach Leaves and a magnifying glass - NOTE: Spinach leaves are not included in the consumable materials and will need to be purchased and provided to students along with a magnifying glass. As an alternative, the teacher may choose to demonstrate during the virtual class.

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Chloroplasts in Action video
- Spinach Leaves and a magnifying glass - NOTE: Spinach leaves are not included in the consumable materials and will need to be purchased and provided to students along with a magnifying glass. As an alternative, the teacher may choose to demonstrate during the virtual class.
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 5 (1 day) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 - 5 (42 min) NAVIGATION OBSERVE THE OUTSIDE AND INSIDE OF LEAVES WATCH A VIDEO OF CHLOROPLASTS MOVING READ PLANT CELLS BUILDING UNDERSTANDINGS DISCUSSION ABOUT PLANT AND ANIMAL CELL STRUCTURES Slides A -J	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) VIRTUAL CLASS: 1. Brainstorm additions to the Consensus Model 2. Observe spinach leaves with a magnifying lens and microscope images of different sections of leaves. 3. Record observations about possible functions for each source. 4. Watch a video of a plant cell and record observations and ideas about possible functions. 5. Discuss how the data sources help us understand how gases get into and out of leaves. 6. Read *Plant Cells* in pairs and answer questions comparing plant and animal cells. 7. Investigate chloroplasts and light. 8. Discuss what the class figured out about plant cells. 9. Revise the Consensus model.	
Part 6 (3 min) NAVIGATION: IDEAS FOR INVESTIGATION Slide K		VIRTUAL CLASS POST-WORK: 1. Brainstorm what to put in a simulation to figure out what's happening inside plant cells.

Return to Lesson Set Overview

Lesson 6 (2 days) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Chloroplast Simulation
- Investigation B Data sharing assignment - *teacher made*
- Claims Discussion Board - *teacher made*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Chloroplast Simulation
- Investigation B Data sharing assignment - *teacher made*
- Claims Discussion Board - *teacher made*
- Discussion Board - *after completion*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 6 (2 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 - 5 (44 min) NAVIGATION ORIENT STUDENTS TO THE SIMULATION CONDUCT INVESTIGATION A MAKE SENSE OF INVESTIGATION A PLAN INVESTIGATION B Slides A -K	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) 3. Create Investigation B Data sharing assignment. VIRTUAL CLASS: 1. Review simulation desired components. 2. Orient students to the interface for the simulation. 3. Have students explore the simulation using the procedures for investigation A. 4. Make sense of investigation data. 5. Plan investigation B to explore how changing the inputs affects the outputs.	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 6 (15 min) CONDUCT INVESTIGATION B Slide L		VIRTUAL CLASS POST-WORK: 1. Conduct investigation and share results.
Part 7 (10 min) SHARE OUR CLAIMS WITH OUR GROUPS Slide M	1. Create a Discussion Board assignment (question stream, shared document, ect.) for students to submit their claims. 2. Review student submission, facilitate discussion as needed, and revisit in Virtual Class.	DISCUSSION BOARD: 1. Make claims based on simulation data and add it to the Discussion Board. 2. Review and respond to other student claims.
Part 8 (15 min) CONSENSUS DISCUSSION ABOUT INTERACTIONS Slides N, O	*Revisited in Virtual Class.*	VIRTUAL CLASS POST-WORK: 1. Create a model that demonstrates processes inside a chloroplast. 2. Update Progress Trackers.
Part 9 (5 min) NAVIGATION	*Not addressed in distance learning - option for teacher to build in during Virtual Class or Post-Work if time allows.*	

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Lesson 7 (1 day) - Investigation and Problematizing

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Chloroplast Consensus Model - *after completion*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Chloroplast Consensus Model - *after completion*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 7 (1 day) - Investigation and Problematizing

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 -4 (42 min) NAVIGATION READ: HOW DO SCIENTISTS MEASURE ENERGY IN FOOD? EXAMINE FOOD LABELS FOR EVIDENCE THAT THE INPUTS TO THE PLANT SYSTEM PROVIDE ENERGY ARGUE FROM EVIDENCE IN A SCIENTIST CIRCLE ABOUT THE ROLE OF SUNLIGHT Slides A -E	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) VIRTUAL CLASS: 1. Review student claims. 2. Develop a consensus model for chloroplast processes by discussing student-created models from Lesson 6. (Share model with students after completion.) 3. Discuss why plants need light with partners then the whole class. (If break out rooms are not possible, discuss whole-class.) 4. Read the article and complete the checklist and Making Sense questions. (You may choose to have students work with a partner or in a small group to complete the questions.) 5. Examine food labels for photosynthesis components in small groups. 6. Create arguments that sunlight provides energy to plants.	
Part 5 (5 min) UPDATE OUR PROGRESS TRACKERS Slide F		VIRTUAL CLASS POST-WORK: 1. Identify what we figured out so far about why plants need light.

Return to Lesson Set Overview

Lesson 8 (2 days) - Putting Pieces Together

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Initial Models from Lesson 1
- Thinking Deeper Documents from previous Lessons
- Midpoint Assessment document

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Initial Models from Lesson 1
- Thinking Deeper Documents from previous Lessons
- Midpoint Assessment document
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 8 (2 days) - Putting Pieces Together

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 - 4 (45 min) NAVIGATION: LOOKING BACK CREATE A GOTTA-HAVE-IT CHECKLIST REVISE THE CLASS CONSENSUS MODEL UPDATE OUR PROGRESS TRACKERS (OPTIONAL) Slides A - F	**Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) VIRTUAL CLASS: 1. Review Phenomena, related phenomena, and questions. 2. Create a Gotta-Have-It Checklist in groups. 3. Revise the Consensus model. 4. Update Progress Trackers.	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 4 (45 min) CHECK FOR UNDERSTANDING USING THE EMBEDDED MIDPOINT ASSESSMENT Slide G	1. Assign Midpoint Assessment.	VIRTUAL CLASS POST-WORK: 1. Work individually to revise initial models by creating a new model 2. Argue from evidence on how a scientist could survive in a container with just plants.

Return to Lesson Set Overview

Lesson 9 (1 day) - Problematizing

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Discussion Board assignment (DQB) - *teacher-made*
- Maple Tree Tapping video
- Discussion Board assignment (Models) - *teacher-made*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Discussion Board assignment (DQB) - *teacher-made*
- Maple Tree Tapping video
- Discussion Board assignment (Models) - *teacher-made*
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- None

Lesson 9 (1 day) - Problematizing

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (10 min) NAVIGATION: TAKE STOCK OF QUESTIONS WE'VE ANSWERED FROM THE DRIVING QUESTION BOARD. Slides A - B	1. Share Lesson Slideshow with students 2. Share Thinking Deeper Document with students 3. Create a Discussion Board assignment (question stream, shared document, etc.) for students to submit their ideas about what the model does and does not help us explain. 4. Review student submissions, facilitate discussion as needed, and revisit in Virtual Class if needed. *Additionally, students can complete the "Move questions" portion of the task if the DQB was created in a shareable format (Padlet, Jamboard, etc).*	VIRTUAL CLASS PRE-WORK: 1. Identify questions that can be answered on the DQB. 2. Submit two DQB questions and their answers to the Discussion Board. 3. Submit affirmative responses to other students' submissions.
Part 2 (7 min) APPLY OUR MODELS TO EXPLAIN WHY SUGAR IS FOUND IN MAPLE TREES Slides C - D		VIRTUAL CLASS PRE-WORK: 1. List ideas about how sugar gets into Maple syrup. 2. Complete T-chart of notices and wonders after re-watching video from Lesson 1 and reading about Maple tapping.

Part 3 (12 min) DEVELOP INITIAL EXPLANATIONS FOR WHY SUGAR IS FOUND IN MAPLE TREES Slides E - F	1. Create a Discussion Board assignment (question stream, shared document, etc.) for students to submit their ideas about what the model does and does not help us explain. 2. Review student submissions, facilitate discussion as needed, and revisit in Virtual Class if needed.	VIRTUAL CLASS PRE-WORK: 1. Create explanations about food molecules in plants. 2. Submit ideas about how to use models to explain sugar in Maple trees to the Discussion Board. 3. Submit affirmative responses to other students' submissions. 4. Record initial explanations about food molecules in plants.
Part 4 (16 min) ADD TO OUR DRIVING QUESTION BOARD Slides G	*If the DQB was created in a shareable format (Padlet, Jamboard, etc.), students may share their questions directly to the board, otherwise these can be shared in the next virtual lesson..*	VIRTUAL CLASS PRE-WORK: 1. Create additional questions about food molecules and plants.

Return to Lesson Set Overview

Lesson 10 (2 days) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Discussion Board assignment - *teacher-made*
- Secondhand Data for Leaves in the Dark handout

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Conditions Chart - *shared after creation*
- Investigation Data Table - *shared after creation*
- Discussion Board assignment - *teacher-made*
- Secondhand Data for Leaves in the Dark handout
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 10 (2 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 - 3 (42 min) NAVIGATION: REVISIT IDEAS ABOUT WHY PLANTS ARE MAKING FOOD MOLECULES PLAN AND INVESTIGATE PHOTOSYNTHESIS IN THE DARK MAKE SENSE OF OUR RESULTS Slides A-I	Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* *Teachers will need to plan for the in class investigation. Teachers may conduct and record the investigation prior to the virtual class.* VIRTUAL CLASS: 1. Revisit ideas about why plants are making food molecules. 2. Review Initial Explanations from the previous lesson. 3. Plan investigation of photosynthesis in the dark and make predictions. 4. Carry out investigation of photosynthesis in the dark. 5. Compare patterns from this investigation and Lesson 4 and discuss findings as a class. Small groups can complete this task in breakout rooms (via Zoom or Meet if possible) otherwise complete this task in a whole group discussion.	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 4 (20 min) ANALYZE SECONDHAND DATA Slides J-O	1. Share Secondhand Data for Leaves in the Dark handout with students. 2. Create a Discussion Board assignment (question stream, shared document, ect.) for students to submit their ideas about the other classes results. 3. Review student submissions, facilitate discussion as needed, and revisit in Virtual Class if needed.	VIRTUAL CLASS POST-WORK: 1. Review progress from the previous class and identify areas for further study. 2. Review results from another investigation and post to the Discussion board. 3. Make predictions about the behavior of gasses. 4. Analyze data tables and graphs. 5. Compare results from 2 different investigations to identify patterns.
Part 5 (7 min) COMMUNICATE OUR FINDINGS Slide P		VIRTUAL CLASS POST-WORK: 1. Create a 1 minute news release about photosynthesis in the dark.
Part 6 (13 min) BUILDING UNDERSTANDINGS DISCUSSION Slides Q- S	*Discussion addressed in Lesson 11 Virtual Class.*	VIRTUAL CLASS POST-WORK: 1. Identify ideas around what is happening within human cells. 2. List ideas about plants and cellular respiration. 3. List ideas for what is happening with a human cell and add them to a model.

Part 7 (5 min) GENERATE NEXT STEPS Slide T		VIRTUAL CLASS POST-WORK: 1. Identify possible future investigations involving plant food.

Return to Lesson Set Overview

Lesson 11 (3 days) - Putting Pieces Together

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Lesson 10 Thinking Deeper Document - Human Cell Model
- Discussion Board assignment - *teacher-made*
- How Do Plant (And Animal) Cells Use Food? reading
- Lesson 11 Assessment: Maple Tree through the Seasons Explanation

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Lesson 10 Thinking Deeper Document - Human Cell Model
- Consensus Model: Human cell - *after completion*
- Sprouting seed video
- Discussion Board assignment - *teacher-made*
- How Do Plant (And Animal) Cells Use Food? reading
- Maple Tree Time Lapse video
- Lesson 11 Assessment: Maple Tree through the Seasons Explanation
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 11 (3 days) - Putting Pieces Together

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1- 4 (45 min) NAVIGATION: WHEN ELSE CAN'T PLANTS DO PHOTOSYNTHESIS? WATCH A VIDEO OF SPROUTING CHILE SEEDS PLAN THE BTB BEAN SPROUT INVESTIGATION INVESTIGATE BEAN SPROUTS WITH BTB Slides A - H	Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* *Teachers should prepare for the class investigation prior to the lesson. This investigation utilizes a 24 hour reading of the test results. It is strongly recommended that teachers conduct a sample test on the day prior to the virtual lesson in order to have a 24-hour result for display. Teachers may choose to conduct and record the investigation prior to the lesson.* VIRTUAL CLASS: 1. Share ideas about cellular respiration in plant cells. 2. Develop a consensus model of activity in a human cell. Share with students when complete. 3. Recall ideas about how plants create energy without leaves and sunlight. 4. Stream video of sprouting seeds. 5. Conduct a video debrief to connect this video to the expected growth pattern in seeds. Small groups can complete this task in breakout rooms (via Zoom or Meet if possible) otherwise complete this task in a whole group discussion. 6. Lead a whole class discussion to plan an investigation to identify cellular respiration in bean seeds. 7. Test bean seeds with BTB. 8. Record day 2 observations in your science notebook. *Although this takes place on day 2, it is included at this point for logistical reasons.*	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 5 (3 min) NAVIGATION Slide I		VIRTUAL CLASS POST-WORK: 1. Students will recall the purpose of the bean sprout test. 2. Students will identify the indicator used in the test.
Part 6 (16 min) RECORD OBSERVATIONS AND MAKE EVIDENCE-BASED CLAIMS ABOUT THE BTB BEAN SPROUT LAB Slide J-K	*Observations addressed in the previous Virtual Class.* 1. Create a Discussion Board assignment (question stream, shared document, etc.) for students to submit their arguments and give feedback. 2. Review student submissions, facilitate discussion as needed, and revisit in Virtual Class if needed.	VIRTUAL CLASS POST-WORK: 1. Students will make a claim based on evidence from the investigation to post in a Discussion Board.
Part 7 (10 min) MAKE CONNECTIONS ABOUT SIMILARITIES BETWEEN PLANT AND ANIMAL CELLS DOING CELLULAR RESPIRATION Slide L		VIRTUAL CLASS POST-WORK: 1. Students will look for similarities between animal and plant cell respiration.
Part 8 (15 min) READ THE ARTICLE HOW DO PLANT (AND ANIMAL) CELLS USE FOOD? Slide M-Q	1. Assign How Do Plant (And Animal) Cells Use Food?	VIRTUAL CLASS POST-WORK: 1. Students will summarize key ideas from a reading.

Day 3		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 9 (15 min) CONSENSUS DISCUSSION ABOUT HOW PLANTS STAY ALIVE WHEN THEY CAN'T MAKE FOOD Slides R-T		VIRTUAL CLASS POST-WORK: 1. Identify suggestions for revisions to the consensus model.
Part 10 (5 min) UPDATE OUR PROGRESS TRACKER Slide S		VIRTUAL CLASS POST-WORK: 1. Identify what has been figured out about cellular respiration in plant cells.
Part 11 (15 min) CONSTRUCT AN EXPLANATION FOR HOW A MAPLE TREE LIVES THROUGH THE SEASONS Slides T- V	1. Assign Lesson 11 Assessment: Maple Tree through the Seasons Explanation (Students will need to make their own copy in order to edit unless you assign a copy for each student on your platform.)	VIRTUAL CLASS POST-WORK: 1. Complete an assessment that explains two aspects of the phenomenon in the video.

Return to Lesson Set Overview

Lesson 12 (3 days) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Breakfast or lunch foods poster from Lesson 1
- Where else does our food come from? reading
- One of the following readings: Sugar reading, Agave Syrup reading, High Fructose Corn Syrup reading, Honey reading, Sucralose reading, Stevia reading
- Nutrition Labels: What is in Food? handout
- Chicken and Cow Diets reading
- Discussion Board assignment - *teacher made*

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Breakfast or lunch foods poster from Lesson 1
- Making Sap into Syrup video
- How Corn Syrup is Made video
- How Flour is Made video
- Where else does our food come from? reading
- One of the following readings: Sugar reading, Agave Syrup reading, High Fructose Corn Syrup reading, Honey reading, Sucralose reading, Stevia reading
- Discussion Board assignment - *teacher made*
- Nutrition Labels: What is in Food? handout
- Chicken and Cow Diets reading
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1 and 3

Lesson 12 (3 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 - 4 (45 min) NAVIGATION INVESTIGATE HOW SAP BECOMES SYRUP INVESTIGATE OTHER SWEETENERS COMPARE DIFFERENT SWEETENERS Slides A - J	Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* VIRTUAL CLASS: 1. Revisit breakfast foods poster from Lesson 1 to take stock of what has or has not been figured out. 2. Watch and analyze what happens when Maple sap is turned into syrup. 3. Investigate natural vs. synthetic foods by watching how Corn syrup is made. 4. Investigate different sweeteners using a jigsaw reading process. Prepare the readings for sharing with students. (Sugar reading, Agave Syrup reading, High Fructose Corn Syrup reading, Honey reading, Sucralose reading, Stevia reading) 5. Obtain further information about where our food comes from. (Students can be assigned this reading for completion outside of class - Where else does our food come from?)	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 5 (20 min) CONSENSUS DISCUSSION ABOUT NATURAL VS. SYNTHETIC SWEETENERS Slide K	1. Create a Discussion Board assignment (question stream, shared document, etc.) for students to submit a claim about whether their sweetener is natural or synthetic. 2. Review student submissions, facilitate discussion as needed (refer to pgs. 73-75 in the TE for guidance), and revisit in Virtual Class if needed.	VIRTUAL CLASS POST-WORK: 1. Students will identify if their sweetener is artificial or natural. 2. Students identify food molecules in their sweetener.
Part 6 (10 min) INVESTIGATE PROCESSED FOODS Slides L-M	1. Students will need access to the Breakfast Foods poster to complete this task.	VIRTUAL CLASS POST-WORK: 1. Students will identify where certain food components come from. 2. Students will determine if the investigated food is artificial or natural.
Part 7 (12 min) INVESTIGATE WHAT IS IN FOODS FROM ANIMALS Slides N-O	Students will need access to the Nutrition Labels: What is in Food? Handout.	VIRTUAL CLASS POST-WORK: 1. Students will identify the source of food molecules in animals. 2. Students will determine if the investigated food is artificial or natural.

Day 3		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 4 (44 min) INVESTIGATE ANIMAL DIETS REVIEW IDEAS FROM READING REMEMBER WHAT ANIMALS DO WITH FOOD MOLECULES UPDATE OUR PROGRESS TRACKER NAVIGATION Slide P-V	Prior to Virtual Class, the teacher should: 1. Provide access to the Chicken and Cow Diets reading 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* VIRTUAL CLASS: 1. Read about animal diets to identify sources of food molecules in their diet. 2. Discuss in small groups or as a class animal diets to identify plants as a common source of food molecules. 3. Lead a discussion in which students recall information from Unit 7.3. 4. Update student Progress Trackers to answer the question “Where does the rest of our food come from?” 5. Navigate to the next lesson by exploring what happens to plant parts that we don’t eat.	

Return to Lesson Set Overview

Lesson 13 (2 days) - Investigation

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Reference Data from Food handout
- Organisms that use food that doesn't get eaten
- Pumpkin decomposing video
- Kebabs decomposing video
- Mushrooms growing on a tree video

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Reference Data from Food handout
- Organisms that use food that doesn't get eaten
- Pumpkin decomposing video
- Kebabs decomposing video
- Mushrooms growing on a tree video
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 2

Lesson 13 (2 days) - Investigation

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 1 (10 min) NAVIGATION: WHERE DOES THE FOOD GO NEXT? Slide A	1. Share Lesson Slideshow with students. 2. Share Thinking Deeper Document with students.	VIRTUAL CLASS PRE-WORK: 1. Students will identify possible outcomes for food that does not get eaten.
Part 2 (12 min) INVESTIGATE WHAT HAPPENS TO FOOD THAT DOES NOT GET EATEN Slides B-D		VIRTUAL CLASS PRE-WORK: 1. Students will record Notice and Wonderings for decomposing food.
Part 3 (13 min) INVESTIGATE THE CHANGES AROUND UNEATEN FOOD Slide C		VIRTUAL CLASS PRE-WORK: 1. Students will collect data for decomposing food. 2. Students will make sense of the data from decomposing food investigation.
Part 4 (5 min) BUILDING UNDERSTANDINGS DISCUSSION ABOUT WHAT HAPPENED IN THE BREAD MOLD SYSTEM THAT WE CANNOT SEE Slide D	*Students begin thinking about these questions in pre-work, but discussion takes place in the Virtual Class meeting.*	VIRTUAL CLASS PRE-WORK: 1. Identify the inputs and outputs of bread mold in the light and dark.

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Parts 4-9 (45 min) NAVIGATION OBTAIN INFORMATION ABOUT ORGANISMS THAT USE FOOD THAT DOESN'T GET EATEN COMMUNICATE INFORMATION ABOUT THE ROLE OF THESE ORGANISMS REVISE OUR CONSENSUS MODEL TO INCLUDE DECOMPOSERS NAVIGATION Slides E-J	Prior to Virtual Class, the teacher should: 1. Students will need access to the Organisms that use food that doesn't get eaten reading 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* VIRTUAL CLASS: 1. Facilitate a Building Understanding Discussion on what inputs and outputs mean to the decomposition process. 2. Lead an Obtaining Information activity utilizing a jigsaw reading process. 3. Conduct a virtual Gallery Walk to share information from reading. 4. Revise the Class Consensus Model to include any new information. 5. Share ideas around decomposers' role in producing CO_2. VIRTUAL CLASS POST-WORK: 1. Home Learning gathering evidence of decomposers.	

Return to Lesson Set Overview

Lesson 14 (2 days) - Putting Pieces Together

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Thinking Deeper Documents from lesson 9-14
- Class Consensus Model - *when completed*
- Discussion Board Assignment - *teacher made*
- Story of an Atom Assessment document

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Thinking Deeper Documents from lesson 9-14
- Class Consensus Model - *when completed*
- Discussion Board Assignment- *teacher made*
- Story of an Atom Assessment document
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 14 (2 days) - Putting Pieces Together

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Parts 1 - 4 (45 min) NAVIGATION: UPDATE OUR PROGRESS TRACKERS SHARE HOME LEARNING UPDATE OUR WHOLE CLASS CONSENSUS MODEL PROBLEMATIZE HOW ATOMS IN DECOMPOSERS COULD BECOME PART OF US Slides A - E	Prior to Virtual Class, the teacher should: 1. Share Lesson Slideshow and Thinking Deeper Document with students. 2. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* VIRTUAL CLASS: 1. Facilitate updating of Progress Trackers. 2. Facilitate sharing of home learning on decomposers. 3. Revise the Consensus model to detail interactions between plant cells, animal cells, human cells and decomposers. 4. Facilitate small group discussions around how atoms can move from decomposers to humans.	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 5 (5 min) UPDATE OUR PROGRESS TRACKERS Slide F		VIRTUAL CLASS POST-WORK: 1. Identify outcomes of decomposer outputs.
Part 6 (20 min) CREATE A GOTTA-HAVE-IT CHECKLIST FOR LESSONS 9-14 Slide G	1. Create a Discussion Board assignment (question stream, shared document, ect.) for students to submit a claim about whether their sweetener is natural or synthetic. 2. Review student submissions, facilitate discussion as needed and revisit in Virtual Class if needed.	VIRTUAL CLASS POST-WORK: 1. List important ideas that the class has figured out since lesson 8.
Part 7 (10 min) EXPLAIN THE STORY OF A FOOD ATOM Slide H	1. Assign The Story of a Food Atom to students. They will need to make a copy in order to edit unless the platform allows the option to make a copy for each student when assigning..	VIRTUAL CLASS POST-WORK: 1. Chronicle the journey of a food atom through the different parts of the matter and photosynthesis cycle.
Part 8 (5 min) PROVIDE AND RECEIVE FEEDBACK	*Addressed in Lesson 15 Virtual Class*	*1. Provide feedback on another student's Food Atom story.* *2. Receive feedback on your own Food Atom story.*
Part 9 (5 min) RESPOND TO FEEDBACK	*Addressed in Lesson 15 Virtual Class*	*1. Revise Food Atom story based on received feedback.*

Return to Lesson Set Overview

Lesson 15 (2 days) - Putting Pieces Together

In this **Lesson**, students will need the following materials to appropriately engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Peer Feedback Guidelines Reference
- Lesson 15 Assessment Whale Fall Task

In this **Lesson**, students who don't have home internet need the following print-outs or files to best engage in learning:

- Lesson Slideshow
- Thinking Deeper Document
- Peer Feedback Guidelines Reference
- Whale Fall video
- Whale Fall Notice/Wonder chart - *when completed*
- Lesson 15 Assessment Whale Fall Task
- Virtual Class Recording - *after completion*

In this **Lesson**, students should join virtual classes on the following days to engage in learning:

- Day 1

Lesson 15 (2 days) - Putting Pieces Together

Day 1		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Parts 8 & 9 From Lesson 14 Parts 1 - 4 (50 min) PROVIDE AND RECEIVE FEEDBACK RESPOND TO FEEDBACK EVALUATE OUR DQB QUESTIONS REVISIT THE DRIVING QUESTION BOARD (DQB) ADD TO OUR PROGRESS TRACKERS PREPARE FOR FINAL ASSESSMENT: THE IMPORTANCE OF WHALES Slides A - H	Prior to Virtual Class, the teacher should: 1. Make arrangements for students to access the DQB. 2. Add Driving Question Board questions to the Thinking Deeper Document prior to its distribution. 3. Share Lesson Slideshow and Thinking Deeper Document with students. 4. Make arrangements for students to work in groups. (Group work can be performed in break-out rooms in Zoom or Meet, if available. Whiteboard apps like Jamboard or shared Google docs also can be used to allow sharing among groups.) **Teachers build in reviewing norms and setting expectations as needed for Virtual Class.* VIRTUAL CLASS: 1. Facilitate feedback session for Food Atom story. Use Peer Feedback Guidelines Reference as needed. 2. Facilitate student evaluation of DQB questions. 3. Facilitate addition of DQB answers to the Progress Tracker. 4. Stream Whale Fall video and create an accompanying whole class Notice/Wonder chart. 5. Provide students with information on the Assessment Task.	

Day 2		
Lesson Components	**Distance Learning Plan**	
	Teacher	**Student**
Part 4 (45 min) DEMONSTRATE UNDERSTANDING ON AN ASSESSMENT TASK Slide I	1. Assign Lesson 15 Assessment Whale Fall Task.	VIRTUAL CLASS POST-WORK: 1. Work individually to complete the assessment task.
Part 4 (8 min) QUICK WRITE: REFLECT ON OUR EXPERIENCES Slide J		VIRTUAL CLASS POST-WORK: 1. Students will reflect on their experiences with the unit.

Return to Lesson Set Overview