

# Louisiana Believes

## Distance Learning Support for OpenSciEd Grade 7 Unit 7.1 Chemical Reactions and Matter

This resource is designed to support teachers in implementing distance learning for OpenSciEd Unit 7.1, Unit 3 on the [Louisiana Guide for Piloting OpenSciEd Grade 7](#). It is intended as a supporting document and should be used in conjunction with the [OpenSciEd Unit 7.1 Instructional 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](mailto:STEM@la.gov) so that we may use your input when updating this guide.

Updated September 22, 2020



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**

**Lesson Set 1: Lessons 1-4**

Provided Resources Students Will Need	Additional Resources Students Will Need	Additional Materials for Students Without Internet Access
<p><b>Lesson Slideshows for each lesson:</b></p> <p><a href="#">L1</a>, <a href="#">L2</a>, <a href="#">L3</a>, <a href="#">L4</a></p> <p><b>Thinking Deeper Documents for each lesson:</b></p> <p><a href="#">Lesson 1 TDD</a>, <a href="#">Lesson 2 TDD</a>, <a href="#">Lesson 3 TDD</a>, <a href="#">Lesson 4 TDD</a></p> <p><b>Additional Documents:</b></p> <p>Optional: <a href="#">Sample Parent Letter</a> (include relevant safety information from teacher Edition for Home Investigations)</p>	<p><b>Teacher-Created Resources:</b></p> <ul style="list-style-type: none"> <li>Initial Thoughts Discussion Board - Lesson 1</li> <li>Investigation Ideas Discussion Board - Lesson 1</li> <li>Digital Word Wall - Lesson 3</li> <li>Progress Tracker Assignment (<i>optional</i>) - Lesson 3</li> <li>Investigation Ideas Discussion Board - Lesson 4</li> </ul> <p><b>Additional Resources:</b></p> <ul style="list-style-type: none"> <li>Take Home Lab Kits (10-15 homemade bath bombs, pipette, plastic zipper bags, safety goggles, non-latex gloves) - Lessons 1 &amp; 2</li> <li>Bath Bomb ingredients found at home (<i>optional</i>) - Lesson 3</li> </ul>	<p><b>Prior to Lesson:</b></p> <ul style="list-style-type: none"> <li><a href="#">Bath Bomb video</a> - Lesson 1</li> <li><a href="#">Gas Investigation video</a> - Lesson 2</li> </ul> <p><b>After Lesson Completion:</b></p> <ul style="list-style-type: none"> <li>Discussion Boards- Lesson 1, 2, 4</li> <li>Virtual Class recordings - Lessons 1, 2, 3, 4</li> <li>Digital Word Wall - Lesson 3</li> </ul>
<p><b>Students should ideally join VIRTUAL CLASS on the following days:</b></p> <p style="text-align: center;">Day 2 - Lesson 1                      Day 4 - Lesson 2                      Day 6 - Lesson 3                      Day 7 - Lesson 4</p> <p style="text-align: center;">*Note: Option to convert Lesson 4 to a two-day lesson and have the virtual class meeting on Day 8.</p>		
<p><b>Formative and Summative Assessment Opportunities:</b></p> <p>Lesson 1: Initial Models - Day 1</p> <p>Lesson 2: Evidence-based answer to Lesson Question - Day 2</p> <p>Lesson 3: Progress Tracker - Day 2</p> <p>Lesson 4: Arguing From Evidence</p>		

Lesson Set Overview: Lessons 5, 6, 7

Lesson Set 2: Lessons 5-7		
Provided Resources Students Will Need	Additional Resources Students Will Need	Additional Materials for Students Without Internet Access
<p>Lesson Slideshows for each lesson:</p> <p><a href="#">L5</a>, <a href="#">L6</a>, <a href="#">L7</a></p> <p>Thinking Deeper Documents for each lesson:</p> <p><a href="#">Lesson 5 TDD</a>, <a href="#">Lesson 6 TDD</a>, <a href="#">Lesson 7 TDD</a></p> <p>Additional Documents:</p> <p>Optional: <a href="#">Sample Parent Letter</a> <a href="#">Lesson 6 Assessment</a></p>	<p>Teacher Created Resources:</p> <ul style="list-style-type: none"> <li>Progress Tracker Assignment (<i>optional</i>) - Lesson 5</li> <li>Bath Bomb Gas CER Assignment (<i>optional</i>) - Lesson 5</li> <li>Driving Question Board - Lesson 6</li> <li>Related Phenomena Class List (<i>from Lesson 1</i>) - Lesson 6</li> <li>Particle Level Discussion Board - Lesson 6</li> <li>Initial Consensus Model - Lesson 7</li> </ul> <p>Additional Resources:</p> <ul style="list-style-type: none"> <li>Store-bought bubble mix or video like this <a href="#">one</a> - Lesson 5</li> <li>Thinking Deeper Document from Lesson 4 - Lesson 5</li> <li>Thinking Deeper Documents Lessons 1-6 - Lesson 7</li> </ul>	<p>Prior to Lesson:</p> <ul style="list-style-type: none"> <li>Bubble video like this <a href="#">one</a> if student does not have bubble mix at home - Lesson 5</li> <li>Flammability investigation Videos: <a href="#">Helium &amp; Air From the Room</a> &amp; <a href="#">Bath Bomb Gas</a> - Lesson 5</li> <li>Lesson 6 Assessment Videos (<a href="#">video 1</a>, <a href="#">video 2</a>) - Lesson 6</li> </ul> <p>After Lesson Completion:</p> <ul style="list-style-type: none"> <li>Virtual Class recordings - Lessons 5, 7</li> <li>Discussion Boards - Lesson 6</li> </ul>
<p>Students should ideally join VIRTUAL CLASS on the following days:</p> <p style="text-align: center;">Day 2 - Lesson 5<span style="margin-left: 250px;">Day 4 - Lesson 7</span></p>		
<p>Formative and Summative Assessment Opportunities:</p> <p>Lesson 5: Bath Bomb Gas CER (completed in virtual class) Lesson 6: <a href="#">Elephant Toothpaste Assessment</a></p>		

Lesson Set Overview: Lessons 8, 9, 10, 11, 12, 13, 14

Lesson Set 3: Lessons 8-14		
Provided Resources Students Will Need	Additional Resources Students Will Need	Additional Materials for Students Without Internet Access
<p><b>Lesson Slideshows for each lesson:</b></p> <p><a href="#">L8</a>, <a href="#">L9</a>, <a href="#">L10</a>, <a href="#">L11</a>, <a href="#">L12</a>, <a href="#">L13</a>, <a href="#">L14</a></p> <p><b>Thinking Deeper Documents for each lesson:</b></p> <p><a href="#">Lesson 8 TDD</a>, <a href="#">Lesson 9 TDD</a>, <a href="#">Lesson 10 TDD</a>, <a href="#">Lesson 11 TDD</a>, <a href="#">Lesson 12 TDD</a>, <a href="#">Lesson 13 TDD</a>, <a href="#">Lesson 14 TDD</a></p> <p><b>Additional Documents:</b></p> <p>Optional: <a href="#">Sample Parent Letter</a>  <a href="#">Some Common Gases</a> Handout (linked in the article on TDD) - Lesson 11  <a href="#">Lesson 11 Assessment</a>  <a href="#">Lesson 12 Assessment</a>  <a href="#">Lesson 14 Assessment Part 1</a>  <a href="#">Lesson 14 Assessment Part 2a</a>  <a href="#">Lesson 14 Assessment Part 2b</a></p>	<p><b>Teacher Created Resources:</b></p> <ul style="list-style-type: none"> <li>Constructing an Argument Shared Document - Lesson 9</li> <li>Constructing Explanations Assignment (<i>optional, may choose to have students turn in their TDD</i>) - Lesson 10</li> <li>Unit Reflections Discussion Board - Lesson 14</li> <li>Class Particle Model and Key Model Ideas from Lesson 8 - Lesson 11</li> </ul> <p><b>Additional Resources:</b></p> <ul style="list-style-type: none"> <li>Odor Vials for Home Investigation - If supplies allow, send home one sealed vial of each substance per student in a plastic zipper bag. **Check for student allergies before sending substances home.** (See additional options in Lesson overview) - Lesson 13</li> </ul>	<p><b>Prior to Lesson:</b></p> <ul style="list-style-type: none"> <li><a href="#">Gas From Heating Water Video</a> - Lesson 9</li> </ul> <p><b>After Lesson Completion:</b></p> <ul style="list-style-type: none"> <li>Virtual Class recordings - Lessons 8, 9, 10, 11, 12, 14</li> <li>Discussion Board - Lesson 14</li> </ul>

Students should ideally join VIRTUAL CLASS on the following days:

Day 1 - Lesson 8

Day 3 - Lesson 9

Day 4 - Lesson 10

Day 6 - Lesson 11

*NOTE: Teacher may choose to extend Lesson 11 one extra day. Virtual Class remains on Day 6 and the assessment would occur the following day.*

Day 8 or 9 - Lesson 12

Day 11 or 12 - Lesson 14

**Formative and Summative Assessment Opportunities:**

Lesson 10 - Constructing Explanations - on the TDD, option to create separate assignment

[Lesson 11 Assessment](#)

[Lesson 12 Assessment](#)

[Lesson 14 Assessment Part 1](#)

[Lesson 14 Assessment Part 2a](#) & [Lesson 14 Assessment Part 2b](#)

## 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](#)
- Initial Thoughts Discussion Board - *teacher made*
- Investigation Ideas Discussion Board - *teacher made*
- Take Home Lab Kits (10-15 homemade bath bombs, pipette, plastic zipper bags, safety goggles, non-latex gloves)

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](#)
- [Bath Bomb video](#)
- Initial Thoughts Discussion Board - *teacher made*
- Investigation Ideas Discussion Board - *teacher made*
- Take Home Lab Kits (10-15 homemade bath bombs, pipette, plastic zipper bags, safety goggles, non-latex gloves)
- Discussion Boards - *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
<p>Part 1 (7 min)</p> <p>INTRODUCING BATH BOMBS &amp; PREPARING FOR STORE BOUGHT BATH BOMB INVESTIGATION</p> <p>Slides: A</p>	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Create and assign a discussion board to gather initial thoughts of students about bath bombs.</li> </ol>	<p>DISCUSSION BOARD:</p> <ol style="list-style-type: none"> <li>1. Share what you know about bath bombs on the discussion board.</li> </ol>
<p>Part 2 (10 min)</p> <p>CARRYING OUT OUR STORE BOUGHT BATH BOMB INVESTIGATION</p> <p>Slides: B, C</p>	<ol style="list-style-type: none"> <li>1. Share <a href="#">Bath Bomb video</a> for students not able to perform the lab.</li> <li>2. Remind students about safety regarding investigations - information from the teacher edition for this lesson has been added to the slide, but reference safety information at the beginning of the unit as well prior to assigning any home investigations.</li> </ol>	<p>HOME INVESTIGATION:</p> <ol style="list-style-type: none"> <li>1. Watch a bath bomb video or place a store bought bath bomb in water and observe.</li> <li>2. Record observations on Thinking Deeper Document.</li> </ol>
<p>Part 3 (10 min)</p> <p>CARRYING OUT HOMEMADE BATH BOMB INVESTIGATIONS</p> <p>Slides: D, E</p>	<ol style="list-style-type: none"> <li>1. Prepare homemade bath bombs and pipette kits to distribute to students for the take home labs.</li> </ol>	<p>VIRTUAL CLASS PRE-WORK/HOME INVESTIGATION:</p> <ol style="list-style-type: none"> <li>1. Create a list of procedures for conducting homemade bath bomb investigations.</li> <li>2. Conduct investigations and record results on the Thinking Deeper Document.</li> </ol>



<p>Part 4 (18 min)</p> <p>REPORTING PATTERNS IN THE DIFFERENT PHENOMENA AND DEVELOPING INITIAL MODELS AND EXPLANATIONS</p> <p>Slides: F</p>	<ol style="list-style-type: none"> <li>1. Models can be used as a formative assessment.</li> <li>2. Decide how students will submit their models and ensure they have directions for doing so - one suggestion is to have students take screenshots of their models and add them to a shared Google Slideshow for a virtual Gallery Walk</li> </ol>	<p>VIRTUAL CLASS PRE-WORK:</p> <ol style="list-style-type: none"> <li>1. Compare store bought and homemade bath bombs.</li> <li>2. Create a model to represent what is happening at the macro level.</li> <li>3. Develop an initial model using the guide on Thinking Deeper Document.</li> <li>4. Submit models to the teacher.</li> </ol>
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Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Parts 5-9 (45 min)</p> <p>COMPARING INDIVIDUAL MODELS &amp; DEVELOP SHARED NORMS</p> <p>DEVELOP INITIAL CONSENSUS MODEL FOR THE BATH BOMB PHENOMENA</p> <p>CHOOSE A FOCAL NORM AND RECORD EXPERIENCES WITH RELATED PHENOMENA</p> <p>SHARE RELATED PHENOMENA</p> <p>Slides G-L</p>	<p>Prior to virtual class:</p> <ol style="list-style-type: none"> <li>1. Collect student models and ensure they can be displayed during virtual class.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Compare models and follow discussion protocols. Collect ideas from other models and record on Thinking Deeper Document.</li> <li>2. Develop classroom norms based on your virtual classroom needs.</li> <li>3. Develop Initial Consensus Model together for bath bomb phenomena. (The teacher can use a digital platform or draw on a poster. Ensure that students have access to the model after completion.)</li> <li>4. Reflect on class focal norms on Thinking Deeper Document.</li> <li>5. Students independently record related phenomena on Thinking Deeper Document then share out and discuss with the class.</li> </ol>	

Day 3		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Part 10 (5 min)</p> <p>DEVELOP INITIAL QUESTIONS</p> <p>Slides: M</p>		<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Review models of bath bombs.</li> <li>2. Review related phenomenon.</li> <li>3. Brainstorm how and why questions related to the bath bomb phenomena.</li> </ol>
<p>Part 11 (25 min)</p> <p>DEVELOP A DRIVING QUESTION BOARD AND REFLECT ON NORMS</p> <p>Slides: M</p>	<ol style="list-style-type: none"> <li>1. Create and assign the DQB assignment for students to submit questions. (Using a platform like Google Jamboard will allow students shared access to the DQB)</li> <li>2. Review submitted questions and organize the DQB.</li> <li>3. 3. Ensure students have access to the DQB to reference throughout the unit.</li> </ol>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Choose one question and post on class DQB.</li> </ol>
<p>Part 12 (10 min)</p> <p>CHOOSE A FOCAL NORM AND DEVELOP INITIAL IDEAS FOR FUTURE INVESTIGATIONS</p> <p>Slides: N</p>	<ol style="list-style-type: none"> <li>1. Create a discussion board for students to share ideas for investigation.</li> </ol>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Review DQB and make a list of future investigations that can be done to answer some of these questions.</li> <li>2. Share your ideas on the discussion board.</li> <li>3. Read and respond to peer ideas.</li> </ol>
<p>Part 13 (15 min)</p> <p>START PROGRESS TRACKER AND REFLECT ON NORMS</p>	<p><i>Not addressed in distance learning due to progress tracking on Thinking Deeper Documents and no Virtual Class meeting on this day.</i></p>	

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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](#)
- Take Home Lab Kits (10-15 homemade bath bombs, pipette, plastic zipper bags, safety goggles, non-latex gloves)

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](#)
- [Gas Investigation video](#)
- Take Home Lab Kits (10-15 homemade bath bombs, pipette, plastic zipper bags, safety goggles, non-latex gloves)
- 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 2

## Lesson 2 (2 days) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (2 min) NAVIGATION: WHERE IS THE GAS COMING FROM? Slides: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Ensure students have access to the DQB</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Review DQB.</li> <li>2. Record questions about where the gas is coming from.</li> </ol>
Part 2 (20 min) PLAN AND CARRY OUT AN INVESTIGATION OF THE GAS FROM BATH BOMBS Slides: B, C, D	<p><i>(Slides for actual lab procedures are available in the lesson slides (E-H) if the teacher chooses to schedule an additional virtual lesson to demonstrate investigations or if materials are available to students.)</i></p> <p>If you are having students perform the investigations, please refer to relevant safety information in the teacher's guide and ensure students have this information..</p>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Answer reflection questions on Thinking Deeper Document to plan investigation.</li> <li>2. Recall prior learning about gases.</li> <li>3. Record predictions for possible outcomes.</li> <li>4. Watch the <a href="#">Gas Investigation video</a>, record observations, and fill in the data table.</li> </ol>
Part 3 (20 min) BUILDING UNDERSTANDING ABOUT THE GAS FROM BATH BOMBS Slides: I	<p><i>This will be revisited in the virtual class on Day 2.</i></p>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Analyze results of investigation by answering questions on Thinking Deeper Document.</li> </ol>
Part 4-5 (3 min) NAVIGATION Slides: J		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Answer navigation questions on Thinking Deeper Document.</li> </ol>

Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 6 (5 min) PLAN THE INVESTIGATION Slides: K, L		VIRTUAL CLASS PRE-WORK: 1. Plan the investigation with the crushed bath bomb. (Take home kit)
Part 7 (10 min) CARRY OUT THE INVESTIGATION Slides: M, N	<i>Students may not have a food scale at home to measure mass. They can record their observations on inflation only and the teacher can also do a quick demo at the beginning of the virtual class to demonstrate change in mass.</i>	HOME INVESTIGATION: 1. Follow investigation procedures on the slide. 2. Conduct investigation and record data. 3. Be ready to share results with class during virtual class.
Parts 8-9 (30 min) SCAFFOLDING ARGUMENT: WHERE DOES THE GAS COME FROM? NAVIGATE TO THE NEXT LESSON Slides: O-T	VIRTUAL CLASS: 1. The teacher can do a quick demo of the investigations for students unable to participate with emphasis on the mass measurements since many students will not have a scale at home. 2. Discuss observations from investigations done in pre-work. 3. Discuss claims, evidence, and reasoning and how to argue from evidence or write a scientific explanation. 4. Revisit the lesson question. 5. Students will write an answer to the lesson question in the form of an evidence-based argument. <i>(formative assessment opportunity - the teacher can choose to have students submit these for individual feedback or have students share out and discuss)</i> 6. Revise the lesson question based on new knowledge.	

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### Lesson 3 (2 days) - Investigation

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Bath Bomb ingredients found at home - *optional*
- Digital Word Wall - *teacher created*
- *Progress Tracker Assignment - teacher created, optional*

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](#)
- Bath Bomb ingredients found at home - *optional*
- Digital Word Wall - *teacher created, after completion*
- *Progress Tracker Assignment - teacher created, optional*
- Virtual Class recording - *after completion*

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

- Day 2

### Lesson 3 (2 days) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (5 min) NAVIGATION: WHAT'S IN A BATH BOMB? Slides: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Answer Navigation questions on the Thinking Deeper Document.</li> </ol>
Part 2 (10 min) OBSERVING BATH BOMB INGREDIENTS Slides: B, C		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Compare store bought bath bombs ingredients to homemade bath bomb ingredients.</li> <li>2. Identify patterns in homemade bath bombs.</li> <li>3. Answer reflection questions.</li> </ol>
Part 3 (20 min) OBSERVING THE INGREDIENTS IN BATH BOMBS Slides: D, E	The word wall component should be conducted during the virtual class on Day 2. Teachers can choose to have students explore samples found at home and/or conduct online research in addition to showing samples in the virtual class. (NOTE: If you are having students explore at home, review and relay any relevant safety information from the teacher edition.)	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Make observations of any of the ingredients that you can find at home or conduct research on individual ingredients.</li> </ol>
Part 4 (5 min) NAVIGATION Slides: F		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Respond to the reflection question on Thinking Deeper Document.</li> </ol>

Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Parts 5-7 (35 min)</p> <p>NAVIGATION</p> <p>TESTING ONE INGREDIENT IN BATH BOMBS</p> <p>INTERPRETING OUR DATA</p> <p>Slides: G-L</p>	<p>Prior to Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Decide how to create the class “word wall” (<i>Example: Create a digital word wall that is available for students to view. This can be done as a Google slide, Jamboard, etc</i>)</li> <li>2. Decide how students will submit their Progress Trackers following the Virtual Class meeting. (<i>They can submit their TDD, but for ease of reviewing and compiling, it may be a good idea to create a separate assignment or have them screenshot that section to submit.</i>)</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>3. Share exit ticket responses and discuss where we should go next.</li> <li>4. Complete word wall strategy to add “property” to the word wall. (Students should refer to section J-L on Thinking Deeper Document to record the information for property.)</li> <li>5. View all of the individual bath bomb ingredients and discuss any observations. (Students can update their chart for the Ingredients Investigation)</li> <li>6. The teacher demonstrates testing each substance with water while students record observations on the Thinking Deeper Document.</li> <li>7. Respond to reflection questions and discuss.</li> <li>8. Enter the state of matter and solubility data on the chart.</li> <li>9. Complete “word wall” chart on Thinking Deeper Document. Give students independent think/recording time on each word and follow up with a discussion. Add new words to the class word wall.</li> </ol>	
<p>Part 8 (10 min)</p> <p>ADDING TO OUR PROGRESS TRACKER</p> <p>Slides: M</p>	<ol style="list-style-type: none"> <li>1. Create a consensus document from student submissions to make available for students in the next lesson.</li> </ol>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Record new knowledge on Progress Tracker on Thinking Deeper Document.</li> <li>2. Submit Progress Tracker to teacher.</li> </ol>



<p>Part 9 (5 min)</p> <p>NAVIGATING TO THE NEXT LESSON</p> <p>Slides: N</p>		<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"><li>1. Record new questions and ideas by responding to Exit Ticket questions.</li></ol>
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## Lesson 4 (1 day) - Investigation

*NOTE: This lesson has been condensed from 2 days into 1 day. If needed, the teacher may choose to convert back to a two-day delivery by having students complete post-work from the previous lesson and pre-work for this lesson asynchronously on the first day and conducting the virtual class meeting on the second day.*

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Investigation Ideas 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](#)
- Investigation Ideas Discussion Board - *teacher made*
- 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 (1 day) - Putting Pieces Together/Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 2 (10 min)  ADDING TO OUR PROGRESS TRACKER  Slides: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Share teacher-created consensus document from Progress Tracker submissions. (Follow up in the Virtual Class meeting.)</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Add new ideas from peers to progress tracker. Be sure to add evidence to support these ideas.</li> </ol>
Part 3 (5 min)  NAVIGATION  Slides: B	<ol style="list-style-type: none"> <li>1. Create a discussion board for students to share ideas about next investigations.</li> </ol>	DISCUSSION BOARD: <ol style="list-style-type: none"> <li>1. Share ideas about what our next investigation should be on the discussion board.</li> </ol>
Parts 1, 5 (5-10 min)  NORMS	<i>Build out as needed in the Virtual Class meeting.</i>	

<p>Parts 4, 6-7 (40 min)</p> <p>PLANNING AND CARRYING OUT OUR INVESTIGATION</p> <p>ANALYZING OUR LAB DATA AND NAVIGATION</p> <p>Slides: C-E</p>	<p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Decide what combinations of ingredients would be most interesting to test.</li> <li>2. Predict the amount of combinations it would take to test them all.</li> <li>3. Discuss additions to progress tracker.</li> <li>4. Refer students to “Combinations of Ingredients to Test” data chart on Thinking Deeper Document.</li> <li>5. Discuss the amount of combinations and why some are shaded. <i>(The shaded cells are either like ingredients or repeated combinations.)</i></li> <li>6. The teacher will conduct combination testing, students will record results. <i>(If it is not possible for a virtual class, the teacher may record these investigations for students to watch on their own. Due to the amount of ingredients needed, it is not advised to send in take home kits.)</i></li> <li>7. Students identify patterns in the data and discuss possible patterns.</li> </ol> <p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Answer navigation questions to explain observations and make predictions.</li> </ol>	
<p>Part 8 (10 min)</p> <p>ARGUING FROM EVIDENCE</p> <p>Slides: F, G</p>		<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Analyze lemonade mix ingredients.</li> <li>2. Make claims based on evidence from investigation to support an argument.</li> </ol>

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## Lesson 5 (2 days) - Investigation

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Progress Tracker Assignment - *optional (teacher may choose to have students turn in TDD instead)*
- Store-bought bubble mix - *optional*
- Thinking Deeper Document from Lesson 4
- Bath Bomb Gas CER Assignment - *teacher made, optional*

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

- [Lesson Slide Show](#)
- [Thinking Deeper Document](#)
- Progress Tracker Assignment - *optional (teacher may choose to have students turn in TDD instead)*
- Store-bought bubble mix or video like this [one](#)
- Thinking Deeper Document from Lesson 4
- Bath Bomb Gas CER Assignment - *teacher made, optional*
- Flammability investigation Videos: [Helium & Air From the Room](#) & [Bath Bomb Gas](#)
- Virtual Class recording – *after completion*

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

- Day 2

## Lesson 5 (2 days) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (5 min)  NAVIGATION Slides A, B	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Brainstorm about the composition of the gas bubbles.</li> <li>2. Reflect on properties of gases and related phenomena.</li> </ol>
Part 2 (5 min)  ANALYZE AND INTERPRET PROPERTIES FOR GASES Slide: C		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Study chart of common gases and properties and record notices and wonders.</li> </ol>
Part 3 (15 min)  TEST THE FLAMMABILITY OF OUR BATH BOMB GAS AND OTHER KNOWN GASES  Slides: D-G	<ol style="list-style-type: none"> <li>1. Create a discussion board for students to share ideas for Progress Tracker.</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Make a prediction about what will happen to a lit match when it is placed inside a bottle filled with air from the room, helium, and bath bomb gas.</li> <li>2. Watch the investigation videos (<a href="#">Helium &amp; Air From the Room</a>, <a href="#">Bath Bomb Gas</a>) and record observations on the table.</li> <li>3. Update Progress Tracker and share ideas on the class discussion board.</li> </ol>

<p>Part 4 (10 min)</p> <p>INVESTIGATE AND PREDICT DENSITY EFFECTS FOR HELIUM</p> <p>Slides: H- J</p>		<p>VIRTUAL CLASS PRE-WORK/HOME INVESTIGATION:</p> <ol style="list-style-type: none"> <li>1. Reflect on what happens when you blow bubbles from a bubble solution.</li> <li>2. Make predictions about what the flame test can tell us about helium’s density.</li> <li>3. Watch a <a href="#">video</a> demonstrating the helium density investigation and reflect on what this test could tell us about the gas created by a bath bomb.</li> </ol>
<p>Part 5 (8 min)</p> <p>MAKE PREDICTIONS ABOUT THE GAS FROM A BATH BOMB</p> <p>Slides: K, L</p>	<ol style="list-style-type: none"> <li>1. Option to create a separate assignment by adapting the <a href="#">handout</a> rather than having students turn in their Thinking Deeper Document.</li> <li>2. Review student responses and provide feedback as needed individually or during the Virtual Class meeting.</li> </ol>	<p>VIRTUAL CLASS PRE-WORK:</p> <ol style="list-style-type: none"> <li>1. Make predictions about the density of bath bomb gas when a flame is placed above or below the bath bomb gas.</li> <li>2. Submit your predictions to the teacher.</li> </ol>

Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Parts 6-11 (45 min)  TEST PREDICTIONS ABOUT THE GAS FROM A BATH BOMB  UPDATE INDIVIDUAL PROGRESS TRACKERS  NAVIGATION: ARGUE FROM EVIDENCE  CONSTRUCT WRITTEN ARGUMENTS ABOUT THE GAS FROM A BATH BOMB  NAVIGATION	<p>Prior to the Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Decide how the Density and Flammability discussion will be conducted (break-out rooms, shared documents for small group discussion boards, whole class, etc.) and prepare (assign groups, create shared documents, etc.)</li> <li>2. Edit discussion <a href="#">protocol</a> as needed. (Must make a copy to edit.)</li> <li>3. Option to create a separate assignment for students to turn in their CER about what the bath bomb gas is.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Discuss problems we might encounter performing the density test with gas from the bath bomb.</li> <li>2. Watch the video demonstrating the lab and discuss.</li> <li>3. Review previous Progress Tracker (from earlier in the TDD) and discuss new information - students update the previous progress tracker.</li> <li>4. Share and discuss protocol for group discussions.</li> <li>5. Students discuss what they think the bath bomb gas might be using the discussion protocol.</li> <li>6. Review the optional slide from Lesson 2 or your own class anchor chart.</li> <li>7. Students complete a CER for the following question: What gas(es) could be produced by a bath bomb? - The teacher may choose to have students turn this in prior to class discussion. Share and discuss claims, evidence, and reasoning for identifying the bath bomb gas.</li> <li>8. Revise the Driving Question based on new information and discuss what's next for us to figure out.</li> <li>9. Discuss navigation questions about how we know a new substance is there and what we think is happening to the particles.</li> <li>10. Introduce the Lesson 6 Assessment that students will complete the following day.</li> </ol> <p>NOTE: If class meeting time is limited, the teacher may choose to have students complete the navigation questions as post-work.</p>	

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## Lesson 6 (1 day) - Putting the Pieces Together

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Driving Question Board
- Related Phenomena Class List - *created in Lesson 1*
- [Lesson 6 Assessment](#)
- Particle Level 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](#)
- Driving Question Board
- Related Phenomena Class List - *created in Lesson 1*
- [Lesson 6 Assessment](#) and Videos ([video 1](#), [video 2](#))
- Particle Level Discussion Board - *teacher made*
- Discussion Boards - *after completion*

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

- None

## Lesson 6 (1 day) - Putting the Pieces Together

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (7 min)  NAVIGATION Slide: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Assign the <a href="#">Lesson 6 Assessment</a>.</li> </ol>	VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Look back at related phenomena.</li> <li>2. Explain what you can with what we have done so far.</li> </ol>
Part 2 (20 min)  DEVELOP INDIVIDUAL ARGUMENTS Slides: B-C	<ol style="list-style-type: none"> <li>1. Share the related phenomenon list to the students if not in thinking deeper document</li> </ol>	VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Watch a <a href="#">video</a> on a related phenomenon and complete the first half of the assessment.</li> <li>2. Watch <a href="#">video 2</a> and complete the rest of your observations.</li> </ol>
Part 3 (15 min)  REVISIT THE DRIVING QUESTION BOARD  Slide: D	<ol style="list-style-type: none"> <li>1. Make sure students have access to the class driving question board</li> </ol>	VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Use the chart on the thinking deeper document to revisit the driving question board.</li> <li>2. Copy any questions we have made progress on and/or have evidence for.</li> <li>3. Complete the chart</li> </ol>
Part 4 (5 min)  DISCUSSION BOARD Slide: E	<ol style="list-style-type: none"> <li>1. Create and assign a discussion board for students to share their initial ideas about what is happening at the particles level.</li> </ol>	DISCUSSION BOARD: <ol style="list-style-type: none"> <li>1. Add your ideas on what is happening with the particles in the system that could help explain why we are getting different outcomes.</li> </ol>

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## Lesson 7 (1 day) - Putting Pieces Together

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Initial Consensus Model
- Thinking Deeper Documents from Lessons 1-6

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 Consensus Model
- Thinking Deeper Documents from Lessons 1-6
- 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) - Putting Pieces Together

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Parts 1-3 (40 min)  NAVIGATION  TAKING STOCK OF WHAT WE HAVE LEARNED  A NEW CONSENSUS MODEL  Slides: A-H	Prior to the Virtual Class, the teacher should: <ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Ensure students have access to the Initial Consensus Model and their TDD's from previous lessons.</li> </ol> VIRTUAL CLASS: <ol style="list-style-type: none"> <li>1. Discuss what we have learned so far that helps us to answer our driving questions and what questions we still have.</li> <li>2. Discuss what we have learned in lessons 2-5 (Each slide discusses individual lessons) - and how we should revise our consensus model to capture these ideas using the table on Slide H. Students follow along on their TDD.</li> <li>3. Record Key Model Ideas on a poster or electronically in a document that can be shared with students and revise the model. (Make sure students have access to the new consensus model and updated key ideas - if done on a poster, take a picture and share.)</li> <li>4. Discuss initial ideas about particles we included in our consensus model and additional information needed.</li> <li>5. Students brainstorm independently about what we should add to our consensus model about particles then share and discuss. - record and revise on TDD</li> </ol>	
Part 4 (6 min)  NAVIGATION  Slide: I		VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Answer the following question and be prepared to share at the next virtual class: What is happening at a particle level that could help explain how this is possible?</li> </ol>

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## Lesson 8 (1 day) - Problematizing

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

- [Lesson Slideshow](#)
- [Thinking Deeper 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](#)
- 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 (1 day) - Problematising

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (23 min)  SHARING AND REPRESENTING INITIAL IDEAS  Slides: A, B, C, D	Prior to the Virtual Class, the teacher should: <ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> and <a href="#">Thinking Deeper Document</a> with students.</li> <li>2. Cut out circle particles before the lesson or set up a document to manipulate the dots electronically.</li> <li>3. Create a chart on a document (like the poster pictured in the Teacher’s Edition) to record student ideas.</li> </ol> VIRTUAL CLASS: <ol style="list-style-type: none"> <li>1. Conduct an Initial Ideas discussion using the prompts on Slide A.</li> <li>2. Project the cut out (or digital) circles using your document camera &amp; sharing your screen.</li> <li>3. Ask: <i>What are some ideas you have for ways to represent what happens to particles when new substances are made?</i></li> <li>4. Listen to student ideas and manipulate the circles under the document camera (or digitally using the drawing tool on google docs) in ways students suggest.</li> <li>5. Add ideas to a document &amp; tell students to add ideas to their Thinking Deeper Document by using a drawing tool.</li> <li>6. Ask for student suggestions on how to phrase the remaining portion of the claim to develop a new key model idea.</li> <li>7. Once the class has come to consensus, add this claim to the Key Model Ideas.</li> <li>8. Students record any new questions they have on their Progress Tracker in the TDD.</li> </ol>	
Part 2 (22 min)  READING: A LOOK BACK IN HISTORY Slides: E, F		VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Read “Dalton’s Investigations”.</li> <li>2. Add new findings to the What I Figured Out section of Progress Tracker in TDD.</li> <li>3. Answer questions at the end of the reading.</li> </ol>

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## Lesson 9 (2 days) - Investigation

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Constructing an Argument Shared Document - *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](#)
- [Gas From Heating Water Video](#)
- Constructing an Argument Shared Document - *teacher made*
- Virtual Class recording - *after completion*

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

- Day 2

## Lesson 9 (2 days) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (5 min)  NAVIGATION  Slides: A	1. Share <a href="#">Lesson Slideshow</a> with students. 2. Share <a href="#">Thinking Deeper Document</a> with students.	VIRTUAL CLASS PRE-WORK: 1. Students identify properties of gases to be tested to help us determine the identity of the gases produced from heated water & running electricity through water.
Part 2 (20 min)  CARRYING OUT PROPERTY TESTS ON THE GAS FROM THE HEATED WATER  Slides: B		VIRTUAL CLASS PRE-WORK: 1. Watch <a href="#">video</a> of gases produced from heating water. 2. Record observations.
Part 3 (20 min)  PROBLEMATIZING: PLANNING AND CARRYING OUT A NEW INVESTIGATION  Slides: C		VIRTUAL CLASS PRE-WORK: 1. Students will record their ideas about the different clear liquids on the TDD.



Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 4 (45 min)  ANALYZING & INTERPRETING DATA  COLLECTING DATA ON THE DENSITY OF THE CLEAR LIQUID  ARGUING FROM EVIDENCE  NAVIGATION  Slides: D- Q	<p>Prior to the Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Pre-determine groups for the small group discussion and decide how this will be facilitated (group notebook on teams or google doc, breakout rooms in zoom, etc.).</li> <li>2. Create a document that all students can contribute to (Google Jamboard, Microsoft Whiteboard App, Google Doc) with the claim and box for Observations/Data and another box for Key Model Ideas. (see Slide O)</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Brainstorm how to find density &amp; determine how to use the curve of liquid in a graduated cylinder to measure volume.</li> <li>2. Make predictions about density relationships on their TDD.</li> <li>3. Use the mass &amp; volume data given in the data table on their TDD to create Volume vs Mass line graphs for each known substance and determine patterns seen in the graph. - teacher supports as needed</li> <li>4. Calculate densities of each of the known substances.</li> <li>5. Make predictions about the density of the unknown liquid collected from the gas produced from heating water. Share predictions.</li> <li>6. Calculate the density of the unknown liquid.</li> <li>7. Read, evaluate &amp; discuss two student claims in a small group setting.</li> <li>8. Add ideas to the Observations/Data box and Key Model Ideas Box in a whole class document.</li> <li>9. Construct an argument to support the claim: The gas inside the bubbles that was produced from heating the water was made of water particle</li> <li>10. Make predictions about the gases they think will be produced from running electricity through water in a whole class discussion.</li> </ol>	

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## Lesson 10 (1 day) - Investigation

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Constructing Explanations Assignment - *optional, may choose to have students turn in their TDD*

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](#)
- Constructing Explanations Assignment - *optional, may choose to have students turn in their TDD*
- 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 (1 day) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Part 1 (35 min)</p> <p>NAVIGATION</p> <p>OBSERVING THE SETUP OF ADDING ENERGY TO WATER WITH ELECTRICITY</p> <p>TESTING THE GASES COLLECTED AFTER ADDING ELECTRICITY TO WATER</p> <p>Slides: A-G</p>	<p>Prior to the Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> and <a href="#">Thinking Deeper Document</a> with students.</li> <li>2. Set up the <a href="#">hydrolysis lab</a> and set up the flammability test or include the link to the <a href="#">video</a> in the lesson slideshow.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Whole class discussion using the navigation questions found on slide A.</li> <li>2. Students watch teacher demo of hydrolysis test and record observations.</li> <li>3. Practice stating claims based on the state of matter of the substances collected in the test tube at room temperature compared to the state of matter of the gases that were collected in the flask from heating the water at room temperature.</li> <li>4. Make predictions about whether the gases produced in both test tubes are the same gas.</li> <li>5. Observe the flammability test for Gas A, discuss the results and what this test could tell us about Gas B.</li> <li>6. Observe the flammability test for Gas B, record observations and discuss the implications for comparing the two gases.</li> <li>7. Determine where the gases must be coming from based on the Law of Conservation of Mass.</li> </ol>	
<p>Part 4 (10 min)</p> <p>CONSTRUCTING AN EXPLANATION</p> <p>Slide: H</p>	<ol style="list-style-type: none"> <li>1. Option to create a separate assignment for ease of reviewing responses rather than having students submit their TDD.</li> <li>2. Review responses and provide feedback as needed.</li> </ol>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Students construct an explanation to answer the lesson question.</li> <li>2. Submit response.</li> </ol>

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## Lesson 11 (2 days) - Investigation

NOTE: Part 5 from Day 1 has been moved to Day 2 in order to be grouped into the Virtual Class meeting. This means that, while Day 1 has only 30 minutes of activities, Day 2 has a 45-minute Virtual Class and an 18-minute assessment. If scheduling allows, teachers may consider providing an additional day for students to complete the assessment prior to starting Lesson 12. This would also give additional time for creating the Virtual Gallery Walk from student models.

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Class Particle Model and Key Model Ideas - from Lesson 8
- [Lesson 11 Assessment](#)

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](#)
- [Some Common Gases](#) Handout (linked in the article on TDD)
- Class Particle Model and Key Model Ideas - from Lesson 8
- [Lesson 11 Assessment](#)

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

- Day 2

## Lesson 11 (2 days) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (10 min)  NAVIGATION  Slide: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Insert picture of your class Particle Model into Slide A.</li> <li>4. The teacher will need to follow up by adding these news ideas to the particles model and Model Key Ideas in the next Virtual Class meeting.</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Revisit new ideas from the last investigation &amp; connect to Class Particle Model.</li> <li>2. Model how the blue circles could be used to represent a water particle to make two different kinds of particles.</li> <li>3. Define the term “chemical reaction” and compare this type of particle level change to a phase change.</li> </ol>
Part 2 (6 min)  SETTING GOALS FOR THE READING & ENGAGING IN THE FIRST PART  Slide: B		VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Identify and record the question “How do Dalton’s models of the particles that change in a chemical reaction compare to the ones we developed?”.</li> <li>2. Review the steps of the reading protocol.</li> <li>3. Read the first page of the reading, pausing to think about and answer the two questions.</li> </ol>
Part 3 (9 min)  ENGAGING IN THE 2ND PART OF THE READING  Slide: C		VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Using the protocol read the 2nd part of the reading.</li> </ol>
Part 4 (5 min)  ADDING TO INDIVIDUAL PROGRESS TRACKERS  Slide: D		VIRTUAL CLASS POST-WORK: <ol style="list-style-type: none"> <li>1. Record findings from reading on Progress Tracker in TDD.</li> </ol>

Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Part 5 (45 min)</p> <p>USE ATOMS TO REVISE OUR CLASS PARTICLE MODELS</p> <p>NAVIGATION</p> <p>EXPLORATION OF MOLECULAR MODELS</p> <p>COMPARE MOLECULAR STRUCTURES OF OTHER SUBSTANCES</p> <p>REVIEW WHAT WE KNOW ABOUT THE SUBSTANCES IN THE BATH BOMB CHEMICAL REACTION</p> <p>Slides: E-L</p>	<p>Prior to the Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Decide how students will discuss the patterns in the molecular models (pairs/groups in break-out rooms or on a shared document, individual to whole group, etc.) and make arrangements for group assignments and mode of discussion if needed.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Revisit Progress Trackers and connect ideas from reading to “What is happening to particles when substances are made” model. Revise model based on class discussion. (Ensure students have access to the updated model.)</li> <li>2. Complete <i>Representing Dalton’s Atoms in Different Molecular Models of Water</i> through a class discussion.</li> <li>3. Revise the definition of chemical reaction.</li> <li>4. Compare Molecular Models of Water and look for patterns.</li> <li>5. Interpret and extend the chemical formula notation through a class discussion.</li> <li>6. Students look for patterns in the Molecular Models of Other Substances. *This could be done as a small group activity or individual to whole group.</li> <li>7. Using a consensus discussion students determine which possible gases could be coming from the bath bomb and use the molecular models to determine which gas.</li> <li>8. Overview of Lesson 11 Assessment that students will complete independently following class.</li> </ol>	
<p>Part 10 (18 min)</p> <p>USE MOLECULAR MODELS TO REVISE AN EXPLANATION OF THE ANCHORING PHENOMENON</p> <p>Slide: M</p>	<ol style="list-style-type: none"> <li>1. Assign the <a href="#">Lesson 11 Assessment</a>. (NOTE: You will need to select the option to make a copy for each student if available in your platform in order for students to edit.)</li> </ol>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Students develop a revised explanation on the “Constructing Revised Explanations” sheet.</li> </ol>

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## Lesson 12 (2 days) - Putting Pieces Together

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

- [Lesson Slideshow](#) - *replace sample model on Slide B with your class model*
- [Thinking Deeper Document](#) - *replace sample model with your class model (see instructions in teacher notes)*
- [Lesson 12 Assessment](#)

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

- [Lesson Slideshow](#) - *replace sample model on Slide B with your class model*
- [Thinking Deeper Document](#) - *replace sample model with your class model (see instructions in teacher notes)*
- [Lesson 12 Assessment](#)

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

- Day 2

## Lesson 12 (2 days) - Putting Pieces Together

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (10 min)  COMPARING MODELS AND EXPLANATIONS  Slides: A	<ol style="list-style-type: none"> <li>1. Upload Class Consensus Model from Lesson 7 and replace the sample model on Slide B in the lesson slideshow and on the Lesson 12 TDD. (On the TDD, you will need to double click on the drawing, delete the sample model, and paste the image of your model.)</li> <li>2. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>3. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>4. Prepare virtual gallery walk by inserting all student models (from Constructing Revised Explanations handout) into a shareable slideshow.</li> </ol>	VIRTUAL CLASS PRE-WORK <ol style="list-style-type: none"> <li>1. Read over any teacher comments or feedback on <i>Constructing a Revised Explanation</i> worksheet.</li> <li>2. Participate in a virtual gallery walk to see other student models. Look for other's ideas and see if he/she needs to add any new ideas to improve models.</li> </ol>
Part 2 (10 min)  REVISITING CONSENSUS MODEL  Slides: B, C		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Students generate ideas of more details we can add or changes we can make to our Class Consensus Model.</li> <li>2. Introduction to new vocabulary: Reactants &amp; Products.</li> <li>3. Using the images of the molecules, the students will drag and drop them to the correct place on the model.</li> </ol>



<p>Part 3 (25 min)</p> <p>INDIVIDUAL ASSESSMENT</p> <p>Slides: D</p>	<p>1. Assign the lesson 12 Assessment. (NOTE: You will need to select the option to make a copy for each student if available in your platform in order for students to edit.)</p>	<p>VIRTUAL CLASS PRE-WORK:</p> <p>1. Students complete <a href="#">Lesson 12 Assessment</a>.</p>
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Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Part 4 (7 min)</p> <p>COMPARING AND DEVELOPING MODELS WITH A PARTNER</p>		<p><i>Not addressed in Virtual learning.</i></p>
<p>Part 5 (35 min)</p> <p>UPDATING OUR CLASS CONSENSUS MODEL</p> <p>TAKING STOCK OF CHEMICAL PROCESSES</p> <p>REVISIT THE DRIVING QUESTION BOARD QUESTIONS</p> <p>IDENTIFY NEXT STEPS FOR OUR ODOR RELATED QUESTIONS</p> <p>Slides: F-K</p>	<p>Prior to the Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Ensure students have access to the most recent consensus model and the most recent DQB.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Update the portion of the model that shows the liquid after the reaction on the right side of the class consensus model to add 1 molecule of sodium citrate interspersed with water molecules.</li> <li>2. Compare two models and determine which is a stronger model for supporting an explanation for why the mass of the closed system didn't change during the reaction.</li> <li>3. Have students manipulate the water molecules on their TDD to illustrate what happens when a heated to produce a gas and when it cools back down to form water. Share ideas. (The teacher can manipulate the molecules electronically in response to student ideas or allow students to share their screens.)</li> <li>4. Compare chemical reactions and phase changes while students fill in the chart on the TDD.</li> <li>5. Revisit DQB and follow directions on Slide I. (If students do not have access to a shared electronic DQB, the teacher may provide an image to students to evaluate and annotate the DQB based on student ideas.)</li> <li>6. Consider questions about odor and record what we could do to investigate those questions. Answer on TDD.</li> </ol>	

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## Lesson 13 (1 day) - Investigation

NOTE: Suggested home investigation involves sending odor vials home with students if supplies allow. Other options:

1. Film your own family members smelling the vials and describing what they smell so students can record the observations secondhand.
2. Have students, with parent supervision, find any of the common substances around their home and perform a blind smell test with family members to identify the scents and record observations. (Be sure to stress proper waft techniques and safety guidelines if choosing this option.)

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

- [Lesson Slideshow](#)
- [Thinking Deeper Document](#)
- Odor Vials for Home Investigation - If supplies allow, send home one sealed vial of each substance per student in a plastic zipper bag. \*\*Check for student allergies before sending substances home.\*\*

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](#)
- Odor Vials for Home Investigation - If supplies allow, send home one sealed vial of each substance per student in a plastic zipper bag. \*\*Check for student allergies before sending substances home.\*\*

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

- None

## Lesson 13 (1 day) - Investigation

Day 1		
Lesson Components	Distance Learning Plan	
	Teacher	Student
Part 1 (5 min)  NAVIGATION  Slides: A	<ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Prepare vials (odor lab) for student pickup and distribution prior to lesson OR update Slide E based on other selected option.</li> </ol>	VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Students answer questions on TDD.</li> </ol>
Part 2 (5 min)  PREPARING FOR ODOR LAB Slides: B, C		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Students read 2 goals for today.</li> <li>2. Students prepare Progress Trackers by inserting questions in TDD.</li> </ol>
Part 3 (12 min)  ODOR LAB AND READING  Slides: D, E		HOME INVESTIGATION: <ol style="list-style-type: none"> <li>1. Read Odor Lab Procedure and How to Smell Odors Safely.</li> <li>2. Follow directions on Slide E to complete Odor Lab. Record observations on TDD.</li> </ol>
Part 4 (13 min) READING ABOUT RECEPTORS Slide: F		VIRTUAL CLASS PRE-WORK: <ol style="list-style-type: none"> <li>1. Students read, highlight and annotate as they read.</li> <li>2. Fill in progress trackers to answer both questions in the progress tracker.</li> </ol>

<p>Part 5 (10 min)</p> <p>DEVELOP AN EXPLANATION</p> <p>Slide: G</p>		<p>VIRTUAL CLASS PRE-WORK:</p> <ol style="list-style-type: none"><li>1. Develop an explanation to answer the lesson question.</li></ol>
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## 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](#)
- [Lesson 14 Assessment Part 1](#)
- [Lesson 14 Assessment Part 2a](#) & [Lesson 14 Assessment Part 2b](#)
- Unit Reflections 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](#)
- [Lesson 14 Assessment Part 1](#)
- [Lesson 14 Assessment Part 2a](#) & [Lesson 14 Assessment Part 2b](#)
- Unit Reflections Discussion Board - *teacher made*

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 & 2 (42 min)  NAVIGATION  PART ONE OF ASSESSMENT  Slides: A-E	<p>Prior to Virtual Class, the teacher should:</p> <ol style="list-style-type: none"> <li>1. Share <a href="#">Lesson Slideshow</a> with students.</li> <li>2. Share <a href="#">Thinking Deeper Document</a> with students.</li> <li>3. Share <a href="#">Lesson 14 Assessment Part 1</a>. (NOTE: You will need to select the option to make a copy for each student if available in your platform in order for students to edit.)</li> <li>4. Set up for the calcium carbonate and malic acid investigation - Option to film the investigation and have students complete the entire assessment independently.</li> </ol> <p>VIRTUAL CLASS:</p> <ol style="list-style-type: none"> <li>1. Share interesting things learned in the last lesson on odor.</li> <li>2. Students fill in a progress tracker to develop explanations from the previous day. (See Slides B &amp; C)</li> <li>3. Ask, "Does this new information help us explain any of our related phenomena?"</li> <li>4. Orient students to the context of both parts of the assessment, the Taj Mahal.</li> <li>5. Have students complete #1 &amp; 2 on their Lesson 14 Assessment.</li> <li>6. Demonstrate the calcium carbonate and malic acid investigation while students fill in their data table - #4 on the assessment.</li> </ol> <p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Students complete #5 on the assessment and submit.</li> </ol>	
Part 3 (3 min) CLEAN UP AND COLLECTION		<i>Not addressed in the virtual learning plan since students observe the investigation.</i>

Day 2		
Lesson Components	Distance Learning Plan	
	Teacher	Student
<p>Part 4 (3 min)</p> <p>REVIEW THE OPTIONS FOR PART 2 OF THE ASSESSMENT</p> <p>Slide: F</p>	<p>1. Share <a href="#">Lesson 14 Assessment Part 2a</a> and <a href="#">Lesson 14 Assessment Part 2b</a>. (NOTE: You will need to select the option to make a copy for each student if available in your platform in order for students to edit.)</p>	<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Read Slide E as a reminder of the options for Part 2 of the assessment.</li> <li>2. Choose Part 2a or 2b to complete for the assessment.</li> </ol>
<p>Part 5 (30 min)</p> <p>PART 2 OF ASSESSMENT</p> <p>Slide: G</p>		<p>VIRTUAL CLASS POST-WORK:</p> <ol style="list-style-type: none"> <li>1. Complete part 2 of the assessment and submit.</li> </ol>
<p>Part 6 (12 min)</p> <p>REFLECTING ON NORMS AND CELEBRATING ACCOMPLISHMENTS</p> <p>Slide: H</p>	<p>1. Create a discussion board for students to complete their reflections on the unit. - Consider creating a thread for each question.</p>	<p>DISCUSSION BOARD:</p> <ol style="list-style-type: none"> <li>1. Complete reflection questions and submit.</li> </ol>

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