I. Content: Describe what it is you will teach. What is the content?

Our four lesson of our matter unit will begin with a discussion of the role that heat plays in making matter change states. This will prime us for a read aloud and video exploration of what makes a gas a gas. We will conduct an experiment to further explore the properties of a gas.

II. Learning Goal(s): Describe what specifically students will know and be able to do after the experience of this class.

- Content: SWBAT identify what is a gas and what are the properties of a gas.
- Language: SWBAT listen to several sources (text and video) and distill the properties that make a gas a gas; SWBAT orally express those properties.

III. Rationale: Explain how the content and learning goal(s) relate to your Curriculum Unit Plan learning goals.

In this lesson, we will address two content standards of the Massachusetts Frameworks for physical science (listed below). We will achieve the first by reviewing what makes a solid a solid and what makes a liquid a liquid. Additionally, we will explore what makes a gas a gas. Secondly, we will rely on our understanding of the water cycle in order to reinforce the concept of state changes. In addition to these content standards, the lesson will also tackle practice standards, or habit of mind, so essential to the scientific discipline. The first is that our classroom scientists will be charged with employing technical language and vocabulary in order to communicate precisely; in this lesson, they will be required to define matter, solids, liquids, and gas correctly. Additionally, our scientists will continue to use a method in order to discern facts from experiments. This scientific method models the thinking and practice of all scientists. This lesson incorporates literacy development by tasking students to engage with new vocabulary and to begin to employ it in their oral and written language. This is referenced in my language objective for this lesson, which appears in the learning goals section of this LAP. Lastly, we will further build our community of learners by maintaining a safe environment to ask questions, make mistakes, and challenge one another. Students will also work collaboratively in our whole group experiment; as such, they will be forced to rely on one another as funds of knowledge. This type of interaction also allows a period of “legal” talk, in which interpersonal and social conflicts must be set aside for the purpose of achieving the most points.
IV. Assessment: Describe how you and your students will know they have reached your learning goals.

There will be a variety of formal and informal assessments that will indicate to me whether my students will have reached my learning goals. First, students will be assessed by their contributions to a review of last class, which will reveal their retention of how heat influences the state of matter, as well as the definitions of matter, solid, and liquid. Students will also be assessed by their participation in our read-aloud and video; they will be assessed by their ability to cull important definitions and properties regarding gasses from the source that I present to them. Finally, students will be formally assessed by their performance on the worksheet in which they have to use the scientific method to organize their ideas and discoveries.

V. Personalization and equity: Describe how you will provide for individual student strengths and needs. How will you and your lesson consider the needs of each student and scaffold learning? How specifically will ELL students and students with learning disabilities gain access and be supported?

The strengths of individual students will be brought out and encouraged in several ways:

**High flyers** will benefit greatly from sharing their retained knowledge during our review, as well as participating actively in the accompanying discussion. This will give them an opportunity to grow their understanding by showing it. Furthermore, they will benefit from the read-aloud, which offers a great deal of facts for the close listener. During the experiment, high flyers will be provided with a more comprehensive version of the scientific method. Students who have an **IEP** or **504** will benefit from clear, single-step directions. To further support their success, I have thoughtfully selected preferential seating spots for them, as well as provided repeated directions as necessary. Both students on an IEP or 504 as well as **ELLs** will have a modified worksheet with less writing prompt and tasks; this worksheet also provides more space for illustrations.

ELLs will also benefit from the read-aloud, which provides many visuals of the concepts at hand. They will benefit from the teacher doing the reading work, so that they can do the content tasks. As always, I will emphasize model the correct use of vocabulary and encourage students to reference our anchor charts for assistance. Furthermore, ELLs who have the opportunity to work with more fluent English speakers will have the chance to encounter this new domain specific academic vocabulary employed by their peers. **Auditory** learners will be supported by the repetition of our new vocabulary. They will also profit from the oral nature of the discussion. **Visual** learners are sure to benefit from the read-aloud, which is rich in illustrations, as well as
our anchor charts. Finally, kinesthetic will be allowed to work in open spaces as is deemed appropriate. All students will enjoy the video, which is as rich in visuals as it is in content!

### VI. Activity description and agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00-0:10</td>
<td>I will guide a discussion on the role that heat plays in making matter change states.</td>
<td>Students will use their background knowledge of the water cycle to participate.</td>
<td>Anchor Chart Water Cycle Graphic (textbook) Markers</td>
</tr>
<tr>
<td>0:10-0:20</td>
<td>I will conduct a read aloud and show the video. I will scribe a list of the properties of a gas.</td>
<td>Students will generate a list of the properties that make a gas a gas.</td>
<td>Book ELMO &amp; Computer Same as above</td>
</tr>
<tr>
<td>0:20-0:40</td>
<td>I will conduct the gas experiment.</td>
<td>Students will complete the accompanying worksheet.</td>
<td>Worksheet Pencils</td>
</tr>
<tr>
<td>0:40-0:45</td>
<td>I will lead a wrap up review of our three major states.</td>
<td>Students will participate in the review.</td>
<td>Anchor Chart</td>
</tr>
</tbody>
</table>

The main challenge I foresee for this lesson is timing. I am asking my students to accomplish a lot in a short window of time. In order to stay focused, I am going to write my objective on the board, so that our many tasks are always guided by the same goal: to isolate what specifically makes a gas a gas and not a solid or a liquid. Additionally, I may conduct the gas experiment on my own as a display for the rest of the class, just as I did with the liquid experiment; this would cut down on time that would be spent maintaining order and cleanliness in the room. Finally, I always have the option of splitting this gas lesson into two and continuing on Friday. I have been reluctant to separate the last two lessons on solids and liquids so as to maintain a sense of unity (one lesson per state); however, if I’m rushing, I’ll have to make adjustments.

### VII. List the Massachusetts Learning Standards this lesson addresses.

Massachusetts Frameworks for physical science (pg 64):

2. Compare and contrast solids, liquids, and gases based on the basic properties of each of these states of matter.

3. Describe how water can be changed from one state to another by adding or taking away heat.

### VIII. Reflection

This lesson was my first science experience where I felt at ease just as I do with math. By this I mean that I was comfortable “winging-it” a bit, instead of strictly following the plan I laid
out above. Instead of starting with the water cycle, I decided to begin with a review of solids and liquids, which I had intended to do at the end but felt was a better introduction to gasses. I’m glad that we did, because it segued nicely into the book’s discussion of gasses. I wish that I had foreseen that students would have difficulty differentiating between liquids and gasses, as their work samples represent. In our next lesson, I think I’ll begin with what makes a gas a gas instead of a liquid, or a liquid a liquid instead of a gas. Perhaps we can make a class list and then discuss the differences between the categories. That would be a great way to connect oobleck, which doesn’t really seem to fit in any category!

Another on the fly edit I made to this lesson was watching the video as an experiment to the first part of our lesson. I’m so glad I figured out a way to use the ELMO to watch the video because the students responded so well to it; they even asked if we could watch it during snack, which we did! The question (“Can a gas be poured?”) was a great impromptu task, as it led to a variety of hypothesis. I was glad that I got the chance to reinforce that science (and learning, for that matter) is all about making mistakes and changing our minds based on evidence. The video also was a fluid connection to our next activity, in which we made the same gas that was featured in the video (carbon dioxide).

Perhaps the biggest difference from my plan was my lack of copies; I had extras from last week that I intended to use this week, but I forgot that it had last week’s experiment’s question on the top. Instead, I used blank sheets of paper folded in half. This was totally unintentional, but it provided interesting results. Without the boxes and clutter of a worksheet, the students were able to write at the length that came naturally to them. I think this allowed several students to write more than they would have had they just been provided with boxes. The lack of a worksheet also made my teaching feel less rigid or preformulated.

That being said, I have one area that I really needed to work on. Patty pointed out that I seem kind of tense when I’m teaching, as evident in my tone and need for control. I completely agree, and as a young teacher I feel the impulse to demonstrate my control over the room more intensely. Going forward, I’m going to try to relax a bit more and show my enjoyment of teaching, which I truly feel on the inside. I want my students to know that watching them learn is a joy for me.