I. Title and brief description: Give a title and short description. What, briefly, will students be doing in this unity of study? (2-3 sentences)

In this unit, students will be exploring how a habitat provides for an organism’s basic needs. Students will also discuss what a habitat is and will learn specifically about the Arctic and desert habitats. They will perform experiments to learn about adaptations and will work together to become an expert on a particular animal or plant at the end of the unit.

II. Big Idea/Essential Question: Explain your “big idea” and/or essential question.

How do habitats provide for living things?
Why do animals and plants live where they live?

In this unit, students will discuss and learn about reasons why organisms live in a particular place and how these habitats provide the four basic needs.

III. Learning Goals: Explain what learning goals you have set for students’ investigation of the big idea/essential question. Consider the following areas:

a. Development of content understanding (key concepts and ideas)

Students will be able to:
• Identify the four basic needs: food, water, shelter, and air
• Recognize how different habitats uniquely provide for living things
• Compare and contrast different habitats (the Arctic and the desert)
• Explain how a plant or animal adapts in a particular habitat
• Demonstrate their knowledge of an animal and how it adapts through a final presentation

b. Development of habits of mind and work, including habits of independent or collaborative thinking and doing typical of readers, writers, speakers, creators, researchers, and thinkers in the discipline (ways of knowing)

Students will develop collaborative thinking
• Students will work collaboratively with classmates to explore habitats and to become experts

Students will begin to think as scientists
• Students will apply elements of the scientific method during experiments, such as making observations, hypotheses, and drawing conclusions
• Students will use a science journal to review notes and observations

Students will develop research and inquiry skills
• Students will become experts on a particular animal, using research to find information about this animal
• Students will share their information with the class in a presentation format

c. Literacy development, including capabilities of proficient readers, writers, and speakers

Students will develop as readers by reading both nonfiction and fiction texts to learn more about habitats and animal and plant adaptations. Students will develop as writers by being able to write hypotheses, observations, and conclusions. They will also be able to write notes about the animal they do research on. They will develop as speakers by presenting their final projects. They will also be able to discuss aspects of habitats and adaptations in whole group work and partner/small group work.

d. Development of the classroom as a learning community

Students will be able to work collaboratively in small groups throughout the unit. There will also be turn and talks during discussions and students will follow classroom discussion rules. When students become experts and present their final projects, they will develop as a learning community because students will be learning from each other.

IV. Rationale: Your rationale should show clearly your careful consideration of a full range of factors in planning your unit to ensure equitable support and meaningful, authentic, and substantial learning for all students, as follows:

a. Learning goals: Explain why your big idea/essential question and your learning goals are important for your discipline and meaningful for your students.

Essential Question: How do habitats provide for living things? and Why do we live where we live?

Throughout the unit, students will be observers and scientists by looking at our natural world and habitats that exist. Students will be able to realize the relationship that they have with plants and animals and will see themselves as a part of a habitat as well. Students will develop as scientists and researchers as
they hypothesize, make observations, and draw conclusions. Students will be able to explore the relationship between plants and animals and how they adapt to their habitats. By learning about these scientific concepts, students will have a better understanding of their own relationship with nature. They will begin to have a respect for nature, which is important for our world’s future.

b. **Curriculum standards**: Explain how the big idea/essential question connects to the **Guiding Principles** in the MA curriculum frameworks. Identify which learning standards are addressed and how.

**MA Frameworks Life Science**

**Characteristics of Living Things 2.1**: Recognize that animals (including humans) and plants are living things that grow, reproduce, and need food, air, and water.  
This standard is addressed throughout the unit, as students will continue to explore what the four basic needs are and that both plants and animals need them in order to survive.

**Living Things and their Environment 2.8**: Identify the ways in which an organism’s habitat provides for its basic needs (plants require air, water, nutrients, and light; animals require food, water, air, and shelter).  
This standard is addressed throughout the unit, as students will continue to explore both the arctic and desert habitats. They will participate in experiments, read alouds, and discussions in order to develop understanding of adaptations and how a habitat provides for its living things.

**CCSS.ELA-Literacy.W.2.8** Recall information from experiences or gather information from provided sources to answer a question.  
This standard will be addressed when students recall their prior knowledge and experiences of habitats and adaptations. In each lesson, students will need to recall what we learned to build upon knowledge throughout the unit.

**CCSS.ELA-Literacy.W.1.2** Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.

**CCSS.ELA-Literacy.SL.2.1** Participate in collaborative conversations with diverse partners, peers and adults in small and larger groups.  
Students will work together throughout the unit to discuss texts and videos and build upon understanding.

**CCSS.ELA-Literacy.SL.2.2** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.  
There will be read alouds throughout the unit that will help to support students in their
learning and they will be required to discuss these texts, identifying key
information.

c. **Students’ background and readiness:** What strengths and interest, in terms of their
content understanding (prior knowledge), academic and literacy development,
personal and cultural abilities, and development as a learning community, are you
taking into account in planning this unit?

I anticipate that most of my students will not know what a habitat is or have much
background knowledge on these concepts. However, my students are very
interested in animals and get excited about them, so this will be a great way for
them to learn more about them. I will try to activate as much prior knowledge as
they do have that can connect to this unit and I will try to make connections to my
students. I will also be sure to define key vocabulary throughout the unit for my
students, which will help to support their learning. We will spend time going over
these words and reviewing what we have already learned from previous lessons,
to be sure that we are building upon this knowledge. My students have had some
experience reading for particular information and they know how to work
together well. I will use this as a strength as we work on our final projects. They
have also done a final group presentation before, so this will also be familiar to
them and what I expect of them. Because I know my students’ reading and
writing abilities, I will be sure to make groups that will help to support student
learning throughout the unit.

d. **Student needs:** What particular needs of your students—academic, social,
personal, language (ELLs)—have you taken into account in planning the unit?
What will they need to be able to do in order to meet the learning goals?

Because students may not know much about the arctic and the desert, I will be
using a lot of visual aids, which will help to support my ELLs. This unit allows
for hands-on experiences, which every student can have access to. Experiments
will allow students to work in small groups and this will again support my ELLs
and students with learning disabilities and they will feel comfortable in this type
of environment. There will be many turn-and-talks and opportunities for group
discussions, which will help to support my ELLs and students with learning
disabilities. Students will have the opportunity to show their learning through
many different ways, such as participating in group and partner discussions,
writing and drawing.

e. **Research-and evidence-based best practice ideas:** Explain how research and best
practice ideas have informed your plan.
I will be using best practices identified by Zemelman, Daniels, and Hyde such as collaborative activities and gradual release of responsibility. I will also be using primary sources such as photos in order for students to gain access. There will be many different ways for students to show their learning, such as writing, speaking, creating, and listening. This will allow all students to be a part of the classroom community. I will also be using Janice Koch’s *Science Stories* to help guide my unit. Koch writes that science should be inquiry based and discovery is essential. The hands-on experiments in this unit will allow students to discover adaptations within their science groups. Students will be encouraged to ask questions throughout the unit and share ideas.

**V. Assessments:** It is essential for both you and your students that your formative and culminating assessments clearly show the extent to which students have achieved learning goals.

a. Explain your main assessments and why they are appropriate for your learning goals.

Throughout the unit, there will be opportunities for class discussions, turn and talks, and group work. During experiments, students will write their predictions and their conclusions, as well as draw observations. We will use KWL charts as a class and there will be exit slips for students to complete to show their understanding. Students will be working together to research during their final project and they will create a poster presentation as their final project. They will present these final projects. All of these assessments will allow me to see if students truly understand what a habitat is and how it provides for plants and animals.

b. How will students know what to expect and the criteria for good work?

Students will know what to expect in the classroom and will know what good work looks like for many different reasons. Because there will be group work, we will model what “good group work” looks like and go over the rules of working in groups. Before students are on their own, the activities that are given will be modeled for them. Before the lesson begins, students will be given clear directions both orally and written on the board so they can refer back to them. They will also be informed of where the unit is headed so that they can better understand the full picture and why they are learning what is being taught. For the final assessment, there will be a rubric given to students so they will know the expectations.

c. Explain your culminating assignment and corresponding assessment criteria/rubric.
The final assessment will be a research project in which students create a poster of an animal or plant they researched in groups. The poster will have one half that is a drawing of what students are assigned and the other half will have a writing component. Groups will be assigned an animal or plants from either the Arctic or the desert, the two habitats the unit focuses on. I will be looking for students to show me what adaptation the plants or animals have and how these help them to survive in their environment. I will be sure to provide students with examples of what I am looking for. When groups are finished, they will present their final project to the class. There will be a 4 scale rubric for students to measure their progress.

d. How will students and parents learn about students’ overall academic progress from these assessments?

Students will receive written feedback on their written responses as well as oral feedback during discussions. Students will be able to take home in-class assignments for parents to see their work.

VI. Unit Calendar

a. Provide a calendar of key learning activities, learning strategies, and assessments for your anticipated timeframe for the unit.

<table>
<thead>
<tr>
<th>Lesson 1 Introduction to Habitats</th>
<th>Activities</th>
<th>Learning Strategies</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-brainstorm with students how a squirrel (an animal that is common in Worcester) survives, brainstorm ideas and share, connect to four basic needs</td>
<td>-making connections</td>
<td>-turn and talks</td>
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<tr>
<td></td>
<td>-watch Discovery Education video on habitats and basic needs</td>
<td>-using technology</td>
<td>-group discussion</td>
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<tr>
<td></td>
<td>-step into the picture—have students describe what they see, might hear, and feel in this environment</td>
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<td>-exit slip</td>
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<tr>
<td></td>
<td>-exit slip</td>
<td></td>
<td></td>
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<tr>
<td>Lesson 2 Desert Environment</td>
<td>-Read aloud of Welcome to the Sea of Sand by Jane Yolen, turn and talks and group discussion</td>
<td>-learning through literature</td>
<td>-turn and talks</td>
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<tr>
<td></td>
<td>-Watch short video about the desert habitat <a href="https://jr.brainpop.com/science/habitats/desert/">https://jr.brainpop.com/science/habitats/desert/</a></td>
<td>-using technology</td>
<td>-group discussion</td>
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<td></td>
<td></td>
<td></td>
<td>-graffiti board</td>
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<tr>
<td>Lesson 3</td>
<td>Animals/Plants in the Desert</td>
<td>DAY 1:</td>
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<td></td>
<td>- Read <em>Desert Giant: The World of the Saguaro Cactus</em> by Barbara Bash</td>
<td>- Hands on minds on experiment</td>
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<td></td>
<td>- Discuss adaptations and how a cactus adapts to the desert environment</td>
<td>- Learning through literature</td>
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<tr>
<td></td>
<td>- Cactus experiment <a href="http://www.oceanoasis.org/teachersguide/activity8.html">http://www.oceanoasis.org/teachersguide/activity8.html</a></td>
<td>- Turn and talks</td>
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<tr>
<td></td>
<td></td>
<td>- Group discussion and student hypotheses, observation s, and conclusions</td>
<td></td>
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<td></td>
<td>DAY 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Group discussion after experiment about what happened, students draw observations and conclusions</td>
<td>- Hands on minds on experiment</td>
<td></td>
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<tr>
<td></td>
<td>- Make connections between what occurred and cactus adaptations</td>
<td>- Learning through literature</td>
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<tr>
<td></td>
<td>- Hands on minds on experiment</td>
<td>- Turn and talks</td>
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<tr>
<td></td>
<td>- Group discussion and student hypotheses, observation s, and conclusions</td>
<td>- Learning through literature</td>
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<tr>
<td></td>
<td></td>
<td>- Making connections to prior knowledge in the unit</td>
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<tr>
<td></td>
<td></td>
<td>- Using technology</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Turn and talks and discussion</td>
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<tr>
<td></td>
<td></td>
<td>- Finished graffiti board (half will be the desert and the other half the arctic so students can compare)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Lesson 4</th>
<th>Arctic Environment</th>
<th>- Read aloud <em>The Arctic Habitat</em> by Molly Aloian, (Read aloud <em>Arctic Son</em> as well at a different time)</th>
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<tbody>
<tr>
<td></td>
<td>- Discuss what the arctic looks like and what animals how this might affect plants and animals</td>
<td>- Hands on minds on experiment</td>
</tr>
<tr>
<td></td>
<td>- Finish graffiti board and compare the desert and arctic habitats</td>
<td>- Turn and talks and discussion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Finished graffiti board (half will be the desert and the other half the arctic so students can compare)</td>
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<table>
<thead>
<tr>
<th>Lesson 5</th>
<th>Animals/Plants in the Arctic</th>
<th>- Read aloud sections of <em>Polar Bears</em> by Gail Gibbons</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>- Blubber glove experiment</td>
<td>- Hands on minds on experiment</td>
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<tr>
<td></td>
<td>- Group discussion to connect back to adaptations of the polar bear</td>
<td>- Learning through literature</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Turn and talks and group discussion</td>
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<tr>
<td></td>
<td></td>
<td>- Student hypotheses, observations, and conclusions</td>
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</tbody>
</table>

<table>
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<tr>
<th>Lesson 6</th>
<th></th>
<th>- Review of what we know about the basic needs and adaptations</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>- Using the research</td>
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<tr>
<td></td>
<td></td>
<td>- First draft of writing</td>
</tr>
</tbody>
</table>
-students will be assigned either plants or an animal from the desert or Arctic, will be given appropriate sources to use -expected to show how the environment provides for this animal or plant, what are its adaptations? How do these help it survive in their habitat?

process to learn -making connections between prior knowledge and new information found

-poster board presentations

b. Explain your sequence of activities—why does this particular order make sense in light of your learning goals and rationale for the unit?

I decided to start with an introductory lesson to the four basic needs, which is essential to the unit. I wanted students to truly understand the environments before they moved onto adaptations because they need to know what the environment is like before they can understand how a plant or animal survives there. This is why there is a lesson on the desert environment before the cactus adaptation experiment. When we switch to the Arctic environment as well, we will start again with the environment and be able to compare and contrast the Arctic and the desert before we move into an adaptation. Then, there will be a final presentation for groups to apply what they have learned to a new plant or animal that lives in the Arctic or the desert.

VII. Resources:

a. How will you work to actively involve parents in their child’s academic activities and performance, and communicate clearly with them?

I will be sending home what students are working on in school with written feedback when appropriate. There will also be a section on science in the newsletter that is sent home.

b. What resources—such as guest presenters, A/V, field trips, and material artifacts—from colleagues, families, and the community will you draw on to enhance learning?

I will be using primary sources such as informational texts about the Arctic and desert as well as photographs. I will also be including video clips in this unit so students can see what these habitats look like and what animals and plants live there. I will also be bringing in my own cactus for students to look at.
c. What legal or ethical issues are involved in your use of the Internet and other resources and how have you addressed them?

I will be sure that all Internet sources are reliable.

VIII. Post-Teaching Reflection
   a. Based on your culminating and other assessments of learning goals, analyze the extent to which students achieved your learning goals.

   i. To what extent did different students achieve the learning goals?

I felt that this was a powerful unit for my students and because they were excited about the content, they really understood it. In our first lesson, students were able to discuss the four basic needs and connect them to their own lives and their own needs: food, water, shelter, and air. This was a great starting point for them because it is something we continuously referred back to when discussing adaptations and the harsh climates of the Arctic and the desert. During the second lesson and many after, students had to work together. An important learning goal was that students would develop collaborative thinking and I wanted my students to really learn how to work in groups without needing to talk to me all the time about something going wrong in their group. They had some problems with this at first, but I could tell throughout the unit that they got much better and during the final project, they barely needed me to mediate problems.

   It was also important that my students develop inquiry skills, which definitely happened. My students were so curious and had so many questions throughout the unit, that we had a “Parking Lot” full of questions, which I tried to address when there was extra time in the morning or at the end of the day. Some of these questions were, “Who lives in the Arctic?,” “What is the largest desert in the world?” and “Is it dark in the Arctic?” During the cactus experiment especially, I had students who were asking again and again what is going to happen tomorrow when we look at the sponges? It was great to see my students trying to problem solve
and hypothesize what was going to occur. One student wrote, “I think the one without the wax paper because if you go swimming and you do not dry yourself with a towel you dry slower than if you do not use a towel.” Although this was not correct, the student justified their thinking with a good reason. Another student wrote, “I think the sponge with the wax paper will stay wet because the water will stay tight in the sponge.” Again, this student was able to show their thinking and give a reason for their hypothesis. This is a part of the scientific method that I think my students were able to understand and apply well throughout the unit.

The discussion during the cactus experiment was really great and my students were definitely listening to each other because they were building onto each other’s comments. Some of my students would say “Yes, I think the same thing as ___” which was great to see the shift between relying on what I have to say and really listening to each other. Students again worked well together during the blubber glove experiment and one student hypothesized, “I think the glove with fat will keep my hand warmest because polar bears have fat that keep them warm.” Another wrote, “I think the glove with fat will keep my hand the warmest because fat keeps humans and animals warm.” It was great to see that my students really understood the connection between what we were learning about and the experiment. This was clear during the discussion as well at the end.

For the final presentations, my students worked really well together and supported one another. It was clear that students understood the term adaptation because they pulled out the important information about how their plant or animal survives. For example, a part of what one group wrote was, “Snowy owls have sharp eyesight and great hearing, which can help the owl find prey under the snow. Prey means an animal that another animal eats.” Another group wrote, “In winter, a camel’s fur is like a warm fuzzy blanket. The blanket keeps the camel nice and
'warm. Bactrian camels’ fur sheds in summer. A Bactrian camel can go days without drinking. It can drink a lot of water. A camel can close its nostrils to keep sand out of its nose. Its long eyelashes protect its eyes. This is how it survives in the desert.” Both groups understood what was important and were able to present to the class. This was a great way to end the unit because students were really interested in what other people were assigned and even during the project, they would try to go over and see what other students were working on. This project also shows that students can apply their knowledge of what an adaptation is to different contexts, which shows true knowledge of the content.

ii. What do you learn from the differences in performance, or puzzling student performances (hard for you to explain), about the particular challenges of learning in this unit?

I think that the explicit vocabulary instruction within context was key for this unit. At first, my students did not understand what adaptation means, even as we read about it and put it on the chart. However, when we did the cactus experiment and then came back to this word in our discussion, it was like a light bulb went off. Almost everyone understood that it is something that helps an animal or a plant to survive and it is different depending upon where the animal or plant lives. This concept was then solidified when we did the polar bear experiment and compared the adaptations. It was important for students to know this vocabulary and I did not want to take these science words away at all, so we just continued to refer back to them and eventually it clicked, especially with the hands-on experiments.

I really did feel that my students were able to be successful throughout this unit. One aspect that I can think of that has been a struggle in other units as well is that some students don’t finish their writing. For example, for the hypothesis and conclusion of the experiments, a few students won’t finish even though I model this and give sentence starters. However, when having
discussions with these students, they are able to give answers, so it is really a struggle for them to get their ideas down on paper. They are able to talk about it and understand what is happening, but I notice that the same few students have had unfinished work that I try to finish with them one-on-one. This is a trend for them in other subject areas. I could have had two options for a hypothesis and had these students circle one instead of writing their own.

Another challenge in this unit was that students had to work together to accomplish their tasks. One student in particular had a very hard time doing this and had to do some work individually. I feel that he did not benefit as much from this unit as other students did because he could not work well with others. We tried different groups and other strategies, but unfortunately this did not help very much. Some of my students had problems in the beginning working together, but eventually they were able to work out their problems without me, which was great to see.

iii. What do you learn from the differences in performance about the effectiveness of your planning for the needs of different students?

I think that my students were able to do really well throughout the unit and one of the reasons for this is the support they had from their classmates. One of my students who has a lot of difficulty with reading and writing, still was able to be successful during the final project because there were students there to read aloud the content, which he then was able to understand. In his group, he did a lot of the drawing and presented at the end of the unit. Also, this student needs a scribe, so for all of his experiments, we provide this accommodation for writing hypotheses and conclusions. For example, his hypothesis during the cactus experiment was “I think the one wrapped in paper will stay wet because it has a shield on the top and the other one doesn’t.” Although this was written for him, it was all his idea. He was able to fully
participate in the experiments because they were hands-on and he contributed to discussions. This shows that my students do have the same learning objectives, but there are different ways to get them there. He was still able to be a member of our learning community, which is exactly how I want all of my students to feel.

For my ELLs and students with learning disabilities, the sentence starters really helped to support them. Also, I noticed that the visuals for them were key throughout the unit. There were lots of pictures I showed of the Arctic and the desert and they kept referring back to them when answering and asking questions. I really think that my students performed really well throughout the unit and there were not much differences between students’ understanding. The vocabulary was a challenge for most of my students, which again was reinforced in context again and again, so that by the end of the unit, most of my students had a true understanding. For example, in our discussion at the beginning of the blubber glove experiment, I asked students what adaptations we saw when we did the cactus experiment, to revisit that word. One student answered, “A cactus has waxy skin so it keeps in the water.” When I asked what an adaptation is, someone answered, “An adaptation helps an animal or plant to survive.” This set them up to think about an adaptation that the polar bear has.

During the final presentations, I realized that the community we created as a class really was strengthened. One of my students who is below grade level in reading and went to speech volunteered to read aloud his groups’ final project. His group allowed him to do so without argument and when this student got up to speak, he could not read some of the words. However, instead of me having to step in and help him, one of his group members stood behind him and whispered the word. I was so proud of both of these students and it was really great to watch happen. I think this moment really does show that even though my students are all at different
levels, they were able to come together throughout this unit and learn from one another. For the final projects, I thought a lot about how I would group my students and what their strengths were and how they could all contribute to a group. This planning really supported all of my students and it was a great unit to end my year with my students.

I didn’t anticipate that there would be a student who would have such difficulty working in a group and how to handle it, but he was able to contribute to a project, just on his own. He still presented with this group at the end and I don’t think I would’ve changed the group project because I wanted my students to learn together as a group.

b. What would you change to improve this plan and why?

I honestly wish this unit was longer and we could look at another habitat as well. At first, I had planned to go in depth into one habitat, the Arctic. However, I’m glad that I chose two extreme climates because it helped the students to be able to compare and contrast and really see why animals and plants have the adaptations they do. I think my students would have still stayed interested if we continued this unit into another habitat. I had students tell me they were sad that what we were doing was over when they presented their final projects, so I wish I had more time with them.

I also would have liked to start the Parking Lot questions sooner so that I could have addressed them in a different way. It was a great way to have students thinking and asking questions about the unit, but I could have probably tied it more into the unit rather than answering questions separately at a different time. With the amount of time we had for science, it was difficult to not separate the actual lesson and the questions asked. However, I could have seen what questions connected to the next lesson or another in the future and answered them at that point. I did like trying out the Parking Lot idea and will probably use it again in the future.
also could have had a science corner for students to explore on their own, which would have
added to the questions they had. This could have been something I added to Daily 5 if there was
a literacy component. Overall, I thought my students really enjoyed the unit and it was one of the
most excited times I’ve seen them, when we do science.