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Learning Context

**School Demographics**

School district: Charter School  
Name of school: Edith Bowen Laboratory School  
Title 1 school: No

Demographics of school: Edith Bowen is a charter school in Cache valley located on Utah State University’s Main Campus. Students are selected to attend by the use of a raffle system from which they are randomly selected. There are approximately twenty-seven children in each classroom and there are two classrooms per grade. As of Fall 2017, Edith Bowen is comprised of 358 students, 192 of which are male and 166 of which are female. 287 students are considered white, the next largest group of students identify as Hispanic and contains thirty-three students. The third highest group contains 18 students and they identify as mixed race. As for the other polled ethnicities, they make up then less than ten percent of the school combined. Approximately twenty-seven percent of the students are considered economically disadvantaged, while about fifteen percent of the student body have learning disabilities. Only one percent of the student body is considered as English Language Learners. Edith Bowen has a significant amount of students who identify as LDS, this impacts the student behavior as well as the amount of parent involvement. *Resource Data Gateway, Utah Board of Education

<table>
<thead>
<tr>
<th>SAGE Results for Edith Bowen Laboratory School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts</td>
</tr>
<tr>
<td>66%</td>
</tr>
</tbody>
</table>

As seen above Edith Bowen did significantly better on the SAGE exams than the state average in all categories. *Resource Data Gateway, Utah Board of Education

Description of school climate: Edith Bowen has a very distinct school climate. Their vision states “We value children and respect their curiosity and potential. We commit to providing a
learning environment that allows and encourages children to explore connections between their learning and the world around them." * Resource Edith Bowen Official Website. They are truly dedicated to providing children with experiences, and as they often say “putting the paddle in the children’s hands.” They utilize “The 7 Habits of Highly Effective People” also known as “Leader in Me” as their school-wide behavior management plan- which empowers students to be their most successful inside and outside of the classroom. On top of this, there are countless positive behavior rewards in place where children can earn prizes, titles, and special privileges such as silver star leaders, and self-manager wristbands. The full-time school counselor works tirelessly to build relationships with every student and give students the tools to mediate conflicts, stand up to bullies, and become self-regulating. While I was there I was able to see the peer mediator program in action, this is a program where selected students are trained on how to mediate conflicts for their peers, then when conflict arises students schedule times to work with the peer mediators and solve their own conflicts. The children give their feedback on the school’s climate semi-annually, and their feedback is valued data, which is in turn used to determine what programs will be implemented in the next year. The children are shown the data and it is explained what programs were designed due to the results. The entire school functions with the current students in mind- and it is easily seen through the intentionality in each action at EBLS.

The school itself is set up so that each discipline of learning has its own space (ex. there is a separate art room, music room, gym, Spanish room, and auditorium) which are separate from the classrooms, open spaces, and cafeteria. Which just reinforces that Edith Bowen cares about the whole child and sees each discipline as equally important therefore it deserves its own space. Often an open area available in the school is being used. It is not unusual that the hallways, playground, auditorium, and lobbies are being used for learning. I would often see classes performing pieces of poetry in the auditorium, designing engineering projects in the lobby, or learning outside for the day. This is one of the many beauties of EBLS, the staff truly understands that most children don’t learn by sitting in desks and that it is possible to learn in spaces that are not your traditional classroom. This is again seen through the field experiences that EBLS executes. These field experiences happen often and are very different than the traditional field trips that are seen in most elementary schools. I think the name summarizes the difference. The students aren’t just merely going on trips just to do something fun or go somewhere cool. These are experiences where the children are engaged in deeper level learning, where the students are working in small groups to apply their knowledge to the real world, and are gaining memories that will last them a lifetime. Each activity planned on these field experiences are tied to the Utah Core Standards and are developed with specific children in mind. I was lucky enough to help plan and attend over eight field experiences in my time at EBLS, and I was able to plan and see for myself and first hand saw how deliberate each step of the process was. Through field experiences, the students have the opportunity to interact with the community around them, and parents and the community have the opportunity to see and participate in what is happening in the school. This is just one of the many ways that EBLS incorporates families and the community into the school. Parents are often in the classroom observing or helping on a day to day basis- which helps tie the home and school environments together for the students.
For being such a “small school” Edith Bowen has a giant staff. Edith Bowen is committed to hiring “master teachers” and staff members. Every staff member hired at Edith Bowen has a minimum of three years of teaching experience and often has a master’s degree or higher. For just observing for a few minutes you can clearly see the teachers’ passion and depth of the content knowledge. The teachers are expected to develop their own scope and sequence for the core standards to determine which order and at what time the students should learn the grade level material. The teachers and are not required to use any specific programs, but can if they would like to use any. For example, many teachers choose to use Go Math, while others choose to use Engage NY - the underlying belief is that the teachers that are hired to work there are “masters of the trade” and should be able to choose the best ways to teach their students. This team of teachers was the most pleasant and collaborative group of educators I have ever had the pleasure to work with. Even though they are all highly trained and experienced they often seek each other out for advice and resources. It is not uncommon to see the teachers collaborating and sharing ideas during preparatory and lunch periods. Edith Bowen is also different than most because there are at least two student teachers in every single classroom, which definitely impacts the learning environment. The students are often able to get the one-on-one, or small group they need because there are so many teachers available. The student’s progress is monitored more closely because each student is having individual interactions with teachers every day, and there are more educators involved in IEP and 504 meetings. One of the interesting things about EBLS is that the learning environment truly changes from classroom to classroom because the teachers are empowered to showcases their individuality, creativity, and craftsmanship. Although regardless of the classroom you enter you will notice that students are engaged, the children are problem-solving, the work there are doing is differentiated and child-centered, and the classroom is shared space that belongs to both the teacher and the students. EBLS is a constructivist school, which mean that teachers there believe that the students should take part in creating their own learning. From the classrooms that I had the opportunity to be in, I can say that the classroom schedules, structures, and management were entirely different. However, both created a positive and challenging experience for the students. Children in every classroom are learning the Core Standards through activities and topics that are interesting to them.

My Classroom Demographics
Grade level: 3rd
**Learning environment:** Mr. Boling’s classroom is an incredibly positive environment for children. He has empowered his students to become self-regulatory. The children are sat in table groups of about 6-8 students per table, but students are really only in their desk when they have individual work that needs to be completed. Most of the day is spent outside of the table groups. The children receive a majority of their instruction at the large rug in the classroom and they are most often released to work collaboratively with peers on assignments in a location in the room of their choosing. Mr. Boling was a teacher at an Expeditionary Learning School previous to coming to EBLS and he has integrated a lot of that model of teaching into his classroom. This means the students spend a lot more time talking than he does, the children are found working in pairs or small groups, and most lessons are inquiry-based. The class has a set of five classroom norms or expectations, which the children helped choose. The norms are an integral part of the classroom and are reviewed almost constantly in a positive way. Each lesson that is taught as an academic learning target and a behavioral learning target. The children in each lesson read and break down all the learning targets so they very clearly know what they are trying to learn and what is expected of them. Mr. Boling encourages children to be creative and to demonstrate their learning in a variety of ways, he respects that each learner is different and allows them to display their learning in a way that is effective for them. You can tell that the classroom is a space that the children consider their own because the children will randomly choose to hang up their artwork on the walls. While I was in this classroom the students were taping “How to draw _____” pictures to the walls. This was not an assignment given to the children they just felt comfortable enough to hang their free time work on the walls. This just reinforces how much these students adore drawing. As you look around the classroom there is not anything on the walls that is pre-made or there to please the teacher. The classroom is visibly full of student work and accomplishments.

**Classroom Management:** Mr. Boling is really fantastic at silent signaling. For my first week being in his classroom, I had no idea what was going on but the children would somehow recognize what Mr. Boling was signaling and could transition from place to place, and activity to activity without Mr. Boling saying a word. Mr. Boling has set very high behavioral expectations for these third graders. Their desks are always pristine, they line up and transition almost always silently. Mr. Boling gives rewards and punishments silently as well. He uses a dot system where the children have a dot card on their desk and when the children do something good they get to color in dots on the card, when the card is full they can trade the card for a prize. He has trained the children to save their dots in their head so he can give out dots in the hallway, on field experiences or at the rug and the children tap their temple and save their dots so they can color them in when they return to their desk. His punishment system is called pulling cards. Each child has three cards a green a yellow and a red card in a pocket hanging system in the back. When the children are not following a norm Mr. Boling will ask them to pull a card and put it in the norm they are not following. This requires the child to reflect on the norm they are not following. If at the end of the day no children have pulled cards and therefore every student has a green card on top still the whole class gets a green day. If they get 10 green days they win a class prize.

**Subject matter of lessons:** Math and Art

**Total number of students:** 27

**Students with special needs and short explanation of the needs:**
With IEPs: 3 IEPs
Students who receive speech/language services: 4
English language learners: 0
Gifted and talented: 0
Other (e.g., 504 plans--please specify): 0

Description of Student Receiving services and their needs:

In our classroom, we have three students who are receiving academic support, and three students who are receiving speech support. We also have one student is currently being evaluated for a possible IEP for dyslexia and support for writing and reading.

Student 1- Student one is far below grade level due to a difficult home life. This student has younger parents, who are in a lower socioeconomic status. This student often comes to school late, and tired. Often this student is so tired that they lay their head on their desk and lay down on the rug. This student needs major support reading and writing. When I worked with this student I found that this third-grade student could not even write or spell their last name and was reading at about a mid-first grade level. However, this student can verbally articulate their ideas at a third-grade level and would often participate in academic discussions in class. This student is also receiving speech services. This student’s IEP states that they can have extended time on activities, the directions read to them, the directions re-read to them, and have breaks when needed.

Student 2- This student is adopted, and has some underlying academic struggles due to mistreatment by the biological parents. While I was in this classroom this student was in the process of stopping medication to help with attention span and social anxiety so there were often large changes in behavior and academic achievement. If you were to just observe our classroom this is not a student that you would have assumed needed an IEP or speech services- yet this student receives both. This student typically produced work on grade level, however, they occasionally struggled to articulate their ideas verbally in larger group settings. In my time in the classroom, I noticed that this student needed lengthened times on activities and some redirection to stay on task. This student’s IEP states that they can have extended time on activities, the directions read to them, the directions re-read to them, and have breaks when needed.

Student 3- This student has a severely troubled home life and spent much of their day in my mentor teachers office and in the counselor’s office. From my interactions with this student, I had many red flag conversations. This nine year old often spoke of violence, death, and suicide, and discussed many inappropriate topics for a third grader. Dependent on what was happening at home that day this child was lively, compassionate, and bright. This student is on an academic IEP and receives services to help this student stay on level for reading, writing, and math. This student’s IEP states that they can have extended time on activities, the directions read to them, the directions re-read to them, and have breaks when needed.

Student 4- This student is very intriguing to me because they are so smart, but their attention span is not comparable to other third grade students. If you could get this student engaged in an activity, they will excel. However, if you don’t engage them their misbehavior will disrupt the entire class. My mentor teacher told me that he had spoken to this child’s parents about his behavior many times and asked them to come observe but the parents told him “our
child is happy so that is all that matters.” This child is receiving speech services and has a noticeable speech delay.

Student 5- This student is typically performing in class, and is receiving speech services for a slightly noticeable speech delay.

Focus Students

Description of student B: Very High Achieving Student

Academic ability/ Prior Learning: Student B (now referred to as B for this point forward) is one of the top students in the class especially when it comes to math and science. It is not unusual to have B request to have extra math time as a reward or for free time. As I searched through B’s achievement binder and noticed every math test was either one hundred percent or nearly that. During most lessons but especially math lessons B’s hand is the first to be raised for every question. For RtI placement B was in the accelerated math group and the accelerated ELA group and was thriving.

Personal background: B is new to EBLS this year, and you can tell by B’s attitude that they are new here. A lot of children at EBLS have been there all of their schooling years and do not understand how different EBLS is, or how lucky they are to be there. B understands what an opportunity it is. B would tell me about the school they attended before EBLS, and how there were not filed experiences, and they spent most of the day doing worksheets. I think this understanding contributes to B’s success in school because he genuinely enjoys coming to EBLS and knows how good he has it. B is the middle child of three children, all three children attend EBLS. The oldest is in the sixth grade, and the youngest is in kindergarten. B’s Parents are well off financially and are involved in their children’s academic experience. My mentor teacher said of B’s parents “They definitely push B in both behavior and academics to be successful.”

Other relevant characteristics: B loves puzzles and patterns. In B’s free time they would choose to work with blocks or create his own math problems to solve. B would play with the fraction blocks and place them so they were standing upright on his desk and then create this incredible piece of what I would label art as he would organize them carefully by height. You could tell that B had a vision of these blocks could all fit together to make this design. This is just one example of the precision and intelligence of B. One day in a math lesson Mr. Bolling was teaching the children had to come up with as many ways as they could to represent thirty-six. I was glancing at B’s paper when I noticed they had written down “1+2+3+4+5+6+7+8” immediately I pulled out my phone calculator so I could see if this was true. To my astonishment it was true, that does, in fact, add to thirty-six. I asked B “Tell me about how you figured out this represents thirty-six.” B couldn’t really explain it, but said: “1+2+3+4+5+6+7+8 equals thirty-six it just makes sense I can just see it in my head.” I monitored the student’s papers and not a single other student put this down. B is a student that I would like label as gifted in math, as they explained B can just “see it in his head”
Influence of all of these characteristics on your teaching: B is often a fast finisher when it comes to math because they grasp the material and they are excited to complete it and ask for more math. One of the reasons this project is great is because it is easy to extend and differentiate based on needs. I knew that if I required the class to include at least ten animals in their zoo, that B would want to have twenty. I knew the challenge would intrigue B and the spatial reasoning of how to fit everything into the allocated space would become like a puzzle.

Description of student L: Lower Achieving Student

Academic ability: L is well behaved in class, I would even can this student poised. Their work is often high quality, however, they struggle with math, and dread that time of the day. L has said many times while I have been her teacher “I am not good at math. Math is really hard for me.” I spent some time going through L’s student achievement binder. I noticed that she did have some lower scores on her overall exams, they tended to average around seventy percent. L is also in my Math RtI group, which is a tier two instruction group. The children in my group are in a lower achieving level and need reinforcement of the math basics. When I took over their group they had just finished a reteaching of multiplication and arrays. L was really struggling which could be seen through the assessments. On the overall arrays and multiplication test, she received a seventy-five percent. While on her weekly multiplication exams she was getting around fifteen to twenty-seven percent. For receiving intensive small group instruction on the subject L’s scores should have at least been proficient if not higher. I began instruction on area and perimeter and focused on giving my group specific strategies to help them. I noticed immediately that L was struggling with math facts and particularly multiplication, which made area and perimeter hard exceptionally difficult.

When I went to ask my mentor teacher which student should be my lower achieving student, he suggested L because most of the other lower achieving students has already been done by his previous student teachers and level threes, and he thought that the major concepts he was having me review were a significant need for L. I knew that to engage L in this math-based unit I was going to have to integrate a subject that L felt very strongly about. Immediately I knew I had to integrate art, but more specifically drawing. That’s when I knew the zoo project would be perfect for students L. Student L is constantly doodling, L especially love to draw animals. When the children in my class got free time, L always chooses to draw.

Personal Background: Student L (which will be referenced as L from here on out) is from an upper-middle-class family. My mentor teacher said of L “L is from a privileged family”. L is the youngest of 4 children The oldest is in high school. L’s parents own a company and they both the time and money to travel. L told me one day “My parents are out of town building houses for poor people, so my sister is in charge this weekend.” L’s mother is the class mom and is quite involved in the social aspects of the classroom. At school L is quite social, L is friends with the entire class, and outside of school has playdates with many of the other children.

Other relevant characteristics: L achieves on grade level for every other subject. L especially excels in art. L spends their free time drawing, and they have drawn me many pictures. L also loves animals. Most of the pictures L draws are of animals. L has two dogs at their house and tells me about them often.
Influence of all of these characteristics on your teaching: L’s attitude toward math really bothered me, because I knew they had the potential to be good at math, and I feel strongly that it is often easy to make math engaging and fun for children. I began this project based spiral review math unit because I knew it would help make the material engaging for L, while also allowing L to utilize their strengths of drawing.

![L's drawings](image)

Above are some of L’s drawing that they completed in class. You can tell L is quite talented.

Lesson Plans

Students’ prior knowledge for these lessons: When I entered the third-grade mid-semester and told my mentor teacher about the work sample project he did not immediately think of a subject that he would like me to teach. After about a week of prodding him he finally said he would love for me to do a spiral review on area and perimeter, multiplication, division, addition, and fractions all in the same unit somehow. This task was initially very overwhelming to try to cover so many topics in one unit- without having seen how these topics had been taught the first time. When I began to determine how I was going to do this I chose the focus of my lessons to be on area and perimeter because you can use addition, multiplication, to find area and perimeter and you could easily tie fraction and division into your lessons. Now that I had a focus I had to determine how I was going to teach my unit on area and perimeter. When I was switching at mid-block into third grade some things that the last student teacher had said really began to stick out to me. She said that this class was incredibly artistic and that they had an unusual distaste for math. My early childhood background had well prepared me for this moment as a began to draw a webbing for the class of their interests and their needs, and spent the first days in this class observing the students. I spoke to the students about their favorite activities and projects they had done in class, I also asked the students about why they disliked math and what I would need to do to make math more engaging for them. Many of the children told me about a research project they had completed about animals, which was being turned into a classroom book while I was there, and about their trip to the Hogle Zoo the previous
semester. As for their suggestions for math they wanted to do more than sit on the rug is what they described to me, and they wanted opportunities to draw out their thinking. I took these students interest in animals and zoos and created a project-based learning unit that met their needs and their interests. The students were going to design their own zoos.

I reviewed the students’ unit tests on area and perimeter, multiplication, division, and fractions and then decided that I would structure my unit by using a refreshers lesson on each topic while the students began working on their zoo projects. I would start with an inquiry-based lesson where the students would be looking at area and perimeter. The next day I would introduce the project and requirements, and release them to get started. The next day I would review some strategies for finding the area and perimeter. Then I would give the students several days to work on their zoo projects. I would then do a review lesson on division and fractions. I would make some small tweaks to their zoo projects then give the students several days to finish their zoos.
Lesson 1 - Area and Perimeter and Introduction to the Spiral Review Unit

<table>
<thead>
<tr>
<th>Title: Area and Perimeter</th>
<th>Time: 1 Hour</th>
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</thead>
<tbody>
<tr>
<td>Grade: 3rd</td>
<td>Date: 3/16/2018</td>
</tr>
<tr>
<td>Subject: Math</td>
<td>Topic: Review of Area and Perimeter</td>
</tr>
</tbody>
</table>

**Language Skill:** Speaking and Listening Standard 1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

**Utah Core Math Standards:**
- **Standard 3.MD.6** - Measure area by counting unit squares (square centimeters, square meters, square inches, square feet, and improvised units).
- **Standard 3.MD.7** - Relate area to the operations of multiplication and addition (refer to 3.OA.5).

**Objective:** The students will be able to explain the relationship between area and perimeter.

**Learning Targets:**
- Academic: I can examine how area, perimeter, and multiplication are related.
- Behavioral: I can follow our norms while actively working in small groups.

**Materials:** Smartboard, whiteboards, whiteboard markers, pre-cut rectangles with an area of 12, ziploc baggies

**Content Vocabulary:** area, perimeter, rows, columns, units, square units, factors

**Academic Language:** examine, related, actively

**Rationale for Instructional Methods:** In this lesson, I will be using a structured inquiry approach. The reason I have chosen inquiry is because I wanted to see what the kids already knew about perimeter and area and what their misconceptions were, without asking them. I am new to this classroom and to review this many topics is a large request especially when I haven’t seen any of the previous teachings. Inquiry allows the children to spend most of the time talking and developing their definitions for these academic terms. Which will help me see how much time I need to spend reviewing these topics, or if I can take their understanding deeper. I have specifically chosen structured inquiry because I wanted to be able to guide the conversation to area and perimeter, but I wanted the children to be able to provide evidence from their previous lessons that supported the discoveries we were making.

Since this was the first lesson I am ever teaching in this classroom I chose to start the lesson off by splitting into small groups so the children would feel comfortable discussing and I could listen to the students in an environment they felt safe in before I had them share their ideas in front of the whole class.
**Accommodations**: For this lesson, I did not make many accommodations besides some universal accommodations such as allowing for wait time because the children were mostly working in heterogeneous groupings or in a whole group setting. So I just monitored that lower achieving students were being listened to and participating in their groups. To meet the needs of my students with academic IEP’s I will make sure that on some of the Partner think, pair, shares I partner with those lower students and I am able to listen to their thinking, and share with them.

**Technology Integration**: We will be using the smart board in this lesson. The reason I have selected to use the smart board is so that the children can manipulate the rectangles and draw on them to help them reinforce the explanations they are developing about area and perimeter.

**Engage (10 minutes)**: In every lesson, the children will start by listening to the learning targets being read by the teacher, then a volunteer will read the learning targets, then as a class, we will all chorally read the learning targets. I will then ask the children to identify what the keywords are in the learning target and we will define/demonstrate those words. Then we will have some children describe what the learning target means in their own words. For our learning targets in this lesson, we will be looking at the words examine, related, and actively.

I will have the class come together at the rug and then split into 8 groups of 3. I will give each of the children a bag with three rectangles inside of it that all have the same area but different perimeters, then I will pose the question “How are these rectangles similar and different?”

While the students will split off into their small groups to determine how the rectangles are similar or different the teachers will float throughout the classroom monitoring behavior and posing extension questions.
- Can you think deeper about how these rectangles are similar and different?
- How did you figure out what the area was?
- How did you figure out what the perimeter was?
- How is it possible that all these rectangles have the same area but are shaped differently?

**Explore (40 minutes)**: I will have the children return to the rug for a discussion. On the whiteboard, we will make a chart of how the rectangles are similar and how they are different. On the Smartboard, I will have the three rectangles available so if the children want to be able to more clearly show what they are trying to say they can show the class on the smart board. I will guide the conversation to lean towards area and perimeter. The goal is that the children will discover that the rectangles have the same area but different perimeters.

Once this is discovered I will pose the following questions and have the children pair and share, and draw their ideas on the smart board.

“What is area?”
“What is perimeter?”
“How many rectangles are possible with an area of 12?”
“Which rectangle has the biggest perimeter? Why?”
“Which rectangle has the smallest perimeter/ Why?”
“Could you have a rectangle with the same area and perimeter?”

After the discussion, I will write the number 12 on the board. I will have the children help me
write all the factors of $12$ under the number. Then I will pose the question “what do you notice about the factors of $12$ and our rectangles?” We will have a discussion that one way to find the area is to multiply the length by the width, and we can determine how many different rectangles we can make by using the factors of the area.

“What are factors” “
How are factors connected to the number of rows (up and down) and numbers of columns?”

<table>
<thead>
<tr>
<th>Apply (10 Minutes):</th>
<th>I will have the children go back to their desks and pull out their whiteboards and dry erase markers. I will have the children show me the answers to the following questions on their whiteboards to check for understanding.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>List the factors for $24$.</td>
</tr>
<tr>
<td></td>
<td>How many rectangles could I make with an area of $24$ square units?</td>
</tr>
<tr>
<td></td>
<td>Draw the rectangles</td>
</tr>
<tr>
<td></td>
<td>Draw a rectangle with an area of $10$ square units</td>
</tr>
<tr>
<td></td>
<td>What is the perimeter</td>
</tr>
<tr>
<td></td>
<td>Draw a RECTANGLE with an area of $7$ square units</td>
</tr>
<tr>
<td></td>
<td>-Why is there only one way to draw this rectangle?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assess:</th>
<th>My pre-assessment was looking through the students unit test of area and perimeter. This helped me understand what skills the teachers wanted the children to be able to accomplish, identify what some of the largest misconceptions were, and gain a general idea of where all the students were on their understanding.</th>
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<tbody>
<tr>
<td></td>
<td>Throughout the lesson, I will be moving through the classroom and checking students’ work in their groups, during the discussion, on their whiteboards.</td>
</tr>
<tr>
<td></td>
<td>I will be checking understanding more deeply in my next lesson where the students will have to apply their understanding of area and perimeter to be able to design a zoo.</td>
</tr>
</tbody>
</table>

**Attached Materials:** Cut out rectangles and put into individual baggies
<table>
<thead>
<tr>
<th>Lesson 2- Introduction to the Zoo Project and Planning Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Designing a Zoo Part 1</td>
</tr>
<tr>
<td><strong>Grade:</strong> 3rd</td>
</tr>
<tr>
<td><strong>Subject:</strong> Math and Art</td>
</tr>
<tr>
<td><strong>Language Skill:</strong> Speaking and Listening Standard 6 - Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification</td>
</tr>
<tr>
<td><strong>Utah Core Math Standards:</strong> Standard 3.NBT.3 - Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (for example, 9 x 80 and 5 x 60) using strategies based on place value and properties of operations.</td>
</tr>
<tr>
<td><strong>Utah Core Fine Arts Standards:</strong> Standard 3.V.CR.4- Individually or collaboratively construct representations, diagrams, or maps of places that are part of everyday life</td>
</tr>
<tr>
<td><strong>Objective:</strong> The students will be able to apply their understanding of multiplication create a zoo planning form</td>
</tr>
<tr>
<td><strong>Learning Targets:</strong> Academic: I can apply my understanding of area and perimeter to my zoo project Behavioral: I can follow work individually on my zoo project while making other successful.</td>
</tr>
<tr>
<td><strong>Materials:</strong> Zoo packets, extra graph paper, whiteboard, white board markers, pencils, red pencils, calculators</td>
</tr>
<tr>
<td><strong>Content Vocabulary:</strong> blueprint, contractor, exhibit, proposal, special considerations, habitats, area, perimeter, rows, columns, units, square units, factors</td>
</tr>
</tbody>
</table>
Academic Language: apply, understanding, individually, successful

Rationale for Instructional Methods: For the next 5 days the children will be using their math time to design their rough draft of their zoo project. I chose to use a project approach to this unit because this allows me to constantly monitor student progress because the student will be engaged with their individual projects. This means that I can help lower achieving students, and give tier 2 instruction to those students. Project-based learning will also help me get to know these new students because each of their zoos will be different and have touches of their own personality. This project approach also allows for a lot of formative assessment throughout so I can identify those students that might not be lower achieving but are struggling with these concepts.

In this stage of the unit I will also be using a gradual release of responsibility the students will watch me model how to solve the problem, we will together practice how to solve a few specific problems, and then I will release them to work individually, but there will be checkpoints where the students will need to get their work checked off before moving on. This helps ensure me that all students are moving at an appropriate pace and are completing the crucial planning steps of this project correctly.

For the individual work portion of the lesson I will pull all of the students on IEPs to work with the level three student teacher to receive more direct instruction of the strategies and to keep them engaged and on task.

Accommodations: For the individual work portion of the lesson I will pull all of the students on IEPs to work with the level three student teacher to receive more direct instruction of the strategies and to keep them engaged and on task.

I do (30): In every lesson, the children will start by listening to the learning targets being read by the teacher, then a volunteer will read the learning targets, then as a class we will all chorally read the learning targets. I will then ask the children to identify what the keywords are in the learning target and we will define/demonstrate those words. Then we will have some children describe what the learning target means in their own words. For our learning targets in this lesson we will be looking at the words apply, understanding, individually, and successful.

I will have the class come together at the rug we will go over the learning targets and address the academic language in the learning targets. After this, I am going to introduce the zoo project. “I am very excited to tell you what we are going to start working on today. You all are going to be designing your very own zoo. You will have to use what you know about area, perimeter, factors, and multiplication in order to create your zoo. I am going to be the contractor for your zoo. A contractor is a person who approves designs of buildings and makes sure that they are okay to build. As your contractor, I am going to be checking your math, and making sure that your zoo design meets all of the requirements. Let’s take a look at the requirements for your zoo.”

On the board behind me, the following will be written.
“My Zoo must have…
At least 10 animal exhibits
At least two animals in each exhibit
An elephant exhibit, chimpanzee exhibit, a hippo exhibit, and a lion exhibit
30 foot wide walkways
At least two bonus areas

“I will leave this up on the board while you are working on your zoo project so you can check and make sure that you have everything you are supposedly in your zoo. For your zoo project, everything you need will be in your Zoo Packet. This is what the Zoo Packet looks like. On the cover, you will see you have a checklist of things you need to complete. Use this checklist to make sure you are staying track. We I release you to work on you zoo today I am going to have you begin by working on your Zoo planning form. This is what your zoo planning form looks like. You will see that you need to write down the animal you want to add to your zoo, how many of that animal you would like to add to your exhibit, the square footage needed - which mean the area needed, and any special considerations that animal might need.”

“I am going to show how to fill out the planning form. The first thing I am going to do is look at the animal list to see what my options are for animals I can put in my zoo. The first thing I am going to do is circle the four animals I know I am required to have in my zoo. Could someone raise their hand and tell me what animals I have to include in my zoo are? Right and if I forget what those animals are where could I look? Yes, they are on the board. Right okay now I have circled the 4 animals I have to have in my zoo. Now, how many more animals do I have to put into my zoo? That is right I have to have at least six more because the requirements say I have to have at least ten. Could I put more than ten? Yes, that is right I can have more but I have to have at least 10. For now, I am just going to circle 6 more. If you would like to have more than 10 exhibits you need to make sure that you have met all the requirements and that your zoo planning form is completely filled out before adding your eleventh animal. Please raise your hand and get approval to add more animals before you add more to your list.”

“If you would like to add an animal to your zoo that is not on the list you may but you will need to make a proposal to the contractor, that’s me. A proposal is when you ask if you can do something. Before you make a proposal you need to know what you are going to say. In your proposal for a new animal, you must tell that you would like to make a proposal to add an animal. You must tell the name of the animal, and how many square feet you are going to need for one of that animal and where you got that number, and what special considerations you are going to need for that animal. For example, if I wanted to make a proposal to add penguins I would raise my hand and wait to be helped by a contractor. I would then say ‘I would like to make a proposal to add penguins to my zoo. I think that one penguin would take up 1000 square feet, which is the same amount of space as an owl because they are about the same size. For my special considerations, I would want to Make sure that there is water for the penguins to swim in and that the exhibit is kept cold so it is similar to their habitat.”

“There I have circled the ten animals I want in my zoo. Now I need to put them on my zoo planning form. Before we do that turn to your partner and share one animal that you would like to put into your zoo. Alright come back together in 10...9.. (countdown to zero) My first animal is going to be the elephants. I am going to write elephant under the animal section on my zoo planning form. Now I am going to write how many I want to have in my exhibit. What is an exhibit? Someone think back to your field experience at the Hogle Zoo and tell me what an exhibit is. That's right! An exhibit is one enclosed space that the animals live in. So at the Hogle zoo, they have a tiger exhibit and it is surrounded by netting to keep the tiger in and not let any other animals into the tiger's space. Some exhibits might have glass around them, while others might just have a fence. Those are things you might want to put into your special considerations. Anyway now I need to write in how many I want. I want to have two so I am going to fill that in. Now I need to figure how much space I am going to need for two
elephants. I know that I need 2000 square feet for one elephant or I am going to need 4000 square feet for 2 elephants because 2000 plus 2000 is 4000 or 2000 times 2 is 4000. My special considerations for this animal is that it needs to stay far away from the lions and tigers so it doesn’t get stressed. There now my elephants are all planned onto my zoo. Now I can move on to the next animal.”

**We do (30 minutes):** Can you all help me fill in for my zoo planning form for the chimpanzees. Okay, what should I put in the first box? That is right the animal name. What is the animal name? A chimpanzee that is right. Okay, we have written the animal name now what should I put into the second box. That is right how many I want to have. How many chimpanzees should I have? Remember we need to be conscious, or be thinking about how much space we take up because we have a lot of exhibits we still need to plan for. So how many should I have? (child suggests reasonable number) Great okay, so we have four. What do we need to put into the next box? That’s right the square feet we need. What does the square footage mean? That is right in the area or how many squares we are going to need on your graph paper. COuld someone volunteer to tell me how much space one chimpanzee takes up? That is right 1,500 square feet. How will we know how much space four chimpanzees take up? True we could add 1500 plus 1500 plus 1500 plus 1500. What else could we do? 1500 multiplied by 4. This is a great time for me to teach you a trick to help you on this project. Let’ try to multiply 1500 by 4 using the way we know. Alright, what is 4 times 0. (continue with this process showing the third graders how tedious it would be to do all of your calculations like that.) Okay, I am going to show you a trick to make your multiplying easier. First, we are going to take the zeros off of 1500, and we are going to put them over here so we remember them later. Now we are going to do our multiplication but now we have 15 multiplied by 4. Which is sixty? Now we need to put our two zeros back on the end. Which gives us 6000 square ft. Alright, now we put the square footage in our planning form. What goes in the last box? That’s right the habitat description and special considerations. What special considerations do you think I will need for my chimpanzees. Trees good idea, hammocks cool! Does anyone remember what the chimpanzee's exhibit looked like at the Hogle Zoo? Awesome so we could add some of those things.

Alright, let’s try adding one more animal together. Let’s do the hippos. Alright, class, you walk me through what I need to do. What is the first step? I need to write the animal name in the first box. Okay hippos, check. Now what. I need to decide how many I want to have. Okay, I think I would like to have 10, do you think that is a good number? You don’t think it is because hippos are big and that would take up a lot of space. Good thinking, how many should I have? Two sounds good. Okay, so I have written two. Now what? I need to figure out how much space they need. Okay, how do I do that? I need to look at the animal list okay it says here that hippos need 2000 square feet. Okay, so I just write down 2000 square feet. I don’t? What do I need to do? I need to multiply 2000 by 2? Why? Okay, I understand. This math looks difficult, what could I do to make it easier. Have a student demonstration on the board removing the zeros trick. Awesome. So now we know we need 4000 square feet for the hippos. What do I put into the last box? Awesome. You all know how to fill out your zoo planning form. Let's get to work.”

Review the behavioral learning target again, as well as the steps of today's zoo work. Release the students to their desks.

**You do (30 Minutes):** The children will work individually at a level 0 at their desks on their zoo planning forms. Children that need help will be pulled to work with the level 3 teacher.
Walk around to monitor student progress, approve proposals, and answer questions.

**Work on the zoo planning forms may roll over to the next day or few days. I will be using my judgment to determine when I can give instructions on how to begin the blueprint section of this project**

**Assess:** My pre-assessment for this lesson was the lesson I taught about area and perimeter last week. I will be pulling students I believe will need help based off of my formative whiteboard assessment.

Throughout the individual work time, I will be moving through the classroom and checking students’ work.

I will be checking students’ zoo planning forms a form of assessment to see who may need to be pulled for the next day, and who may need help meeting the objectives for this lesson.

**Attached Materials:** Zoo Packet
**Used with permission of the creator Sarah**

This is the order I decided to print my packets in, which is different than how Sarah designed.
Math Project: Design Your Own Zoo

Due __________

You have been chosen as a member of a design team to create plans for a new zoo in your town. Use the checklist and guidelines to design your zoo.

Design a Zoo Checklist

☐ 1. Choose at least 10 animals to include in your zoo.
☐ 2. Research the animals to learn specific habitat requirements.
☐ 3. Use the provided charts to determine the amount of square footage required.
☐ 4. Complete the “Zoo Planning Sheet.”
☐ 5. Use grid paper to draw a blueprint of the animal exhibits.
☐ 6. Add at least 2 “Extras.”
☐ 7. Label all Exhibits and Extras.
☐ 8. Write the title on your blueprint.
☐ 9. Complete the “Area and Perimeter” sheet.

Design a Zoo

Requirements and Notes

• You must include at least 10 different types of animals, and you may include more.
• You must include at least two of each animal, but you may use as many as you like. (For example, if you choose giraffe as one of your animals, you must have at least two giraffes.)
• When planning your zoo, be sure to include a path that is at least 30 feet wide between all exhibits. Hint: If each square is 100 square feet, then each side of the square is 10 feet.

Here are some logistics to consider. (Hint--You may need to do additional research!)

• Some animals should not be in the same vicinity as others. Just because they are in the same family does not mean they can be housed together.
• Some animals will need particular items in their habitat such as a body of water or trees.
• Some animals will need a controlled climate (very cold, hot, or wet).
• Some animals will need cages or aquariums, while others will need large open spaces.

*Please note, the area suggestions are just numbers for your project purposes only. Animals in the wild or in a carefully designed realistic zoo habitat would require a much larger space in most cases!
Tips Drawing your Zoo Blueprint

1. Use your “Zoo Planning Sheet” as a guide.
2. Remember that the “Square Footage Required” is a minimum, and your area may be larger.
3. Be sure to leave space for pathways. They should be 30 feet or 3 squares wide.
4. You must also choose at least 2 “bonus” non-animal areas to your zoo. Your patrons would appreciate a restroom 😊.
5. Label each area and exhibit or use a key.

<table>
<thead>
<tr>
<th>Bonus Areas</th>
<th>Area (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>restroom</td>
<td>800</td>
</tr>
<tr>
<td>kiddie splash pad</td>
<td>500</td>
</tr>
<tr>
<td>auditorium</td>
<td>2,500</td>
</tr>
<tr>
<td>concession stand</td>
<td>1,000</td>
</tr>
<tr>
<td>gift shop</td>
<td>1,000</td>
</tr>
<tr>
<td>playground</td>
<td>1,000</td>
</tr>
<tr>
<td>zoo equipment room</td>
<td>500</td>
</tr>
</tbody>
</table>

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Math Project: Design Your Own Zoo

Use the following list of animals to help plan your zoo. The square footage is per individual animal. For instance, if one zebra requires 2,000 square feet, then two zebras would require 4,000. You may also use animals that are not on this list. Just make a reasonable estimate for the area required.

<table>
<thead>
<tr>
<th>Mammals</th>
<th>Area (sq. ft.)</th>
<th>Birds</th>
<th>Area (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>zebra</td>
<td>2,000</td>
<td>peacock</td>
<td>1,000</td>
</tr>
<tr>
<td>elephant</td>
<td>2,000</td>
<td>ostrich</td>
<td>2,000</td>
</tr>
<tr>
<td>giraffe</td>
<td>2,000</td>
<td>owl</td>
<td>1,000</td>
</tr>
<tr>
<td>hippo</td>
<td>2,000</td>
<td>toucan</td>
<td>1,000</td>
</tr>
<tr>
<td>rhinoceros</td>
<td>2,000</td>
<td>stork</td>
<td>1,000</td>
</tr>
<tr>
<td>anteater</td>
<td>1,500</td>
<td>emu</td>
<td>2,000</td>
</tr>
<tr>
<td>kangaroo</td>
<td>1,500</td>
<td>flamingo</td>
<td>1,000</td>
</tr>
<tr>
<td>camel</td>
<td>1,500</td>
<td>macaw</td>
<td>1,000</td>
</tr>
<tr>
<td>llama</td>
<td>1,000</td>
<td>eagle</td>
<td>2,000</td>
</tr>
<tr>
<td>hyena</td>
<td>1,000</td>
<td>vulture</td>
<td>1,500</td>
</tr>
<tr>
<td>warthog</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sloth</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>koala</td>
<td>500</td>
<td>alligator</td>
<td>1,000</td>
</tr>
<tr>
<td>red panda</td>
<td>1,000</td>
<td>Galapagos tortoise</td>
<td>1,000</td>
</tr>
<tr>
<td>porcupine</td>
<td>500</td>
<td>alligator snapping turtle</td>
<td>500</td>
</tr>
<tr>
<td>bats</td>
<td>2,000</td>
<td>crocodile</td>
<td>1,000</td>
</tr>
<tr>
<td>chimpanzee</td>
<td>1,500</td>
<td>anaconda</td>
<td>500</td>
</tr>
<tr>
<td>orangutan</td>
<td>1,000</td>
<td>boa</td>
<td>500</td>
</tr>
<tr>
<td>gorilla</td>
<td>2,000</td>
<td>Gila Monster</td>
<td>200</td>
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<tr>
<td>lemur</td>
<td>1,000</td>
<td>Green Iguana</td>
<td>200</td>
</tr>
<tr>
<td>lion</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tiger</td>
<td>2,000</td>
<td>Animal</td>
<td>Area (sq. ft.)</td>
</tr>
<tr>
<td>leopard</td>
<td>2,500</td>
<td>poison dart frog</td>
<td>100</td>
</tr>
<tr>
<td>cheetah</td>
<td>2,500</td>
<td>bullfrog</td>
<td>100</td>
</tr>
<tr>
<td>panther</td>
<td>2,500</td>
<td>toad</td>
<td>100</td>
</tr>
<tr>
<td>black bear</td>
<td>1,500</td>
<td>fire-bellied newt</td>
<td>100</td>
</tr>
<tr>
<td>panda bear</td>
<td>1,500</td>
<td>salamander</td>
<td>100</td>
</tr>
</tbody>
</table>
Use this chart to plan what animals to include in your zoo. Use the back of this page if necessary. You must include at least 10 different animal and two of each animal that you choose. For the “Special Habitat Considerations” column, consider things that this animal would need to make a realistic habitat. For instance, a snapping turtle needs a pond, and you probably want to put your snakes in a glass enclosure that they can’t escape from. Giraffes will require acacia trees, and koalas need eucalyptus trees. You will need to research your animals to make their habitats as realistic as possible.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Quantity</th>
<th>Sq. Footage Needed</th>
<th>Special Habitat Considerations</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Use this chart after you draw your blueprint to record the area and perimeter of each exhibit. The type of animal is the exhibit, so you may have a giraffe exhibit. Be sure to name your exhibit. For example: “Playful Penguins” or “Wild and Crazy Gorillas.” Also include your “Extras” here such as restrooms, concession stands, etc...

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Area</th>
<th>Perimeter</th>
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# Lesson plan 3- Determining Area and Perimeter and Drawing Blueprint

<table>
<thead>
<tr>
<th><strong>Title:</strong> Designing a Zoo Part 2</th>
<th><strong>Time:</strong> 1 hour lesson (3+ hours for project development)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade:</strong> 3rd</td>
<td><strong>Date:</strong> 3/20/2018</td>
</tr>
<tr>
<td><strong>Subject:</strong> Math and Art</td>
<td><strong>Topic:</strong> Area and Perimeter/ Rough Draft Stage</td>
</tr>
</tbody>
</table>

**Language Skill:** Speaking and Listening Standard 6 - Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**Utah Core Math Standards:**
- **Standard 3.MD.6** - Measure area by counting unit squares (square centimeters, square meters, square inches, square feet, and improvised units).

  and

- **Standard 3.MD.7** - Relate area to the operations of multiplication and addition (refer to 3.OA.5).

**Utah Core Fine Arts Standards:**
- **Standard 3.V.CR.4** - Individually or collaboratively construct representations, diagrams, or maps of places that are part of everyday life.

**Objective:** The students will be able to apply their understanding of area and perimeter to create a zoo blueprint.

**Learning Targets: Academic:** I can apply my understanding of area and perimeter to my zoo project.

**Behavioral:** I can follow work individually on my zoo project while making other successful.

**Materials:** Zoo packets, extra graph paper, whiteboard, white board markers, pencils, red pencils, calculators

**Content Vocabulary:** blueprint, contractor, exhibit, proposal, special considerations, habitats, model, scale, area, perimeter, rows, columns, units, square units, factors

**Academic Language:** apply, understanding, individually, successful

**Rationale for Instructional Methods:** For the next 5 days the children will be using their math time to design their rough draft of their zoo project. I chose to use a project approach to this unit because this allows me to constantly monitor student progress because the student will be engaged with their individual projects. This means that I can help lower achieving students, and give tier 2 instruction to those students. Project-based learning will also help me get to know these new students because each of their zoos will be different and have touches of their own personality. This project approach also allows for a lot of formative assessment throughout so I can identify those students that might not be lower achieving but are struggling with these concepts.

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**Accommodations:** For the individual work portion of the lesson I will pull all of the students on IEPs to work with the level three student teacher to receive more direct instruction of the strategies and to keep them engaged and on task. I will also pull students that are getting behind to work with the lead teacher so they can finish their zoo planning form and catch up on drawing their blueprints.

**I Do (30 minutes):** In every lesson, the children will start by listening to the learning targets being read by the teacher, then a volunteer will read the learning targets, then as a class we will all chorally read the learning targets. I will then ask the children to identify what the keywords are in the learning target and we will define/demonstrate those words. Then we will have some children describe what the learning target means in their own words. For our learning targets in this lesson we will be looking at the words apply, understanding, individually, and successful.

I will have the class come together at the rug we will go over the learning targets and address the academic language in the learning targets. Yesterday/ the last few days we have been working on our zoo planning forms. Today I am going to show you how to draw your blueprint—which is the rough draft drawing of your zoo. Before we get started on that. Let’s take a look again at the requirements for your zoo.”

On the board behind me, the following will be written.

"My Zoo must have…
1. At least 10 animal exhibits
2. At least two animals in each exhibit
3. An elephant exhibit, chimpanzee exhibit, a hippo exhibit, and a lion exhibit
4. 30 foot wide walkways
5. At least two bonus areas

How is your zoo doing so far in meeting the requirements? (fist to five- 5 great I remembered to do all of those things. Fist I might need to make some changes so I am meeting the requirements)

“I will continue to leave this up on the board while you are working on your zoo project so you can check and make sure that you have everything you are supposedly in your zoo. Today we are going to starting our blueprint. Can someone raise their hand and tell me what a blueprint is? Awesome is a rough draft of a drawing which normally has measurements on it. Let’s take a look at your zoo packet. The first page of graph paper is for your blueprint. Could someone raise their hand and tell me which page of graph paper your blueprint goes on? Correct the first page. This one side of the page is ALL the space you have to draw your zoo because that is all the land I have available for you to build your zoo on. However your blueprint drawing is like a model, it will represent what your zoo should look like when it is built. However, when we build your zoo it will be a LOT bigger than your piece of paper, but it would be really hard to make a model drawing that is the size of an actual zoo. We would need a HUGE piece of paper. So we are going to use a scale, a scale tells you how a models size compares to a real creation for something. In our case, one square on our graph paper represents 100 square feet. Draw a square on the whiteboard and write 100 square feet inside of it. What is the area
of this square? 100 square feet. That’s right. So how would we figure out what the length of the sides are? We know that the area is found by multiplying the length by the width and in our case we know the area is 100. We also know that since this is a square the sides are the same length. Meaning some number multiplied by itself equals 100. (write the equation on the board __ x __ =100) That is right! ten multiplied by ten equals 100. So what is the length of one side of the squares? Ten! That is correct. I will leave this drawing up so you can look at while you are making you zoo blueprint. What we need to remember is that each square has an area of 100, and each side of a square has a length of 10.”

“Alright, so I have my zoo planning form that you helped me start. Mine is not finished so I shouldn’t start drawing but I am going to so you all can see how to do your blueprint. I am first going to draw my elephant exhibit. We know by looking at our planning form that we need 4000 square feet. We also know that each square is 100 square feet. I am going to teach you a few tricks so you can get the area right on your blueprint. The first way would be to use your calculator and divide 4000 by 100 which equals 40. 40 is how many boxes we need, On my planning form under the square footage, I am going to write 40 so that I can remember how many squares I need. Another way to figure out how many boxes you need is by looking at your square footage and removing two zeros. So, for example, my elephants need 4000 square feet if I take off two zeros that would give me 40. Again I would write how many boxes you need under your square footage on your planning form so you can remember.”

“Now I am going to draw. I know I need to have a rectangle that has 40 boxes inside. To figure how I can draw a rectangle with an area of 40 boxes I am going to look at the factors of 40. I am going to make a list of all the factors of 40. (make a list on the board) Now I can choose a set of factors that I think will fit best into my blueprint. I am going to pick eight by five. I am going to over eight boxes and down five. Now to double check my work I am going to label all the boxes from 1-40.”

“To review first I used one of the strategies to figure out how many boxes I needed. Then I found the factors of that number. Next, I picked how I wanted to draw my rectangle. Finally, I double checked my work by labeling the boxes.”

We do (30 minutes): “Let’s try to draw some together. Alright, my next animal is a chimpanzee. First I need to figure out how many boxes I need. How would I figure that out? Yes that’s right I am going to look at the square footage I have on my planning form and divide by 100 or just take off two zeros. So my square footage says 6000. How many boxes do I need? Yes, 60! Now, Where should I write that number down? That's right under my square footage on planning form. Now how do I know the ways I could draw a rectangle that has 60 boxes in it? Yes, I need to list out the factors. What are the factors of 60? (Make a list on the board) Awesome which I am going to use 5 and 12. Could someone come up and draw me a rectangle that has one side of 5 units and along the side of 12 units. Great, what is the last thing I need to do? Yes, I need to label my boxes so I know I have the right amount.”

“Let's try one more altogether. Now I have to draw my hippo exhibit. What do I do first? Right, I need to figure out how many boxes. How do I do that? Yes, I can divide by 100 or take off two zeros. My square footage for my hippos is 4000. So how many boxes do I need? 40 That’s right. Am I just going to remember that number? No? What should I do with it? Okay, I will write it down let me find a random piece of paper. No? Where should I write it? Okay, I will write it under the square footage.Okay now what. Now I need to make a list of the factors of forty. Luckily I have already made one, I think I am going to do a 1 unit by 40 unit rectangle, does that sound okay? No why not. Okay so that won’t fit on my paper what could I do if I
want a long skinny exhibit? I could do a 2 unit by 20 unit rectangle or a 4 unit by 10 unit. I think I will try the 4 by 10 unit. Could someone draw that for me? Awesome. Now I am finished. No? I have to double check my work. Okay, I'll label the boxes. Alright, you are ready to start your blueprints."

Review the behavioral learning target again, as well as the steps of today's zoo work. Release the students to their desks.

**You do (30 Minutes):** The children will work individually at a level 0 at their desks on their zoo blueprints. Children that need help will be pulled to work with the level 3 teacher. Walk around to monitor student progress, approve proposals, and answer questions.

**Work on the zoo blueprints may roll over to the next day or few days. I will be using my judgment to determine when I can give instructions on how to begin the blueprint section of this project**

**Assess:** My pre-assessment for this lesson was the lesson I taught about area and perimeter last week. I will be pulling students I believe will need help based off of my formative whiteboard assessment.

Throughout the individual work time, I will be moving through the classroom and checking students’ work.

I will be checking students’ zoo blueprints for accuracy as a form of assessment to see who may need to be pulled for the next day, and who may need help meeting the objectives for this lesson.

Lesson Plan 4- Area and Perimeter and Final Drafts

<table>
<thead>
<tr>
<th>Title: Designing a Zoo Part 3</th>
<th>Time: 1 hour lesson (3+ hours for project development)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade: 3rd</td>
<td>Date: 3/22/2018</td>
</tr>
<tr>
<td>Subject: Math and Art</td>
<td>Topic: Area and Perimeter/ Rough Draft Stage</td>
</tr>
</tbody>
</table>

**Language Skill:** Speaking and Listening Standard 6 -Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification

**Utah Core Math Standards:** Standard 3.MD.6 -Measure area by counting unit squares (square centimeters, square meters, square inches, square feet, and improvised units).

and

Standard 3.MD.7 -Relate area to the operations of multiplication and addition (refer to 3.OA.5).
Utah Core Fine Arts Standards: Standard 3.V.CR.4- Individually or collaboratively construct representations, diagrams, or maps of places that are part of everyday life

**Objective:** The students will be able to apply their understanding of area and perimeter to create a zoo blueprint

**Learning Targets:**
- **Academic:** I can apply my understanding of area and perimeter to my zoo project
- **Behavioral:** I can follow work individually on my zoo project while making other successful.

**Materials:** Zoo packets, extra graph paper, whiteboard, white board markers, pencils, red pencils, calculators

**Content Vocabulary:** blueprint, contractor, exhibit, proposal, special considerations, habitats, model, scale, area, perimeter, rows, columns, units, square units, factors

**Academic Language:** apply, understanding, individually, successful

**Rationale for Instructional Methods:** For the next 5 days the children will be using their math time to design their rough draft of their zoo project. I chose to use a project approach to this unit because this allows me to constantly monitor student progress because the student will be engaged with their individual projects. This means that I can help lower achieving students, and give tier 2 instruction to those students. Project-based learning will also help me get to know these new students because each of their zoos will be different and have touches of their own personality. This project approach also allows for a lot of formative assessment throughout so I can identify those students that might not be lower achieving but are struggling with these concepts.

In this stage of the unit I will also be using a gradual release of responsibility the students will watch me model how to solve the problem, we will together practice how to solve a few specific problems, and then I will release them to work individually, but there will be checkpoints where the students will need to get their work checked off before moving on. This helps ensure me that all students are moving at an appropriate pace and are completing the crucial planning steps of this project correctly.

**Accommodations:** For the individual work portion of the lesson I will pull all of the students on IEPs to work with the level three student teacher to receive more direct instruction of the strategies and to keep them engaged and on task. I will also pull students that are getting...
behind to work with the lead teacher so they can finish their zoo planning form and catch up on drawing their blueprints.

I Do (30 minutes): In every lesson, the children will start by listening to the learning targets being read by the teacher, then a volunteer will read the learning targets, then as a class we will all chorally read the learning targets. I will then ask the children to identify what the keywords are in the learning target and we will define/demonstrate those words. Then we will have some children describe what the learning target means in their own words. For our learning targets in this lesson we will be looking at the words apply, understanding, individually, and successful.

I will have the class come together at the rug we will go over the learning targets and address the academic language in the learning targets. Yesterday/ the last few days we have been working on our zoo blueprints. Today we are going to fill out the Area and Perimeter form. Before we get started on that. Let’s take a look again at the requirements for your zoo.”

On the board behind me, the following will be written.

<table>
<thead>
<tr>
<th>My Zoo must have…</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 10 animal exhibits</td>
</tr>
<tr>
<td>At least two animals in each exhibit</td>
</tr>
<tr>
<td>An elephant exhibit, chimpanzee exhibit, a hippo exhibit, and a lion exhibit</td>
</tr>
<tr>
<td>30 foot wide walkways</td>
</tr>
<tr>
<td>At least two bonus areas</td>
</tr>
</tbody>
</table>

How is your zoo doing so far in meeting the requirements? (fist to five- 5 great I remembered to do all of those things. First I might need to make some changes so I am meeting the requirements)

“I will continue to leave this up on the board while you are working on your zoo project so you can check and make sure that you have everything you are supposedly in your zoo. Today we are going to start our Area and Perimeter form. Now that your blueprints are finished or almost finished it is time to complete our area and perimeter forms. For this form, you are going to be looking at your blueprint to determine the answers. This is the Area and perimeter form. You can see that the first box asks you for the name of the exhibit. This is where you can get creative and think of a fun name for the different spaces in your zoo. For example on my elephant exhibit, I might name it “Exploring Elephants” or “Funktastic”. I will fill in the name for the exhibit on in the first box. In the second box, It asks me for the area of the exhibit. What are some strategies we can use to find the area of a rectangle? Yes, we can count the boxes By looking at my blueprint I can see I have 40 boxes. So my area is 40 right? Yes, the answer is NOT 40 because each box is 100 square feet. So I can find my area by multiplying 40 by 100, or by counting the squares and then adding two zeros. What is another strategy I could use to find the area? Right, I could multiply the length times the width. My length is 8 and my width is 5. 8 multiplied by 5 is 40. Again I need to either multiply by 100 because each square is 100 square units or add two zeros. My area is 4000 square feet. Now I need to find the perimeter. What is a strategy to find the perimeter of a rectangle? One strategy is the count around where we count each line around the outside putting a slash through each line. What is another strategy? Yes, we could use the count and add strategy. This is where we will count one side write off the edge and do the same for the other sides and then add. There is one last strategy. Yes double the length, double the width and add. I will demonstrate what each of the strategies looks like and then you can choose your favorite to use on your area and perimeter form. (demonstrate the three strategies) So we can see the perimeter of my
elephant exhibit is 26 units. Is that correct? How long is one side length? That is correct it is 10 feet so we either need to add a zero, or multiply by ten to get the right answer. So my perimeter is actually 260 feet.”

We do (30 minutes): “Let’s try to find the area of my chimpanzee exhibit altogether. So my first step is to name my exhibit. Does anyone have a good name suggestion? Great, I will put that in the first box. Now I need to find the area. Some pick one of the strategies to find the area, we can either count the boxes or multiply the length by the width. Alright, we got 60. Now we know we either need to multiply by 100 or add two zeros. What would that give us? That is right 6000 so our area is 6000 square units. Now it asks for the perimeter, someone pick one of our three strategies to find the perimeter, count around, count and add, or double and add. Awesome! So we got 34, now what should we do? Either multiply by ten or add one zero. So our perimeter is 340 feet.”

“Let’s do my hippo exhibit altogether. What is the first step? Right, I need to name my exhibit. Does anyone have a good name for my hippos exhibit? Great, my exhibit is named. Now, what is the next step? Right, I need to calculate the area. Can someone name one of the strategies to find the area? Count the boxes. What is the other strategy? Length times the width. Perfect. of the strategies and find the area. You got 40. Is our area solved yet? Nope why not. That’s right because that would be the area if each box stood for one square foot but it doesn’t it is 100 square feet so we need to multiply by 100, or add two zeros. Which gives us 4000 square feet. Now we have found the area what is the next step? Correct we need to find the perimeter. Let’s list our strategies. 1. Count around 2. Count and add 3. Double and add. Pair share with a partner the steps of how to do one of those strategies. In your head use the strategy your partner described to you to find the perimeter. What did you get as the perimeter? How did you get that answer? (answers will vary) Awesome so our final perimeter is 240 feet. Alright you are ready to complete your area and perimeter forms”

Review the behavioral learning target again, as well as the steps of today’s zoo work. Release the students to their desks.

You do (30 Minutes): The children will work individually at a level 0 at their desks on their zoo Area and perimeter forms. Children that need help will be pulled to work with the level 3 teacher. Walk around to monitor student progress, approve proposals, and answer questions.

**Work on the area and perimeter forms may roll over to the next day or few days. I will be using my judgment to determine when I can give instructions on how to begin the blueprint section of this project**

Assess: My pre-assessment for this lesson was the lesson I taught about area and perimeter last week. I will be pulling students I believe will need help based off of my formative whiteboard assessment.

Throughout the individual work time, I will be moving through the classroom and checking students’ work.

I will be checking students’ area and perimeter forms for accuracy as a form of assessment to see who may need to be pulled for the next day, and who may need help meeting the objectives for this lesson.
Lesson Plan 5- Spiral Review of Division and Fractions

<table>
<thead>
<tr>
<th>Title: Fractions and Division</th>
<th>Time: 3 hours (1 ½ hour for instruction, 1 ½ hours for zoo application)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade: 3rd</td>
<td>Date: 3/23/2018</td>
</tr>
<tr>
<td>Subject: Math</td>
<td>Topic: Review of Fractions</td>
</tr>
</tbody>
</table>

**Language Skill:** Speaking and Listening Standard 1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

**Utah Core Math Standard:** 3.NF.1 - Understand that a unit fraction has a numerator of one and a non-zero denominator.

**Objective:** The students will be able to explain the parts of fractions and then apply their understanding to their zoo projects.

**Learning Targets:**
I can articulate the relationship between division and fractions.
I can follow our norms will participating appropriately in a math lesson.

**Materials:** Smart board, white boards, white board markers, zoo packets, pencils, tv/projector, exhibit changes form

**Vocabulary:** Numerator, denominator

**Accommodations:**
Tier 2 Students: During the apply section of the lesson I will have the tier two students work with the level 3 to get more explicit instruction and to keep them on task.

Gifted students: As the gifted students finish the application of the changes to their zoo projects I will have the gifted students continue working on the maps of their zoos, or whichever extension step they are on.

Technology Integration: I will be using the smartboard to teach the review of the core standard. The smart board allows the students to demonstrate their thinking in an interactive and engaging way. (Slides attached below)

**Technology Integration:** I will be using the smartboard to teach the review of the core standard. The smart board allows the students to demonstrate their thinking in an interactive and engaging way. (Slides attached below)

**Utah Core Educational Technology Standards: Standard 7** - Use telecommunications and online resources (e.g., email, online discussions, web environments) to participate in collaborative problem-solving activities to develop solutions or products for audiences inside and outside the classroom.
**Engage (5 minutes):** “What does it mean to have ½ of something”
I will ask the children to first think in their heads about this question and then picture having ½ of something and what that means. Then I will have them pair and share their ideas. “Who would like to share what ideas their partner had about ½?” I will take notes of keywords from student answers. I will be looking for the words: pieces, part, whole, equal, two, and one of. As a class, we will finalize our answer as to what it means to have ½ of something. I will write this on the board. I will excuse the students to their desks and have them pull out their whiteboards and markers.

**Explore (30 minutes):** Using our running class definition of ½ I will have the children work on their whiteboards and on the smart board to complete a series of tasks, adjusting our definition as needed.

Task 1: “Which shapes represents ½ .” I will choose a shape off the smart board and have the children write on their whiteboards whether the selected shape does or does not represent ½. I will have students share their reasoning as to why they selected yes or no. I will adjust the definition as needed.

Task 2: “Without counting, how can we tell how many pieces these wholes are split into?” I will guide the children into noticing that the number of pieces we have is the same as the bottom number of the fraction. “A fraction is made up of two parts a top number and a bottom number. The top is called the numerator and the bottom is called the denominator. The denominator or the bottom of the fraction tells us how many total pieces a whole is split into.” On their whiteboards/ on the smartboard I will have the children split a whole into fourths, sixths, and eighths. “How many lines did you have to draw to split that into sixths?”

Task 3: Think, pair, share- “We know that the denominator or the bottom of the fraction tells us how many TOTAL pieces we are splitting a whole into. So what does the number on the top of a fraction, or the numerator tell us? “ I will guide the children into understanding that the top number tells us how many of total pieces we have. I will have the children shade in the correct amounts of shapes as indicated by the numerator on their whiteboards/ smartboard. On each question, I will have a student identify which number is the numerator and which number is the denominator and what that means. I will then have the children erase their whiteboards and draw a line down the middle. I will have the children sort a list of fractions, by which have the same denominator and which ones have the same numerator.

**Apply (30 Minutes):** In today’s zoo time I will be showing the class some of the animals I have purchased for their zoo and explained that some problems have arose, for example, some animals are sick, some are fighting, and some are having a baby. The children will have to apply their understanding of fractions, and division to solve the problems.

“Okay you all have been working so hard on designing your zoo blueprints and they are looking fabulous. I also think you have a great understanding of area and perimeter. I am very impressed. I was so excited that I bought some of the animals for your zoo, would you like to see them?”

I will show the class a video of their elephant, who to my surprise just had a new baby meaning they are going to have to increase the size of their exhibit. I will also inform them that because there is a baby we are going to have to separate the mom and baby from the other elephants.
I will then show them a video of the hippos that are fighting. I will then explain that I accidentally bought all male hippos and they do not get along. So they are going to have to separate all of their hippos.

I will finally show them a video of a lion who is sick and has the stomach flu. And explain they we are going to have to separate all of the lions so that the others do not get sick.

We will go over the exhibit changes form with the class and release them to get to work on their exhibit changes and begin working on their new rough draft. Pass out the Exhibit Change Form and walk students through the process of filing this form out.

Assess: Throughout the lesson, I will be moving through the classroom and checking students’ work on their whiteboards. I will do a formative assessment on how the students are feeling about their capability to complete the changes to their zoos before releasing them to do work on it. Students will be required to have their division and fraction work checked by a contractor (a teacher) before they can move on to applying the changes to their zoo blueprint.

I will be using the given rubric to assess students zoo projects to see that they are proficient at the standards we have been covering.

Attached Materials- Zoo Change form, Smartboard slides (with childrens’ work on them)
What does it mean to have \( \frac{1}{2} \) of something?

Which represents \( \frac{1}{2} \)?
Look at the fractions below... how do I know how many pieces our whole is split into?

The bottom of the fraction is called the denominator, it tells us how many pieces to split our whole into.

Split this whole into fourths

Split this whole into sixths
We know the **bottom** or the **denominator** of a fraction tells us how many **TOTAL** pieces so what does the top tell us?

**Color in the number of shapes indicated by the fraction.**

\[
\begin{array}{cccc}
\frac{3}{6} & \frac{2}{3} & \frac{4}{7} & \frac{1}{4} \\
\begin{array}{cccc}
\text{□} & \text{□} & \text{□} & \text{□} \\
\text{□} & \text{□} & \text{□} & \text{□} \\
\end{array} & \\
\begin{array}{cc}
\text{□} & \text{□} \\
\text{□} & \text{□} \\
\end{array} & \\
\begin{array}{cc}
\text{□} & \text{□} \\
\text{□} & \text{□} \\
\end{array} & \\
\begin{array}{c}
\text{★} \\
\text{★} \\
\end{array} & \\
\begin{array}{c}
\text{★} \\
\text{★} \\
\end{array} & \\
\end{array}
\]
Move the fractions with the same denominator to the right; move the fractions with the same numerator to the left!

I have purchased the animals for the zoo... there have been some slight changes

DON'T PANIC
Exhibit Changes Form

Elephant Exhibit Changes

Area before any changes are made: _____________________

Perimeter before any changes are made: ___________________

I had ______ elephants in my exhibit in my original exhibit. One of those elephants is the mom of the new baby elephant.

Now with a new baby elephant, I have _______ elephants in my exhibit.

With this new elephant the area of my exhibit is going to change. With ______ elephants my new square footage needed is ________.

The first step is to split my new exhibit into the same number of parts as elephants I now have with the new baby. This mean I need to split my elephant exhibit into _______ equal parts.

I will then combine _______ of those parts for the mother elephant and the new baby elephant.

These combined equal parts will become separate and safe space for the mom and the new baby. The area for these two elephants is ___________. Which mean the area for the other part of my elephant exhibit is ____________.

The mom and baby exhibit represents what fraction of the new total elephant exhibit space. _______

The new perimeter for my elephant exhibit is __________________.
**Hippo Exhibit changes**

Area before any changes: ______________

Perimeter before any changes: ______________

I have ________ hippos in my exhibit before changes

I need to split my exhibit into ________ equal parts to separate the hippos and stop them from fighting.

I split my hippo exhibit into equal parts and put glass between the exhibits. The area for each of my hippos is __________

The perimeters for each of my new hippo exhibits are ________________

**Lion Exhibit Changes**

Area before any changes: ______________

Perimeter before any changes: ______________

I have ____________ lions in my exhibit before any changes

So I need to split my exhibit into ____________ equal parts to prevent the other lions from getting sick.

I have now split my lion exhibit into equal parts so that each lion has the same amount of space. The area for each lion’s exhibit is ______________
The new perimeters for my lion exhibits are

________________________________

**Reflection**

**Overall Qualitative Reflection:** I was overall greatly impressed with the quality of the work that these students produced. The students were so engaged in this project it was hard to get them to stop working on it. They would ask me every transition if we were going to be working on zoos next, or if I was going to be teaching math today. One of my overall goals of this unit was to improve the attitude about math in this classroom and to make children excited about this subject. One of my favorite quotes in the middle of the unit from one of the students was “Ms. Hill we haven’t done math in weeks, when are we going to do math again?” When I responded that we were going to go inside and work on zoos next the child excitedly exclaimed: “Oh well, that’s way better than math!” I couldn’t believe most of the students didn’t even know we were working on math, and they we so enthralled to be working on their zoos. We worked on our zoo projects for almost a month because the children wanted to keep working and perfecting their final drafts. I swear I could have centered the rest of the year in every subject on their zoos and the students wouldn’t have minded one bit. Honestly, the class’s engagement became one of my biggest struggles. My high students worked so diligently on their projects it was hard to get them to keep moving forward, and my low students completed beautiful rough drafts and were moved on to extension activities that were challenging yet no one else was working on to help them with these assignments.

I was really impressed that some of the typically lower achieving students quickly became some of my students needing an extension. Below I will attach some pictures of a lower-achieving student and an excelling student that were not my focus students. Try to guess which is which, it is almost impossible. It just goes to show that when students needs and interests are met all students can perform at a proficient level.

On top of the students being exorbitantly engaged in the project, they were all eager to participate in the typical math lessons I described above. I think this is due to the use of the smart board which the children had NEVER been allowed to touch before I came to their classroom. Every student wanted the opportunity to be able to show their thinking and use the smartboard. Students that I had watched not pay attention at all during my mentor teacher math lesson, (which were awesome but did not engage every learner) were jumping out of their chairs to participate in my lessons. When I left this classroom ninety perfect of the cards the students wrote me mentioned that I was a good math teacher. What a difference that was from the attitude that was held when I entered their classroom.
Welcome to the zoo. My favorite animal is the zebra because it has such a unique black and white pattern. I also love the lions and tigers. The giraffes are so tall and cool. I think the elephants are amazing. Overall, I had a fun time at the zoo today.
These are some extension activities that were completed by various students.

**Overall Quantitative Reflection:** The average on the area and perimeter test that the students took before I was their teacher was a seventy percent. While I didn’t make the entire class retake that exam, due to push back from my mentor teacher. I would assume the average would definitely increase. Most students got all of their calculations correct. Many students would tell you they learned new strategies that worked for them through my lessons as well. The zoo project was graded on a scale of 40 points. The average on the zoo was 35 points, which is 87.5 percent. Which means all of the students would have been considered proficient. The most common missed points were for not having big enough walkways in their zoos, and for the zoo not being realistically laid out so it could be functional. I also worked with my mentored teacher to determine outside of their grade if each student met proficiency on each standard I had linked to this project. We sat and talked about each student to determine if we could provide evidence that the student met the standard.

**Teaching Effectiveness:** His project could not have gone better if I had tried. I think the biggest success of this entire unit was the intentionality. I came into this wanting to find something that would genuinely be interesting to the students, and because my intention was in the right place the students were successful.

The one thing that I would have changed was my exhibit changes form. The original draft that the students used could have been made to be a lot clearer. In my head it made sense but for the children, it was almost impossible to complete even for excelling students on their own. I ended up just pretty much walking through that whole assignment with the whole class having them figure out their numbers. I have attached the draft I would use in the future to this document but you will be able to see the old document in my focus student’s work.

My other change is I wish I would have run with the zoo project even more and let it roll over into the other subjects intentionally. The students were working on argumentative writing for ELA, I would have loved to take over that subject and let them write about their zoos. In Social
studies, we were learning about maps, making maps, and map orientation which I could have easily extended their zoo project there as well. I guess looking back I wish overall I was just more confident in how awesome this project was, and allowed the project-based learning to become what the children wanted to make of it.

Having the lower achieving students work in a small group with a teacher directly was really effective for them it kept them on task and at pace. I believe because those students could get immediate help when they got stuck it kept their frustration levels low, allowing them to stay engaged and excited to participate. Unfortunately having that many teachers in one room isn't the case in most schools, so you would have to figure out a way to give these students the support they need while monitoring the other student's progress. Luckily in my position at Promontory next year I have a full-time aide, so this might be something I continue in my instruction in the future.

**Focus Student B Reflection:** B’s final zoo turned out clean and precise. B was one of the last students to finish their zoo because B decided to propose and add many things that were not on the animal or bonus area lists. For example, B decided to add a train and a water bear/microscopic organism exploration exhibit with microscopes. B’s rough draft is not as detailed as other students in the class, however, B was able to prove in conversation that all of the exhibits were calculated correctly, and B’s work was still really clean. Since B was getting so behind due to his intense planning I let B move forward without a very detailed blueprint. B’s final draft was clean and easy to grade. B missed a point for some of the walkways being too small, but all of B’s math was correct and B was really engaged and participated during the math lessons. So I would say that B’s is proficient at these standards. One of the most interesting things to watch B accomplish was figuring out the perimeter of the train track. This long and skinny non-rectangular shape was a challenge for B to figure out, yet B persevered and used the count around method to figure out the answer. I had B retake the unit exam on area and perimeter, which he had scored a one hundred percent on the first time. He again scored one hundred percent at the end of the spiral unit.

**Work samples attached below**
Focus Student L Reflection: I could cry at how proud I am of this student. L was a constant example to the other students in our class. L was the girl who was ‘bad at math” when we started, but during this project student L was the student everyone turned to for help. Student L was right in their comfort zone to have to draw and design, and being pushed right to the edge of their ZPD doing these large calculations. All of student L’s work was produced at such an extreme high quality, the calculations were done with precision, and the blueprint was laid out with great care and consideration for each exhibit. Student L completed all of the calculation on their own without help and got every single one correct. Student L lost a single point for some sidewalks not being wide enough and was labeled proficient on all the standards in this unit. When student L retook the unit test they got an ONE HUNDRED PERCENT. Not once did I have to pull Student L to work with the level three student. Student L worked diligently and stayed right on pace with where we were supposed to be.

**Work samples attached below**
Zoo Planning Sheet

As you learn about the different animals at the zoo, use this chart to plan how you might want to include them in your zoo. Use the basic rules to guide your decisions.

### Animal Information

<table>
<thead>
<tr>
<th>Animal</th>
<th>Quantity</th>
<th>Size</th>
<th>Feeding</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>LION</td>
<td>5</td>
<td>3000</td>
<td>Meat</td>
<td>African</td>
</tr>
<tr>
<td>ELEPHANT</td>
<td>3</td>
<td>5000</td>
<td>Vegetables</td>
<td>Asia</td>
</tr>
<tr>
<td>BIRD</td>
<td>10</td>
<td>1500</td>
<td>Grain</td>
<td>Tropical</td>
</tr>
<tr>
<td>SNAKE</td>
<td>2</td>
<td>100</td>
<td>No food</td>
<td>Cave</td>
</tr>
<tr>
<td>DOG</td>
<td>6</td>
<td>2000</td>
<td>Dog food</td>
<td>Kennel</td>
</tr>
<tr>
<td>CAT</td>
<td>4</td>
<td>1000</td>
<td>Cat food</td>
<td>Litter</td>
</tr>
</tbody>
</table>

### Area and Perimeter

In the chart below, you will use your knowledge of area and perimeter to design your zoo's exhibits. You may have to adjust a few plans to make more of the area fit into your exhibit. For example, you may have an exhibit that needs to be larger and can be divided into two or three sections. Use this chart to help you.

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Area (sq ft)</th>
<th>Perimeter (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOLPHIN</td>
<td>2000</td>
<td>160</td>
</tr>
<tr>
<td>GHANA</td>
<td>1000</td>
<td>150</td>
</tr>
<tr>
<td>ANACONDA</td>
<td>500</td>
<td>150</td>
</tr>
<tr>
<td>ELEPHANT</td>
<td>1000</td>
<td>200</td>
</tr>
<tr>
<td>NEANDER</td>
<td>800</td>
<td>150</td>
</tr>
<tr>
<td>COBRA</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>HIPPO</td>
<td>1000</td>
<td>250</td>
</tr>
<tr>
<td>LION</td>
<td>2500</td>
<td>350</td>
</tr>
<tr>
<td>ELEPHANT</td>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>ZEBRA</td>
<td>500</td>
<td>150</td>
</tr>
<tr>
<td>PIG</td>
<td>400</td>
<td>100</td>
</tr>
</tbody>
</table>

### Elephant Exhibit Changes

Area before: 4000 sq ft
Perimeter before: 3600

I have 3 elephants in my exhibit.
I need to split my elephant exhibit into 2 equal parts.
I will split my exhibit into 2 equal parts so the younger elephant and the new baby elephant
This combined area is 5000 sq ft of the total elephant exhibit.
The new areas for my elephant exhibit are 4000 sq ft and
The new perimeters for my elephant exhibit are 2400 ft each.

### Hippo Exhibit Changes

Area before: 2000 sq ft
Perimeter before: 3000

I have 4 hippos in my exhibit.
I need to split my exhibit into 2 equal parts to separate the hippos and give them a better living area.
The areas for my new hippo exhibits are 2000 sq ft each.
The perimeters for my new hippo exhibits are 1500 ft each.