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| **Introduction / Response:**  When discussing what to do for our lesson plan, we decided to do a math lesson on base 12 using a scavenger hunt for an activity. We would also review base 10 mathematics during the lesson while also using group work to foster community. In our classroom, we have a student with an SLD, more specifically dyslexia, a student with an orthopedic impairment that uses a wheelchair, and a student with ASD. Our student with dyslexia could have barriers with reading the activity sheet for the scavenger hunt or understanding calculations with the base 12 system. The student with an orthopedic impairment who uses a wheelchair might have difficulty measuring certain lengths or traveling around the school; the barriers that we thought a student with ASD might have with our activity is group work and activity recap. We accounted for these barriers in our lesson plan below. | |
| **Title: Base 12 Measuring Scavenger Hunt** | |
| **Developed by: Britney Breckheimer**  **Date: Written on September 4th 2020**  **Subject: Math** | **School: N/A**  **Grade Level: 3rd** |

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| **Learning Objectives**: | **Materials**: | |
| * After the lesson, students will understand that not everything in life follows a Base 10 system. * Students will be able to use a Base 12 system and apply it to measurement situations using feet and inches in addition format. | * Ruler or tape measure * Scavenger Hunt Activity worksheet * Pencil / Pen * String * Number cubes | |
| **Technology:** (*Highlight all that apply)* | |
| * Laptop * SMART board * LCD Projector * Computers * iPad/tablet * iPod or mp3 player * Calculators * FM System | * Webcam * Digital Camera * Document camera * Digital microscope * Video Camera * Scanner * Color Printer * Other (specify): |

| **Assessment** *(How will you know students have attained the learning objectives?)***:**  \* TIP\* Anticipate barriers your students may have to various forms of assessment – use UDL solutions to guide your decisions when planning for assessment (links provided at the end of the template) |
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| * To check for mastery, students can accurately add measurements outside of the Base 10 system in various environments. * Students will have accurately completed the activity worksheet by adding different measurements together that are in Base 12. * Students who were not able to walk around the school and measure different assigned objects are able to measure different lengths of string and add them together accurately. * Students will use drawings to show their base 12 learning by making bundles and sharing them in small groups. Teacher can collect the drawings at the end of class to assure learning. If necessary, students can verbally show their learning to the teacher using manipulatives. |

| **Barriers to Learning, UDL Solutions, Accommodations/Modifications:** | | | | |
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|  | **General Barriers to Learning and/or Engagement *(i.e., characteristics of this disability category)*** | **Potential Barriers to Learning, Engagement, and/or Assessment *– specific to this lesson plan*** | **UDL Solutions *specific to this lesson plan*** | **Individualized Accommodations/ Modifications for Each Category –*specific to this lesson plan*** |
| **Category 1: SLD -** dyslexia | Difficulty with   * Reading skills * Written comprehension * Written expression * Reading fluency * Mathematical calculation * Problem solving | Mathematical Problem Solving   * Difficulty understanding calculations outside of the base 10 system and how to apply it. | Review Base 10 using number cubes and working with a group that has taken hold of the mathematical concept. | If student has a difficult time reading locations on scavenger hunt worksheet, the measurements of each object in hunt are on worksheet. |
| **Category 2**:  OHD - Orthopedic impairment | * Has difficulty in inaccessible areas * Restrained movements | * Moving about school to measure objects in a timely manner * Some objects out of reach for measurement | Students measure string lengths and document calculations with those measurements | If student desires to complete actual scavenger hunt, partner them with student who is mobile and have them begin activity 15 minutes in advance in order to finish on time |
| **Category 3**:  ASD | * Limited social interactions * Communication skills * Difficulty initiating interaction | * Partner work is difficult with limited peer interaction * activity recap may be overwhelming | Allow student to partner with someone they are familiar with such as a friend or one-on-one with a partner | Provide student with list with exact locations in scavenger hunt or allow students to complete worksheet that already provides measurements |

| **Planned Differentiation** *(i.e., leveled text, leveled independent work, etc.)*: |
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| For students who need more of a challenge, they can create a list for the class on what other bases are used in mathematics (example: baking with eggs: eggs are referenced by dozens, time: referenced in amounts of 60).  For students who may need additional support, review what Base 10 system is using number cubes provided by the teacher. The student can then be partnered with other students who understand the topic and can assist them in their learning. |

| **Procedure** | **UDL Solutions** |
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| **Before the Lesson** *(i.e., anticipatory set, priming background knowledge, modeling)*:   * Review the Base 10 System through a class discussion. Have students individually demonstrate bundling on white boards and share with partners * Have 2 student volunteers to measure a desk length and the whiteboard length * As a class, discuss/demonstrate adding the two measurements from desk and white board together using Base 12 (inches and feet) * Put desk and whiteboard together to show students what they calculated is (or should be) the actual measurement. | **Representation (content):**  Provide students with a brief handout that summarizes the base 10 system. Have the information on the handout be presented by bullet points for our friends with ASD and Dyslexia who would be overwhelmed with a paragraph of content. The handout will also allow our friend with an orthopedic disability to have access to the same content without physically partaking in the measuring introduction activity. |
| **Action/Expression (process):**  Pass out whiteboards to all students to partake in the base 10 system demonstration to show what they already know. Use the smartboard to write out equations and demonstrate bundling for all students to utilize and engage in the learning. Have students raise their hands to partake in the discussion and allow think, pair, share time after the desk and whiteboard demonstration |
| **Engagement:**  Students will share their foundational learning of the Base 10 system with one another and partake in the class discussion with the measuring activity of the whiteboard and desk to solve the mathematical equation in Base 12. |
| **During the Lesson** *(i.e., learning activities, guided practice, independent practice):*   * Explain the base 12 system with inches and feet through another example (add together the measurement of teachers desk and a students arm length) * Share with the class that they will work in groups to look throughout the school and measure different objects * Explain scavenger hunt activity to students * Send students out to complete scavenger hunt | **Representation (content):**  Students will continue to receive interactive instruction with another example at the front of the class. They will also receive a scavenger hunt sheet to complete as they physically measure various objects throughout the school or by different lengths of string. |
| **Action/Expression (process):**  Students will be in control of the measuring process as they travel throughout the school measuring objects or measuring different lengths of string. They will use rulers, a pencil, and their scavenger hunt worksheet. |
| **Engagement:**  Students will work together in pairs as they complete the measuring scavenger hunt, or they will work in the classroom with the other students measuring string lengths. I will be of assistance in the classroom for all when needed. |
| **After the Lesson** *(i.e., group/ independent assessment, lesson closing/wrap-up, group reflections):*   * Have students return to desks and add up appropriate measurements of the objects in their groups * Have students work individually to create drawings for measurements using tally marks or simple picture of choice * When activity sheet is completed, have students partner up and share/compare their drawings with one another | Representation (content):  Students use the measurement content on their scavenger hunt worksheet to add up the various measurements grouped in base 12. The examples completed as a class will remain on the board as a frame of reference for all. |
| Action/Expression (process):  Students are encouraged to complete work in groups to solve the equations. Those who measured string lengths can be placed throughout the other groups because the same concept is being utilized for all measurements. Rulers will be collected. After group work, students will express their learning through drawings and share their drawings with their partner. |
| Engagement:  Students practice the Base 12 system and solidify their understanding of the concept through group work and individual drawings. Students will reflect on the material and apply it further in tomorrow’s system application regarding time in Base 60. |

| **Behavior Expectation Plan – CHAMPs – Conversation, Help, Activity, Movement, Participation** | |
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| **C**onversation –   * Can student engage in conversation with each other during this lesson? * If yes, about what? * How many students can be involved in a single conversation? * How long can the conversation last? | Students work in groups throughout the entirety of the activity whether it is in groups for the scavenger hunt or in partners when sharing their drawings. Group work will take about 20 minutes while partner work takes about 5 minutes. Students will work individually to complete calculations which will last approximately 10 minutes. |
| **H**elp –   * How do students get questions answered? * How doe students get your attention? * If students have to wait for help, what should they do while they wait? | If a student has a question, they are encouraged to first work with group members. If question is still not answered when collaborating with the group, they can ask the teacher for further assistance. If the teacher is busy, they can move on to measure a different object while they wait. |
| **A**ctivity –   * What is the expected end product of this activity? | The expected end product of the activity is to recall the base 10 system, adapt their knowledge to apply a base 12 system using addition, and students begin to make further connections to other bases. Additionally, classroom community environment is built positively through group work and collaboration. |
| **M**ovement –   * Can students get out of their seats during the activity? Do they need permission? * If yes, acceptable reasons include:   + Pencil   + Drink   + Restroom   + Hand in/pick up materials   + Other | Before the lesson, students will remain within the proximity of their desks to partake in review and introduction to activity. During the lesson, students are expected to move throughout the building to complete the activity. After the lesson, students are also encouraged to place themselves around the room to share their drawings with their partner. Additionally, bathroom breaks are allowed if it is an emergency as well as sharpening a pencil and other needs. |
| **P**articipation –   * What behaviors show that students are participating fully and responsibly? * What behaviors show that a student is not participating? | The classroom should be actively participating in some form during the lesson. In the beginning, they will use whiteboards to engage in the lesson, during the activity they stay with their groups to measure objects in scavenger hunt throughout building, and after the activity they will engage in discussion with a partner and demonstrate active listening skills. A student who is not participating will show signs of disconnection from their group, lack of engagement in lesson materials, stubbornness to complete the activity. |

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| **Notes/Reflections:** |
| In conclusion, students will show collaboration and community building while working in groups to complete the activity and further construct their learning of base 12 system. Additionally, from their drawings, students will be able to visualize how the base 12 system works in consideration to addition calculations and further apply to real-world scenarios. |