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| Lesson Overview | Title | Intorduction to coordinate plane |
| | Subject Area | Mathematics |
| | Grade Level | Elementary Grade 5 |
| | Duration | 90 minute mathematics block |
| | Materials | <ul style="list-style-type: none"> • Smartboard • Coordinate plane smartboard document • Small white boards • Dry erase markers |
| Learning Environment | Classroom Setting | <ul style="list-style-type: none"> • The classroom desks are arranged in a U shape. <ul style="list-style-type: none"> ○ Lucas sits at the desk nearest to the exit and uses a specific desk adjustable to his wheelchair. ○ Jenna is seated on the desk closest to the teacher’s desk and smartboard ○ Students have seats assigned according to a seating plan that changes twice a year and as needed throughout the year. • The teacher's desk is at the front of the class. The teacher's assistant's desk is at the back of the class and has a small table that can seat up to 5 students for small group instruction when needed. • Students sit at their desks during instruction, but there are options for flexible seating during individual and group work. <ul style="list-style-type: none"> ○ Carpet area with beanbags ○ High Table with four stools ○ Backrest cushions for working on the floor • Students have lockers labelled with their names outside the classroom. In the classroom, students keep the materials they need inside their desk storage space. • The classroom has a classroom library with books on different reading levels and interests. • Two computers are available to students for research during assignments and can earn free time on the computer for good behaviour • The teacher uses a smartboard for instruction. |
| | Teacher & Student Population | <ul style="list-style-type: none"> • A general education teacher who has a masters in education teaches the class supported by a teacher’s assistant. • There are 22 students in the classroom <ul style="list-style-type: none"> • 12 boys • 10 girls • Academic Standing: <ul style="list-style-type: none"> • 18 students are performing at grade level in all subjects • 3 students are performing at the low end of grade level achievement and have been identified as needing RTI interventions in math, English or both. • 3 Students are on IEPs |

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| | <p align="center">IEP</p> <p align="center">Student Population</p> | <ul style="list-style-type: none"> • Andrea receives services under the Other Health Impairment category. She is diagnosed with ADHD - predominantly inattentive type. <ul style="list-style-type: none"> ▪ Strengths: Andrea is very caring and compassionate and is often the first to help a peer in need. Academically, Andrea excels in science lessons and enjoys inquiry-based lessons where she can maintain interest and motivation. ▪ Weaknesses: She often misses important details in questions and assignments that result in low grades that do not indicate her true academic capabilities. • Lucas receives services under Orthopedic Impairment. He was diagnosed with Muscular Dystrophy at age five and started using a wheelchair last year. Lucas has begun experiencing difficulties with fine motor skills and uses an iPad to complete his work. <ul style="list-style-type: none"> ▪ Strengths: Lucas is an avid reader; he enjoys reading books about world wars. He reads at grade level and has excellent reading comprehension skills. ▪ Weaknesses: As his condition has worsened, Lucas has developed some anxiety and does not feel comfortable advocating for his needs or discussing his condition. At times he can be resistant to help. • Jenna receives services under the Hearing Impairment Category. She wears a hearing aid that is compatible with an FM system worn by the teacher. <ul style="list-style-type: none"> ▪ Strengths: Jenna is strong in math; once she grasps a concept, she can develop fluency and enjoys completing math assignments. ▪ Weaknesses: Due to her hearing loss Jenna has poor articulation, she works with a speech-language pathologist to improve her articulation, but it currently causes her difficulties in forming social relationships with her peers as she fears they won't understand her. |
| <p align="center">Lesson Goals & Objectives</p> | <p align="center">Common Core Standards</p> | <p>CCLS -Math: 5.G.1 Category: Geometry Sub-Category: Graph Points On The Coordinate Plane To Solve Real-World And Mathematical Problems State Standard: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p> |
| | <p align="center">Learning Objectives</p> | <p>By the end of the lesson students will be able to:</p> <ul style="list-style-type: none"> • Use the new vocabulary taught <ul style="list-style-type: none"> • Coordinate plane • Coordinate • X coordinate • Y coordinate • Axis • X axis • Y axis • Origin point + zero point • Ordered pair • Correctly label the x and y axis • Write down the ordered pair of a point on the first quadrant of the plane with 90% accuracy • Draw a point on the first quadrant of the plane when given an ordered pair with 90% accuracy • Objectives will be met with 90% accuracy as measured by the independent practice |

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| | <p>IEP Goals Targeted</p> | <p>Andrea's Goal</p> <ul style="list-style-type: none"> • When given a checklist of steps, Andrea will complete her work independently without skipping any steps 8/10 times. <ul style="list-style-type: none"> ○ Anna will receive a checklist of steps for completing an assignment reminding her to read all questions, think about her answer, and then write it down. She will also receive a list overviewing the lesson, specifically how to locate a coordinate pair on a plane. <p>Lucas' Goal</p> <ul style="list-style-type: none"> • By the end of the year, Lucas will advocate for his needs by asking for a break to rest when needed. <ul style="list-style-type: none"> ○ To work towards the end of year goal, Lucas will be reminded by the teacher or TA at the beginning of the lesson to request a break when he needs one. <p>Jenna's Goal</p> <ul style="list-style-type: none"> • Jenna will work on her articulation and confidence to speak by contributing to class discussions at least three times during the school day. <ul style="list-style-type: none"> ○ Using an agreed upon signal between Jenna and her teacher Jenna will signal to the teacher that she is comfortable to be called upon or will raise her hand to add to the discussion. <ul style="list-style-type: none"> • Any vocal contribution from Jenna will be reinforced with praise regardless of accuracy in articulation to promote more contributions. |
| <p>Instructional Timeline</p> | <p>Introduction [15minutes]</p> | <ul style="list-style-type: none"> • Begin the lesson by displaying a blank page on the smartboard and ask the students for a volunteer to draw a number line from 0 to 10 on the bottom of the page. <ul style="list-style-type: none"> • Tell the students to watch as their peer draws the line and ask them about the direction the student moved in (moved right as the numbers increased.) • Next, tell the students that you want to draw a line starting at zero but goes upwards instead of to the right and ask for a volunteer to draw it. <ul style="list-style-type: none"> • Tell the students to watch as their peer draws the line and ask them about the direction the student moved in as he/she labeled the numbers (moved upwards as the number increased.) • Next, ask students to show you the number 7 on the board <ul style="list-style-type: none"> • If the student points to the 7 on the x axis ask them why they didn't think you meant the other 7 and introduce them to the x axis and y axis. <ul style="list-style-type: none"> • Tell the students that y is the vertical line and to remember the “y goes up to the sky.” • Ask students to locate numbers on the different axes • Next, draw vertical lines from each point on the x axis and horizontal lines on from each point on the y axis until a graph is formed. <ul style="list-style-type: none"> • Tell students that this is what we call a coordinate plane. • Draw a circle on the (7,4) point on the cartesian plane, tell the students to pretend that the circle is a home and you wanted to know the address of the home and ask them if they think they can use the cartesian plane to find the address. <ul style="list-style-type: none"> • Discuss the different options until a student suggests 7 & 4 then write it as an ordered pair (7,4) and tell the students that this is how we write the location of points on the cartesian plane and they're called an “ordered pair.” <ul style="list-style-type: none"> • We write our x coordinate first, then our y coordinate, think about their order in the alphabet. • Next, ask a student to locate (0,0) on the plane and tell them that its called the zero point or the origin, its called the origin because we always start counting from that point. • Write a coordinate on the board and ask a student to locate it on the plane <ul style="list-style-type: none"> • Remind the students of the direction they moved in when they drew the number lines. • To review the information show students the learning video by NUMBROCK (https://www.youtube.com/watch?v=d6vhjpnfd3c) |

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| | Development [25 minutes] | Response Cards <ul style="list-style-type: none"> • Distribute small whiteboards and a dry erase marker to every student. • Open a coordinate plane on the smartboard and draw different shapes at different locations and ask students to write the ordered pair on their whiteboard. <ul style="list-style-type: none"> • Once every student has an answer, ask them to raise their boards <ul style="list-style-type: none"> • If a student answered incorrectly, ask a student who answered correctly to show how they got to their answer. • Ask students to come up to the board and draw a shape for their peers to locate. <ul style="list-style-type: none"> • The student who draws the point has to show the ordered pair to the teacher before drawing. |
| | Activity / Small Group Work [25 minutes] | Coordinate Plane Game <ul style="list-style-type: none"> • Ask the students if they have ever played the game battleship, have a student who has played the game explain it to his/her peers • Inform the students that they will be playing a similar game in pairs • Students will each be handed a coordinate plane activity sheet that contains two empty coordinate planes (the second plane is labeled “guesses I have made”), a box labeled “shapes I have found” and the following instructions: Instructions: <ol style="list-style-type: none"> 1. On the coordinate plane below draw the following shapes: 2. You and are your partner will take turns guessing the location of each other's shapes. <ul style="list-style-type: none"> • Remember we identify the location by the x axis first then the y axis (x , y) 3. The player to guess the location of all their partners shapes first wins the game 4. You can use the coordinates plane on the following page to mark down all your guesses, this will help you remember the locations you already guessed so you don't repeat them. 5. Once a player guesses the correct location of a shape tell that player which shape they found so that they can check it off. |
| | Independent Practice & Assessment [25 minutes] | Worksheet Students will complete a teacher made worksheet revising the vocabulary and skills taught during the lesson. They will be given 25 minutes to complete the task and are required to complete it independently They will be required to: <ul style="list-style-type: none"> • Number an empty coordinate plane • Label the x and y axis • Locate the origin/zero point by circling it on the plane • Draw shapes on a coordinate plane when given an ordered pair • Write the ordered pair of coordinates of shapes located on a plane |
| | Assessment | The worksheet serves as a formative assessment to assess student learning, identify any learning gaps and determine if students are ready for the next topic. Students will not receive a grade on their assignment; however, it will be used by the teacher to assess if learning objectives have been met. |

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| Modification & Classroom Management | Multilevel Modification/ Adaptations | <p>Andrea</p> <ul style="list-style-type: none"> • Andrea will receive a checklist to remind her of the steps she needs to take when completing an assignment. She will also receive a short guide reminding her of the steps she needs to take when locating a coordinate pair. • She will be given a small manipulative (eg, counter cube) to help her count the steps she needs to move when locating coordinates • Liam who has been identified as needing RTI instruction will be given the same accommodations to assess whether his academic performance is improved with increased directions. <p>Lucas</p> <ul style="list-style-type: none"> • Because Lucas is struggling with his fine motor skills and has less control over his hands and arms, Lucas will use his iPad to complete the game and the individual assignment which reduces the physical strain required by holding a pencil <p>Jenna</p> <ul style="list-style-type: none"> • Jenna uses a hearing Aid which connects to an FM system, the teacher uses a microphone during instruction and connects the computer whenever any clips are played. • During the game portion of this lesson, Jenna will be paired with Lucy who she is comfortable with and will feel more encouraged to speak with. <ul style="list-style-type: none"> • The teacher and TA will help Jenna when she struggles to articulate certain words using tips from the speech and language pathologist. |
| | Behavior/ Self-management | <p>Classroom constitution</p> <ul style="list-style-type: none"> • At the beginning of the year, the students and teachers agreed upon a set of classroom behaviour expectations in the form of a class constitution. • The constitution begins with “In this classroom we...” <ul style="list-style-type: none"> ▪ Examples include: <ul style="list-style-type: none"> ▪ Respect one another ▪ Take care of our environment. ▪ Always try our best • The constitution is written on a large poster that is placed in the classroom. When students are not following the constitution, the teacher may ask them to look at the poster and see if there is a part of it they might not be abiding by <p>Class-wide token economy</p> <ul style="list-style-type: none"> • The teachers and students decided on items that would allow students to earn class dollars that they can use towards backup reinforcers, which include items and activities • According to predetermined amounts per rule broken, any student who does not follow the constitution must pay a fine using their classroom dollars. • The teacher also uses the token economy during different activities such as rewarding the winning team in a game, excellent behaviour on field trips and behaviour that exceeds expectations. <p>Praise</p> <ul style="list-style-type: none"> • The teacher uses a self-monitoring checklist with a list of students names to ensure that students receive specific praise throughout the day <ul style="list-style-type: none"> ▪ Praise is behaviour specific and generic statements such as “well done” and “good job” without stating what exactly was done well are avoided. |