Part-Part Whole Strategies Lesson

Grade: 1st

Subject: Mathematics

Materials: Mini Jenga games, recording sheet, pencils, play dough, 10's frames, manipulatives, part-part-whole signs, number signs for students, addition and equal sign posters

Technology Needed: computer, activeboard

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)

Explain:

- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Standard(s)

1.OA.1- Use strategies to add and subtract within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.

1.OA.5- Relate counting to addition and subtraction.

1.OA.6- Use strategies to add and subtract within 20.

Objective(s)

By the end of the lesson, students will be able to demonstrate their understanding of part-part-whole addition problems and how to solve them by choosing between effective strategies learned in class to evaluate these problems and write appropriate number sentences during a game of part-part-whole Jenga.

Bloom's Taxonomy Cognitive Level: Evaluating

Differentiation

Below Proficiency: Students will choose strategies that involve manipulatives to solve the math problems. Students will play fewer games of Jenga, have increased teacher support, and be paired with people who can help reinforce the topic. Students focus on part + part instead of the missing part equations.

Above Proficiency: Students answer all problems in the Jenga games, play more rounds, use higher-order solving strategies, complete the above-proficiency work sheets in free time, and help the students who are below proficiency.

Approaching/Emerging Proficiency: Students will choose strategies that involve drawings and story problems. They may choose to use manipulatives at times. Teacher will support where needed. Students will be paired with those who are confident in the topic.

Modalities/Learning Preferences:

Kinesthetic- Students play a game of Jenga, participate in solving strategies that utilize manipulatives. Students move around the room during Human Part-Part-Whole game.

Auditory- Students hear the information on solving part-part-whole and missing addend problems from the teacher and from their classmates.

Visual- Students view the Jenga game, see the equation on the piece, and then record the number sentence on paper.

Classroom Management- (grouping(s), movement/transitions, etc.)

- Students turn-and-talk with a person they can work well with, near them.
- Teacher has many students asking and answering questions during the lesson.
- Students sit close to the teacher.
- All students have their own play dough and 10's frame for ease of activity.
- Students have all the materials they need already at their desks.
- Students get some movement when transitioning to different parts of the activity.
- Teacher engages students with visuals and hands-on activities.
- Team tables are already grouped for students who work well together.
- Students are paired by the teacher ahead of time based on behaviors from the day prior.

Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)

- Students sit quietly, level zero, on the imaginary carpet unless told otherwise.
- Students are expected to use the ACTIVE board safely and responsibly.
- Students actively participate while turn-and-talking with a partner and asking and answering questions in the discussion.
- During discussions, students use appropriate language and volume, raise their hand instead of blurt and give others a chance to speak.
- Students move about the room safely.
- When I say "class class" the class says "yes yes" and then are silent after.
- Students stay seated at their desks during the Jenga activity, making sure to use the game properly and safely.

Part-Part Whole Strategies Lesson

Minutes	Procedures
60	**Set-up/Prep:** - Create Jenga games (add math problems) - Create recording sheet for number sentences - Have manipulatives and 10's frames prepared for student use - Hook up computer and audio - Create human part-part-whole game
	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) - Human Part-Part-whole/missing part game - All students get a sign taped on their stomachs with a number 1-10 on it. - Students stand in a circle around the room - I tell the students who the whole and the first part is, or I tell them a part and a part without telling them the missing component, then those students lay on the floor under signs that say part-part-whole. There will also be an addition sign and an equal sign between the students. The students see the number sentence, the parts, and the whole, and they all get to participate with their bodies. - I go through multiple examples so all students get to lay on the floor at some point. - Teacher gives examples that are a mix of addition and missing part problems - As the students describe the correct parts and whole, the teacher writes it on the board along with a drawing of the parts and the whole for the students who do not connect with the activity.
	Explain: (concepts, procedures, vocabulary, etc.) - As we remember from earlier in the week, a part plus a part equals a whole. In addition, if we are given one part and the whole, we can find the missing part using a variety of strategies. Today, we are going to review those strategies. - Write a part-part = whole problem on the board. Ask students, what is one way that you can solve this problem and show your work doing it? - Students are allowed to come up to the board to solve the problem. Teacher then narrates what the student did. o Strategies include: ▪ Drawing out the parts and counting up to get the whole ▪ Drawing out the part and counting up until they reach the number that is the value of the whole ▪ 10's frame with manipulatives such as mini erasers, play dough, dual-colored counters ▪ Drawing the whole above with the two parts below ▪ Counting up on your fingers - Make sure to demonstrate how you can solve a part-part-whole equation using all of these strategies. (I DO & WE DO) - Explain to students that they should choose solving strategies that are most efficient and make the most sense for *them*. - Right now, it doesn't matter what their peers are doing to solve the problems, they need to choose a strategy that fits their needs. - Teacher will then write up two parts and a whole without putting it in a number sentence. - Have students turn-and-talk and discuss with each other how they would say and write the number sentence. - Do a few examples of this.

Part-Part Whole Strategies Lesson

Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)

- Today, you are going to be solving addition and missing part questions while playing a game of Jenga with your classmates.
- Each piece in the Jenga game will have a math problem on it.
- Each of you will have a recording sheet, where you will transfer your number sentence and solve the problem.
- You can use whatever strategy you want for solving these problems; however, I should be able to see what you did one way or another.
- Watch a quick video describing Jenga rules.
- Link: https://www.youtube.com/watch?v=RtGYWqx_MYI (if students don't already know how to play)
- Teacher models how the game will be played and how she records the information.
- Students are then paired up by the teacher with people they work well with. (YOU DO)
- Teacher explains that if the Jenga gets too rowdy or out of control, that students will have an alternative math activity to complete that is NOT a fun game like this one.
- Students go to their teams and begin playing.
- The whole time the students play, teacher walks around to be sure students are doing what they are supposed to be, able to solve the problems accurately, and using strategies that fit their needs. I will support wherever needed. If students need to go back to a simpler activity, I will have those printed and ready. If students finish too early, there will be more challenging worksheets they can work on in the spare time.

Review (wrap up and transition to next activity):

- Teacher gives positive reinforcement and words of encouragement to the students after working so hard on the game and math problems.
- The students finish up the activity by making sure they check with the teacher that they have done the problems correctly and written out their number sentences.
- If the students have not answered the questions correctly, the student will need to go back, try a new strategy and rework the problems. I will be walking around enough that hopefully I will catch this issue, if there is one, before the end of the activity.
- Students rejoin teacher on the carpet
- I ask students to share their thoughts on the activity (what they liked, disliked, found to be hard, what made it easier)
- Students discuss the strategies they used to solve the problems as well as the strategies they used to work as a team
- Some students wanted more of a challenge after the JENGA activity, so I gave them harder part-part-whole worksheets, and the students elaborated on how the practicing with the Jenga game made them feel more confident to solve harder problems.

Formative Assessment: (linked to objectives) **Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.**	**Summative Assessment (linked back to objectives)** **End of lesson:** **If applicable- overall unit, chapter, concept, etc.:**

Part-Part Whole Strategies Lesson

- Teacher observes participation in the human part-part-whole activity. - Teacher watches who is able to answer the questions correctly in the game. - Teacher looks at number sentences to see who has written them and if they have done it correctly. - Teacher observes what strategies the students use to solve the problems. **Consideration for Back-up Plan:** Students participate in alternative activities and worksheets. Students do the game at the beginning of class on the board instead. Students who do not participate appropriately do an alternative, less fun activity.	- Not applicable at this time.

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

I absolutely loved teaching this lesson. The kids were amazed by how much fun math can be. First of all, I had them playing a human part-part whole game, and here, the students each had a number, and there was a plus and equal sign on the floor. The students all sat in a circle. I would give them a part, 2 parts, or a part and a whole, and they either had to solve the whole equation or find the missing part. Then, the students with those numbers would come lay in the correct position in the number sentence. This helped them practice order and writing number sentences. They were laughing and participating more than I have ever seen. Also, they looked so cute laying on the floor like that. Then, I did a short lesson on strategies that can be used to solve part-part-whole problems. I had the students help me identify strategies. Then, I gave an explanation of each and an example. Finally, I briefly told them about how they should be searching for the best strategy for them, personally. What works for one student might not be the best strategy for another. It really helped when I went over the expectations for the Jenga game. I had the students brainstorm the best way to go about playing the game so everyone in the class could do their best learning. This eliminated a lot of problems during the activity.

I know that the students learned a lot about using effective strategies during this activity, for they were each doing different things to find the solution to the problems. Many students decided to draw out the problem, other decided to use divider plates and mini erasers, and other students used other counting-up strategies. I knew they were able to write out number sentences, too, for they had a recording sheet where they had the number sentence, their work, and the answer. Many students wanted to continue playing on the back of their recording sheet, for they were having so much fun and wanted to challenge themselves. Some students told me they thought it was getting too easy for them, so I gave them the option to work on a more challenging missing part worksheet that extended their knowledge of missing part into the double digits. They were so excited that I had something harder for them to do, and they did so well on the harder material. I was so impressed. I did help some students find strategies that would work best for them because some of them did not know their own needs. I found that the divided plates and mini erasers worked extremely well for the below proficiency students, and the more advanced strategies worked well for those above proficiency.

If I were to make any changes, I would just make sure to create more floor space during the human part-part-whole activity. This would have created less “momentary chaos” as they were moving into and out of positions. I would also really like to expand my collection of mini Jenga games. With these, I would differentiate the difficulty levels of each pack, so I could have students participating to their fullest at any ability level. I lucked out that all my students were able to complete the problems I had created for my students, however, I would have liked to have a harder and easier set in case anybody needed that. Other teachers in the building were asking me all day what I did and how I came up with this idea, and how much fun it looked like the kids were having. People now want to borrow my Jenga games and get a copy of my lesson. Overall, this was extremely successful, and I cannot wait to teach it again.