Math Case Study

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Introduction

Highland Park Elementary school is a lower socioeconomic school based on the fact that 70% of the students received a free or reduced-priced lunch. This area also has a high percentage of students who are culturally diverse. Within Ms. Lockhart's classroom has four students who received below average scores and did not show growth or decline in their scores from week one to week two. All of the students within this group got one or more digits right when they took the test the first time, but the second time the students took this test they did not show growth or their scores dropped. The students within this group will continue to work on addition and subtraction problems using manipulatives and the standard form of algorithm. The four students will be pulled together during math groups to continue to work on their addition and subtraction skills over the course of a week.

Goal Statements

Over the course of the next week, the four students will have a goal statement they will focus on to achieve growth and success in adding and subtracting problems. The goal for the students over the course of this week will be to use the group time as a tool to help them become stronger mathematicians by using two different manipulatives to help them solve addition and subtraction math problems in the standard algorithm form.

Meeting the Goal

On Monday during math groups, the four students would start with basic addition of one digit numbers. The students would work with base ten frames with star and heart markers to practice adding and subtracting the one digit numbers (see Appendix A). At first the teacher would model a problem for the students so they could hear and see the teacher's thinking. Next, the teacher of the small group would have the students add a certain number of stars and hearts

together. Next, the students would write the standard algorithm addition equation on their white boards. After a few problems, the students would create their own addition problem with the base ten frame, stars, and hearts and write their own standard algorithm addition equation. This allows for the students to have choice and for the teacher to see their understanding in addition. For their summative assessment, the teacher would have the students write an addition problem on their white board, use the base ten frame to solve their answer, and write the sum on their white board to show the teacher.

On Tuesday the four students would come to their math groups together to work on subtraction of one digit numbers. The students would use the base ten frames again, but this time the student would only have stars to work with. The teacher of the small group would start by modeling the lesson again followed by the students performing subtraction problems that the teacher gave. The students would start by placing a set number of stars in the base ten frame and taking away stars. The students would see that the number left in the tens frame is the difference. After they found the difference, the students would write the standard algorithm on their white board. After the students practice the subtraction of one digit numbers, the students would be able to make up their own problem followed by writing the standard algorithm on their while boards. At the end of day two, the teacher would hand out an exit slip for a formative assessment with one addition and one subtraction standard algorithm on it.

On Wednesday the teacher would introduce adding with connecting cubes to the four students in the small group session from Nancy Hughes *Number Talks for kindergarten, 1st, and 2nd Grade Teachers* book (see Appendix B). Again, the teacher would start with modeling their thinking out loud and explain their thought process of adding the cubes together. The teacher would model having a certain amount of cubes together to represent the first number in the

addition problem and model the second amount of cubes together for the second number. Once this step is done the teacher will put both sets of cubes together to equal the sum. The teacher will then write the standard algorithm addition problem on the white board. The students will repeat this activity the same way the teacher modeled it. If the students are advancing, the teacher can start to implement some higher numbers to add and write on their white boards. For a formative assessment, the students would have to solve an addition problem using their connecting cubes and turn in their standard algorithm and sum in on an exit slip.

For Thursday during math group, the students would repeat the connecting cubes activity but they would work on subtraction. The teacher would begin to model the lesson, the students would move on to completing problems and writing the standard algorithm on their white boards, and eventually having the students create their own subtraction problems. To end the small group work of subtracting with connecting cubes, the teacher would have the students do a turn and talk with one person at their table on their explanation of how they solved the problem and state what the difference was for their formative assessment.

For Friday, the four learners will have a review day of all four methods they used. The students will be able to choose what addition and subtraction method they want to use when completing a set number of problems in the group. The students will use their white boards and manipulatives to figure out the standard algorithm problems. For the summative assessment, the learners will complete the CBM Computation worksheet in their small group so the teacher can evaluate the progress each student has made during the week.

Conclusion

The four students at Highland Park Elementary will benefit from working in a small group working on their addition and subtraction skills in standard algorithm form. The learners

will be able to practice different math problems using manipulatives to help them see, manipulate, and understand how to add or subtract numbers. Also, the learners will benefit from practicing writing addition and subtraction problems in the standard algorithm because they will better understand the process. These methods will help the learners show progression in their addition and subtraction math skills on their next CBM Computation worksheet.

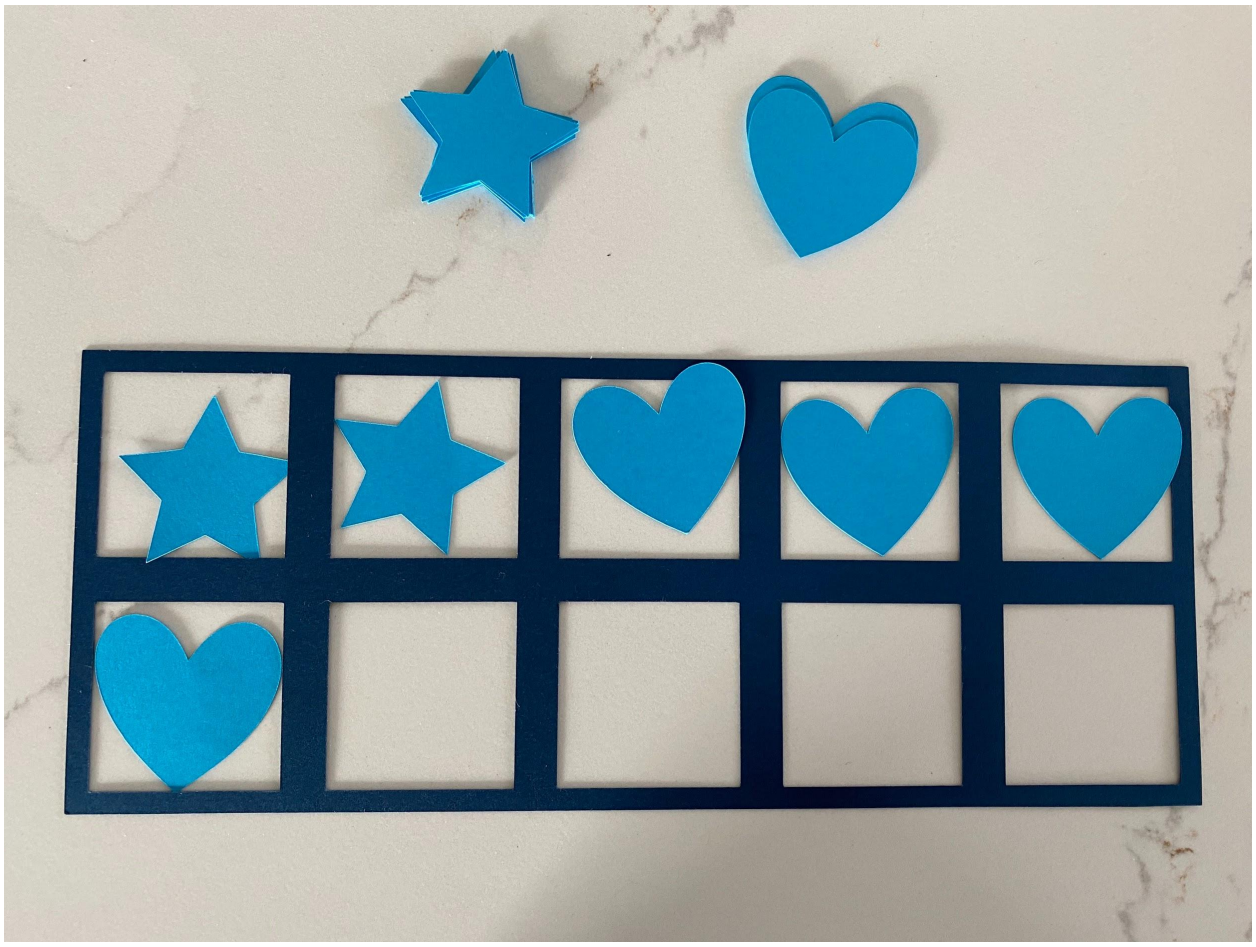
References

Hughes, N. (2019). *Classroom-ready number talks for kindergarten, 1st and 2nd grade teachers: 1000 interactive activities and strategies that teach number sense and math facts*. Berkeley, CA: Ulysses Press.

Appendix A

Base 10 Frame with Stars and Hearts

The figure below shows how a student could use a tens frame to add stars and hearts together to get a sum.



Appendix B

Adding with Connecting Cubes

The fist figure below shows an additional problem of adding 4+5 using connecting cubes. The second figure below shows how the connecting cubes look in Nancy Hughes *Number Talks for kindergarten, 1st, and 2nd Grade Teachers* book.