Signature Assignment: Unit Plan for Assessments

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Fieldwork Reflection #1

For my observation hours for TEP 512 this spring, I went to Dr. Kane's 6th grade class. In her class, she has six SPED students and 8 EL students. Since my unit plan is on math, I got information from Dr. Kane on the students' math placements. Of the 29 students, 8 students are at least early in their grade level, 10 students are one grade below, and 11 students are two or more grade levels below. Within the specific domains, the majority of the class is behind in Measurements and Data. There is even a student who met grade level in the numbers and operations domain and scored at a second grade level in Measurements and Data. Dr. Kane does what she can to support her students who are behind and can do so without neglecting the ones ahead because those students go to a higher class for math.

My unit plan's title is "The Math of Money" and the focus is on understanding, recognizing, and using ratios and rates within several money situations. The first lesson will be on the understanding and recognizing of ratios and rates and learning the mathematical terms and values and vocabulary associated with each. The second lesson will be on the use of ratios in several situations described in the section above. The third lesson will be on the use of rates in several situations described in the section above.

To help accommodate the range of abilities represented by all the students, I'll make instructional decisions according to UDL practices. For example, I will be including assessments that are technology based, written, and spoken. There is a Kahoot quiz in the first lesson, a self-assessment in which students gauge their confidence in the second lesson, and a written set of problems and a short answer question in the third lesson as a summative assessment. Throughout all the lessons I will be asking questions and parts of questions verbally of individual students and of groups. Having these multiple means of expressing what they learned will help

ensure that the form of testing does not keep the students from doing their best in at least one of the assessments. I should be able to gauge what the students know because I will be gathering data in these various ways before, during, and following instruction.

In my observation of Dr. Kane's 6th grade class, I paid particular attention to three specific students. For privacy, I have given each student an alias. Kade, an EL student, gets frustrated easily because of his difficulty in understanding language, but he will persist with encouragement. He needs extra time to think and works best when things are organized, clear, and in context. He sees math as his strength, though he is good at other subjects as well. He is helped by sentence frames, but doesn't always ask for them when he needs them. To help him, I will give him sentence frames for the tasks that would require them and I will make sure to give him the guidance he needs to break down work problems into manageable number problems that he can then solve on his own.

Ronald, a SPED student with ASD, has strength in whatever he chooses to spend his time on. He distracts the class often, but they haven't given up on him. Other students try to support him, but he is often resistant or argumentative. One of his parents encourages his behavior and even shows signs of the same challenges he faces. He does read well and is aware of what is going on. He thinks he doesn't have to do what is expected of him and this is supported in one of his homes. Custody plays a big part in his compliance. He is supported outside the classroom once per week. In my observation, I saw him get distracted and choose not to do what he was supposed to many times. Dr. Kane even gave him a warning, which he then talked back to, and had to take away his chromebook. She has him sitting in the front of the room to the side, which will be helpful when I'm teaching my lessons. To support him, I need to watch him and help

keep him on task. I should also enlist the help of his table group to get him to participate with them.

Gerald excels in math in addition to other academic areas. He has accommodations to be able to do different work and to do the work in different ways. He is at least one grade level above in math. In fact, this student is a 5th grader who joins the 6th grade class for the math hour. He needs to be challenged, but without getting too much work. To help Gerald, I need to provide opportunities to do more challenging problems or take problems deeper. I should listen to his ideas of how to solve things that may be a little different than how I am teaching it. I don't want to fall to the common practice of just giving more work.

Fieldwork Reflection #2

For my observations, I went to Dr. Kane's 6th grade class and taught the second lesson from my unit plan. I started by giving the students the diagnostic assessment from lesson 1 before then moving to lesson 2. This was a Kahoot quiz I made. Though it took longer than I expected, the Kahoot went well and the students were engaged. They largely answered correctly and there was good discussion between each problem, but there was also a lot of side talking.

One thing I wish I had done differently is given more time to direct instruction before setting them loose on the problems on the board. Getting them all signed in to the Kahoot and giving them that took much longer than I expected so I didn't have enough time to go through a bunch of problems on the board on my own and with them. I ended up just jumping in and calling them up so that I could see a little more what I was working with and what I needed to focus my instruction on. Thus, the problems on the board didn't go particularly well for the first set. They were pretty lost on most of it, but then we went through them all together as a class and they did better. The second set went much better and they were actually able to explain to the

class what they did. I was able to see some really strong logical thinking from some of the students which was exciting and encouraging. After the second set, I told the students that they needed to have completed the work on their paper for at least one full problem set so that I could see how they are doing. So the students took the last 15-20 minutes to work on those problems and were able to see the work of 4-6 of the problems on the board to help them do the work on their papers.

The self-assessment went well and was very quick. Going through them will give me some good insight into how the students are feeling about their ability to manage and use the topic taught in the lesson. I passed out the papers as the students were working on the independent practice questions. As they finished the self-assessment and the worksheet of problems, they brought them up to me together so now I have everyone's self-assessment paired with their work, which will be helpful as I sort through the results and data.

The three focus students were interesting to watch through the course of the lesson. Kade wasn't there, but another EL student in the class participated well. She went with another student to the board and though they couldn't give an answer, they had good work and discussion together as they tried to get one. I was very happy to hear of her contributions. Gerald sat in his table group in the back and seemed to track well and raised his hand when I asked who was understanding, but he wasn't super involved. He didn't volunteer to go to the board or volunteer to answer questions. Ronald was very distracted the whole time, but he thankfully did not appear to be distracting anyone else. He didn't do the work on his paper, but as the paraeducator had told him, he wrote on his paper, "I was having a hard time focusing." They are trying to get him to self-track and become more aware of what is causing him difficulty in focusing and applying

himself. He did fill out the self-assessment, and unfortunately circled the frowning face for all three questions.

General difficulties amongst the class included focus and understanding during certain parts, but the strengths were in their willingness to learn from someone new in a new way and do what was asked of them. For a time I was concerned about the way it was going because the material seemed a little too hard for them, especially one type of problem. However, I think that by the end I was able to see enough evidence of learning that I can confidently say that it was worthwhile and the kids learned some helpful things. I learned a lot about the kids from this process and I will be able to use that information as I teach my other lesson to the class tomorrow.

Fieldwork Reflection #3

For my observations, I went to Dr. Kane's 6th grade class and taught the third lesson from my unit plan. Overall, it went much better than my second lesson. I did not have to start with the time consuming and complicated Kahoot like the day before and so was able to ask the students to come in and clear their desks right away. I asked them to think of something they had learned yesterday and then asked for volunteers to share their thoughts. I am glad I did this because they needed the refresher and warm-up that it gave them.

I had, before they came in, written the first four problems on the board, and so the next step was to do these problems with their help. I asked them for ideas and asked guiding questions to help them figure out what some of the steps might be. This went quite well and I was happy to see several of the students really engaging and giving it their best effort. Unfortunately, there were many students who did not give it very much attention, but I used proximity and cold-calling to draw them in a bit more.

After we did the four together, I asked for volunteers to come up in pairs to do the same problems on the board. I had to give a little help on each of them, but no pair was completely lost. After they had explained their problems to the class, another set of students came up to do the next four problems. Several of the first set of students asked if they could be up the second time and so I let them, but asked them to try a different kind of problem. This second set went even better and at that point I had given them all the practice worksheet. One thing I would have done differently is giving them all the worksheet before we worked through the first set of four so that they could have written down the work as we went, but I suppose it allowed them to focus solely on learning the material and not on getting a worksheet done.

After the second set, I passed out the "quiz" and gave them the rest of the time to work on it. This had mixed results. Some students were lost and had no desire to do any of it. Others tried a couple problems but checked out for the rest of them. Still others finished the entire thing and seemed to enjoy it. I did tell them all that if they got stuck on a problem, to just move on and do another, so there were several papers on which only one or two of the easiest ones were answers. Still, it was a good assessment and if I had been able to use a grade to motivate them, I think I would have had more cooperation. As it was, walking around and giving verbal redirection was not good enough.

Ronald was unfortunately rather absent mentally from the lesson. The teacher has him sitting near the back facing the outer wall, so it is not easy to engage him. During the summative assessment time, I went over and talked to him and encouraged him to answer the free response question about how he can use math in real life. He actually gave me a verbal answer that made sense, so I asked him to write it down so I could remember his great answer. I had to come back several minutes later to ask him again to write it, at which point he did. He had made the

comment that he can use math to read prices and figure out how much things cost. He said he hadn't ever realized that before, but that it just came to his mind. It made me very happy to have succeeded in even this small way in imparting some information to him.

Gerald came up with another GATE 5th grader and did one of the harder problems in the second set. They made one mistake, but at my question, corrected it. It proved to me that the question was at an appropriate level of difficulty for them, which I was happy to see. Kade participated at a similar level as the other students and, as far as I could tell, did not seem to have any particular difficulties in keeping up, which was also nice to see.

All things considered, I was very happy with how this lesson went, even though most students did not complete very many questions on the summative assessment simply because they did not wish to apply themselves to something that made no difference on their grade for the full half hour I gave them. I am confident that many students learned a lot, and I learned a lot from the experience as well.

Fieldwork Reflection #4

After teaching the second and third lessons of my unit to Dr. Kane's sixth grade class, I was able to gather and analyze the assessment data from her students. Based on how I felt following the lessons, I expected to see that most students grade themselves poorly on the self-assessment and that most students simply copied the work from the board for the two independent practice worksheets. I also expected to see an average score of about 75% on the summative assessment. Below are charts of the data I collected. Because of missing papers, the student numbers of each chart do not directly correlate with the student numbers of the other charts.

Ratio Practice Sheet

All students were given the same worksheet with three of each type of question and asked to complete at least one of each. Each column represents a student and each row represents a type of question. The contents of the boxes show how many questions of the type the student completed correctly. If it is empty, it means the student completed one, the expected amount. If it is gray, they completed none. If it has a "+", the student completed more than one, and if it has a "-", the student completed part of one. Lastly, if the student completed one and a half, it will be marked with a "+-" and two half finished or incorrect problems are shown by a "-,-". The second chart shows summarized data. The success rate of the second two types of problems are particularly low because those problems took more steps and the students were not fully prepared for them as we only had time for 2 brief examples of each type.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
q1	+						+				-		+		+	+	
q2	+				+		+				-,-	-			+	+-	-
q3	+	-					+-	-		-	+-		+-	-	-,-	+-	
q4		-			-	-	+	-	-	-	-,-	-	-	-,-	-,-	-,-	-

	Q 1	Q 2	Q 3	Q 4
Total Right	18	13	11	3
Total Attempts	19	18	21	20
Percent Right	94.7%	72.2%	52.4%	15%

Self-Assessment

Following the second lesson, the one on using ratios, students were asked to circle the face that showed how confident they were in three separate areas. The chart below shows the number of each answer I received for each of the three questions. It is divided by students in order to show variations and trends. For recording purposes, the worst frown is represented by a 1 and the biggest smile is represented by a 5, with the others falling on the numbers between. The last student, marked with an R, was my SPED focus student.

	Confidence teaching a friend	Confidence taking a quiz	Confidence they learned well
1	3	2	3
2	3	2	4
3	3	2	4
4	2	1	2
5	3	2	4
6	1	1	1 (written: “don’t understand nothing”)
7	3	2.5	4
8	4	4	4
9	3	2	4
10	3	4	5
11	1	1	2
12	3	2	3
13	2	2	2.5
14	4	2	5
15	3	3	3
16	4	3.5	4
17	2	3	3

18	3	3	3
19 R	1	1	1
Mean	2.68	2.32	3.24

Rate Practice Sheet

The students were all given the same worksheet with three of each type of question and asked to complete at least one of each. Each column represents a student and each row represents a type of question. The contents of the boxes show how many questions of the type the student completed correctly. If it is empty, it means the student completed 1, the expected amount. If it has an X, they completed none. If it has a +, the student completed more than 1. The first student, marked with an R, was my SPED focus student. An * denotes that the student showed no work.

	1 R	2	3	4	5	6	7	8	9	10	11	12	13	14*	15	16	17
q1		+		+	+		+	+	+			+	+	+	-		-
q2				+	+-		+	+-	+	-			+	+			-
q3				+	+-		+	-	+	-			+	+			
q4				+-			+-		+-	-			+	+			

	Q 1	Q 2	Q 3	Q 4
Total Right	23	17	16	13
Total Attempts	25	21	19	17
Percent Right	92%	81%	84.2%	76.5%

Summative Assessment

The students were given about 30 minutes to complete the summative assessment and while some finished, others only completed a couple of questions. To fairly and accurately

measure responses to each question, the chart below has information divided by question and by student. Grayed boxes show there was no attempt. White boxes show it was correct, and Xs show it was incorrect or incomplete. Questions 11 and 12 were free response questions, with 12 being labeled as extra credit, and so have an S for satisfactory or an I for incomplete or off-topic answers. The rows are students and the columns are questions. The first student, marked with an R, was my SPED focus student. The second table shows some summary statistics comparing the ratio problems to the rate problems.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
1 (R)											I	
2				X	X							
3			X									
4				X							I	
5				X								
6	X			X	X	X	X	X		X	I	I
7	X	X	X	X	X	X	X	X	X	X	I	I
8	X		X		X						I	
9					X							
10								X		X	S	
11											I	
12		X				X		X				
13	X		X		X	X						
14	X											
15	X			X		X		X		X		
16	X		X		X							
17	X		X		X	X		X				

Total right	4	14	4	7	1	1	1	1	4	1	6 I 1 S	2 I
Total tried	12	16	10	13	9	7	3	7	5	5	7	2
% right	25%	87.5%	40%	54%	11%	14%	33%	14%	80%	20%	I	I

	Ratio Problems	Rate Problems
Total Right	14	24
Total Attempts	39	48
Percent Right	35.9%	50%

Conclusions

Based on the data above, I can see that the students certainly understood the lesson on rates more than they did the lesson on ratios. This is shown both in the difference between the percentage correct on the ratio practice sheet versus the rate practice sheet but also within the summative assessment itself. I am not surprised by this as I felt the rate problems would be a little simpler and I could tell the rate lesson went more smoothly.

Also based on the above data, I can see that the students are not where I expected them to be academically and did not have the motivation to even do the assessments at a level that would show me where they truly are. There were so many unattempted questions and there were several practically blank papers that I didn't even bother to grade because they would tell me nothing except that the students do not seem to want to work hard and that they thought these assessments were too much trouble to apply themselves to them.

Because of how incomplete my data is, it is really only beneficial to myself as the teacher and not to students or parents. However, if I gave these assessments to my own students some day, then I would share the results with the students by simply passing back the graded papers. I

would probably wait to share any data with parents until I had collected a bit more over a couple weeks of work and then sent out updates or do parent conferences as needed.

Though the assessments were not completed by many, nor done well, I don't think I would change anything about them if I were giving them to my own students. I would take more time for each lesson and each problem and build up better buy-in with my students, but I wouldn't change anything about the styles of assessments. I might change the fourth question type on the ratio practice though if I kept it as a three day unit because it includes an additional step that is a little too complicated. I think that as a whole, though, the only thing I would do differently is take a week to teach this unit so that more practice and examples could be done and so that students would feel better prepared for the summative assessment and have more time to complete it.

It was difficult to gain information about the three focus students as they weren't all in there for the full time both days and I was too busy with a rather big class aside from them. An aide came in near the end of the second day and was helping Ronald, which is the one thing that would have been great to have for him the whole time. None of the EL students seemed to struggle more than their peers and all the GATE students seemed appropriately challenged for the time they were in the room. Thus, I don't think I would need to make any UDL changes, perhaps only a couple of differentiation changes based on what students I have in my class someday.

If I were continuing to teach with these same students, I would not move on from this unit. I would have slowed it down and taken more days. I would go back and reteach before moving on to another lesson.

In addition to the more general observations and conclusions, I was able to see some specific interesting cases. For example, student 9 in the ratio practice and student 11 in the self

assessment were the same. He did three and a half questions correctly, but still said he didn't get it. He was honest about the fact that he probably copied the work from the board and didn't really understand it in detail. I appreciate this because I believe he wasn't the only student in that situation. I think he may have answered this way because he thinks he should understand it more fully and still felt there were things he didn't get.

Furthermore, I noticed that though question type 3 on the ratio practice had a very low percentage of correct answers, most students did get the correct first part of the answer which was what the rate of pay should be. Thus, even though they did not get the more complex part, they were not as completely lost as the 52.4% suggests.

A third thing I noticed was that many students answered question 6 on the summative assessment with the incorrect answer of $11.25. The question asked how much Michelle spent if the 75% off coupon saved her $15. It wasn't in quite those words, but that was the idea. Basically, most students figured out 75% of $15 instead of answering what the question was actually asking. To fix this in future, I would take more time, even more days, to prepare them and give more example problems to do so that they know what questions are asking. I would also remind them throughout the test to read questions carefully. I think that students copying off of each other contributed to the problem as well, and to fix that, I would prepare them well enough beforehand to succeed on their own and then have silence in the room and walk around as they take their quiz.

In looking at all the assessments I could within the confines of my situation of borrowing a classroom of students I didn't know, I was still able to learn a lot about the students' academic level, behavior habits, and my own teaching ability and testing preferences.

Final Reflection

Developing this unit plan was not only very rewarding in the immediate satisfaction and gratification the completion of it gave, but also in the ways in which it prepared me for my future career as a teacher. It demonstrated to me the importance of aligning objectives, instruction, and assessments, and it gave me concrete ways in which to improve my ability to effectively incorporate assessments into my instructional planning.

First, creating this unit plan taught me how to successfully use alignment in my instruction. Alignment is the degree of agreement among standards, tests, curriculum, and instruction, (McMillian, 2018, pg. 98). It is important that all of these are working together and in the same direction to ensure an efficient and effective education. Working backwards from the goals to assessment to activities is a great way to achieve this and it is the process I used in the forming of this unit plan. This backwards design works well and keeps me on track, so I plan to use it in future.

Additionally, creating this unit plan showed me ways to improve how I incorporate assessments into my teaching. After all, “Despite policies and electronic grading programs that attempt to standardize assessment practices, each teacher does his or her own thing,” when it comes to giving assessments, (McMillian, 2018, pg. 23). It is my responsibility to make sure that I am teaching my students well and that they have learned what they need to. To do this, I need to use valid and reliable assessments tailored to the needs of my class. Incorporating these using the backwards design will be the best way to ensure they are fulfilling their purpose.

In conclusion, writing this Math of Money unit plan for 6th graders about ratios and rates has helped me grow as a teacher and curriculum creator. It was a positive experience and I feel that I am much more prepared to begin my career as an educator.

TEP 512 Unit Plan

Unit Plan Overview	
Teacher: Molly Hake	**Time Frame (Days, Periods, etc.)** 3 1-hour lessons given over the span of 3 weeks
Unit Title: The Math of Money	**Grade Level:** 6th Grade

Unit Rationale and Goals:

Many of the students come from lower socioeconomic class families and many don't have parents who graduated from college. They would benefit greatly and practically from learning skills involved with the daily use of money. This will help prepare them as they gain more financial autonomy and independence in decision making involving money.

STAGE 1 – DESIRED RESULTS

Subject Area/Topic and Common Core State Standards:

Math (ratios and rates and data analysis)

CA.CCSS.6.RP

1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*

3. Use ratio and rate reasoning to solve real-world and mathematical problems, *e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.*

b. Solve unit rate problems including those involving unit pricing and constant speed.

c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Unit Goals (Goals are broad, generalized statements about what is to be learned.)	**Essential Questions:**
1. Students will learn what ratios and rates are 2. Students will learn to use ratios and rates	1. How can I use math in daily life? 2. How are ratios used to compare two quantities or values? 3. How can ratios and proportional reasoning be used to solve real-world mathematical problems? 4. Why do we need to use rates and ratios?

STAGE 2 – ASSESSMENT EVIDENCE

Lesson 1	**Lesson 2**	**Lesson 3**
Identify accompanying lesson and UDL strategies (Multiple Means of Expression) The focus of this lesson will be on the understanding and identification of ratios and rates. In short, it's the basics. For UDL, information will be given through direct instruction from the teacher, through a video with captions, and through printed examples. Students will show their learning through a Kahoot, verbal answers, and written examples on personal whiteboards. **<u>Assessments</u>** **Pre-Assessment:** Problems of the Day **Formative:** Verbal Answers to Questions & Kahoot quiz again	**Identify accompanying lesson and UDL strategies (Multiple Means of Expression)** The focus of this lesson will be on the use of ratios to solve problems about fair salaries for workers who put in different hours/efforts and about budget. For UDL, information will be given through direct instruction from the teacher and through printed examples. Students will show their learning through written sentences, pair work on the board, and oral explanations. **<u>Assessments</u>** **Student Self-Assessment:** At the end, a series of questions about confidences **Formative:** Problems in pairs on the board that are explained orally.	**Identify accompanying lesson and UDL strategies (Multiple Means of Expression)** The focus of this lesson will be on the use of rates to solve problems about percent-off sales, and one to two time interest problems. For UDL, information will be given through direct instruction from the teacher and through printed examples.Students will show their learning through the written solving of problems pertaining to all three lessons, pair work on the board, and oral explanations **<u>Assessments</u>** **Summative Assessment:** Written test with 10 problems **Formative:** Problems in pairs on the board that are explained orally.

Scope and Sequence:

The scope of this unit includes understanding, recognizing, and using ratios and rates within several money situations.

The first lesson will be on the understanding and recognizing of ratios and rates and learning the mathematical terms and values and vocabulary associated with each. The second lesson will be on the use of ratios in several situations described in the section above. The third lesson will be on the use of rates in several situations described in the section above and students will take a summative assessment.

Lesson Overview

Lesson 1

Objectives:

When asked verbally, SWBAT clearly explain the concept of a ratio.

When asked verbally, SWBAT clearly explain the concept of a rate.

When asked verbally and shown a situation on the board, SWBAT use ratio language to describe a ratio relationship between two quantities.

When asked verbally and given situations in the context of ratios, SWBAT use rate language to explain what is going on

Subject-Specific Pedagogical Methods:

Pre-assessment, direct instruction of ratio material, class collaboration and cold-calling for various problems on the board and verbal questions, individual assessment with class review during the final Kahoot

Assessments

Pre-Assessment: Kahoot game
https://kahoot.it/challenge/03167985?challenge-id=4fbbc4fd-1a36-4961-bad1-e7c5db2e89d2_1706062274077

Before the lesson, students will take a 10-question Kahoot quiz that includes questions about what a ratio is and what examples of them are and what specific ratios mean/represent. Time will be taken between each question to have one student volunteer explain why they chose the correct answer. This will help draw upon their prior knowledge and gauge where the class is.

Formative: Answers to Verbal Questions

Throughout the lesson, cold-called students will correctly answer, using ratio language, questions, asked verbally by the teacher, about what a ratio is and what examples of them are and what specific ratios mean/represent.

Formative: Problems of the Day

Following the lesson, students will answer the 4 questions that are written on the board on their individual papers. These questions will be those written below. (The answers of the questions will be gone over using class collaboration and teacher guidance immediately afterwards)

1. Of the following, write down the example(s) of a ratio. (¾, 30 mph, 4:3, 2 to 5, 20%)
2. Of the following, write down the example(s) of a rate. (¾, 30 mph, 4:3, 2 to 5, 20%)
3. Is the following a ratio or a rate? (The sale took 50% off of the cost of the shirt)
4. Is the following a ratio or a rate? (Sarah worked for 5 hours and Damian worked for 3)

Lesson 2

Objectives:

When given problems on the board, in pairs, SWBAT use ratio reasoning to solve real-world and mathematical problems with 80% accuracy.
When given problems on the board, in pairs, SWBAT use ratios to determine how much to budget for two items with different costs and amounts with 90% accuracy.
When given problems on the board, in pairs, SWBAT use ratios to determine appropriate pay for work with 90% accuracy.

Subject-Specific Pedagogical Methods:

Direct instruction of material, pair work, individual work, class work, self-assessment

Assessments

Student Self-Assessment: At the end, a series of questions about confidences

Following the lesson, students will answer 3 questions (listed below) by circling one of the five faces, ranging from smiling to frowning, to show their confidence in different areas of the first two lessons.

1. How confident would you be explaining what ratios and rates are to a friend not in this class?
2. How confident would you be taking a quiz by yourself with similar questions to those of today?
3. How confident are you that you learned well what the teacher taught?

Formative: Problems in pairs on the board

At the end of the lesson, but before the self-assessment, in the open space on the board, students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them

solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The other sets of 4 will be of the same format.

1. Annabelle spends a ratio of 5 to 2 on food to paper goods when she hosts a party. If she spent $250 on food, how much would she spend on paper goods?
2. Annabelle spent $40 on paper goods. Using the ratio of 5:2 for food to paper goods, how much would she spend on food?
3. Gerald worked for 7 hours and Emily worked for 3. Paul, the one who hired them, gives them $200 for the job. How much should each of them get?
4. Paul hires Gerald and Emily for a job that takes 16 hours of work. He is paying them $300. If Gerald and Emily work for hours at a ratio of 1:3, how much should each of them get paid?

Lesson 3

Objectives:

SWBAT use rate reasoning to solve real-world and mathematical problems with 90% accuracy.
SWBAT solve unit rate problems including those involving unit pricing with 90% accuracy.
SWBAT find a percent of a quantity as a rate per 100 with 90% accuracy.
SWBAT solve problems involving finding the whole, given a part and the percent with 90% accuracy.

Subject-Specific Pedagogical Methods:

Direct instruction of material, pair work, individual work, class work

Assessments

Summative Assessment: Written test with 10 problems and a short answer to the first EQ

Following the lesson, students will correctly answer 8 of the ten questions involving the use of ratios and rates. The questions will be of the same format as those in the formative assessments of lessons 2 and 3. Students will also individually write a few sentences responding to the question, “How can I use math in daily life?” with at least three examples addressed in the first two lessons.

Formative: Problems in pairs on the board

At the end of the lesson, but before the summative assessment, in the open space on the board, students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The other sets of 4 will be of the same format.

1. If each banana costs $0.50, then how much would 6 bananas cost?
2. If the $40 jeans are 20% off, how much do they cost?

3. The 30% off coupon saved Michelle $6. How much did she spend?
4. The sales tax is 10%. With tax, how much is the $35 sweatshirt?

Teach Strategically (Instructional Strategies)

Direct teaching, guiding questions, students teaching students, and making real-life connections are all crucial instructional strategies in this unit.

Resources, Materials & Technology used by students in this unit plan:

Kahoot link (https://kahoot.it/challenge/03167985?challenge-id=4fbbc4fd-1a36-4961-bad1-e7c5db2e89d2_1706062274077)
Chromebooks
Class TV
Classroom whiteboard and markers
Videos and paper assignments (attached below)

The Ratio and Fraction song. (Stereo Hearts) Remix - Math Song
Math Antics - Ratios And Rates
The Math of Money Unit Lesson 2 Worksheet
The Math of Money Unit Lesson 3 Worksheet
The Math of Money Unit Summative Assessment

Reflections

Analyze for Learning Difficulties

EL: Kade gets frustrated easily because of his difficulty in understanding language, but he will persist with encouragement. He needs extra time to think and works best when things are organized, clear, and in context. He sees math as his strength, though he is good at other subjects as well. He is helped by sentence frames, but doesn't always ask for them when he needs them.

SPED: Ronald's strength is in whatever he chooses to spend his time on. He distracts the class often, but they haven't given up on him. Other students try to support him, but he is often resistant or argumentative. One of his parents encourages his behavior and even shows signs of the same challenges he faces. He does read well and is aware of what is going on. He thinks he doesn't have to do what is expected of him and this is supported in one of his homes. Custody plays a big part in his compliance. He is supported outside the classroom once per week.

GATE: Gerald excels in math in addition to other academic areas. He comes from a single parent home and does after-school sports. He has accommodations to be able to do different work and to do the work in different ways. He thinks his strength is in reading, but he is at least one grade level above in math. In fact, this student is a 5th grader who joins the 6th grade class for the math hour. He needs to be challenged, but without getting too much work.

Reach Enhancement Decisions

EL: To help Kade, I will give him sentence frames for the tasks that would require them and I will make sure to give him the guidance he needs to break down work problems into manageable number problems that he can then solve on his own.

SPED: To support Ronald, I need to watch him and help keep him on task. I should also enlist the help of his table group to get him to participate with them. This will be by giving tasks that everyone in the group must finish correctly in order to "compete" with the other groups.

GATE: To help Gerald, I need to provide opportunities to do more challenging problems or take problems deeper. I should listen to his ideas of how to solve things that may be a little different than how I am teaching it. I don't want to fall to the common practice of just giving more work. Asking him to help out his peers could be beneficial as well.

Post-teaching Reflection

Overall, the process went well, but the material was too difficult for how far behind the majority of the students are for their grade level. See the fieldwork reflections above for the more complete reflection on the teaching of these lessons.

The Math of Money Unit Plan

Lesson #1: Understanding Ratios and Rates

GENERAL PLAN

Academic Content Standard(s):	6th grade Math **CA.CCSS.6.RP** **1.** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* **2.** Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3*

	cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
ELD Standard(s):	**Part 1. C. 12.** Selecting and applying varied and precise vocabulary and language structures to effectively convey ideas
Lesson Objectives:	**Content Objective** When asked verbally, SWBAT clearly explain the concept of a ratio. When asked verbally, SWBAT clearly explain the concept of a rate. When given examples, SWBAT differentiate between ratios and rates. When asked verbally or shown a situation in writing, SWBAT identify whether it is an example of a ratio or a rate.
	Language (ELD) Objective When asked questions, students will be able to explain ratios and rates clearly using correct vocabulary.

Assessments	**Diagnostic *(self-created)*** Kahoot Game https://create.kahoot.it/details/b078fba2-0826-4e3c-990c-1c9cec8d68a7 Before the lesson, students will take a 10-question Kahoot quiz that includes questions about what a ratio is and what examples of them are and what specific ratios mean/represent. Time will be taken between each question to have one student volunteer explain why they chose the correct answer. This will help draw upon their prior knowledge and gauge where the class is. *Accommodation/modification for three focus students:* For Kade, the teacher will read the questions aloud as well as have them on the screen to help him understand. Most have pictures that will help as well. For Ronald, the game and technology aspects of this should keep him focused and there is no pressure involved to do well. For Gerald, the questions are generally tricky enough, but speed is part of the game as well, so he should be engaged. **Formative *(self-created)*** **Answers to Verbal Questions** Throughout the lesson, cold-called students will correctly answer, using ratio language, questions, asked verbally by the teacher, about what a ratio is and what examples of them are and what specific ratios mean/represent. *Accommodation/modification for three focus students:* For Kade, ask questions with simple language and put the number information on the board for him to see. For Ronald, ask questions that he can get correct so that he can gain confidence.

	For Gerald, ask one-step-deeper questions that follow another student's question/answer. These may include special cases or slightly changed circumstances of scenario for the question. **Problems of the Day *(self-created)*** Following the lesson, students will answer the 4 questions that are written on the board on their individual papers. These questions will be those written below. (The answers of the questions will be gone over using class collaboration and teacher guidance immediately afterwards) ● Of the following, write down the example(s) of a ratio. (¾, 30 mph, 4:3, 2 to 5, 20%) ● Of the following, write down the example(s) of a rate. (¾, 30 mph, 4:3, 2 to 5, 20%) ● Is the following a ratio or a rate? (The tax added 10% off of the cost to the shirt) ● Is the following a ratio or a rate? (Sarah worked for 8 hours and Damian worked for 3) *Accommodation/modification for three focus students:* For Kade, read aloud the problems as well as write them on the board. For Ronald, check in often and allow him to ask for help from his peers. For Gerald, ask him to help his peers when he is done.
Lesson Summary:	This is the first lesson in the unit on the Math of Money (ratios and rates). The students have already been doing some work with ratios and rates, but not commonly within the area of money.
Time Allotment and Context:	1 hour lesson

IMPLEMENTATION

Instructions	Teacher Activity	Student Activity	UDL/ Accommodations Modification
Learning Context and Anticipatory Set/Engagement Time: 5 min	Talk about how in this unit they are going to be learning more about ratios and rates and how to use them, particularly when it comes to money, which is something we use everyday. Show the Kahoot on the TV and warn them that some of the questions will be tricky, but just try your best and we'll learn more about ratios and rates afterwards. https://create.kahoot.it/details/b078fba2-0826-4e3c-990c-1c9cec8d68a7	Students will take the Kahoot and in between each answer, a student who got it correct will explain how they got their answer.	For Kade, the teacher will read the questions aloud as well as have them on the screen to help him understand. Most have pictures that will help as well. For Ronald, the game and technology aspects of this should keep him focused and there is no pressure involved to do well. For Gerald, the questions are generally tricky enough, but speed is part of the game as well, so he should be engaged.
Input (Verbal) Time: 20 min	First play the following song to give students an overview of the vocabulary. The Ratio and Fraction song, (Stereo Hearts) Remix - Math Song Next, play the following video to explain ratios and rates in the general sense. Math Antics - Ratios And Rates (9 min) Highlight the following	Students will watch closely. Notes are not preferred as for math it works better if full attention is given to learning first and later to remembering.	For Kade, the math antics video has captions. Write the vocab words on the board. For Ronald, the video is a lot more engaging and so should keep him on task. For Gerald, the video has several instances of going deeper just briefly and so he will still learn from it.

	- Fractions are part of a whole - Ratios compare values - Proportions are equal ratios - Rates are ratios with time - Unit rates have one unit of time		
Modeling (I do: Teacher) Time: 10 minutes	Take the information from the videos and show how that relates to problems and situations about money. Model and think aloud for the following four problems. ● Write some examples of ratios. ● Write some examples of rates. ● Is the following a ratio or a rate? (The sale took 30% off of the cost of the backpack) ● Is the following a ratio or a rate? (Emily worked for 3 hours and Dan worked for 2)	Students will watch closely	For all students, watch and pay close attention to how they are responding to your information. Make adjustments as you go.

Guided Practice (We do: Teacher and Students) Time: 15 minutes	Cold-called students and verbally ask questions about what a ratio is and what examples of them are and what specific ratios mean/represent. Only ask for one part of the answer or one step or piece of information that can be used to find the answer. Or give them some of the steps and pieces and ask them to make the connection.	Students will correctly answer, using ratio language, the questions the teacher asks.	For Kade, ask questions with simple language and put the number information on the board for him to see. For Ronald, ask questions that he can get correct so that he can gain confidence. For Gerald, ask one-step-deeper questions that follow another student's question/answer. These may include special cases or slightly changed circumstances of scenario for the question.
Independent Practice (You do: Students) Time: 20 minutes	Put the following questions on the board. ● Of the following, write down the example(s) of a ratio. (¾, 30 mph, 4:3, 2 to 5, 20%) ● Of the following, write down the example(s) of a rate. (¾, 30 mph, 4:3, 2 to 5, 20%) ● Is the following a ratio or a rate? (The sale took 50% off of the cost of the shirt) ● Is the following a ratio or a rate? (Sarah worked for 5 hours and Damian worked for 3)	Students will answer the 4 questions that are written on the board on their individual papers.	For Kade, read aloud the problems as well as write them on the board. For Ronald, check in often and allow him to ask for help from his peers. For Gerald, ask him to help his peers when he is done.

	After the students are done, go over the answers with their help and answer questions.		
Closure Time: 5 minutes	Summarize the main points of the day: - Fractions are part of a whole - Ratios compare values - Proportions are equal ratios - Rates are ratios with time - Unit rates have one unit of time Tell them that the next day they will learn about how to use ratios for money.	Students will listen closely	(Not necessary)
Student Grouping	Students will sit in their usual table groups of 10 for most of the lesson during which the class works all together. This means Kade and Ronald will be at the same table, but not next to each other. Gerald will be with the other 5th grade gate students at their own table. The students will work individually for the problems of the day.		
Academic Language Addressed	Ratio, rate, fraction, proportion, percent, dollar		
Materials/ Technology Resources	Class TV, Chromebooks, Whiteboard and markers		

The Math of Money Unit Plan

Lesson #2: Using Ratios

GENERAL PLAN

Academic Content Standard(s):	6th grade Math **3.** Use ratio and rate reasoning to solve real-world and mathematical problems, *e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.*
ELD Standard(s):	**Part 1. A. 1.** Exchanging information and ideas with others through oral collaborative discussions on a range of social and academic topics **Part 1. C. 12.** Selecting and applying varied and precise vocabulary and language structures to effectively convey ideas
Lesson Objectives:	**Content Objective** When given problems on the board, in pairs, SWBAT use ratio reasoning to solve real-world and mathematical problems with 80% accuracy. When given problems on the board, in pairs, SWBAT use ratios to determine how much to budget for two items with different costs and amounts with 90% accuracy. When given problems on the board, in pairs, SWBAT use ratios to determine appropriate pay for work with 90% accuracy.
	Language (ELD) Objective When given a problem, students will be able to collaborate with a partner and exchange ideas to solve the problem with 90% accuracy.

	After having time to collaborate and prepare, students will be able to orally explain their work on the board to the class with clarity and correct vocabulary.
Assessments	**Formative *(self-created)*** At the end of the lesson, but before the self-assessment, in the open space on the board, students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The other sets of 4 will be of the same format. ● Annabelle spends a ratio of 5 to 2 on food to paper goods when she hosts a party. If she spent $250 on food, how much would she spend on paper goods? ● Annabelle spent $40 on paper goods. Using the ratio of 5:2 for food to paper goods, how much would she spend on food? ● Gerald worked for 7 hours and Emily worked for 3. Paul, the one who hired them, gives them $200 for the job. How much should each of them get? ● Paul hires Gerald and Emily for a job that takes 16 hours of work. He is paying them $300. If Gerald and Emily work for hours at a ratio of 1:3, how much should each of them get paid? *Accommodation/modification for three focus students:* For Kade, having a partner who can help translate as necessary would be great. For Ronald, having a partner will help him learn how to do it, but since he will either have to write or explain, he will still be held accountable.

	For Gerald, he can be assigned to explain the more complicated or longer problem. **Student-self assessment *(self-created)*** Following the lesson, students will answer 3 questions (listed below) by circling one of the five faces, ranging from smiling to frowning, to show their confidence in different areas of the first two lessons. https://docs.google.com/document/d/1HY1eIv2Psr046F4iYk_tiLDHhuanl3ELyF9fFaZ_kvg/edit?usp=sharing ☐ How confident would you be explaining what ratios and rates are to a friend not in this class? ☐ How confident would you be taking a quiz by yourself with similar questions to those of today? ☐ How confident are you that you learned well what the teacher taught? *Accommodation/modification for three focus students:* For Kade, read the questions aloud as well as give him the paper. For Ronald, entice him to participate by saying it is a chance for him to send you a special message about how he is doing. For Gerald, allow him to make written comments explaining his answers if he so chooses.
Lesson Summary:	This is the second lesson in the unit on the Math of Money (ratios and rates). The students have already been doing some work with ratios and rates and will have been taught those concepts thoroughly.
Time Allotment and Context:	1.25 hour lesson

IMPLEMENTATION

Instructions	Teacher Activity	Student Activity	UDL/ Accommodations Modification
Learning Context and Anticipatory Set/Engagement Time: 5 minutes	Ask the students what they learned in the previous lesson to prime prior knowledge. Use guiding questions as needed. Write examples of ratios on the board to review from the previous day.	Students will express to the teacher and their peers what they remember from the previous lesson.	(Not necessary)
Input (Verbal) Time: 10 minutes	Give examples of what the ratios on the board might represent. Give scenarios that involve some piece of missing information that may need to be found using the ratio. Show the students how to find the missing information. This will follow a similar format to the questions in the other portions of the lesson so use those as a guide.	Students will listen and watch closely, asking questions as needed.	For all students, watch and pay close attention to how they are responding to your information. Make adjustments as you go to make things clearer. Allow time for students to help explain to each other to fill in gaps and to cement what they learned.
Modeling (I do: Teacher) Time: 5 minutes	Write and solve, with thinking aloud, example problems according to the format of those in the independent practice.	Students will listen and watch closely, asking questions as needed.	For all students, watch and pay close attention to how they are responding to your information. Make adjustments as you go.

Guided Practice (We do: Teacher and Students) Time: 10 minutes	Write example problems according to the format of those in the independent practice, one at a time.	Students will help the teacher complete each step by answering the specific questions the teacher has for how she is to solve each problem. This may start as voluntary and move to cold-calling.	Make clarifications, say things in different ways, and ask guiding questions to help Kade and Ronald. Ask deeper questions to challenge Gerald.
Independent Practice (You do: Students) Time: 30 minutes	Give students a sheet of these problems as well as 2 other sets of parallel problems. ● Annabelle spends a ratio of 5 to 2 on food to paper goods when she hosts a party. If she spent $250 on food, how much would she spend on paper goods? ● Annabelle spent $40 on paper goods. Using the ratio of 5:2 for food to paper goods, how much would she spend on food? ● Gerald worked for 7 hours and Emily worked for 3. Paul, the one who hired them, gives them $200 for the job. How	Students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The other sets of 4 will be of the same format.	For Kade, having a partner who can help translate as necessary would be great. For Ronald, having a partner will help him learn how to do it, but since he will either have to write or explain, he will still be held accountable. For Gerald, he can be assigned to explain the more complicated or longer problem.

	much should each of them get? ● Paul hires Gerald and Emily for a job that takes 16 hours of work. He is paying them $300. If Gerald and Emily work for hours at a ratio of 1:3, how much should each of them get paid? Observe and answer questions as needed. Facilitate the movement of students and the oral explanations, giving correction when needed.		
Student Self-Assessment Time: 5 minutes	Give students the following questions on a piece of paper with 5 faces, ranging from smiling to frowning, below each. ☐ How confident would you be explaining what ratios and rates are to a friend not in this class? ☐ How confident would you be taking a quiz by yourself with similar questions to those of today? ☐ How confident are you that you learned well what	Following the lesson, students will answer 3 questions (listed below) by circling one of the five faces, ranging from smiling to frowning, to show their confidence in different areas of the first two lessons.	For Kade, read the questions aloud as well as give him the paper. For Ronald, entice him to participate by saying it is a chance for him to send you a special message about how he is doing. For Gerald, allow him to make written comments explaining his answers if he so chooses.

	the teacher taught?		
Closure Time: 5 minutes	Summarize the main points of the day: - Ratios compare values. - We can use ratios with totals to find the amount of each part. - We can use ratios to find fair costs and payments. Tell them that the next day they will learn about how to use rates for money.	Students will listen closely	(Not necessary)
Student Grouping	Students will sit in their usual table groups of 10 for most of the lesson during which the class works all together. This means Kade and Ronald will be at the same table, but not next to each other. Gerald will be with the other 5th grade gate students at their own table. The students will work in pairs for the problems on the board so that they can help each other. They will work individually for the self-assessment so they can take time for personal reflection.		
Academic Language Addressed	Ratio, rate, fraction, proportion, percent, dollar		
Materials/ Technology Resources	White board and several markers Self-Assessment sheet: https://docs.google.com/document/d/1HY1eIv2Psr046F4iYk_tiLDHhuanl3ELyF9fFaZ_kvg/edit?usp=sharing Independent practice sheet: https://docs.google.com/document/d/1X5dwgns6rrpOJjLNk37CDSMXg4g6XXkC8U6OPLzwaAE/edit?usp=sharing		

The Math of Money Unit Plan

Lesson #3: Using Rates

GENERAL PLAN

Academic Content Standard(s):	6th grade Math **3.** Use ratio and rate reasoning to solve real-world and mathematical problems, *e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.* **b.** Solve unit rate problems including those involving unit pricing and constant speed. **c.** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
ELD Standard(s):	**Part 1. A. 1.** Exchanging information and ideas with others through oral collaborative discussions on a range of social and academic topics **Part 1. C. 12.** Selecting and applying varied and precise vocabulary and language structures to effectively convey ideas
Lesson Objectives:	**Content Objective** SWBAT use rate reasoning to solve real-world and mathematical problems with 90% accuracy. SWBAT solve unit rate problems including those involving unit pricing with 90% accuracy. SWBAT find a percent of a quantity as a rate per 100 with 90% accuracy. SWBAT solve problems involving finding the whole, given a part and the percent with 90% accuracy.

	Language (ELD) Objective When given a problem, students will be able to collaborate with a partner and exchange ideas to solve the problem with 90% accuracy. After having time to collaborate and prepare, students will be able to orally explain their work on the board to the class with clarity and correct vocabulary.
Assessments	**Formative *(self-created)*** In the open space on the board, students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The other sets of 4 will be of the same format. ● If each banana costs $0.50, then how much would 6 bananas cost? ● If the $40 jeans are 20% off, how much do they cost? ● The 30% off coupon saved Michelle $6. How much did she spend? ● The sales tax is 10%. With tax, how much is the $35 sweatshirt? *Accommodation/modification for three focus students:* For Kade, having a partner who can help translate as necessary would be great. For Ronald, having a partner will help him learn how to do it, but since he will either have to write or explain, he will still be held accountable.

	For Gerald, he can be assigned to explain the more complicated or longer problem. **Summative *(self-created)*** Following the lesson, students will correctly answer 8 of the ten questions involving the use of ratios and rates. The questions will be of the same format as those in the formative assessments of lessons 2 and 3. Students will also individually write a few sentences responding to the question, "How can I use math in daily life?" with at least three examples addressed in the first two lessons. *Accommodation/modification for three focus students:* For Kade, allow him to use google translate or a trustworthy peer to make sense of any word problems he doesn't get. Also accept bullet point answers for the written problem. For Ronald, every few minutes, check in and make sure he is on task and give gentle reminders as needed. For Gerald, offer an extra credit task at the end of providing an instance in which he used ratios or rates in real life in the last week.
Lesson Summary:	This is the second lesson in the unit on the Math of Money (ratios and rates). The students have already learned the concepts of ratios and rates and will have learned how to use ratios. They will be taking a summative assessment for the unit following this lesson.
Time Allotment and Context:	1.5 hour lesson

IMPLEMENTATION

Instructions	Teacher Activity	Student Activity	UDL/ Accommodations Modification
Learning Context and Anticipatory Set/Engagement Time: 5 minutes	Ask the students what they learned in the previous lesson to prime prior knowledge. Use guiding questions as needed. Write examples of rates on the board to review from the first lesson.	Students will express to the teacher and their peers what they remember from the previous lesson.	(Not necessary)
Input (Verbal) Time: 10 minutes	Give examples of what the rates on the board might represent. Give scenarios that involve some piece of missing information that may need to be found using the rates. Show the students how to find the missing information. This will follow a similar format to the questions in the other portions of the lesson so use those as a guide.	Students will listen and watch closely, asking questions as needed.	For all students, watch and pay close attention to how they are responding to your information. Make adjustments as you go to make things clearer. Allow time for students to help explain to each other to fill in gaps and to cement what they learned.
Modeling (I do: Teacher) Time: 5 minutes	Write and solve, with thinking aloud, example problems according to the format of those in the independent practice.	Students will listen and watch closely, asking questions as needed.	For all students, watch and pay close attention to how they are responding to your information. Make adjustments as you go.

Guided Practice (We do: Teacher and Students) Time: 10 minutes	Write example problems according to the format of those in the independent practice, one at a time.	Students will help the teacher complete each step by answering the specific questions the teacher has for how she is to solve each problem. This may start as voluntary and move to cold-calling.	Make clarifications, say things in different ways, and ask guiding questions to help Kade and Ronald. Ask deeper questions to challenge Gerald.
Independent Practice (You do: Students) Time: 30 minutes	Give students a sheet of these problems as well as 2 other sets of parallel problems. ● If each banana costs $0.50, then how much would 6 bananas cost? ● If the $40 jeans are 20% off, how much do they cost? ● The 30% off coupon saved Michelle $6. How much did she spend? ● The sales tax is 10%. With tax, how much is the $35 sweatshirt? Observe and answer questions as needed. Facilitate the movement of students and the oral explanations, giving correction when needed.	In the open space on the board, students will come up in pairs to do four questions, one question per pair. Those still in their seats will do the problems on paper. The problems will be from a paper and the students at the board will simply re-write and show their work. One of the two students will do the writing on the board and the other will help them solve it. Once all students are done, they will sit down and the students who helped with the problems will explain verbally to the whole class what they did. This process will be continued for another 2 sets of 4 problems so that 24 students will be able to have a chance to work on the board. Some of the problems are below. The	For Kade, having a partner who can help translate as necessary would be great. For Ronald, having a partner will help him learn how to do it, but since he will either have to write or explain, he will still be held accountable. For Gerald, he can be assigned to explain the more complicated or longer problem.

		other sets of 4 will be of the same format.	
Summative Assessment . Time: 20 minutes	Give the students the attached worksheet of 10 summative problems and the question “How can I use math in daily life?” at the end. (For the written part, the rubric/instructions are imbedded and ask for 3 specific examples from what was discussed in class)	Students will correctly answer 8 of the 10 questions involving the use of ratios and rates. The questions will be of the same format as those in the formative assessments of lessons 2 and 3. Students will also individually write a few sentences responding to the question, “How can I use math in daily life?” with at least three examples addressed in the first two lessons.	For Kade, allow him to use google translate or a trustworthy peer to make sense of any word problems he doesn’t get. Also accept bullet point answers for the written problem. For Ronald, every few minutes, check in and make sure he is on task and give gentle reminders as needed. For Gerald, offer an extra credit task at the end of providing an instance in which he used ratios or rates in real life in the last week.
Closure Time: 5 minutes	Summarize the main points of the unit: - Ratios compare values - Rates are ratios with time - Unit rates are rates with one unit of time - We can use ratios with totals to find the amount of each part. - We can use ratios to find fair costs and payments.	Students will listen closely	(Not necessary)

	- We can use rates to find sale and tax amounts. Tell them that they will now be able to use ratios and rates with money any day.		
Student Grouping	Students will sit in their usual table groups of 10 for most of the lesson during which the class works all together. This means Kade and Ronald will be at the same table, but not next to each other. Gerald will be with the other 5th grade gate students at their own table. The students will work in pairs for the problems on the board so that they can help each other. They will work individually for the summative assessment so the teacher can measure understanding more reliably.		
Academic Language Addressed	Ratio, rate, fraction, proportion, percent, dollar		
Materials/ Technology Resources	Independent practice sheet: https://docs.google.com/document/d/1Re_UZvpbeVbd9AVQNWRuNoi8U9JqmNKPcrTq3vVrvX0/edit?usp=sharing Summative assessment worksheet: https://docs.google.com/document/d/1mOLCw4wa7vcGfr_XTf46h85w3bUH6VK_C1AWjcXFYu8/edit?usp=sharing		

Appendix A

Using Ratios Practice

Problem Set #1

1. Annabelle spends a ratio of 5 to 2 on food to paper goods when she hosts a party. If she spent $250 on food, how much would she spend on paper goods?

2. Annabelle spent $40 on paper goods. Using the ratio of 5:2 for food to paper goods, how much would she spend on food?

3. Gerald worked for 7 hours and Emily worked for 3. Paul, the one who hired them, gives them $200 for the job. How much should each of them get? (Hint: find the unit rate which is how much he pays per hour)

4. Paul hires Gerald and Emily for a job that takes 15 hours of work. He is paying them $300. If Gerald and Emily work for hours at a ratio of 1:4, how much should each of them get paid?

Problem Set #2

5. Himena spends a ratio of 3 to 5 on school supplies to books. If she spent $150 on school supplies, how much would she spend on books?

6. Himena spent $50 on books. Using the ratio of 3:5 for school supplies to books, how much would she spend on school supplies?

7. Joseph worked for 6 hours and Ella worked for 9. Sam, the one who hired them, gives them $300 for the job. How much should each of them get? (Hint: find the unit rate which is how much he pays per hour)

8. Nick hires Alyssa and Hannah for a job that takes 12 hours of work. He is paying them $360. If Gerald and Emily work for hours at a ratio of 1:5, how much should each of them get paid?

Problem Set #3

9. Sami spends a ratio of 3 to 2 on donuts to milk. If she spent $150 on donuts, how much would she spend on milk?

10. Sami spent $30 on milk. Using the ratio of 3:2 for donuts to milk, how much would she spend on donuts?

11. Jonathan worked for 2 hours and Emily worked for 1. Paul, the one who hired them, gives them $45 for the job. How much should each of them get?

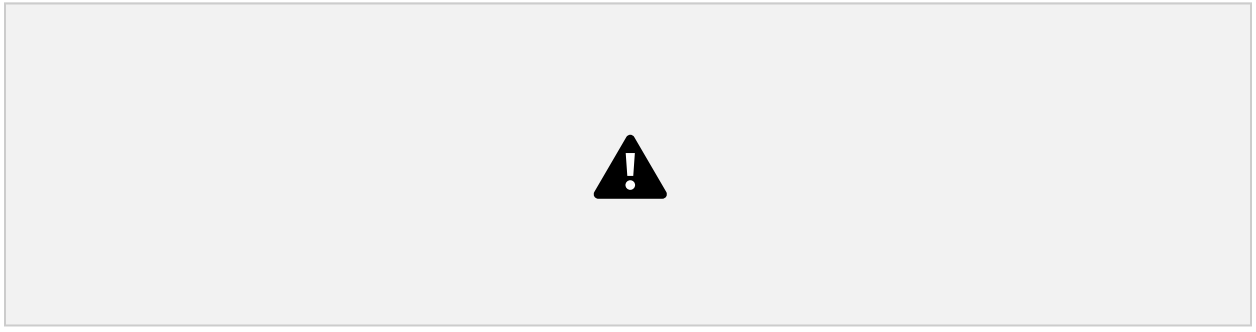
12. Mary hires Nate and Josh for a job that takes 5 hours of work. She is paying them $100. If Nate and Josh work for hours at a ratio of 2:3, how much should each of them get paid?

Let’s Check How We Are Doing!

1. How confident would you be explaining what ratios and rates are to a friend not in this class?

2. How confident would you be taking a quiz by yourself with similar questions to those of today?

3. How confident are you that you learned well what the teacher taught?



Using Rates Practice

Problem Set #1

1. If each banana costs $0.50, then how much would 6 bananas cost?

2. If the $40 jeans are 20% off, how much do they cost?

3. The 30% off coupon saved Michelle $6. How much did she spend?

4. The sales tax is 10%. With tax, how much is the $35 sweatshirt?

Problem Set #2

5. If each orange costs $0.20, then how much would 5 oranges cost?

6. If the $30 shorts are 30% off, how much do they cost?

7. The 20% off coupon saved Sam $6. How much did he spend?

8. The sales tax is 10%. With tax, how much is the $65 vacuum?

Problem Set #3

9. If each apple costs $0.70, then how much would 2 apples cost?

10. If the $35 sweater is 10% off, how much does it cost?

11. The 50% off coupon saved Blake $17. How much did he spend?

12. The sales tax is 10%. With tax, how much is the $50 hoodie?

The Math of Money Quiz

1. Kennedy spends a ratio of 7 to 1 on soda to cups when she hosts a party. If she spent $140 on soda, how much would she spend on cups?

2. If each mango costs $0.80, then how much would 10 mangos cost?

3. Kennedy spent $5 on cups. Using the ratio of 7:1 for soda to cups, how much would she spend on soda?

4. If the $10 hat is 30% off, how much does it cost?

5. Catherine worked for 4 hours and Sebastian worked for 4. Paul, the one who hired them, gives them $160 for the job. How much should each of them get? (Hint: find the unit rate which is how much he pays per hour)

6. The 75% off coupon saved Michelle $15. How much did she spend?

7. Ezra hires Catherine and Sebastian for a job that takes 10 hours of work. He is paying them $300. If Catherine and Sebastian work for hours at a ratio of 6:4, how much should each of them get paid? (Hint: find the unit rate which is how much he pays per hour)

8. The tax is 10%. With tax, how much is the $33 jacket?

Tricky Questions (Read Carefully!)

9. Jeremy pays his workers $15 per hour. Michael worked for 4 hours and Margret worked for 6 hours. How much did Jeremy pay in total?

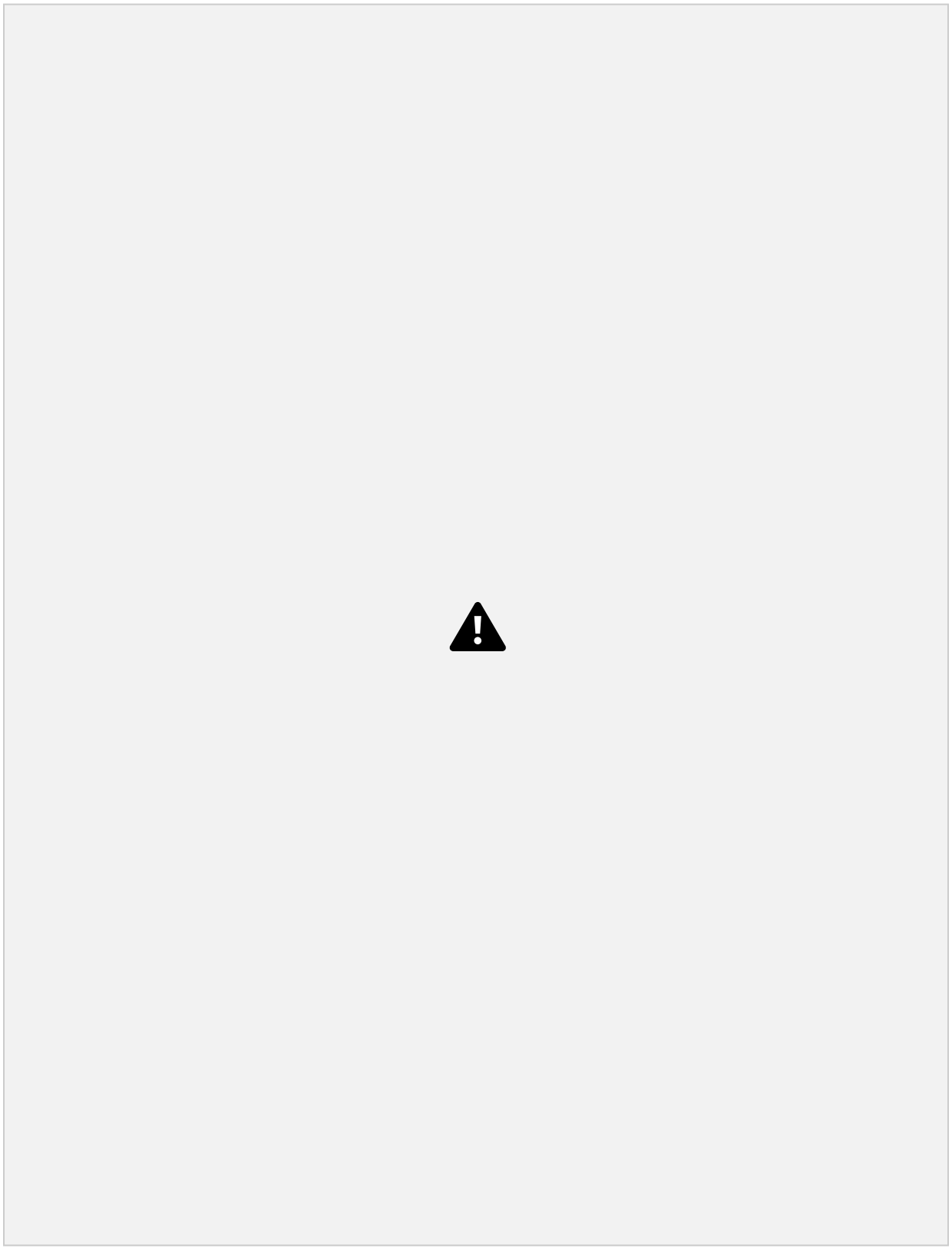
10. The 25% off coupon saved Daisy $15 dollars. How much was the original price?

Written Response

11. How can you use math in real life? (Rubric: Show me what you've learned by giving 2-3 specific examples of things we have talked about in class)

12. EXTRA CREDIT: How have you used ratios and rates in the last week outside of class? (Rubric: Show me what you've learned by giving 2-3 specific examples)

Appendix B
Student Work Examples



References

McMillan, J. (2018). *Classroom assessment: Principles and practice that enhance student learning and motivation* (7th ed.), Pearson.