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InTASC Standard 7 Reflection

Abstract: This reflection and lesson plan is about a three day mini-unit on connecting surface area and proportional relationships. The students use small group work to find how much money it would cost if they were to tile their classroom floor and walls with coins from a certain country. The student groups each research a different country, and then the groups present their findings on the cheapest coin to use. This document is about how the lesson is engaging, relatable, and worthwhile for students to learn. It also discusses the different types of differentiation used and how the unit relates to other things, such as technology and reading. In my future classroom, I would love to use lessons such as this to connect concepts using real life situations that students can relate to, to help them understand how this math is important and strengthen their learning.

Rationale: This lesson is well detailed with student answers, questions to be asked, specific instruction, and more. Each section has preparation notes, instructions, and questions I can ask the students to guide them or challenge them. These instructions are detailed and specific so that students know exactly what they are doing, and the inquiries make the students think deeper about the topics to reveal relational understanding.

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This unit lesson has many elements that show support for all students through instruction and differentiation. Specifically, the mini-unit is supportive for all learners in that there is room for student choice for many parts, and the content and work is also chunked for students that may get overwhelmed. This unit is centered on students using surface area and proportions to tile their classroom with coins. Using their particular classroom engages the students, and the students rely on technology and reading. The mini-unit lasts three days, so the students feel more accomplished and it relates to the real world while learning and reviewing math content.

Differentiation is used in these lessons to help students stay on task, allow students to feel more included in production, and provide the opportunity for all students to participate in the classroom. A main element used in the lesson is the use of a timer. At most steps, a timer is used to let students know how much time they have to complete a part of the project, and how much time they have left once they've started. At each interval, students are instructed that they should be done the task for that day, so the class can move on. This differentiation piece is helpful for students to stay on task, as they have a limited time to get parts of the project done, and also chunk the work so that students do not get overwhelmed by the amount of work to be done. In general, this can be used in response to a specific student who might get overwhelmed easily, but also for all students in the classroom because projects can be difficult and students need instruction to complete certain parts. It is also excellent to keep students on task because they understand that they should have most of their assigned work completed by the time the timer beeps.

Another piece of differentiation that is in multiple places during this unit is the use of choice. On the first day of the unit, students are put into groups and allowed to choose what medium of presentation they would like. They are instructed to choose from 3, or if they wish to use another method to have it approved. The options are given as a poster, PowerPoint or Prezi, but if students wish to use another medium of presentation they are welcome to. This allows to all students to be creative in their presentation of findings. If there are students in the class that need to write they can do a poster; if there is a student that learns better with a certain art- type presentation, they could use that if the teacher allows. If wished teachers can go even further and allow skits, response letters with oral presentation, or any other type of presentation to allow different learners such as kinetic or linguistic learners to represent. Another choice in this mini-unit is the choice of country, from a list of countries projected on the board. I picked countries from various parts of the world so that students that might be interested in those regions would have an interest in those countries. It also allowed me to do the work ahead of time, so I could plan out countries that have comparable coins. At this point in the lesson I instruct the students to choose from the projected countries, so they feel more engaged in the project because they are a part of the production.

All students want to participate in class one way or another. While not all students like to participate in front of the entire class, every student deserves the opportunity to contribute their thoughts to a lesson. Small group differentiation in this mini-unit is heavy. The students are grouped into 3s so that no one student is a leader, and all students have the opportunity to add what they know to the choice in presentation, choice in country, finding information, solving proportions and surface area, and much more. Each student has something to give to their group to make the presentation unique, and small groups are a fantastic way to do so. Individual

projects do not allow students to interact with one another, while in these small groups students learn how to problem solve with other people like they will one day as an adult. There may be some students who prefer individual work, and to differentiate for them the teacher can assign the student a group to themselves if need be or assign the student to a group that will respect and use that students contributions. If need be, the student can have the option of coming to the teacher later in the class period to start an individual project instead. For other students, small groups are a great way to be with friends during class and that is when the timer comes into play to keep the group on task and working while still allowing students to have fun.

During this unit, students review surface area and proportional relationships, and combine the two to figure out how much money it would cost to tile the classroom walls and floor with certain coins. In order to do this, students need to know the concept and formula for surface area, which is content in 6th grade math (CCSS.MATH.CONTENT.6.EE.A.2.C) and how to solve proportional relationships in multiple ways (CCSS.MATH.CONTENT.6.RP.A.3). Surface area is an algebraic and geometric concept, whereas proportional relationships are a solo topic in Common Core. It is also important that the students read carefully and are able to summarize, paraphrase, and problem solve. The lessons have many parts that require students to read word problems carefully, use technology efficiently, and present information. Reading is an inter-disciplinary skill, and using technology is as well. Students find information online about their coin, and they need to know how to search efficiently and find reliable resources.

Problem and project based learning allows students to delve deeper into real life related math problems, which helps them understand both the math concepts and real life situations. This problem based lesson over the span of three days lets students strengthen their comprehension of the two topics involved, ratios and surface area, and piqued their interest in the

content. As a teacher, being able to adapt each lesson depending on the previous day is important for lessons that span more than one day; the students have an idea what the next lesson will be and the teacher verifies that students have solidified their knowledge. In this case, the mini-unit was review for both topics, but relating them together was something the students had not done before. It allowed them to reason through solving the driving question and developed their problem solving skills. This review reinforced the math, and reminded the students of the conceptual understanding of surface area. When I observed the classroom the first time, the students did an activity on surface area and my partner and I found that many of the students did not have a conceptual understanding of surface area; they only knew the formula, not what surface area represents. This project helped them describe and apply what they learned into a situation that related to them personally as it was their classroom, and connected their new relational understanding to another curriculum concept. The project also solidified ratios and proportional relationships for the students; they came up with multiple ways of solving that I had never been taught and by introducing those methods to their classmates, they were reminded of the various ways to solve and reason around proportions. The project overall was a good experience for students to connect concepts and relate those concepts to the world around them.

This project lesson was directly related to the classroom that the students learn in, and part of the project was that students had to measure and find the surface area of their classroom. This engaged them and they had an interesting time measuring the walls and floor. At the end of the unit, the extension includes questions such as “How can these situations relate to your community specifically?” and “how can we use this in other situations like it?” This makes the students truly think about how the content could impact them in the future. While they likely will not be tiling their walls with coins, they could need to figure out the amount of tile or carpet

to use on floors or walls or other things if they need to remodel a home, or an infinite amount of real life situations that students could come up with.

This three day lesson is interactive, challenging, and interesting for students. It is differentiation for all students to have access to knowledge, it uses strategies and skills that are in all types of content areas and disciplines, it relies heavily on technology, and it relates to the world around students at Green Street Academy. This unit lesson solidifies surface area and proportional relationships in an interesting and engaging way, and the span of three days allows students to feel like they achieved more.