**LESSON PLAN OUTLINE- (3-Day Lesson)**

**Day 3-Design Challenge Project**

1. TITLE OF LESSON: Design Challenge Project
2. CONTEXT OF LESSON: In previous lessons, students have learned what discount and sales tax are, how to calculate them, and how to calculate the resulting sale price or resulting final price. Last class they were presented with a design challenge project and discussed the requirements for it. Now they will continue working on this project, researching the items they will "purchase" and calculating the discounts, sale prices, and tax.
3. LEARNING OBJECTIVES and ASSESSMENT:

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| Learning Objective | Bloom | Assessment (Formative/Summative) |
| Students will be able to apply their knowledge of discount and tax to re-design a room in their home on a budget, buying new items and calculating given discounts and tax. | Synthesis | This will be a summative assessment that is collected for teacher review and grading.  |

1. RELATED 2009 VIRGINIA STANDARDS OF LEARNING:

SOL 7.4 The student will solve single-step and multistep practical problems, using proportional reasoning. (*The essential knowledge includes students solving problems involving tips, tax, and discounts.)*

1. MATERIALS NEEDED:

Loose-leaf paper

Calculators

Extra copies of Design Challenge Project handout

Samples of previous Design Challenge projects

Laptop cart(with a laptop for each student to use)

A selection of paper catalogs

Graph paper

Blank computer paper

Markers/colored pencils

\*Classroom teacher will be responsible for securing all of above materials, except

loose-leaf. This will be provided by the students.

G. PROCEDURE:

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| Time | Mathematical Tasks to be Used,Teacher Thoughts/Actions/Questions | Anticipated Student Comments, Questions, Actions, and Strategies |
|  | INTRODUCTION:  Remind students that at the end of last class, they received the Design Challenge Project and talked about the requirements for the project. Remind them of the main idea of the project. They are to re-design their bedroom(or other room of their choice) on a budget, calculating discounts, etc. for each item that they buy. They will need to record all items bought, prices, discounts, final prices, etc. on the spreadsheet on their handout from last time. They will also need to include some sort of sketch or 3-D model of their room. Tell students that they will be working on this project in class today. Each student will get a laptop and will begin by searching for items they would like to include in their room. Then, after they have their items & prices, they may work on their calculations and drawing of the room. Ask students if they have any questions about what they will be working on today. Answer any questions they may have. Review behavior expectations with them and remind them of proper laptop use. Tell students you will call them over individually to sign out a laptop. While students are waiting for a laptop, they should take out their project handout from last class, as well as any other work they have already started on for the project. After they get their laptop, they should log on and begin working. | Students listen as project requirements are reviewed. They ask questions as needed about project requirements. (Most questions were probably answered last class, but there may be one or two more.) Students will get out their project handout and any work they may have started last class. When called, they will sign out a laptop from the teacher, take it back to their seat, log on and begin searching for items to "buy". Questions were answered last time, but teacher should be prepared to answer or remind students of answers to various questions such as, "What if the item is already on sale?"(You may take the given discount off of the sale price), "Can we round the prices?"(Yes, you should), "Can we visit stores to get prices rather than catalogs or websites?"(Yes, but we will be working on this in class, so only do this if you run out of time in class to complete your project), "Do we have to start from scratch or can we keep items from our current room and just add more?"(You must start from scratch), etc. |
|  | BODY: Students will use the laptops and/or paper catalogs to work on their project. As students work, teacher should make sure that students are staying on task and are only visiting websites that are appropriate to their research for this project. You should also assist as necessary when students have questions about rounding, showing their work, sketching their picture, etc.  |  Students begin working on their project. They should be looking up items, recording them, using their loose-leaf to calculate the discounts, final prices, etc., and recording those on their project handout as well.  |
|  | CLOSURE: When there are about 10 minutes left in class, begin to call students back by table group to hand in their laptops. While you are doing this, tell them to talk to their neighbor about the things that they "purchased" and have them look over each others' calculations to make sure there are no obvious mistakes in the calculation of the discount, etc. After all laptops have been put away, remind students of the due date for the project. Remind them that they will not be given any additional class time to work on it, so they will need to finish it at home. On the day it is due, they should be turning in the Design Challenge handout, their loose-leaf showing their work, and their sketch/model of their room. Remind them everything should be nice and neat. Answer any remaining questions students may have. | Students pair up with a neighbor and check each other's work by using mental math to pick out any obvious mistakes in the other person's work. (For example, if an item cost $30, and they have a 20% discount listed as $25.) When they are called, they will return their laptops to the laptop cart. They will also return any other materials they may have used throughout the lesson.  |

H. MEETING THE NEEDS OF ALL STUDENTS: The design challenge project allows for some choice in the way students will present their new room which may be helpful to special needs students. They may find it easier to assemble their new room in a shoebox rather than drawing it two dimensionally. This option should be extended to them when completing the project, and can also be extended to other students. Above grade-level students may want to get creative and generate a computer model of their new room.

Also, some special needs students may prefer to work with paper catalogs rather than the computer. Have a selection of catalogs available if they choose to look up prices in that manner.

I. WHAT COULD GO WRONG WITH THIS LESSON AND WHAT WILL YOU DO ABOUT IT? There could be problems with the laptops and/or internet not working. If it is just a few laptops that are not working, students can share with one another and/or use the paper catalogs provided. If the set of laptops will not connect to the internet, the whole class could be taken to a computer lab to work.

J. CONNECTION TO CTA: As part of the CTA, we were encouraged to relate math to our students' everyday lives. Various speakers also encouraged us to use tasks at varying levels of Bloom's Taxonomy. The project incorporated into this lesson allows students to create and apply their new learning at higher levels than basic practice problems while allowing them to see how the skills they have learned are used frequently in the real world.

**Design Challenge Name:**

**Consumer Math Project - 100 points Date Due:**

**The task**

Picture your dream bedroom. What does it include? Re-design your current bedroom (or other room of your choice) by choosing all new furniture and accessories.

**Details**

* You will have a limit of $2,000 to “spend” on your room.
* You may “shop” at any furniture/accessory store (online or catalog). The following sites have a wide variety of items and may be a good place to start:

 [www.ikea.com](http://www.ikea.com), [www.target.com](http://www.target.com) . Be sure all items “bought” are school-appropriate.

* You must “buy” at least 15 items. When choosing your items, be sure to “purchase” basic furniture *needs* first such as a bed, dresser, etc. Then use any leftover money on other *wants* such as a desk, computer, picture frames, etc.
* Record your items in the table on the back side of this sheet. (You may want to use a separate sheet of paper for a rough copy. The final copy you are turning in should be nice and neat.)
* After choosing your items, you will calculate a 30% discount for the first 5 items, a 20% discount for the next 5 items, and a 15% discount for the last 5 items. (If you choose more than 15 items, you can assume these additional items will not have a discount.)
* Calculate your subtotal, 5% tax, and your total. Remember, your *total* may not be more than $2,000.
* Finally, complete either a sketch of your new room including all items purchased(on blank computer paper) ***or*** a floor plan(bird’s eye view) of your new room including all items purchased. This option would be sketched on graph paper as if you were looking down on it from above.



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| --- | --- | --- | --- | --- |
| **Item** | **Original Price** | **Discount(%)** | **Discount($)** | **Final Price** |
|   |   | 30% |   |   |
|   |   | 30% |   |   |
|   |   | 30% |   |   |
|   |   | 30% |   |   |
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| Subtotal |   |   |   |   |
| Tax(5%) |   |   |   |   |
| TOTAL(not to exceed $2000) |   |   |   |   |

\*Please list the stores (catalogs or websites) you shopped at:

**Grading Rubric**

Item list(completed and includes all basic bedroom needs)……10 points

Original price list(accurate)…......................................................10 points Discounts(calculated accurately)………………………………………….15 points

Final prices(calculated accurately)……………………………………….15 points

Subtotal(calculated accurately)……………………………………………10 points

Tax(calculated accurately)…………………………………………………..10 points

Total(calculated accurately)………………………………………………….5 points

Store/catalog list(completed)………………………………………………..5 points

Sketch or floor plan of room(colored)…………………………………..10 points

Neatness……………………………………………………………………………10 points

 **TOTAL:**