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| **TEAM Lesson Plan Template** |
| Teacher: Dr. Jason DeVito |
| Subject/Grade: Mathematics, grade 7 |
| Lesson Title: Discovery Park Sign |
| **STANDARDS** | **Identify what you intend to teach.** State, Common Core, ACT College Readiness Standards and/or State Competencies; Enduring Understandings and Essential Questions. |
| **SMP1**. Make sense of problems and persevere in solving them.**SMP4**. Model with mathematics. **6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; know and apply these techniques in the context of solving real-world and mathematical problems.**7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.**7.G.B.5** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms |
| **OBJECTIVE(s)/Sub-Objectives** | **Connect prior learning to new learning.** Clear, Specific, Observable, Demanding, High Quality, Measurable, Aligned to Standard(s), and Integrated with other subjects, build on prior student knowledgeStudent-Friendly (I Can Statement) |
| I can estimate the number of squares in the Discovery Park of America sign.  |
| **MATERIALS AND RESOURCES**  | **Content-related:** Clearly supports lesson objective(s); rigorous & relevant; Incorporates multimedia & resources beyond the textbook.  |
| **Activities & Materials** Pencils; paper; Worksheets: “How Many Squares in the Discovery Park Logo?”\_x\_Calculators (optional); \_x\_ Computer, internet access, and projector (optional) **What if the technology is not working?** Skip the video;Practice doing calculations by hand. **Routine for distributing materials.** Pass out. |
| **ACCOMMODATIONS/ADAPTATIONS** | **Learning styles and interests.** Anticipate learning difficulties, regularly incorporate student interests & cultural heritage; differentiate instructional methods. |
| **Modifications/Plans for Diverse Learners** **Differentiation****----- Content ----- Process -----Product ----- Tiered Assignments ----- Flexible Grouping****----- Learning Centers \_\_\_\_ Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****Accommodations****\_\_\_ Preferential Seating \_\_\_ Extended Time \_\_\_ Small Group \_\_\_ Peer Tutoring** **\_\_\_ Modified Assignments \_\_\_ Other** **Early Finishers:** |

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| **MOTIVATING STUDENTS/ANTICIPATORY SET** | **“Hook”: Engage students’ attention and focus on learning.** Personally meaningful and relevant. |
| Have students look at a tile floor or a brick or block wall. Discuss how a builder needs to know how many tiles/bricks/blocks will be needed before building the building. How can we find out how many tiles are needed for a floor before we put the tiles on it? Alternatively, consider showing a full color video of the DPA sign in the following YouTube video (sign appears at 0:54 seconds) and asking, how many of those little metallic squares are there? <https://www.youtube.com/watch?v=kDQKlE7FSqA> |
| **INSTRUCTIONAL PROCEDURES** | **Step-by-Step Procedures-Lesson Sequence: Basic to Complex.** Lesson includes visuals, modeling, logical sequencing and segmenting (beginning, middle, ending); essential information; concise communication; grouping strategies; differentiated instructional strategies to provide intervention & extension; seamless routines; varied instructional strategies; key concepts & ideas highlighted regularly. |
| ***Introductio*n** Do not say too much for the introduction. Let students wrestle with the problem on the worksheet to come up with the idea of area among the members of their group. **Motivating Students** \_x\_ Verbal Reinforcement Monitor groups’ work and provide verbal reinforcement throughout the activity. \_x\_ Small Rewards (offer a small prize or privilege to the group who can explain to the whole class how they got their estimate in question 5 and whose estimate is closest to the correct answer). **Presenting Instructional Content** \_x\_ Discussion \_x\_ Modeling ***Instructional strategies:*****Modeling and Guided Practice *–*** Arrange students in heterogeneous groups of 3 or 4. Ensure that each group has the “How many Squares. . . “ worksheet, pencils, paper, (and possibly calculators). Identify a timekeeper and recorder in each group. Tell them how much time they have. Explain that they should answer the questions in order. Announce that the group whose answer to question 5 is closest to the actual answer will explain their solution to the class and receive \_\_\_\_\_\_\_\_ as a prize. Have them get to work. Monitor the groups’ progress, and ask questions to help them progress if they get stuck. Stop them early enough to do some lesson closure.  **Check for Understanding (CFU) –** ***What am I doing for students that progress at different rates?*** ***What do I do if they get it?*** ***What do I do if they don’t get it?***  |
| **QUESTIONING/THINKING/PROBLEM SOLVING (embedded throughout)** | **Balanced mix of question types.** Utilizes Blooms Taxonomy/Webb’s Depth of Knowledge; high frequency; purposeful & coherent; require active responses; balance based on volunteers/non-volunteers, ability, & gender; lead to further inquiry & self-directed learning.  **Implement four types of thinking (Analytical, Practical, Creative, & Research-based) & Teach/Reinforce problem-solving types**. Provide opportunities for students to generate ideas & alternatives; analyze, evaluate & explain information from multiple perspectives& viewpoints. |
| **Questioning** **Knowledge:**How many squares long is the dollar bill? **Comprehension:** (to help with the question about the “D”) What part (fraction) of the length of the sign is the width of the “D?” (to help with the question about the “D”) What part (fraction) of the height of the sign is the height of the “D?” (to help with the question about the “D”) Can you imagine covering the entire width of the sign with copies of the “D?” How many would it take? Is the area of the “D” the same as its width times it height? ( *there are curves at the edges and a whole in the middle* )Can you re-write the fraction (1 dollar bill)/(3.5 squares ) with a numerator involving inches? [ 3.5 here is an example. The group of students needs to have provided this number. They may have estimated 3.3 or 3.4 or some other value. If the teacher introduces the 3.5 here, it somewhat eliminates the point of the prize for best answer]. **Application:**How do we convert square feet to square inches? Is there another way? Can you convert from feet to inches before making the area calculation? **Analysis:** To know how many little squares to order to build the Discover Park of America sign, is it enough to know how many squares are needed to cover the area? ( *No, we actually have to know how many OF EACH COLOR are needed*). **Synthesis:****Evaluation:** **Thinking**  \_x\_ **Practical** –Worksheet simulates calculations to estimate quantities required for construction materials\_x\_ **Creative**– Students have to visualize the sign from the pictures\_x\_ **Analytical** – Students have to consider the sign in terms of its parts (the little squares) and must explain their answers  \_x\_ **Research-based** – Students develop a mathematical model to explore a real world question **\*What am I going to do to give Ss opportunity to?** **1. Generate variety of ideas:** **2. Analyze problems from multiple viewpoints:** **Problem Solving *Note: Teach 2 or more types of problem solving (NOTE: Clearly identify where you will use each of these in your lesson; do not just check the box!)*****\_x\_ Drawing conclusions/Justifying Solutions** Students have to explain each of their answers.  **\_x\_\_ Predicting Outcomes** Students have to figure out what would happen to the number of squares if the side lengths are halved. **\_x\_ Improving Solutions** Students are asked to estimate the number of squares in two different ways and to determine which way is better  |

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| **GROUPING** | **Maximize student understanding & learning** Varied group composition (race, gender, ability, & age); clearly understood roles, responsibilities & group work expectations; accountability for group & individual work; student opportunities for goal setting, reflection & evaluation of learning. |
| * Place students in heterogeneous groups of 3 or 4.
* There should be a timekeeper and a recorder. All students should discuss the problem and its solutions.
* Identify timekeepers and recorders verbally.
* Each group will submit a completed worksheet.
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| **ASSESSMENT** | **Formative and/or summative assessment.** A variety of assessments, including rubrics, measure achievement of objectives and informs instruction.  |
| ***Assessments:*** **\_x\_\_ Group Assignment** The worksheet provides a formative assessment of students understanding of areas.  |
| **CLOSURE** | **Reflection/Wrap Up.** Summarizing, reminding, reflecting, restarting, connecting. |
| * ***Review/Summary:*** After collecting worksheets, identify the answer to question 5 which is closest to the correct value of 17,284. Congratulate the group and invite them to come to the board to explain how they got the answer. Work with them through the explanation. If they provide a reasonable explanation, announce their prize.

**What explains the difference between our estimates and the actual value?** How would a builder account for the fact that an estimate for an amount of tile needed might not be exact? * ***Preview for next lesson: link what they did today with where they are going next.***
* ***Upcoming assignments: remind them of any upcoming assignments.***

***Today we…. Turn to your partner and…. Let’s review our I Can statements……*** ***Here is your exit ticket for today…..*****Follow-up Activities/Extension** Have students calculate their percent error. (Their answer – Real answer)/(Real answer). Was their estimate a good one? ***Reflection: You must reflect on every lesson you teach.*** |

**NOTES:**

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