Name: Pima Course:

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| **Subject:**  | **Topic:** | **Grade Level**: | **Duration of Lesson:** |  |
| **Components** | **Description of Plan** |
| 1 | Content Standard:Choose ONE standard. Be sure to write out the entire standard, not just the number. | **HS.F-IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts, intervals where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.** | **Est.****# of mins** |
| 2 | Learning Objective:* Choose ONE objective that leads toward mastery of the standard
* Must be *specific*, *measurable*, and *realistic*.
* Must have at least two parts: learning and behavior
 | Students will interpret key features of quantities given a model of a relationship between two quantities by showing intervals (domain) and finding the relative maximum in order to solve motion problems  |
| **3** | **Anticipatory Set:** * Sometimes called a "hook" to grab the student's attention
* Focuses student attention on the *objective* and the *purpose* of the lesson
* Activates prior knowledge
* Requires ACTIVE PARTICIPATION from ALL learners
 | Students will be provided a piece of candy. Standing next to their seat, they will toss the piece of candy into the air attempting to throw it straight up and then catch it. They will answer three questions: How long was the candy going up in the air? How long did was it going down in the air? (interval): How high up did it go? (relative maximum) The answers they will write in their notebook.  | 5 |
| **4** | **Teaching-Input**:Using effective and varied strategies, the teacher provides information for students to gain the concept, strategy, or skill. | **I do:** As a transition, I will ask the question, How precise was your estimate? How do you get a precise answer, you need an equation that describes the motion. That is why math is so great. Because it provides precise equations to arrive at precise answers. The teacher will solve a 2 variable (h=height,=time) rocket problem using a 4-step approach.1. State the formula and all known quantities that are given in the problem.
2. To find intervals, plug in known quantities to solve for the unknown quantities of interest
3. To find maximum quantities, complete the square
4. Overall interpretation
 | 15 |
| **5** | **Teaching-Modeling:**Demonstrate and show examples of what students are expected to do (how to solve the problem, answer the question, do the activity etc**.).** | The teacher will demonstrate the skills needed to complete the steps1. State the formula for rocket motion.
2. Plug in to find the time when the rocket is 100 feet above the ground and the time at which the rocket hits the ground (Interval)
3. Plug in to find maximum height
4. Write out interpretation on the board
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| **6** | **Check for Understanding:*** Various strategies that are ongoing throughout the entire lesson.
* Enables teacher to determine whether ALL students have "gotten it."
 | The teacher will check for understanding by walking around the room and asking each student after input and modeling: Are you following me? Do you have any questions? All students will stand up and then sit down to indicate degree of understanding. | **10** |
| **7** | **Guided Practice:** An opportunity for each student to demonstrate new learning by working through an activity or exercise with the teacher’s guidance. | **We do:** The teacher will solve problems with students to find the maximum height..**You do together:** Students will think-pair-share and solve problems to find maximum height.**You do Quiz** | 15 |
| **8** | **Closure:** * Actions or statements made by teachers AND students that summarize lesson objectives.
* Essential for helping students integrate ideas, make sense out of what has just been taught, and to improve their chances of retention and transfer.
* Must be done BEFORE Independent Practice
 |  **If the height of the candy as a function of time is given by the equation, h(t)=-t2+4t+6, what is the maximum height? What was the time interval to reach the maximum height?** | 10 |
| **9** | **Independent Practice:** AFTER proper closure, it is important to provide time for additional practice. It may be group or individual work in class or it might be homework. | **You do:** Students will receive a homework problem on an exit slip and will be required to complete the homework problem by Monday/Tuesday. The homework problem will involve a bale of hay dropped from an airplane.1. A helicopter drops bales of hay into remote areas to help starving animals. The helicopter is 96 feet above the ground and rising 64 feet per second when it drops the bale of hay. The height, s(t), in feet, of the bale as a function of time is given by  where  is time in seconds,  is the initial velocity, and  is the initial height. a. What is the height of the bale 1 second after it is released?S(1)=1. How many seconds will it take the bale to reach the ground?

t=5.2 approximately1. When does the bale reach a maximum height? What is the max height?

**At 2 seconds, it reaches a height of 160 feet** | 0 |
| **10** | **Assessment:**The formative and/or summative assessments that are aligned with the objective. | Formative assessment takes place while students are learning (Carjuzaa, 296). This will occur in two places. First, the teacher will check to make sure students completed the bellwork (10 points). Next, the teacher will check to make sure the students completed the notes in classwork by writing out the steps. Summative assessment: The teacher will administer a quiz and assign homework. | 10 |
| **11** | **Differentiation:**How you will reach diverse learners by varying the: * Content
* Process
* Product
 | Kinesthetic learners will enjoy the anticipatory set. Visual leaners will benefit from writing the steps for solving problems in their notebook. Auditory learners will benefit from the think-pair-share assignment. Students will vary in their abilities; all will complete the bellwork; most will complete the square and a few will be able to solve the homework problem on their own. For this reason, it will be important to review the homework and find out what difficulties students had. |  |
| **12** | **21st Century Learning:**Includes technology as well as the 4 Cs: Critical Thinking, Creativity, Collaboration, and Communication. | Students will see the quiz visually on the Smart Board. Critical Thinking will take place when students apply steps to solve problems. Creativity will take place in the anticipatory set when students describe their throwing experience and answer questions. Collaboration will take place when students share solutions to completing the square problems. Communication will take place through demonstrated solutions of projectile motion problems. |  |
| **13** | **List of Materials, Handouts and other Supplemental Documents:**1. **Notebook**
2. **Pencil/Pen**
3. **Quiz on SmartBoard**
4. **Clipboard with grades**
5. **Candy**
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