**SCED 420 MICROTEACHING LESSON PLAN**

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| LESSON: | Mathematics |
| GRADE LEVEL: | 9th grade |
| UNIT: | Functions |
| LEARNING DOMAIN: | Numbers & Algebra |
| SUBJECT: | Definition and demonstration of the concept of functions |
| RECOMMENDED TIME: | 30 minutes |
| PREREQUISITE KNOWLEDGE: | Understanding patterns and relationships |
| SKILLS: | Mathematical thinking, reasoning, problem solving, learning by discovery |
| MATERIALS: | Pencil, paper, computer, internet, functions worksheet |
| KEY VOCABULARY: | Domain,range,functions,one to one, sequence,input, output |
| MISCONCEPTIONS: | * Students may assume that a function doesn’t need to include a one to one correspondence. * Students may think that one thing from the domain set can match with two things from the range set; but this is not true since this doesn’t satisfy one to one correspondence. |
| REAL WORLD CONNECTION: | In real life, machines resemble functions because we put input to a machine and it gives us an output. Similarly, functions have a domain (i.e input) and range (i.e output) |
| OBJECTIVES: | Students will be able to,   * Define functions * List the components of a function * Identify if a relation is a function or not * Translate functions to every day situations * Explain what it means for a function to be one to one * Evaluate a function for a given value * Interpret the equality of two functions |
| ONLINE RESOURCES: | Students can do exercises with these sites.   * <http://www.mathplayground.com/functionmachine.html> (in class) * <http://www.shodor.org/interactivate/activities/LinearFunctMachine/> ( in their homes) |
| TEACHING&LEARNING ACTIVITIES: | Lottery Activity: There is a lottery as $150 million with six winners. The lottery commissioner decides to give cars as prizes to each winner instead of the monetary winnings because of the economical state. The winners agree. The six cars are given out randomly to each winner. Give out 6 cards to 6 students to represent winners. Have 6 students write their names and cars on the board. Ask the students these questions:   * Is there a one to one correspondence betweeen winners and cars? * If we take away a car, is there a one to one correspondence betweeen winners and cars? * If two winners share one car, is there a one to one correspondence betweeen winners and cars? * If two winners share the same type of car, is there a one to one correspondence betweeen winners and cars? * Under what condition, do we have a one to one correspondence and when don’t we? * What does this lottery example represent for mathematics?   When students answer these questions correctly, then we relate this subject with functions. |
| TEACHING &LEARNING PROCESS: | Introduction:   * Today, we will be learning about functions concept. * Before explaining it, lets do an activity.( Lottery activity is done) * In this activity, students answer the meaning of one to one correspondence.After students answer the questions of lottery activity, again stress the importance of being one to one in a function. * With the help of students, make the definition of function as: “A function from set A to set B is a rule of correspondence that assigns each element x in set A to each elemnt y in set B, with the sets are not empty.” * Show function notation f(x). * Students explain the domain and range in this example. * Give an example from the real life that machines are like functions. Think toast machine. We put bread, cheese then we get a toast, i.e we give input and get output. * Show the function game on the internet in order to make students understood.   <http://www.mathplayground.com/functionmachine.html>   * Make students groups and give them a worksheet including evaluating a function for a given value, finding the rule for a function, equalities of functions, determining domains and ranges of functions. * Students do exercises with their group friends. * Choose one student from every group and tell them to answer the questions respectively. * Students tell their answers and evaluate with the teacher. * Evaluate the answers in the class. * Ask students that can you think other examples of functions in real life? * Summarize that we learned the concept of functions today and its real life examples. Streess again the one to one correspondence and domain and range. * Give them a functions sheet as homework to do for next lesson. * Students will do their homeworks for next lesson. |
| ASSESSMENT& EVALUATION: | The students will do functions worksheet as a group in class and also, they will do another functions worksheet as homework at their homes for next lesson. |
| REFERENCES: | * <https://www.teachingchannel.org/videos/teaching-functions> * <http://labyrinth.thinkport.org/www/educators/resources/lessons/vats_grade8a.pdf>   <http://www.mathplayground.com/functionmachine.html> |
| HOMEWORK: | Functions worksheet 2 |

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LOTTERY ACTIVITY MATERIALS

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| **#1 Red Dodge Viper** | **#2 Silver Ferrari Spyder** | **#3 Black Mustang** |

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| **4-Yellow Thunderbird** | **5- Blue Porsche GT2** | **6- White Lamborghini** |

FUNCTIONS GROUP WORKSHEET

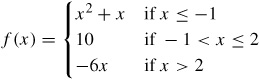
1. Given:   , evaluate
   1. g(-1)
   2. g(0)
   3. g(3)
2. Let f be function and f(x)=y. Then what does f function represents?

|  |  |
| --- | --- |
| X | Y |
| 3 | 11 |
| -8 | 11 |
| 0 | 11 |
| 5 | 11 |

1. f(x)= then find the domain and range of this function.
2. **The function S(r)  gives the surface area of a sphere of radius r. What is the surface area of a sphere of radius 4?**

FUNCTIONS HOMEWORK WORKSHEET

1. Given:  , evaluate a) f(2) b) f(-2) c) f(-*x*)
2. Does the equation y2 + x = 1 represents a function y in terms of x?
3. Given *f*(*x*) = 2*x*² - 3*x* + 6,  find  *f* (2.5)
4. Find f(-1) and f(0) for f(x)= 3x+5-4x2
5. Functions f and g are defined by f(x) = 1/x + 3x and g(x) = -1/x + 6x – 4 find (f + g)(x) and its domain.
6. Find f(5), f(3) for,



1. Function f is defined by f(x) = - 2 x2 + 6 x – 3 find f(- 2).
2. Function h is defined by h(x) = 3 x2 - 7 x – 5. Find h(x - 2).

REFERENCES: <http://www.analyzemath.com/calculus_questions/analytical/functions.html>