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FUTURE CLASSROOMS` LEADERSHIP SCENARIO

# Functions

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**TOPIC:** Mathematics

**GRADE:** 7-9

**APPROACH:**

**DURATION:** 120 min

**Summary**: This lesson plan is designed for students in grades 7-8 to learn about mathematical functions. The lesson plan involves a variety of activities, including a warm-up game to introduce the concept of functions, collaborative work to come up with real-world examples of functions, investigation work using graphing calculators, practice work using ICT to graph different types of functions, producing work to create a poster that explains the different types of functions and their applications, discussion, presentations, and assessment and feedback. The lesson aims to help students understand the definition of functions, identify different types of functions, graph functions, and apply functions to real-world problems. The activities aim to develop students' analytical and problem-solving skills, as well as teamwork and communication skills.

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## Learning Objectives, Skills and Competencies:

What are the main objectives? What skills will the learner develop and demonstrate within the scenario? (e.g. 21st Century Skills).

Learning Objectives:

- Students will be able to define and identify functions
- Students will be able to graph functions
- Students will be able to analyze and compare functions
- Students will be able to apply functions to real-world problems

Skills:

- Analytical and problem-solving skills
- Teamwork and collaboration skills
- Communication and presentation skills
- Critical thinking skills
- ICT skills

Competencies:

- Mathematical literacy
- Logical and analytical thinking
- Self-direction and initiative
- Effective communication
- Collaborative and cooperative work skills.

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## Learners' role:

What sort of activities will the learner be involved in?

The learners will be involved in various activities, such as a warm-up game, collaborative work, investigation work using graphing calculators, practice work using ICT, producing work to create a poster, discussion, presentations, and assessment and feedback. These activities aim to help students develop their analytical and problem-solving skills, teamwork and communication skills, as well as their critical thinking, ICT, and mathematical literacy competencies.

## Tools and Resources

What resources, particularly technologies, will be required?

- Whiteboard and markers
- Laptops or computers with internet access
- Graphing calculators
- Chart paper
- Post-its
- Projector or display screen for presentations
- Copies of the student handout.

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## Learning space

Where will the learning take place e.g. school classroom, local library, museum, outdoors, in an online space?

- Classroom or computer lab

The learning can take place in a variety of settings, such as a classroom, a computer lab, or any other setting that provides the necessary resources and facilities for the activities outlined in the lesson plan.

## Future Classroom Scenario Narrative

Describe in max 10 sentences the main ideas of the scenario

This lesson plan includes a warm-up game to introduce the concept of functions, collaborative work to come up with real-world examples of functions, investigation work using graphing calculators, practice work using ICT to graph different types of functions, producing work to create a poster that explains the different types of functions and their applications, discussion, presentations, and assessment and feedback. The lesson aims to help students understand the definition of functions, identify different types of functions, graph functions, and apply functions to real-world problems. The lesson activities aim to develop students' analytical and problem-solving skills, as well as teamwork and communication skills. The teacher will need to provide the necessary resources, particularly technologies, such as laptops or computers with internet access, graphing calculators, whiteboard and markers, chart paper, post-its, projector, or display screen.

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## Learning Activities

| | |
|---|---|
| Warm-up activity<br>(10min) | Introduce a game called "Function Machine" to the class. The game requires the students to form pairs or small groups and then distribute cards with various inputs and outputs. Each group will then need to come up with a rule that can turn the input into the output, such as "double the input" or "subtract 3 from the input," and write it on a piece of paper. The teacher will then collect the rules and mix them up. The groups will then take turns drawing an input card and trying to apply the rules to determine the corresponding output. If they apply the rule correctly, they earn a point. The game continues until all the input cards are used up, and the group with the most points wins. This game will help students understand the concept of functions and how they work. |
| Collaborative work<br>(10min) | Divide students into small groups of 3-4 and ask them to come up with real-world examples of functions. Provide each group with a set of post-its to jot down their ideas. Have each group present their findings to the class. |
| Investigation work<br>(20min) | Have students investigate different types of functions such as linear and quadratic.<br>Students will work in pairs and use graphing calculators or Geogebra to graph each function and observe the patterns. |
| Practice work:<br>(20min) | Provide students with laptops or computers and ask them to access an online graphing tool.<br>Have students graph different types of functions and analyze the patterns. |

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|---|---|
| Producing work<br><br>(30min) | Ask each group to create a poster that explains the different types of functions and provides real-world examples. Students can use chart paper, markers, and images to illustrate their ideas. |
| Discussion<br><br>(10min) | Facilitate a class discussion on the different types of functions and their real-world applications.<br>Ask students to share any observations they made during the investigation and producing work. |
| Presentations<br><br>(10min) | Ask each group to present their poster to the class and explain their reasoning behind the examples they provided. |
| Assessment and feedback<br><br>(10min) | Use a rubric to assess each group's work based on accuracy, creativity, and teamwork.<br><br>Provide feedback to students on their work and what they can improve for next time. |

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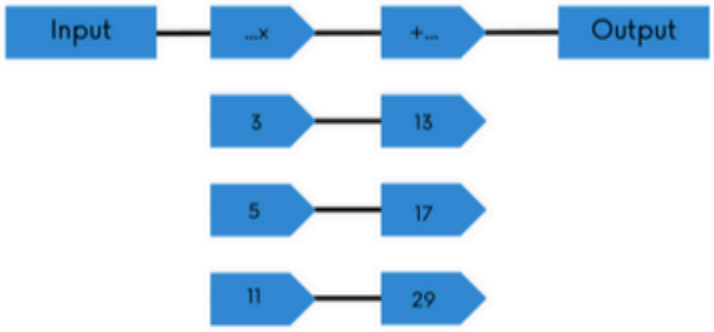
**Student handout for Function Game**

# Function Game

## Find the rule that can turn the input into the output




## Solution

Use the space here to find out the rule.

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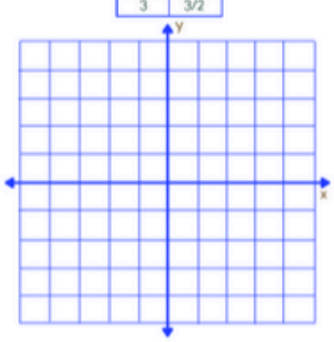
**Student handout for Investigation activity**

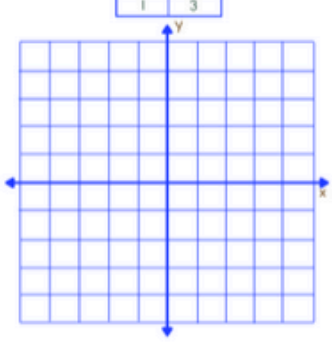
# Function Graphing Practice

**Use the points to plot the line on the coordinate grid.**

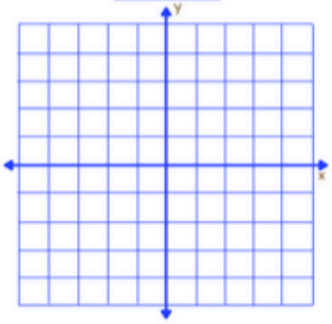
| x | y |
|---|---|
| 2 | 1 |
| 4 | 2 |
| 3 | 3/2 |



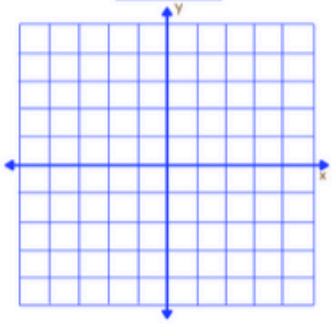
| x | y |
|---|---|
| 2 | 5 |
| 0 | 1 |
| 1 | 3 |



| x | y |
|---|---|
| 5 | -1/2 |
| 4 | -1 |
| -3 | -3 |



| x | y |
|---|---|
| 4 | -3 |
| -4 | 1 |
| 0 | -1 |



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