Activity Design Template

Topic/Theme: Rectangles, Linear and Quadratic graphs and formulae

Class/Year Group: TY/5th Year (Year 10/11)

Subject(s): Mathematics

Outline

What is the **challenge** your students will tackle?

Students are tasked with redesigning the school yard and building a separate enclosure for 1st years. Given 200m of fencing, what is the maximum rectangular area that can be enclosed? Questions will be used to help direct the lesson. Resources available here.

Why is this **meaningful** to the students - what's the hook?

The hope is that this if a entertaining context for a common problem. The context will be referred to throughout the lesson, giving relevance to the work.

What are the **key ideas** that the students will remember?

Scale, perimeter and area of a rectangle, tabulating data, graphing linear and quadratic functions, generalizing data into functions.

Learning Objectives

What **curriculum content** will be addressed?
• Linear and quadratic relationships in real-life contexts
• the various representations of these relationships including tabular, graphical and algebraic formats.
Converse Statements

By the end of this activity students *will be able to:*

• explore patterns and formulate conjectures
• explain findings • justify conclusions • communicate mathematics verbally and in written form • apply knowledge and skills to solve problems in familiar and unfamiliar contexts• devise, select and use appropriate mathematical models, formulae or techniques to process information and to draw relevant conclusions

How are four key **21st Century Skills** addressed?

Creativity
Brainstorming to identify converse statements, and how to measure the space of a 1st year student.

Communication
Students will need to communicate mathematics verbally and in written form throughout.

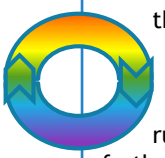
Collaboration
Students will need to work together in order to accomplish the task and answer the assigned questions in the given time.

Critical Thinking
Finding solutions, discussing options, converse statements.

Reflection

How will you know that they are learning?

Through observation of student activity, discussions with the groups and team leaders, and analysis of their results and finished presentations.



In what ways will students reflect on progress?

Students will engage with their peers and teacher throughout the activity, allowing them to reflect on their progress. When they present their results at the end of the activity, they will receive feedback on their progress. Assessment rubrics and feedback forms can be used to provide further summative and formative assessment for the students.

Activity Design Template

Possible Aspects	Description	Time
	**Set up:** Ice-breaker and Team-formation if required. Introduce the challenge (see Outline, above).	5-10 mins
	Warm up: How much space does an average 1st year take up? (Standing? Sitting? Lying down? With/without bag?) How many 1st years are there in your school?	10-15 mins
	Investigate: Experiment: How can you create the largest possible rectangle using 20 lollipop sticks?	5-10 mins
	Plan: Following on from the experiment, fill in the width x length = area table	5-10 mins
	Create: 1. Read from table. Identify that a square is the best combination. 2. Make graphs. Both Linear and Quadratic. 3. Generalise. Find formulas showing the relationships between Width versus Length and Width versus Area.	30 mins
	Create: create a presentation of your results, which includes answers to your assigned questions	20 mins
	Present: Each team presents their results as well as their answers to their assigned questions. (5 mins per team)	25 -30 mins
	Reflect: General, whole group reflection, focusing on what was learned and where the challenges lay.	10 mins