Performance Perimeter – Lesson Plan

Main focus of activity:

- To work out how much security is required for a large event

Learning objectives:

- To be able to work out the perimeter of simple shapes
- To be able to work out the perimeter of compound shapes
- To be able to work out the perimeter of compound shapes that involves decimals and fractions.

Links to curriculum: Links to the maths curriculum are as follows

- Perimeter
- Compound shapes
- Fractions and decimals
- Scales
- Measuring
- Properties of shapes

Activity outline:

Introduction

- On a simple level pupils can be asked to actually physically measure the outside of shapes. These pupils will need to understand the use of scales as well as depending on the length of the perimeter depends on the number of security guards required. (Teachers can change the requirement for security guards. For the basis of these activities it is 1 security guard for every 10 metres of perimeter.)

- The simple shapes can also be worked out by using not to scale representations available on the flipchart. There is a need to interpret the scale of 1cm = 1m so that pupils understand the actual size of the arena.

- Where the venues are more complex, compound shapes are used to show the layout of the arenas.

Main Part of Lesson:

Teaching and Learning:

- The idea is that pupils will need to calculate the perimeter of shapes and then apply this knowledge to work out the actual perimeter of the event area. This perimeter is then used to calculate the number of security guards that are required for the event.
- The scales can be made harder for more able groups. For example 1cm =2.5m rather than 1cm = 1m. Teachers are encouraged to use this variable to differentiate for more able pupils. There is also the amount of security required. For the majority of the exercises 1 security guard is required for every 10 metres of the perimeter.
- The lower ability students are expected to actually measure the shapes to work out the perimeter. They will only be expected to work with integer values.

- For a middle ability group the perimeter does not need to be measured but does need to be calculated. The numbers will generally be larger and consist of some decimals and fractions as well adding to the level of mathematical skill required to complete the task.
- For a more able group the pre-requisite knowledge is as above but includes applying this knowledge to solve problems involving compound shapes.
- At level 6 some of the problems involve working out the circumferences of circles.

You may want students to start at different starting points or use different scales. You could print the slides out and allow students to work through at their own pace.
You may like to print and give students the stage designs from the resource pack. Note that an understanding of Pythagoras' theorem may be useful for the triangular based stages.
Pupils have the option of completing a challenge task which encourages them to design their own stage using the limit of only 12 security guards.

Plenary:

- Discuss the amount of security required for various layouts and discuss if this is realistic or not. For example 1 security guard for every 10m could be fine if he can visibly see all of the 10m he is supposed to be patrolling. But what if the 10m involves a corner of shape. How could we get around these security issues in the best way?

