OUT AND ABOUT

OUTDOOR ACTIVITIES FOR KEY STAGE 2 MATHEMATICS

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MEASURE

Google Earth Comparisons

Developed from an idea from Maths and Geography Outdoors (https://creativestarlearning.co.uk/)

Learning focus

- Explore how scale is used to represent distances on maps
- Measure lengths in different ways
- Identify strategies for measuring accurately in different contexts

Key vocabulary

- Estimate
- Benchmark
- Length
- Perimeter
- Area

Resources

- Digital mapping software
- Tablets/Laptops
- Print-out of school map from Google Earth
- Rulers
- Trundle wheels
- Measuring tapes

Activity

In a whole class discussion, identify suitable benchmarks for key measurements in length. For example, highlight distances such as 10 m, 100 m and 1 km and associate them with locations and distances that are familiar to the children. For longer distances, it may be appropriate to use Google Maps, Google Earth or other digital mapping software to identify landmarks that are specific distances from the school.

Show children the school on Google Earth and discuss what they can see. Ask them to identify the boundary of the school grounds.

> *Can you show me the boundary of the school grounds?*
> *What is the name given to the length of the boundary?*

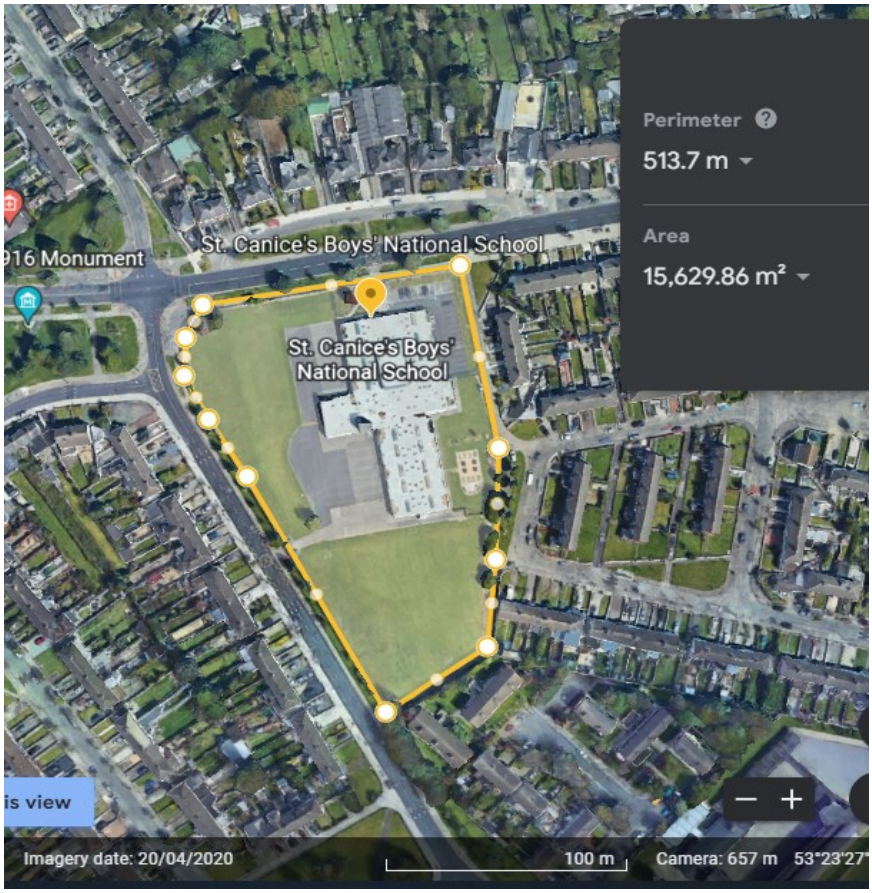
Then ask children to estimate the perimeter of the school grounds. They can use the scale given on the map to help them estimate. Alternatively, give children a printout of the map of their school. They could measure the perimeter using rulers (and/or string if necessary). The scale can then be used to calculate the actual perimeter.

Teaching point

A map shows a real object with accurate sizes reduced or enlarged by a certain amount (called the scale). This means that each element of the map is in the same proportion as in real life.

Scales on maps can be represented in different ways. On the Google Earth photo, a line is shown, the length of which is equivalent to 100 m. Children can measure the line with a ruler to work on the equivalence. For example, if the photo is printed out, the children may measure the line to find that it is 6.5 cm. Every 6.5 cm on the map represents 100 m in real life. Representing the scale in this way allows the proportions to be preserved even when the photo is printed on different sized paper.

Using laptops or tablets, children can then use the distance tool on Google Earth to measure the perimeter.



Assign children to small groups. Ask each group to measure the same distance using measuring tools such as trundle wheels and measuring tapes. The results should be compared across groups and across the different measurement methods.

What results did you get? Are they similar or different to the Google Earth Measurements?
Which do you think is more accurate? Why?
What could we do to be more accurate?

Teaching point

In relation to measuring the perimeter using Google Earth, children's attention might be drawn to the difficulty of measuring curved lines- this tool uses a series of straight lines to approximate the curve- the more straight lines that are used, the more accurate the approximation will be.

In relation to measuring with trundle wheels or measuring tape, children's attention should be drawn to ensuring accuracy of the measuring process, and choosing the most appropriate tool for the measurement context, such as the trundle wheel for curved perimeters.

Taking ideas further

Other sites of interest might be investigated in a similar way.

Google Earth area calculations could be used to support exploration of area and conversion between measurement units. For example, the area of the grounds of other local schools or buildings of interest could be calculated and compared.

Assessment opportunities

Are the children able to:

- Identify benchmarks for key lengths
- Give sensible estimates of length
- Measure accurately using digital and hands-on measuring tools