VISIT MATH

Co-funded by the European Union

Area, perimeter and volum

Topic	Geometry
Learning objectives	Understand the concepts of area, perimeter, and volume Apply formulas for calculating area, perimeter, and volume
Age group	10-14 years
Estimated duration	1 hour
Activities	Calculate area, perimeter and volume for real-life situations
Related visits	Paris, Mons, Namur, Tournai, Gand, Agrinio, Athens, Tourcoing/Roubaix, Amiens, Warsaw, Warsaw Old Town, Beaumont de Lomagne, Montauban, Agen, Toulouse

Previous knowledge required

Formulas to calculate area, perimeter and volume

Step by step: the sequence in the classroom

Step 1: Introducing the topic

Unveiling the World of Area, Perimeter, and Volume

Think of area, perimeter, and volume as the secret codes that unlock the mysteries of shapes and spaces. They provide us with tools to measure and understand the physical world around us.

Imagine you're tiling the floor of your room or marking out a garden for your favourite plants. Area is all about measuring the surface inside a shape. It helps us answer questions like: How much paint is needed to cover a wall? How big is the soccer field

where you play? The concept of area connects geometry to practical tasks like painting, gardening, and even crafting.

Now, let's talk about perimeter. Perimeter is like putting a fence around your imagination. It's the distance around the edge of a shape. When you're planning to put up a fence or measure the length of a path, perimeter comes into play. Whether it's your school's track or the winding trails at a park, perimeter helps us understand boundaries and paths.

Lastly, volume is like capturing space in a box. It's all about measuring the inside of a three-dimensional shape. When you fill a water bottle, stack blocks, or pour cereal into a bowl, you're dealing with volume. This concept connects mathematics to things you can hold, fill, or even build.

Step 2: Class activities

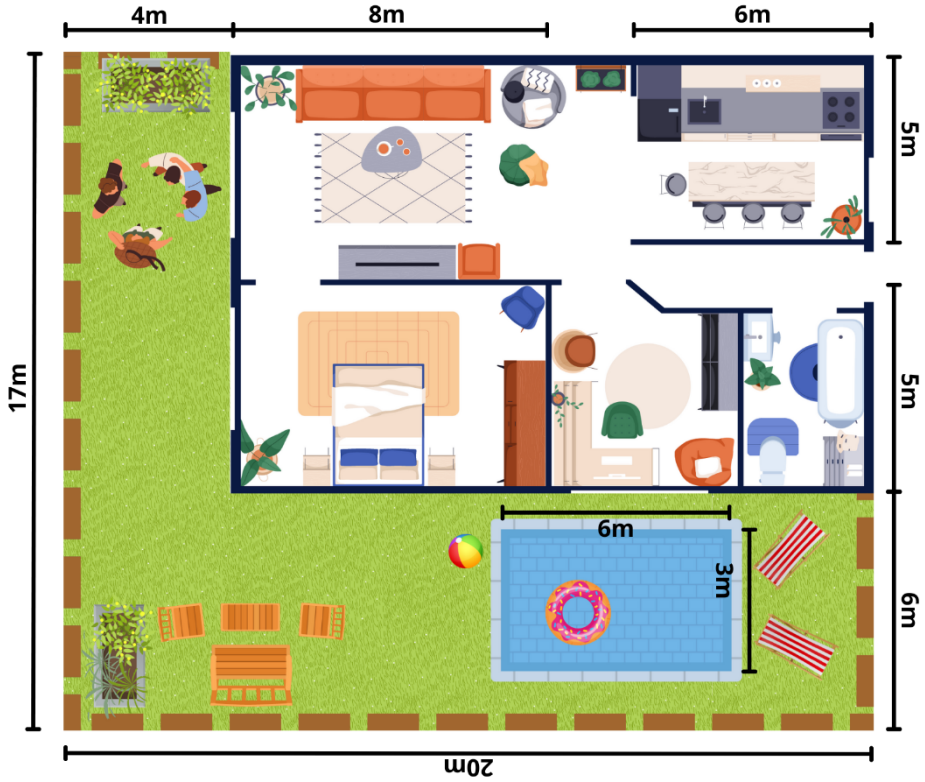
House makeover

You've just moved into a new house and are excited to renovate it before throwing a party for your housewarming.

The house is in good condition. Nevertheless, you still want to make some changes to feel at home.

You want to replace the tiles from the kitchen and the carpet in the bedroom. You also need to install a fence around the house for more safety, and the lawn could use a redoing.

Here is a plan of your new house:



Calculate the meters you need for the fence.

Calculate the area of tiles you need for the kitchen.

Calculate the area of carpet you need for the bedroom.

Calculate the area of lawn of the garden.

Be careful, the swimming pool doesn't count. 😉

Pool party

Now that your house is fully renovated, it is time to throw a pool party with all your friends for your housewarming!

But there is a problem... As the summer is very hot, there are water restrictions.

Owners can fill their pools with one condition: they should not use more than $30m^3$ of water.

Based on your house plan and knowing your pool is 1m50 deep, **calculate the quantity of water needed to fill your pool.**

Are you allowed to fill your pool?

Baking Challenge

Congratulations, you have been selected for being part of the cast for the Great British Bake Off!

The production already announced the theme for the first baking day: “Zero-Waste Chocolate Challenge”. In only 2 hours, you will have to create three chocolate cakes with the least waste possible.

So before the big day, you train at home relentlessly!

Chocolate frosting

You decide to first create a berries and chocolate cake, with a nice chocolate frosting on top at the end.

Here is a picture of your dream cake:

Knowing that your cake will be 25cm in diameter and 7cm high, **calculate the cake area that needs frosting.**

Nutty

This time, you want to bake your signature cake: “Choco-Nut Crunch”. As its name indicates, it’s a chocolate and nuts cake.

The cake is circular and has a layer of crushed nuts decorating its borders.

Knowing your cake is 30cm in diameter and 10 cm high, **calculate the size of the borders of the cake that needs nuts.**

Yule log

You decide to revisit the Christmas yule log for the third and last chocolate cake. The rumour says that one jury member is passionate about coffee...

You make some calculations, and you deduce that the best size for this chocolate coffee cake would be to have a cylinder with a 12cm diameter that's 25cm long.

Now, calculate the volume of the cake that needs filling.

Step 3: Homework and development ideas

Play Area

What would be a perfect play area adapted for kids? On paper, create a plan for it. When you create the plan for the play area, make sure to include all measurements! You must include a round sandbox, a sports field (such as football, basketball, etc.), a communal vegetable garden and a cylindric slide.

Once you created the plan, it is time to get down to business.

How much sand do you need for the circle-shaped sandbox?

What is the size of the place dedicated to the sports field?

How much soil do you need for your vegetable garden?

What is the volume of the cylindric slide?

Renovating your home

Choose one room at home and imagine you were to renovate it the way you want.

Calculate the amount of floor covering you would need (it could be parquet, carpet, tile, etc.). In other words, what is the surface of the floor?

Calculate the amount of wallpaper or paint you would need. In other words, what is the surface of the walls?

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Co-funded by the European Union

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Project code: 1-FR01-KA220-SCH-00027771

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