Grade 3: Mathematics

Calculating the Perimeter of Rectangles

This resource can be used to plan an individual mathematics lesson or a unit of study. The suggested activities can be used in the order presented here, or they can be adapted for your lesson plan and classroom.

ClickView Miniclips

CURRICULUM OBJECTIVES

VIDEO OUTCOMES

Mathematics / Measurement

Understand perimeter as a measurable attribute of real-world and mathematical objects.

Find the perimeter of a polygon by adding the lengths of the sides.

TEACHER PACK OUTCOMES

Mathematics / Measurement

Understand perimeter as a measurable attribute of real-world and mathematical objects.

Find the perimeter of a polygon by adding the lengths of the sides.

DISCLAIMER

A number of the activities within this teacher pack have been adapted from the teacher pack for the *Calculating the Area of Rectangles* Miniclip.

They have been redesigned slightly to incorporate the concept of **perimeter** instead of, or in collaboration with, **area**.

If an activity has already been used to teach area, you may try to incorporate students' previous work to extend their understanding of the new concept.

Alternatively, the activities can be used to introduce perimeter and area at the same time.

Activity	Resources	Outcomes
<u>Activity 1: Perimeters in the Classroom</u> **Timeframe:** 25 minutes **Lesson aim:** To introduce measuring perimeters of rectangles with classroom objects, and the methods that can be used. Watch the ClickView Miniclip *Calculating the Perimeter of Rectangles*. Discuss the concept of perimeters, when we might use perimeters, and the purpose they serve. Measure the sides of different rectangular objects in the classroom. These may include: • Classroom walls • Smartboard / Digital display/whiteboard • Desk • Books • Paper sheets • Wall posters Discuss the features that make them rectangles. Re-watch *Calculating the Perimeter of Rectangles*, paying particular attention to the methods of calculating the perimeters. As a class, practise some of these methods using some of the classroom objects whose sides were just measured. Students may volunteer to solve some using their preferred method. Place some other objects in the middle of table groups and allow students to measure and calculate their perimeters. In their notebooks, students should specify the object measured, which method they used, and show all their working. They can also draw an image of the object measured.	ClickView Miniclip - *Calculating the Perimeter of Rectangles* Rectangular classroom objects Rulers Maths notebooks	Students will: • Understand perimeter as a measurable attribute of real-world and mathematical objects. • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 2: Floored by Rectangles! **Timeframe:** 45 minutes **Lesson aim:** To draw, measure, and order the perimeters of rectangles through a hands-on experience using masking tape rectangles constructed on the classroom floor (or outside). **Note:** Before beginning this activity, construct large rectangles on your classroom floor using masking tape and a ruler. Each rectangle should be referenced by a letter of the alphabet (Rectangle A, Rectangle B, etc.) There should be enough rectangles for each group of students. As a class, walk around and inspect all the rectangles. Ask your students to hypothesize on which rectangle they think has the largest perimeter and why. Students should then be divided into small teams and allocated to a rectangle. Introduce the task of measuring the full-scaled rectangles to find their perimeter as a group. Distribute a copy of the *Floored by Rectangles!* worksheet to each student, and a meter ruler to each group. Following the worksheet instructions, each group must draw and measure the sides of their rectangle using the meter ruler, and record their results on the worksheet. Using one of the three methods for calculating perimeter introduced in the *Calculating the Perimeter of Rectangles* Miniclip, students are to calculate their rectangle's perimeter. This can be done individually or collaboratively depending on ability or preference. Once all students in the group have measured the perimeter of their rectangle, there are two options: • The groups come together and compare their measurements, and discuss their results; • The groups can rotate to the next rectangle and repeat the activity. This results in each group calculating the perimeter of all the rectangles. To conclude the lesson, collate all the measurements and write them up on the Smartboard / Digital display. Ask students to help you order the rectangles from smallest to largest perimeter. Discuss with students: • Was your original hypothesis correct? • Were you surprised by these results? • What have you learned about perimeters from this activity?	Masking tape Meter ruler (one per group if possible) *Floored by Rectangles!* worksheet	Students will: • Understand perimeter as a measurable attribute of real-world and mathematical objects. • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 3: Flexible Perimeters **Timeframe:** 30 minutes **Lesson aim:** To experiment with creating various rectangles using elastic bands on a geoboard, using both free play and a set perimeter length. Distribute geoboards to each student along with rubber bands. If you do not have geoboards available to you, you can use grid paper and pencils instead or access an online geoboard generator. To begin the lesson, encourage students to experiment and create various sized rectangles using the elastic bands. After some time, set students a challenge with a perimeter of a certain length (e.g. 30 spaces representing 30 cm). Ask students: • Is it possible to make different sized rectangles with the same perimeter? • If it is possible, how many can you make? Each rectangle they create should be drawn in their notebooks to scale, with the measurements of each side included. This will allow them keep track of the rectangles they have created, and allow them to compare their results with other students later. Once students have created as many rectangles as they can, ask some to contribute their discoveries to the rest of the class. Students can present their geoboard and explain how they found that specific rectangle using the perimeter provided. After sharing the various rectangles students have created, collaboratively analyse and discuss: • What were the dimensions of the most common rectangle created in the class? • Were there any unique rectangles? • Could you have made a square using the perimeter provided? Why or why not? • What was the maximum number of rectangles that could have been produced for that perimeter? Did anybody find all of them?	Geoboards **OR** Grid paper **OR** Online geoboard generator Rubber bands Pencils Ruler Maths notebooks	Students will: • Understand perimeter as a measurable attribute of real-world and mathematical objects. • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 4: Spaghetti and Meatballs for All! **Timeframe:** 1 hour **Lesson aim:** To read *Spaghetti and Meatballs for All!* by Marilyn Burns to the class, and have a hands-on experience using cut out squares to allow students experiment with the different table and chair configurations for themselves. Alternatively, the activity could be conducted using 8 classroom desks and 32 students/chairs as a whole class approach. **Note:** Before beginning this activity, cut out 8 squares and provide 32 paperclips per student. These can be stored in ziplock bags for convenience. The squares represent tables, and the paperclips represent guests (as well as the unit for measurement). Read *Spaghetti and Meatballs for All!* by Marilyn Burns aloud to your class. Afterwards, discuss how it relates to perimeter. Why do you think moving the tables apart helped fit more guests than when they were all pushed together? Listen to multiple ideas as students will process this concept differently. Introduce the activity of experimenting with the configurations of their own dinner tables and guests. Hand out the ziplock bags that contain the cut out squares and paperclips to each student. Explain what these two objects represent in relation to the book. Students should experiment (individually or in pairs) with creating different configurations of tables and count the number of guests that can be seated at each. The number of guests will represent the perimeter for each square/rectangle. With each table configurations, students should draw it in their notebooks and write how many guests can sit at each (e.g. *This table configuration seats 6 guests*.) Afterwards, students can pair up to share their findings before the class comes together to present and discuss. • Did their results reflect the same from the book? • Which table configuration seated the most amount of guests? And the least? • What did they learn from the activity regarding perimeters? For additional support, refer to the final page of the book to help guide your classroom activities. *This activity has been adapted from the classroom activities provided in the picture book Spaghetti and Meatballs for All! by Marilyn Burns.*	*Spaghetti and Meatballs for All!* by Marilyn Burns Ziplock bags Maths notebooks Cut out squares (8 per student) Paperclips (32 per student) **OR** 8 classroom desks 32 students/chairs	Students will: • Understand perimeter as a measurable attribute of real-world and mathematical objects. • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 5: Perimeters from the Sky **Timeframe:** 45 minutes **Lesson aim:** To measure the perimeter of students' own school grounds and other places of interest using the Google Earth application.		
Download the Google Earth application via www.google.com/earth/ Introduce your students to the Google Earth application using your Smartboard / Digital display. Show them how to search for locations and use the tools that will be featured in this lesson. Using the search bar on the left, input your school address. Once it produces the correct result, zoom in and click "U" (this aligns the perspective to be straight down). You should now be able to view your school from a perfect bird's eye aerial view. *You may demonstrate the following step to your whole class before students begin the activity independently:* Using the "Path" tool **(Ruler > Path tab > select "Meters" > click to plot points)**, students should calculate the perimeter of the building they are in, or the school grounds as a whole. *Please note: Google Earth does not allow you to plot the final point on top of the original point initially, so instruct students to place the final plot, then select and drag it so it falls on top of the original plot.* In their notebooks, students should note their findings. They can draw the aerial view of the buildings on a grid and write the measurement values for each side. They should also include the total perimeter of the building. Afterwards, students can locate and measure the perimeter of other locations such as their homes, local shopping centres, parks, etc.	Google Earth application Smartboard / Digital display Devices with Internet access Maths notebooks	Students will: • Understand perimeter as a measurable attribute of real-world and mathematical objects. • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 6: Pandemonium with Pentominoes! **Timeframe:** 40 minutes **Lesson aim:** To experiment with pentominoes and discover the changes in their shapes in relation to area and perimeter. Distribute a copy of *Pandemonium with Pentominoes!* worksheet to each student and follow the written instructions included. Students should experiment with different pentomino configurations, but should eventually realise that **no more than 12** different pentominoes can be created. This activity should create discussion on reflection and rotation. Students should understand that reflecting or rotating a pentomino does not create a new one. Once students have discovered all 12 possible pentominoes, ask students to begin examining the area and perimeter of each shape. They should calculate the area and perimeter of each pentomino they have created and write it next to each diagram on their grid paper. *Please note that the pentomino squares in the worksheet are not to scale. Students should interpret each square as a unit in itself. Therefore, each pentomino has an area of 5 square units, with a perimeter that can be counted around.* Then, come together as a class and discuss the perimeter and area of the pentomino configurations. • Did the area of each pentomino remain the same or change? • Did the perimeter of each pentomino remain the same or change? • What does this tell us about the relationship between perimeter and area?	*Pandemonium with Pentominoes!* - worksheet Grid paper **OR** Maths notebook	Students will: • Find the perimeter of a polygon by adding the lengths of the sides.

Activity	Resources	Outcomes
Activity 7: Interactive Video **Timeframe:** 15 minutes **Lesson overview:** Students will watch the ClickView Miniclip and answer the interactive questions to show their understanding of calculating the perimeter of rectangles.		
ClickView has created an interactive video lesson to accompany the ClickView Miniclip *Calculating the Perimeter of Rectangles.* It includes a range of question types such as multiple choice, missing word, and true or false. You can assign the interactive video to your students to do at any suitable point in your unit. Alternatively, you can edit the premade questions to suit your students or create your own interactive video. To share the interactive video with your students, follow these steps: 1. Search for the Miniclip *Calculating the Perimeter of Rectangles* that has the interactive logo (Interactive). 2. Click to view the video. 3. Click on the "Interactive videos" tab beneath the video. 4. Click the "Print as Worksheet" OR "Save to Workspace" button on the interactive video. 5. If you click "Save to Workspace", you can either click "Share with your students" or access it via your Workspace. • If you choose "Share with your students", copy the link and send it to your students. • Otherwise go to your Workspace, select the "Interactive videos" folder, and click "Share" to access the link and send to students. Students can watch and answer the interactive questions either in class or at home. Their results will be collated for you to view from your Workspace. The following guides are available if you require assistance: Creating an interactive video www.clickviewsupport.com/hc/en-us/articles/115005656528-PB202 How do I share an interactive video? www.clickviewsupport.com/hc/en-us/articles/115005496667-PB208 How do I make my interactive video private/public? www.clickviewsupport.com/hc/en-us/articles/115005494867-PB206	Smartboard / Digital display or 1:1 device with Internet connection Interactive video for the ClickView Miniclip – *Calculating the Perimeter of Rectangles*	Assessment