Integrating Computing Across the Curriculum

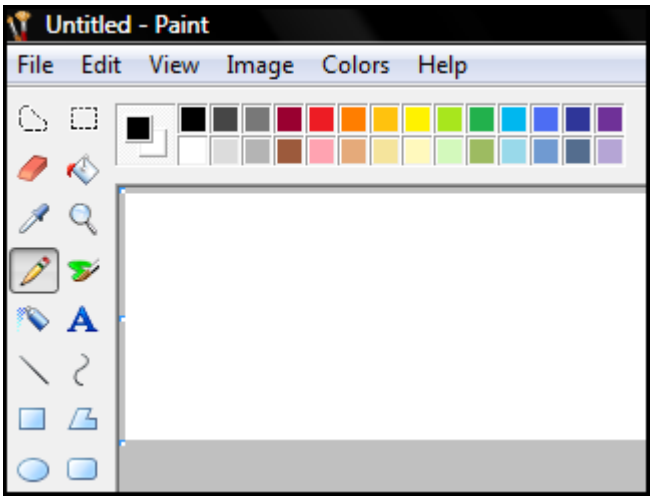
Title:	Building a Clubhouse
Grade(s):	5
Subjects(s)	Math
Author:	ICAC Team
Overview:	The teacher will review the area and perimeter of shapes and provide practice problems. Students will use **Microsoft Paint** to design their own clubhouse and calculate perimeter and area. They will use **Microsoft Word** to write an essay about their clubhouse. *This lesson plan has been developed using materials from Illuminations.*
Content Standards:	MA(5) 11. Estimate perimeter and area of irregular shapes using unit squares and grid paper. MA(5) 12. Calculate the perimeter of rectangles from measured dimensions. ELA(5) 7. Compose expository texts using an introductory paragraph that includes a main idea; supporting paragraphs with a minimum of three reasons, explanations, or steps in a process; and a conclusion. ELA(5) 9. Apply mechanics in writing, including capitalization of first word in a direct quotation and use of punctuation, including quotation marks and comma with direct quotations, colon to introduce a list, and commas after introductory words, with a noun of direct address, and in a compound sentence. ELA(5) 10. Demonstrate knowledge of grammar and usage concepts, including subject-verb agreement with a compound subject; present, past, and future verb tenses; forms of adjectives; forms of nouns; and subject, object, and possessive pronouns. TC(3-5) 2. Use various technology applications, including word processing and multimedia software.
Local/National Standards:	None
Primary Learning Objective:	Using computer software, the students will be able to calculate the area and perimeter of irregular shapes.
Additional Learning Objective:	Using computer software, the students will be able to compose a 3 paragraph written essay.
Approximate Duration of Lesson:	60 minutes
Materials and Equipment:	
Technology Resources Needed:	**Microsoft Paint** and **Microsoft Word**, graph paper graphic

Background/ Preparation: Students will need a working knowledge of perimeter and area of shapes.

Procedures/ Activities:

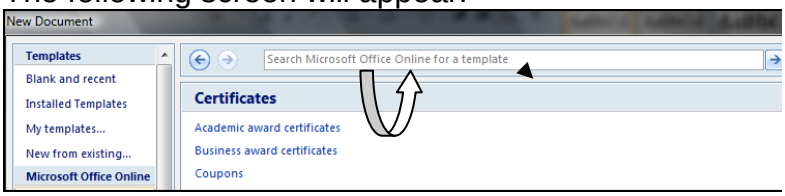
Step 1 Students will learn how to calculate the area and perimeter of shapes. To do so they will use the attached diagrams (Figures 1, 2, 3, & 4) and **Microsoft Paint**. Have the students open **Paint** as follows:

-Click the *Start* button
-Click on *All Programs*
-Click on *Accessories*
-Click on *Paint*



Step 2 Open **Microsoft Word** and click on the Office Button: . Scroll down to "New."

The following screen will appear:



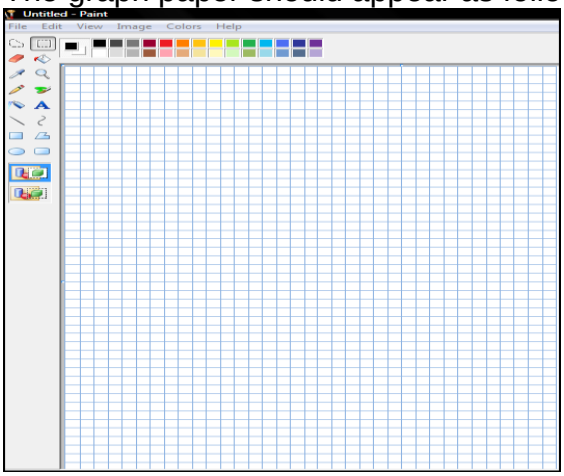
In the "Search Microsoft Office Online for template" type *graph paper.*

When the graph paper is displayed on your **Word** document, double click on the graph paper, then highlight the paper (click and drag over the entire page). Right click and click on "copy" to copy the graph paper.

OR copy the graph paper found at the end of this lesson plan by right clicking on the graph paper image box. Then, paste directly into your **Paint** document.

Return to the **Microsoft Paint** screen.
Next click “Edit”, then “paste” onto the **Paint** screen.

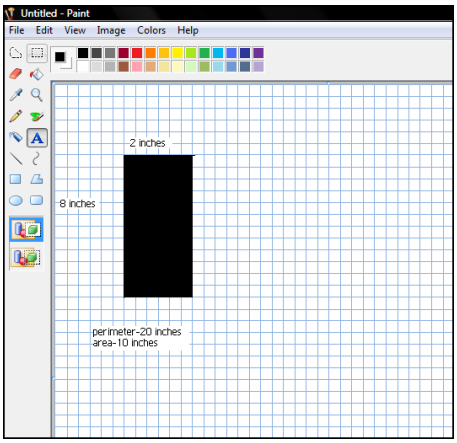
The graph paper should appear as follows:



Step 3 Display each of the attached figures (1-4) on the board or using an Elmo or a Promethean Board. Have students use the shapes tools to duplicate the shapes, and then determine the measurements, perimeters and areas of each figure.

Review the process for calculating the **perimeter** and **area** of different shapes. The **perimeter** is the sum of the lengths of all of the sides. Remind students of the shortcut for calculating the perimeter of regular polygons: find the length of one side and multiply by the number of sides.

To calculate the **area** of a shape, first determine whether it is regular or irregular. For regular shapes like squares and rectangles multiply the length times the width to get the area. For other parallelograms calculate the base times the height. For triangles use ½ x base x height. If the shape is irregular, it must be divided into sections of regular figures, such as rectangles and triangles. The areas of all figures that make up the irregular figure are then calculated and added to get the total area of the figure.



Step 4 Explain to the students that they will design their own clubhouse. Using the graph paper in **Microsoft Paint**, have the students produce a picture of their clubhouse. They will draw on top of the graph paper.

Step 5 Have them calculate the perimeter and area of their clubhouse and add these dimensions to their diagram.

Step 6 Now ask the students to visualize their clubhouse and what they would be doing if they were in the clubhouse. Ask them to use **Microsoft Word** to write a descriptive essay explaining their ideas about the clubhouse.

Their essay should contain **an introductory paragraph that includes a main idea; supporting paragraphs with a minimum of three reasons, explanations, or steps in a process; and a conclusion.**

Step 9 Call on students to read their completed essays.

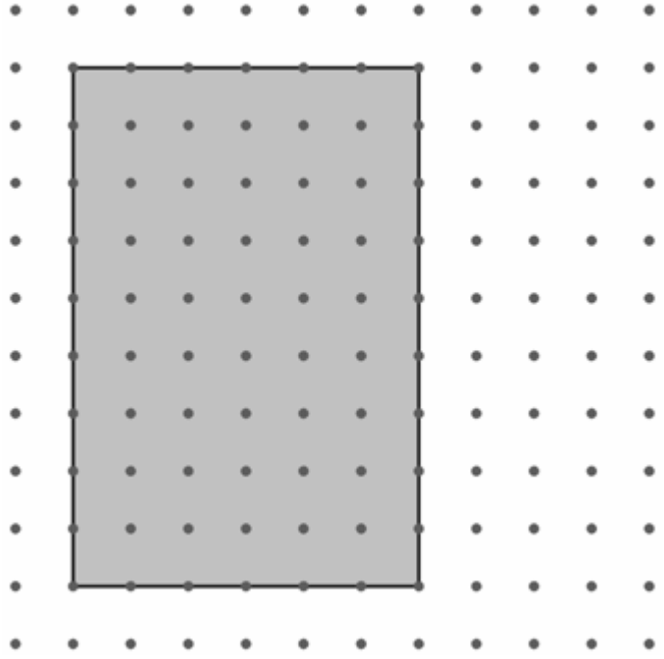
Attachments: Worksheets, rubric, and graph paper

Assessment Strategies: Rubric attached

Extension: Have students figure out the perimeter and area of more difficult shapes. Encourage them to transfer what they have learned to find the area and perimeter of a room or their home.

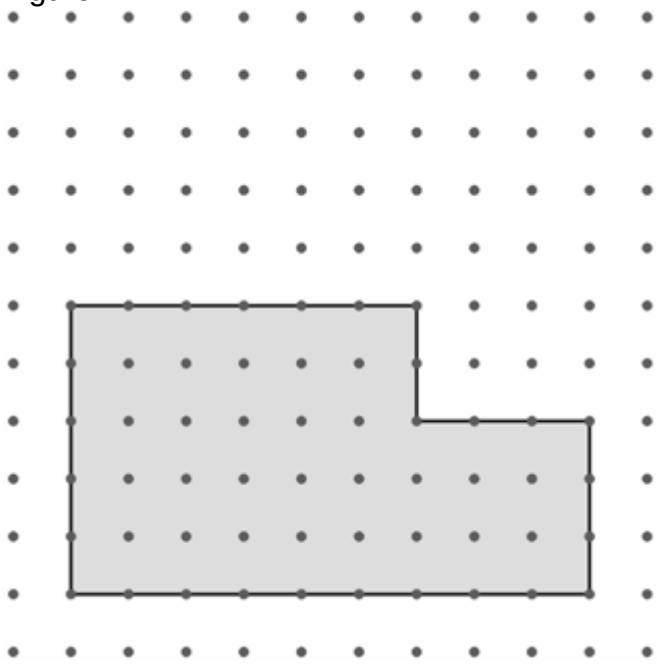
Remediation: Provide students with more shapes on graph paper for them to practice finding area and perimeter. Allow students to work with 2D geometric manipulatives to use simple shapes to build more complex shapes. Students should calculate the area and perimeter of the simple shapes and then use them to create more complex shapes. Then have the students find the area and perimeter of the more complex shapes using addition.

Figure 1



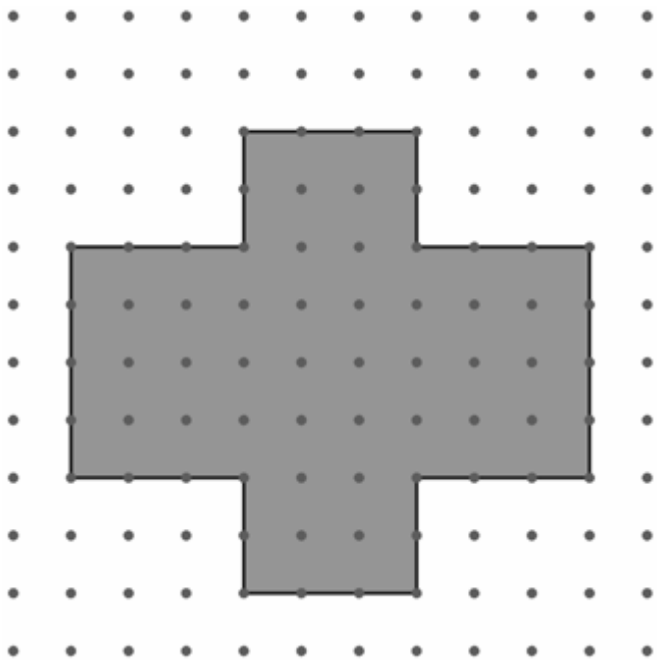
Perimeter___ Area___

Figure 2



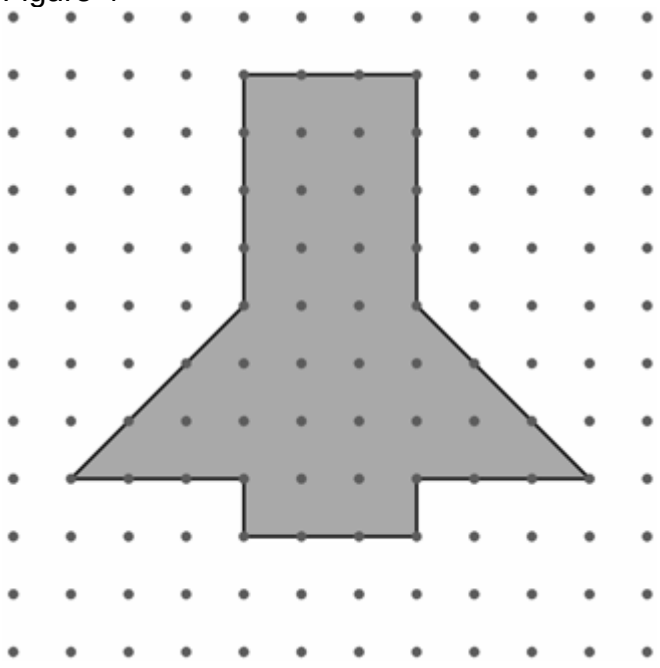
Perimeter___ Area___

Figure 3



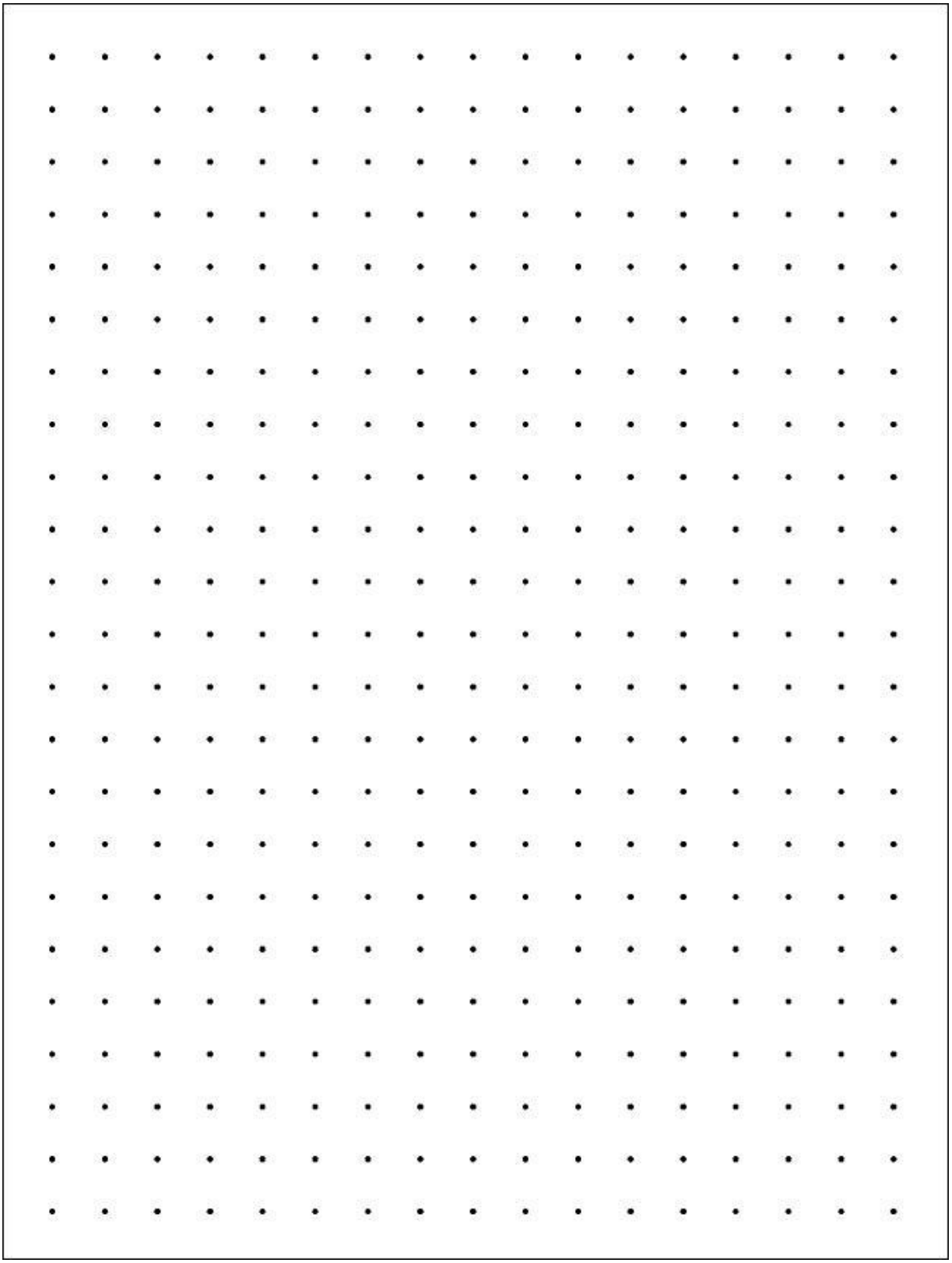
Perimeter___ Area___

Figure 4



Perimeter___ Area___

Assessment Rubric for Clubhouse Activity

Score	1	2	3	4
Participation	No participation in the activity.	Some participation, but didn't work well with the group.	Participated for most of the project and contributed to the outcome.	Outstanding group worker.
Essay	Didn't write an essay, or had major omissions.	Essay was missing several elements.	Essay was missing one required element.	Essay contained all elements: an introductory paragraph that includes a main idea; supporting paragraphs with a minimum of three reasons, explanations, or steps in a process; and a conclusion.
Grammar	Author makes more than 4 errors in grammar or spelling that distract from the content.	Author makes 3-4 errors in grammar or spelling that distract the reader from the content.	Author makes 1-2 errors in grammar or spelling that distract the reader from the content.	Author makes no errors in grammar or spelling that distract the reader from the content.
Math	Did not correctly find the area or perimeter of the shapes.	Found the correct area **or** perimeter of 3 of the 4 shapes and clubhouse.	Found the correct area **and** perimeter of 3 of the 4 shapes and clubhouse.	Found the correct area and perimeter of all 4 shapes and of the clubhouse.
Technology	Did not use Microsoft Paint or Microsoft Word to create the essay or the clubhouse shape.	Did not use Microsoft Paint to create the clubhouse shape but did use Microsoft Word to complete the essay.	Correctly used the appropriate tools to create the shape but did not complete the essay using Microsoft Word.	Correctly used appropriate tools to complete both the essay and the clubhouse shape.

Attachment: Graph Paper