

# **Integrated Math Project**

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Section: P/J 1  
Presented to Professor Jarvis  
Thursday, April 8<sup>th</sup> 2010

# Exploring Measurement and Writing

Grade level: 5

## **Mathematics Curriculum**

Strand: Measurement

Specific Expectation

- Estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools (e.g., grid paper, geoboard, dynamic geometry software) and strategies
- Solve problems requiring the estimation and calculation of perimeters and areas of the rectangles (Sample problem: you are helping to fold towels, and you want them to stack nicely. By folding across the length and/or the width, you fold each towel a total of three times. You want the shape of each towel to be as close to a square as possible. Does it matter how you fold the towel?)

## **Language Curriculum**

Strand: Writing

Specific Expectation

- Identify the topic, purpose, and audience for a variety of writing forms (e.g., a poem or song on a social issue for performance by the class; a formal letter to the teacher outlining their opinion on eliminating soft drinks from the school vending machine; an article explaining the water cycle and including a flow chart, for an outline student encyclopedia)

# Student Activity Sheet 1

## Knowledge and Understanding

Define the following terms:

Area: \_\_\_\_\_

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Perimeter: \_\_\_\_\_

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Centimetre: \_\_\_\_\_

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Metre: \_\_\_\_\_

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Millimetre: \_\_\_\_\_

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Scale: \_\_\_\_\_

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Measure: \_\_\_\_\_

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Dimension: \_\_\_\_\_

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Communicate: \_\_\_\_\_

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Voice: \_\_\_\_\_

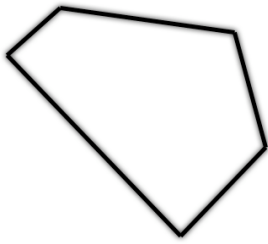
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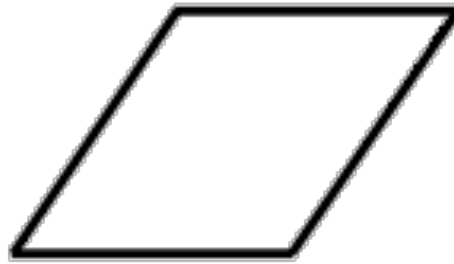
## Student Activity Sheet 2

### Thinking

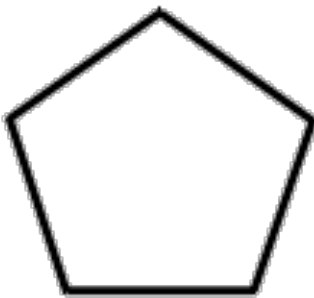
1. Find the perimeter of the following polygons:



a. Perimeter = \_\_\_\_\_



b. Perimeter = \_\_\_\_\_



c. Perimeter = \_\_\_\_\_

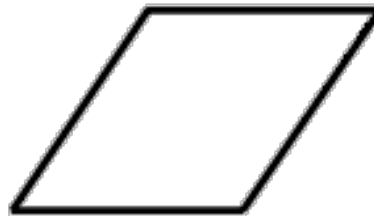


d. Perimeter = \_\_\_\_\_

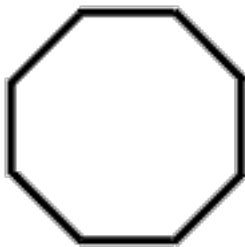
2. Find the area of the polygons



a. Area = \_\_\_\_\_



b. Area = \_\_\_\_\_

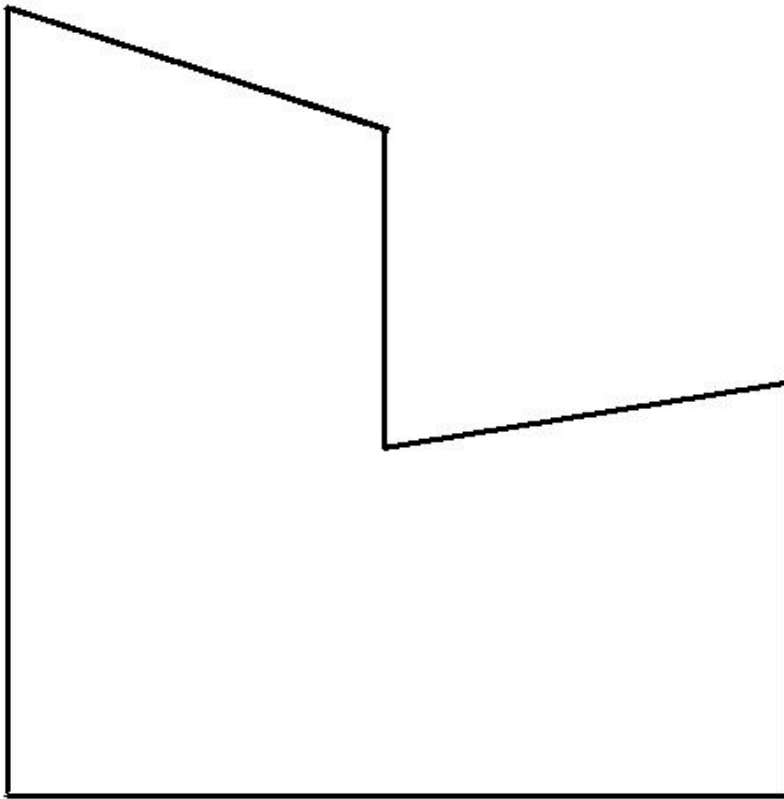


c. Area = \_\_\_\_\_



d. Area = \_\_\_\_\_

3. Find the length of the polygon. Use the scale to calculate the full-size dimension.



Scale:  
1 cm = 100m

Perimeter =  
\_\_\_\_\_

Area =  
\_\_\_\_\_

Calculate Actual  
Size:

## Student Activity Sheet 3

### Application

Homeowners want to add an additional room to their house. They know that they want another room but are not sure how big they want the room, where they want the addition to go or what they will use the room for.

Each person is now a contractor and will put together a building plan for the homeowners. You will need to measure the area and perimeter of the existing floor plan. Decide what kind of room you want to add (example, a gym room, a games room, a indoor swimming pool, etc.) and where you want to put the room. Remember it needs to be attached to the house or garage. Once you decided where you want to attach your new addition, create a floor plan of your room. Use units we have covered. Once your floor plan is finished, measure the perimeter and area of the room. Create a scale to convert your measurement into “real-life” measurements.

Things to remember to do:

- Statement of the project
- Measure the perimeter and area of the existing floor plan
- Decide on the type of room you are creating and where you’re adding it
- Create a floor plan of your addition (Remember it needs to be attached!)
- Measure the room (perimeter and area)
- Create a scale
- Convert the measurements using the scale. Calculate the perimeter and area of the room to “real-life.”
- Be creative!

## Student Activity Sheet 4

### Communication

Once you have completed your floor plan, measurements, and design you need to write a letter explaining your room to the homeowners. You need to tell the homeowners the measurements of the room, why you choose the size of the room, and what you think the room should be used for.

Things to remember:

- Use proper letter formatting
- Include the measurements of the room (grid paper and “real-size”)
- The reason for the size of the room
- What the room should be used for
- Explain the scale you used
- Measurement tools used

## Student Exemplars

### **Exemplar 1 - Communication (Level 4)**

March 4<sup>th</sup> 2010

To: Homeowners,

Thank you for providing B&M Custom Carpentry with an opportunity to bid on your upcoming project. We have used the information you provided to design and quote your upcoming addition to your home. We would like to create a gym room for you and your family to use.

The first step was to decide on the size of the room. Since we want to create a gym for you and your family we thought that this addition would need to be large. By making it large we are giving you lots of space in your new gym. Once we had the room drawn on the floor plan we measured the new room. We did this by measuring the perimeter and area of the space. We measured the perimeter by measuring the four walls and adding the measurements together to get a total. The total perimeter of the house was 280 millimetres, or 45 meters. We used a ruler to measure the plan you provided and used a scale of 5 millimetres being equal to one metre. Next we measured the area of the room. We did this by taking two sides that met in the bottom right corner of the plan and multiplied them together to get the area. We used a ruler as well as a calculator to get the area. The area of the house was 4500 millimetres squared, or 180 meters squared.

We have created a draft plan for you to use to review the improvements we would like to make to your home. Please look it over and communicate to us any changes you would like us to make to our design plan.

Sincerely,

Ivana Tinkle  
CEO B&M Custom Carpentry

## **Exemplar 2 – Communication (Level 2)**

March 4<sup>th</sup> 2010

Dear Homeowners,

We reviewed the plans you gave us and decided to build you a game room. We think you would like to have a game room in your house because we think you like games.

We measured the perimeter of your room and got 27. We measured all four walls and added them to get the total. We measured the area of your room and got 45.5. We got the area by multiplying one wall measurement by the other. We used a ruler to measure the perimeter and the area.

Thanks for choosing our company to build your house bigger.

Mike

## Sample Checklist for Teacher Assessment of Measurement Skills

Application

Student Name: \_\_\_\_\_

	<b>Not Completed</b>	<b>Complete, but incorrect</b>	<b>Complete and correct</b>
Measured Perimeter of Original Floor Plan			
Measured Area of Original Floor Plan			
Scale			
New Room is Drawn			
Perimeter of New Room Measured			
Area of New Room Measured			
Conversion using scale to "real life" - Perimeter - Area			

## Sample Rubric for Teacher Assessment of Letters

Communication Activity

Student's Name \_\_\_\_\_

<b>Criteria</b>	<b>Level 4</b>	<b>Level 3</b>	<b>Level 2</b>	<b>Level 1</b>
<b>Demonstrates knowledge of topic</b>	Demonstrates thorough knowledge of topic	Demonstrates considerable knowledge of topic	Demonstrates some knowledge of topic	Demonstrates limited knowledge of topic
<b>Addresses audience</b>	Consistently addresses audience	Often addresses audience	Occasionally addresses audience	Rarely addresses audience
<b>Explains purpose</b>	Communicates purpose with excellent clarity	Communicates purpose with good clarity	Communicates purpose with some clarity	Communicates purpose with limited clarity
<b>Letter formatting</b>	Uses all parts of a proper letter	Uses some parts of a proper letter	Uses few parts of a proper letter	Uses no parts of a proper letter
<b>Uses vocabulary and terminology correctly</b>	Consistently uses vocabulary and math terminology correctly	Often uses vocabulary and math terminology correctly	Occasionally uses vocabulary and math terminology correctly	Rarely uses vocabulary and math terminology correctly
<b>Spelling/ grammar</b>	Has no/few spelling/ grammar errors	Has few spelling/ grammar errors	Has some spelling/ grammar errors	Has many spelling/ grammar errors
<b>Explaining the concept (Area &amp; Perimeter)</b>	Explains the concepts with excellent clarity	Explains the concepts with good clarity	Explains the concepts with some clarity	Explains the concepts with limited clarity
<b>Select and use correctly, the most appropriate tools</b>	Consistently selects the most appropriate tools	Often selects the most appropriate tools	Occasionally selects the most appropriate tools	Rarely selects the most appropriate tools
<b>Demonstrates an understanding of scale and use of scale</b>	Demonstrates exceptional understanding of scale ad use of scale	Demonstrates considerable understanding of scale ad use of scale	Demonstrates some understanding of scale ad use of scale	Demonstrates limited understanding of scale ad use of scale
<b>Describes a change in measurement</b>	Describes change in measurement with excellent clarity	Describes change in measurement with good clarity	Describes change in measurement with some clarity	Describes change in measurement with limited clarity

## **Student Reflections of Activity**

*Bruce:* In completing this assignment I have learned that math is a part of ever aspect and subject in the curriculum. We choose to integrate math and language for this assignment, but we could have easily chosen another area and still have created a fun and creative lesson. Through doing this assignment I have also enhanced my knowledge of how to apply mathematical thinking and terminology into my own writing. I also became more confident with my measuring skills.

My placement experience gave me the inspiration for this lesson. I taught a class that was 80% male, and subsequently had low writing in math scores on EQAO testing. Because of this, our school had set a mandate to improve these scores my integrating math and language as much as possible. This lesson plays right into our line of thinking of creating “real world” scenario’s that these male students will most likely encounter in future professions. Creating these types of experiences for our learners not only helped engage the students, but also acted as a catalyst for improved marks and work ethic in all areas of the curriculum. Success truly bred confidence with these learners.

I will definitely use integrated lessons in my future teaching practices. This assignment has inspired my creativity as a teacher, planner, and learner. The assignment has also made me realize how much you can integrate math across the curriculum. I have learned the math does not have to be a pain in the side of learners, but rather a tool to enhance learning and cement ideas and concepts in other areas of the curriculum.

*Meagan:* I have learned that I really like integrated lessons. There are so many different ways you can incorporate math and you can do so in any subject. I love this because it takes abstract math concepts and links them to other things. It makes math more enjoyable, more interactive, and makes it more “real-life.” It allows students to ask more questions, think critically, and problem solve. Also by integrating you can add a theme, such as spring or weather and integrate this into your lessons, which may help draw students into the lesson and activities. As teachers we need to engage our students and I think that an integrated activity such as this one would do just that.