Name $\qquad$

## Master 9.6 Additional Activity 1:

 A Kilometre of Dental FlossWork on your own.
You will need a package of dental floss, and paper and pencil.
> Suppose each member of your family flosses her or his teeth once a day.
Do you think your family would use more or less than 1 km of dental floss in a year?
> Explain how you got your answer.

Take It Further:
Calculate about how many packages of dental floss equal 1 km .

Name $\qquad$ Date $\qquad$
Master 9.7
Additional Activity 2: Tangram Perimeters

Work on your own.
You will need a tangram, paper and pencil, and a ruler.
> Use the tangram pieces. Create a figure or a design.
> Trace the outline of your figure onto paper. You may need to have a classmate help you hold the pieces in place while you trace.
> Estimate first.
Then measure to find the perimeter of your figure to the nearest tenth of a centimetre.

## Take It Further:

Trade tracings with a classmate.
Measure to find the perimeter of your classmate's figure.

Name $\qquad$ Date $\qquad$

## Master 9.8 Additional Activity 3: Calculating Perimeter and Area

Work with a partner.
You will need 5 cardboard rectangles of various sizes, labelled A, B, C, D, and E, a ruler, and paper and pencil.
> Choose a rectangle.
One of you estimates the perimeter of the rectangle.
The other estimates its area.
Record your estimates.
> Measure the length and the width of the rectangle.
Record these measurements.
> Use the measurements to calculate the perimeter, then the area of the rectangle.
Record these measurements.
> Repeat with the other rectangles.

## Take It Further:

Order the rectangles from least to greatest perimeter. Then order them from least to greatest area.

Name $\qquad$ Date $\qquad$

## Master 9.9 Additional Activity 4: Investigating Hands

Work in a group of 4.
You will need a pencil, 1-cm grid paper, string, and measuring tape.
> Hold out your right hands so they are near.
Examine the 4 hands.
Estimate to order them from least to greatest area.
> Each of you trace your right hand onto 1-cm grid paper. Find the approximate area of your hand.
$>$ Order the hands from least to greatest area. Compare the results with your estimate.

## Take It Further:

Estimate to order the hands from least to greatest perimeter.
Use the string to find the perimeter of each hand.
Compare the results with your estimate.

Name $\qquad$ Date $\qquad$

## Master 9.10 Step-by-Step 1

## Lesson 1, Question 6

Step 1 How many centimetres is 15 dm ? $\qquad$
Can you draw a length of 15 dm on this page? $\qquad$

Step 2 Do you think a wingspan of 15 dm is reasonable for a pet bird? Explain.

Step 325 cm is about 24 cm .
Divide 24 cm into 4 equal lengths.
Each length is $\qquad$ cm.

Step 4 Is each length of salmon large enough to feed one person? $\qquad$ Is Pablo's statement reasonable? Explain.

Step 5 About how long does it take you to walk 1 km ? $\qquad$ About how long would it take you to walk 5 km ? $\qquad$ Is Betty's statement reasonable? Explain.

Step 6 The length of one shoelace is about 30 cm . How long would 2 shoelaces tied together be? $\qquad$
Do you think this would equal the height of a small child? Explain.

Name $\qquad$ Date $\qquad$
Master 9.11 Step-by-Step 2
Lesson 2, Question 10
Step 1 How tall is Rico? $\qquad$ What is Rico's height in centimetres? $\qquad$

Step 2 How tall is Jeremy? $\qquad$ What is Jeremy's height in centimetres? $\qquad$

Step 3 How tall is Sasha? $\qquad$

Step 4 Order the students from shortest to tallest, using their heights in centimetres. $\qquad$

Step 5 Who is tallest? $\qquad$

Step 6 Subtract the height of the second-tallest student from the height of the tallest student.
$\qquad$

Step 7 How much taller is the tallest student?

Name
Date $\qquad$
Master 9.12 Step-by-Step 3

## Lesson 3, Question 4

Step 1 Find a table in your classroom.
Cut a piece of string as long as the table.

Step 2 How many times does the length of string fit along the length of the hallway?

Step 3 Assume your classmates used a broom. Do you think your classmates will get the same result as you? Explain.

Name $\qquad$ Date $\qquad$
Master 9.13 Step-by-Step 4

## Lesson 4, Question 7

Step 1 What is the circumference of the bracelet?

Step 2 Cut a length of string equal to the circumference of your wrist. Measure the string with a ruler.
What is the circumference of your wrist? $\qquad$

Step 3 Is the circumference of your wrist greater than or less than the circumference of the bracelet? $\qquad$

Step 4 Could you wear the bracelet?
How do you know?
$\qquad$
$\qquad$
$\qquad$
$\qquad$ Date $\qquad$

## Master 9.14 Step-by-Step 5

## Lesson 5, Question 6

Step 1 What is the perimeter of Miss Dahlia's flower garden? $\qquad$

Step 2 Use1-cm grid paper. Let the length of 1 grid square represent 1 m . Draw a figure that is not a rectangle, with perimeter 28 m .
The sides of the figure must be drawn on the lines of the grid paper.

Step 3 Draw 2 other figures that are not rectangles, each with perimeter 28 m .

Step 4 Count the squares in each of your 3 figures. How many squares are in the first figure? $\qquad$
What is the area of the first figure? $\qquad$
How many squares are in the second figure? $\qquad$
What is the area of the second figure? $\qquad$
How many squares are in the third figure? $\qquad$
What is the area of the third figure? $\qquad$

Step 5 Which figure has the greatest area? $\qquad$

Step 6 Which figure will give Miss Dahlia the greatest amount of space for planting flowers?

Name $\qquad$ Date $\qquad$

## Master 9.15 Step-by-Step 6

## Lesson 6, Question 7

Step 1 Draw a rectangle.
Label the lengths of two opposite sides 12.0 m .
Add these lengths: $\qquad$

Step 2 The perimeter is 55.0 m .
Subtract to find the sum of the other two sides.
55.0 m - $\qquad$ $\mathrm{m}=$ $\qquad$ m

Step 3 We know the other two sides of the rectangle are of equal length. Divide your answer to Step 2 by 2 to find the length of each side.
$\qquad$ $m \div 2=$ $\qquad$ m

The dimensions of the garden are $\qquad$ m by $\qquad$ m.

Step 4 Repeat the above calculations for side lengths of 12.1 m to 12.8 m .
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

How many rectangles did you find? $\qquad$

Step 5 Were you able to draw a rectangle with all 4 sides equal? $\qquad$

Name $\qquad$ Date $\qquad$

## Master 9.16 Step-by-Step 7

## Lesson 7, Question 9

Step 1 What is the perimeter of the rectangular garden? $\qquad$

Step 2 Start with a pair of sides on the rectangle being equal to 1 m .
All the side lengths will be whole numbers of metres.
What will the length of the other two sides be?

Step 3 Draw the rectangle on grip paper.
Label all the dimensions.
Check to make sure the perimeter is the same as in Step 1.

Step 4 Increase the length of a pair of sides on the rectangle to 2 m .
What will the lengths of the other two sides be?

Draw the rectangle on grid paper.
Step 5 Continue to increase the length of a pair of sides on the rectangle.
Keep the same perimeter as in Step 1.
Draw all your rectangles on grid paper.
Step 6 Count the number of squares in each of the rectangles.
What is the greatest number of squares you can count? $\qquad$
What is the area of that rectangle? $\qquad$

Step 7 Which garden would provide the most growing space? $\qquad$ The least growing space? $\qquad$

Name $\qquad$ Date $\qquad$

## Master 9.17 Step-by-Step 8

## Lesson 8, Question 10

Step 1 Look at the rectangle.


Step 2 What is its length? $\qquad$ What is its width? $\qquad$
What is the area of this rectangle? $\qquad$

Step 3 Double the length of the rectangle.
What is the new length? $\qquad$
What is the area of the rectangle now? $\qquad$
On grid paper, draw the rectangle with its length doubled.

Step 4 Compare the area in Step 2 with the area in Step 3.
What do you have to do to the area in Step 2 to get the area in Step 3?
$\qquad$

Step 5 Use the rectangle from Step 1.
Double the length and double the width.
What is the new length? $\qquad$
What is the new width? $\qquad$
What is the area of this rectangle?
On grid paper, draw the rectangle with its length and width doubled.

Step 6 Compare the area in Step 2 with the area in Step 5.
What do you have to do to the area in Step 2 to get the area in Step 5?
$\qquad$ Date $\qquad$

## Master 9.18 Step-by-Step 9

## Lesson 9, Question 5

You will need square dot paper, a geoboard, and geobands.
Step 1 On a geoboard, make each figure below.


Step 2 Count the number of whole squares and half squares.
What is the area of each figure?
Figure A: $\qquad$
Figure B : $\qquad$
Figure C: $\qquad$
Step 3 Use a geoband to divide each figure into 2 congruent parts.
Count the number of whole squares and half squares.
What is the area of each congruent part?
Figure A: $\qquad$
Figure B: $\qquad$
Figure C: $\qquad$
Record your work on dot paper.
For each figure, check that the sum of the areas of the congruent parts is equal to the area of the whole figure in Step 2.

Step 4 Divide each figure into as many congruent parts as you can.
You can use whole squares or half squares or a combination of both.
Check that each congruent part of a figure has the same area.
Record your work on dot paper.

Name $\qquad$ Date $\qquad$

## Master 9.19 Step-by-Step 10

## Lesson 10, Question 3

Step 1 Trace a circular object on the grid below.

|  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

Step 2 Cut a length of string equal to the circumference of the object. Measure the string with a ruler.

What is the circumference of the object?
$\qquad$

Step 3 Draw a rectangle along grid lines around the tracing of the object.
Count squares to find the area of the rectangle. $\qquad$
Count the whole squares and part squares outside the tracing of the object, but inside the rectangle. $\qquad$
Subtract this number from the area of the rectangle.
$\qquad$ - $\qquad$ = $\qquad$
What is the area of the tracing of the object? $\qquad$
$\qquad$ Date $\qquad$

## Master 9.20a Unit Test: Unit 9 Length, Perimeter, and Area

## Part A

1. Choose the most appropriate unit. Estimate, then measure. Use any materials you need to help you.

|  | What to Measure | Estimate | Measurement |
| :--- | :--- | :--- | :--- |
| a) | The height of the classroom door |  |  |
| b) | The thickness of a paper clip |  |  |
| c) | The circumference of your ankle |  |  |
| d) | The perimeter of your math book |  |  |
| e) | The area of this paper |  |  |

2. Complete. Use $>,<$, or $=$.
a) 0.7 m $\square$ 7 dm
b) 75 mm6 cm
c) $500 \mathrm{~m} \square 1 \mathrm{~km}$
3. Complete.
a) $75 \mathrm{~mm}=$ $\qquad$ cm
b) $0.24 \mathrm{~m}=$ $\qquad$ cm
c) $8 \mathrm{~m}=$ $\qquad$ dm
4. Record each measure in millimetres, in centimetres, and in decimetres.
a) 0.8 m $\qquad$
b) 1.5 m $\qquad$
5. a) Find the perimeter and the area of each figure.
Use any materials you need.
b) For which figure are the answers approximate? $\qquad$

| Figure | Perimeter | Area |
| :---: | :---: | :---: |
| A |  |  |
| B |  |  |
| C |  |  |


c) For which figures did you have to use a ruler? $\qquad$

Name $\qquad$ Date $\qquad$

## Master 9.20b Unit Test continued

## Part B

6. Suppose you want to find how many benches lined up end to end will fit across the width of the gym floor. How could you do this without moving any benches?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
7. a) Willa's rectangular patio has area $64 \mathrm{~m}^{2}$, and whole-number side lengths.

What might the length and width of the patio be?
Give as many answers as you can.
b) Willa enclosed her patio with 40 m of fence.

What are the length and width of her patio?
Explain how you know.
8. Use the data in the table.
a) Which 2 fish are the same length?
b) Which fish is shortest?
c) Which fish is longest?

| Tropical Fish |  |
| :--- | :--- |
| Name | Length |
| Guppy | 2.5 cm |
| Paradise fish | 75 mm |
| Red platy | 0.4 dm |
| Ruby barb | 65 mm |
| Neon tetra | 4.0 cm |
| Swordtail | 8.2 cm |

d) Which fish is longer than the ruby barb but shorter than the swordtail?

Name $\qquad$

## Master 9.20c Unit Test continued

9. Pablo speed walks around the school playground every evening.

The playground is 80 m long and 45 m wide.
How many times would Pablo have to speed walk around the playground to walk 2 km ?
Use a diagram, words, or numbers to explain your answer.

## Part C

10. Albert has a rectangular garden with perimeter 48 m .

The length and width of the garden are whole numbers of metres.
What might the dimensions and area of Albert's garden be?
Find all the possible answers.

Name
Date $\qquad$

## Master 9.21 Sample Answers

## Unit Test - Master 9.20

## Part A

1. Estimates and measurements will vary.
2. a) $0.7 \mathrm{~m}=7 \mathrm{dm}$
b) $75 \mathrm{~mm}>6 \mathrm{~cm}$
c) $500 \mathrm{~m}<1 \mathrm{~km}$
3. a) 7.5 cm
b) 24 cm
c) 80 dm
4. a) $800 \mathrm{~mm}, 80 \mathrm{~cm}, 8 \mathrm{dm}$
b) $1500 \mathrm{~mm}, 150 \mathrm{~cm}, 15 \mathrm{dm}$
5. a)

| Figure | Perimeter | Area |
| :--- | ---: | ---: |
| A | 16 cm | $8 \mathrm{~cm}^{2}$ |
| B | About 11 cm | About $12 \mathrm{~cm}^{2}$ |
| C | 13.7 cm | $8 \mathrm{~cm}^{2}$ |

b) Figure $B$
c) Figures B and C

## Part B

6. Sample answer:

I would measure the length of one bench, then measure the width of the gym floor. Then I would divide the width of the floor by the length of a bench. This gives me the number of benches.
7. a) Possible answers: 1 m by $64 \mathrm{~m} ; 2 \mathrm{~m}$ by $32 \mathrm{~m}, 4 \mathrm{~m}$ by $16 \mathrm{~m}, 8 \mathrm{~m}$ by 8 m
b) Length: 16 m ; width: 4 m Sample answer: If the length is 16 m and the width is 4 m , the perimeter is $40 \mathrm{~m}:(16+4) \times 2=40$.
8. a) Red platy and neon tetra
b) Guppy
c) Swordtail
d) Paradise fish
9. Sample answer:

Perimeter: $(80 \mathrm{~m}+45 \mathrm{~m}) \times 2=250 \mathrm{~m}$
$2 \mathrm{~km}=2000 \mathrm{~m}$
$250 \mathrm{~m} \times 4=1000 \mathrm{~m}$
So, $250 \mathrm{~m} \times 8=2000 \mathrm{~m}$
Pablo would have to walk around the playground 8 times.
$\square$

## Part C

10. Possible answers:

| Length | Width | Area |
| :---: | :---: | :---: |
| 23 m | 1 m | $23 \mathrm{~m}^{2}$ |
| 22 m | 2 m | $44 \mathrm{~m}^{2}$ |
| 21 m | 3 m | $63 \mathrm{~m}^{2}$ |
| 20 m | 4 m | $80 \mathrm{~m}^{2}$ |
| 19 m | 5 m | $95 \mathrm{~m}^{2}$ |
| 18 m | 6 m | $108 \mathrm{~m}^{2}$ |
| 17 m | 7 m | $119 \mathrm{~m}^{2}$ |
| 16 m | 8 m | $128 \mathrm{~m}^{2}$ |
| 15 m | 9 m | $135 \mathrm{~m}^{2}$ |
| 14 m | 10 m | $140 \mathrm{~m}^{2}$ |
| 13 m | 11 m | $143 \mathrm{~m}^{2}$ |
| 12 m | 12 m | $144 \mathrm{~m}^{2}$ |

## Extra Practice Masters 9.22-9.27

Go to the CD-ROM to access editable versions of these Extra Practice Masters.


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