

# NCTM Process Standards Rubric


## Measurement – Drill Sheets

Expectations Instructional programs from pre-kindergarten through grade 12 should enable all students to:	Drills																				
	Warm-up 1	Timed Drill 1	Warm-up 2	Timed Drill 2	Timed Drill 3	Timed Drill 4	Warm-up 3	Timed Drill 5	Timed Drill 6	Warm-up 4	Timed Drill 7	Timed Drill 8	Warm-up 5	Timed Drill 9	Warm-up 6	Timed Drill 10	Timed Drill 11	Review A	Review B	Review C	
<b>GOAL 1: Problem Solving</b> <ul style="list-style-type: none"> <li>build new mathematical knowledge through problem solving;</li> <li>solve problems that arise in mathematics and in other contexts;</li> <li>apply and adapt a variety of appropriate strategies to solve problems;</li> <li>monitor and reflect on the process of mathematical problem solving.</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>GOAL 2: Reasoning &amp; Proof</b> <ul style="list-style-type: none"> <li>recognize reasoning and proof as fundamental aspects of mathematics;</li> <li>make and investigate mathematical conjectures;</li> <li>develop and evaluate mathematical arguments and proofs;</li> <li>select and use various types of reasoning and methods of proof.</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>GOAL 3: Communication</b> <ul style="list-style-type: none"> <li>organize and consolidate their mathematical thinking through communication;</li> <li>communicate their mathematical thinking coherently and clearly to peers, teachers, and others;</li> <li>analyze and evaluate the mathematical thinking and strategies of others;</li> <li>use the language of mathematics to express mathematical ideas precisely.</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>GOAL 4: Connections</b> <ul style="list-style-type: none"> <li>recognize and use connections among mathematical ideas;</li> <li>understand how mathematical ideas interconnect and build on one another to produce a coherent whole;</li> <li>recognize and apply mathematics in contexts outside of mathematics.</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>GOAL 5: Representation</b> <ul style="list-style-type: none"> <li>create and use representations to organize, record, and communicate mathematical ideas;</li> <li>select, apply, and translate among mathematical representations to solve problems;</li> <li>use representations to model and interpret physical, social, and mathematical phenomena.</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

NAME: \_\_\_\_\_



9a) Listed below in the first column are the formulas that are used to determine the area, surface area, or perimeter of different shapes. Write the shape that each formula represents in the second column. Then, using a ruler, draw a sample of each shape using inches or centimeters. Determine the area or perimeter for each shape you draw.

Formula	Shape it may represent	Sample Shape	Area	Perimeter
Ex: $P = 4 \text{ side}$	Square		$A = s^2$ $A = (0.8 \text{ in}/2 \text{ cm})^2$ $A = 0.64 \text{ sq. in}/$ $4 \text{ sq. cm}$	$P = 4 (0.8 \text{ in}/2 \text{ cm})$ $P = 3.2 \text{ in}/8 \text{ cm}$
i) $A = \frac{1}{2} b \times h$				
ii) $P = 3s$				
iii) $A = l \times w$				
iv) $P = 5s$				
v) $A = \pi r^2$				
vi) $P = 2l + 2w$				
vii) $A = s^2$				
viii) $P = 6s$				
ix) $A = 6a^2$				

SAMPLE

NAME: \_\_\_\_\_



# Review B

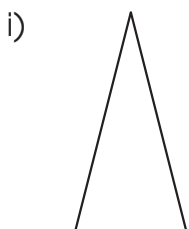
## a) Convert the following measurements.

- i) 2.57 cm = \_\_\_\_\_ mm    ii) 4.5 ft = \_\_\_\_\_ in    iii) 12.5 gal = \_\_\_\_\_ cups  
iv) 5.5 km = \_\_\_\_\_ cm    v) 24 oz = \_\_\_\_\_ lbs    vi) 0.5 kL = \_\_\_\_\_ L  
vii) 138 in = \_\_\_\_\_ ft    viii) 175 mm = \_\_\_\_\_ cm    ix) 30 qt = \_\_\_\_\_ gallons  
x) 19.27 mg = \_\_\_\_\_ g    xi) 28.5 oz = \_\_\_\_\_ lbs    xii) 29.25 kg = \_\_\_\_\_ g  
xiii) 22.5 ft = \_\_\_\_\_ in    xiv) 0.025 kL = \_\_\_\_\_ L    xv) 2.5 tons = \_\_\_\_\_ oz

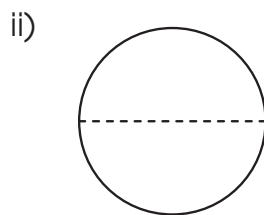
## b) Answer the following quick measurement questions.

- i) Carlos measured the temperature on a cold winter day at  $-3^{\circ}\text{F}$ . What was the temperature in Celsius? \_\_\_\_\_
- ii) A regular pentagon has a perimeter of 12 inches (30.5 cm). What is the measure of each side? \_\_\_\_\_
- iii) Dionne weighed herself and determined she was 85.25 pounds (38.67 kilograms). How many ounces (grams) did she weigh? \_\_\_\_\_
- iv) Wan took a car trip with his family. They traveled close to 158.5 miles (255 km) before arriving at their destination after three days. What was the average amount of miles (km) they traveled each day? \_\_\_\_\_
- v) A box has a length of 3 inches (8 cm), width of 2 inches (5 cm), and a height of 2.5 inches (7 cm). What is the volume of the box? \_\_\_\_\_

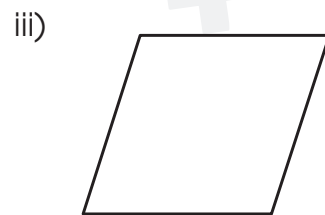
## c) Use a ruler to measure the objects below. Find the perimeter or circumference for each object.



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



Circumference = \_\_\_\_\_



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

# Surface Area of a Rectangular Prism



Obtain a box or other rectangular prism. Working alone or in a small group, devise a plan to determine the surface area of the box without measuring any of the sides.



Then, do the following.

1. Explain your plan.  
\_\_\_\_\_  
\_\_\_\_\_
2. Test your plan. Did it work? \_\_\_\_\_
3. Take measurements of your box. Make a list to identify the main measurements needed for your box. \_\_\_\_\_
4. Calculate the surface area of the box. \_\_\_\_\_
5. Compare the surface area you determined by your calculations to the surface area you determined by using your plan. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Write your findings in a reorganized paragraph.  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. Draw a diagram of your box. Label all of the essential measurements you took to determine the surface area.

