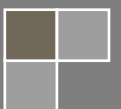
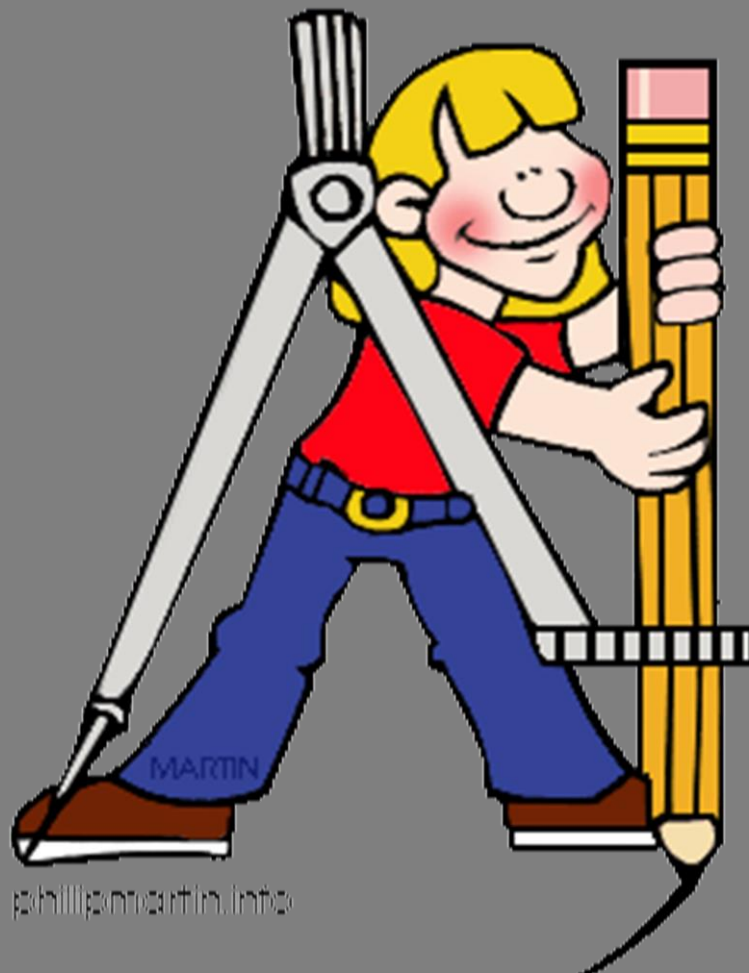


Grade

8

SRPSD Math Common Assessment

Answer Key



Instructions

Administering the Assessments

1. This assessment has been developed with the intention of being split up into individual outcomes and given upon completion of instruction/units throughout the year and **not** as a comprehensive test in June.
2. The division expectation is for the assessment to be given as **both** a pre (formative) and post (summative) assessment which will be entered into SRPSD database.
3. Use professional judgment on whether this assessment is given orally or in written form. The intent is to assess mathematical understanding.
4. Refer to the last few pages for any paper manipulatives needed to administer certain questions. Teachers will have to print off a copy for their class.
5. Calculator use is only allowed where indicated.
6. In the case that a student answers a level 4 question correctly but misses the level 2 or 3, the teacher will need to:
 - a) reassess
 - b) use professional judgment (teacher knows student best).
7. This assessment is not intended to assess ELA reading or writing outcomes therefore questions can be read to students and answers can be scribed when needed.
8. The corrected pre-tests are not to be showed to the students as it will affect post-test results.

Part A: Number Strand

N8.1 Demonstrate understanding of the square and principle square root of whole numbers concretely or pictorially and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to know the perfect squares.	Student knows the perfect squares.	Student is able to determine the approximate square root.	Student is able to determine the approximate square root and justify their answer.

1. Evaluate

a) $\sqrt{81}$

9

b) $\sqrt{144}$

12

2. Between which two consecutive whole numbers is the square root?
How do you know?

$$\sqrt{46}$$

6, 7

Because $6^2 = 36$ and $7^2 = 49$. So, $\sqrt{46}$ is between 36 and 49.

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1 and part of #2 correctly. (Student couldn't explain in #2)

Level 4

Student answered #1 and #2 correctly.

**Part A: Number Strand**

N8.2 Expand and demonstrate understanding of percent greater than or equal to 0% (including fractional and decimal percent) concretely, pictorially, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to represent percent.	Student is able to represent fractional percent greater than or equal 0%.	Student is able to solve problems involving percent.	Student can apply percent to a real life situation and justify their decision.

1. Write a $<$, $>$, or $=$ in each box to make each statement true.

a) 3.21 321%

b) 0.76 7.6%

2. Conner got 21 out of 24 on a science quiz. Rose got 83.333% on the quiz. Who did better? How did you find out?



$$\frac{21}{24} = 0.875 = 87.5\%$$

Connor got the better answer. I changed $\frac{21}{24}$ to a decimal then to percent.

3. Julie said she is going to get her hoodie for free? Is she correct? Explain.



75% off all hoodies!

Take an additional 25 % off TODAY!

No, she is not getting it for free. After the initial 75% is taken off then the 25% is taken off the remaining price.

Or Student may give an example like, the original price of the hoodie is \$100 then goes on sale for 75% off. Now the hoodie is priced at \$25. Taking an additional 25% off of \$25 means the cost of the hoodie would be \$18.75.

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1 and #2 correctly.

Level 4

Student answered # 1, #2, and #3 correctly.

Part A: Number Strand

N8.3 Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance understanding ratios.	Student is able to use ratios to solve problems.	Student is able to solve problems involving rates.	Student is able to solve problems involving proportional reasoning.

1. Marty has 3 white T-shirts, 2 coloured T-shirts, and 4 sweaters. What is the ratio of T-shirts to sweaters?



5 shirts to 4 sweaters

5 : 4

2. Express as a unit rate.

- a) An employee made \$48.00 for 4 h work, how much would they make in one hour?

$$\frac{48}{4} = \frac{12}{1} = \text{\$12.00 per hour}$$

- b) A hockey player scored 36 goals in 9 games, what would his average per game be?



$$\frac{36}{9} = \frac{4}{1} = \text{4 goals per game}$$

36 : 9

4:1 = 4 goals per game

3. In a hockey game, the ratio of shots on net for Prince Albert compared to Saskatoon was 8:5. If Prince Albert had 40 shots on net, how many shots did Saskatoon have?



8 : 5

40 : 25 Saskatoon had 25 shots on net.

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1 and #2 correctly.

Level 4

Student answered # 1, #2, and #3 correctly.

**Part A: Number Strand**

N8.4 Demonstrate understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance in multiplying and dividing fractions.	Student is able to multiply and divide proper fractions	Student is able to multiply and divide improper fractions including mixed numbers. (concretely, pictorially, symbolically)	Student is able to create and solve problems involving multiplication and division of fractions (mixed numbers).

1. Find the product or quotient.

a) $\frac{3}{8} \times \frac{5}{6}$

$$\frac{15}{48} \text{ or } \frac{5}{16}$$

May show using concrete or pictorial representation instead.

b) $\frac{3}{4} \div \frac{7}{8}$

$$\frac{3}{4} \times \frac{8}{7} = \frac{24}{28} \text{ or } \frac{6}{7}$$

May show using concrete or pictorial representation instead.

c) $2\frac{1}{4} \times 2\frac{2}{3}$

$$\frac{9}{4} \times \frac{8}{3} = \frac{72}{12} \text{ or } 6$$

May show using concrete or pictorial representation instead.

d) $\frac{11}{4} \div \frac{7}{3}$

$$\frac{11}{4} \times \frac{3}{7} = \frac{33}{28} \text{ or } 1\frac{5}{28}$$

May show using concrete or pictorial representation instead.

2. John's grade 3 teacher told him that multiplication always makes bigger. Was the teacher correct? Explain, using numbers, pictures or words.

No because $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ and it is smaller.

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1a) and #1b) correctly.

Level 3

Student answered #1 correctly.

Level 4

Student answered # 1 and #2 correctly.

Part A: Number Strand

N8.5 Demonstrate understanding of multiplication and division of integers concretely, pictorially, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance in multiplying and dividing integers.	Student is able to multiply or divide integers. (concretely, pictorially, symbolically)	Student is able to multiply and divide integers. (concretely, pictorially, symbolically)	Student is able to apply their understanding of multiplying and dividing integers to a situational problem and/or order of operations.

1. Find the product or quotient.

a) $(+8)(-3)$

-24

May show using concrete or pictorial representation instead.

b) $(-5)(-4)$

20

May show using concrete or pictorial representation instead.

c) $(+12) \div (-6)$

-2

May show using concrete or pictorial representation instead.

d) $\frac{-20}{+5}$

-4

May show using concrete or pictorial representation instead.

2. Solve the following order of operations.

$(-6) \times [(-24) \div (+8)] + (-3)$

$(-6) \times [-3] + (-3)$

$18 + (-3)$

15

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered some but not all of #1 correctly.

Level 3

Student answered #1 correctly.

Level 4

Student answered # 1 and #2 correctly.

Part B: Pattern & Relations Strand

P8.1 Demonstrate understanding of linear relations concretely, pictorially (including graphs), physically, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to create a table of values and graph a linear relation.	Student is able to create a table of values for a linear relation and graph it.	Student is able to distinguish between linear and non-linear relations.	Student is able to describe a linear relation in a real life situation and explain how to make it non-linear.

1. Pat plans a marshmallow roast. She will buy 2 marshmallows for each person



who attends, and 6 extra marshmallows in case someone shows up unexpectedly. Let n represent the number of people who attend. Let m represent the number of marshmallows Pat must buy.

a) Write an expression that relates the number of marshmallows to the number of people.

$$2n + 6$$

b) Create a table of values for the relation. (Use 4 points)

N	$2n + 6$
1	$2(1) + 6 = 8$
2	$2(2) + 6 = 10$
3	$2(3) + 6 = 12$
4	$2(4) + 6 = 14$

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1a), #1b) and #1c) correctly.

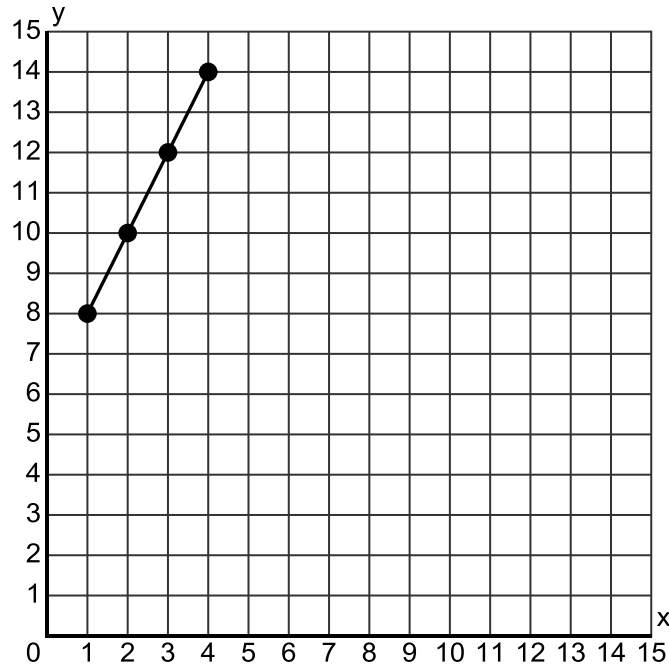
Level 3

Student answered #1 correctly.

Level 4

Student answered # 1 and #2 correctly.

c) Graph the relation.



Teacher Information

d) Is the relation linear? How do you know?

Yes, because it's a straight line.

2. Describe a situation that would make the above problem non-linear.

Answers will vary,
Somebody doesn't eat two marshmallows

**Part B: Pattern & Relations Strand**

P8.2 Model and solve problems using linear equations of the form: $ax = b$ $\frac{x}{a} = b$ $a \neq 0$, $ax + b = c$, $\frac{x}{a} + b = c$ $a \neq 0$, $a(x + b) = c$ concretely, pictorially, and symbolically, where a , b , and c are integers.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to solve linear equations.	Student is able to solve one-step linear equations involving integers.	Student is able to solve two step linear equations involving integers.	Student is able to use a real life situation to solve an equation and verify the solution.

1. Solve for x .

a) $-10x = 33$

$$\frac{-10x}{-10} = \frac{33}{-10}$$

$$x = -3\frac{3}{10} \text{ or } -3.3$$

b) $\frac{x}{-4} = 77$

$$x = 77(-4)$$

$$x = -308$$

c) $6(x-5) = 60$

$$6x - 30 = 60$$

$$6x = 90$$

$$x = 15$$

d) $\frac{x}{8} - 2 = 4$

$$\frac{x}{8} = 6$$

$$x = 48$$

2. One-third of the grade 8 students went to the track and field meet. Five track coaches went too. There were 41 people on the bus. How many students are in grade 8? Verify your solution.



$$\frac{x}{3} + 5 = 41$$

$$\frac{x}{3} = 36$$

$$x = 108 \text{ students}$$

$$\frac{108}{3} + 5 = 41$$

$$36 + 5 = 41$$

$$41 = 41$$

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1a) and #1b) correctly.

Level 3

Student answered #1 correctly.

Level 4

Student answered # 1 and #2 correctly.



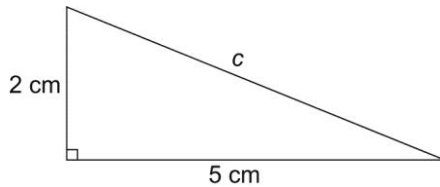
Name: _____

Part C: Shape & Space Strand

SS8.1 Demonstrate understanding of the Pythagorean Theorem concretely or pictorially and symbolically and by solving problems.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance in using the Pythagorean Theorem.	Student is able to solve for the hypotenuse using the Pythagorean Theorem.	Student able to solve a problem using the Pythagorean Theorem.	Student is able to solve problems using the Converse of the Pythagorean Theorem.

1. Find the length of the missing side.



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 2^2 + 5^2 &= c^2 \\
 4 + 25 &= c^2 \\
 29 &= c^2 \\
 \sqrt{29} &= 5.39\text{cm} = c
 \end{aligned}$$

2. Kelsa wants to determine if her garden is a rectangle. The garden has side lengths 24 m and 10 m and a diagonal length 26 m. Determine whether the garden is a rectangle.



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 24^2 + 10^2 &= 26^2 \\
 576 + 100 &= 676 \\
 676 &= 676
 \end{aligned}$$

The garden is a rectangle because all the angles are right angles.

Teacher Information

Level 1
Student was not able to complete #1 independently.

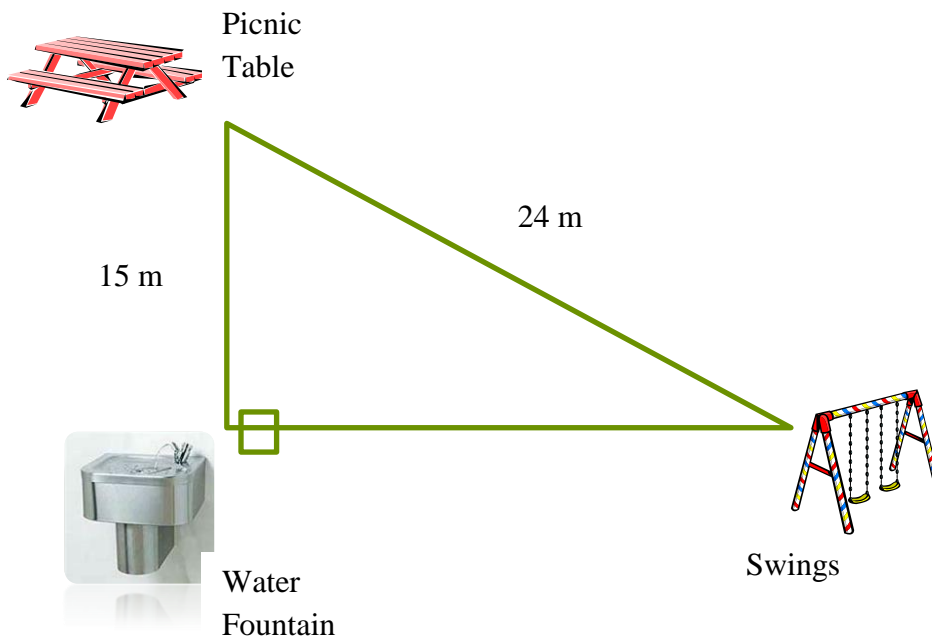
Level 2
Student answered #1 correctly.

Level 3
Student answered #1 and #2 correctly.

Level 4
Student answered #1, #2 and #3 correctly.

3. The positions of the water fountain, the picnic table and the swings at a local park are shown below.

The Pythagorean Theorem was used to determine the distance, in meters, from the water fountain to the swings. What is the distance between the swings and the water fountain?



$$a^2 + b^2 = c^2$$

$$15^2 + b^2 = 24^2$$

$$225 + b^2 = 576$$

$$b^2 = 351$$

$$b = 18.734\text{m} = \text{distance between the swings and the fountain.}$$

Teacher Information



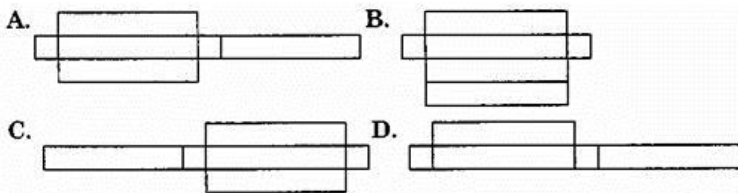
Name: _____

Part C: Shape & Space Strand

SS8.2 Demonstrate understanding of the surface area of 3-D objects limited to right prisms and cylinders (concretely, pictorially, and symbolically) by analyzing views, sketching and constructing 3-D objects, nets, and top, side, and front views, generalizing strategies and formulae, analyzing the effect of orientation, and solving problems.

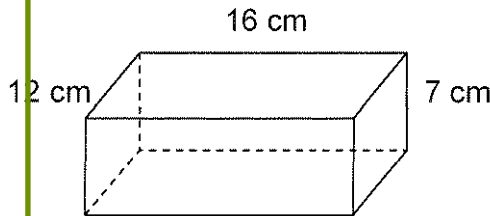
Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to create nets for right prisms and cylinders.	Student is able to create nets of right prisms and/or cylinders.	Student is able to apply strategies to determine the surface area of right prisms and cylinders.	Student is able to solve problems involving surface area.

1. Draw a net for a right rectangular prism.



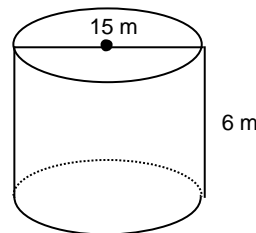
2. Find the surface area of the prism.

$$\begin{aligned}
 16 \times 12 &= 192 \\
 7 \times 12 &= 84 \\
 16 \times 7 &= 112 \\
 16 \times 12 &= 192 \\
 7 \times 12 &= 84 \\
 7 \times 16 &= 112 \\
 \hline
 776 \text{ cm}^2
 \end{aligned}$$

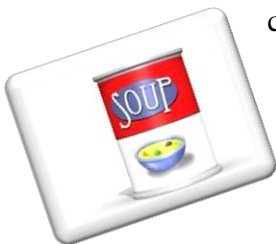


3. Find the surface area of this cylinder. Round your answer to the nearest tenth of a square metre.

$$\begin{aligned}
 &2 \times \text{area base} + \text{area of rectangle} \\
 &2\pi r^2 + \pi \times d \times w \\
 &2(3.14)(7.5)^2 + (3.14)(15)(6) \\
 &(6.28)56.25 + (47.1)(6) \\
 &353.25 + 282.6 \\
 &635.9\text{m}^2
 \end{aligned}$$



4. A soup can measures 10 centimeters high with a radius of 4 centimeters. What is the area of the **label** of the soup can if the **label** covers the cylinder?



$$\begin{aligned}
 \text{Area of the label} &= \pi dh \\
 &(3.14)(8)(10) \\
 &251.2\text{cm}^2
 \end{aligned}$$

OR

$$\begin{aligned}
 \text{Area of the label} &= 2\pi rh \\
 &(2)(3.14)(4)(10) \\
 &251.2\text{cm}^2
 \end{aligned}$$

Teacher Information

Level 1

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1, #2, and #3 correctly.

Level 4

Student answered #1, #2, #3, and #4 correctly.



Name: _____

Part C: Shape & Space Strand

SS8.3 Demonstrate understanding of volume limited to right prisms and cylinders (concretely, pictorially, or symbolically) by relating area to volume, generalizing strategies and formulae

•analyzing the effect of orientation, and solving problems.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to determine area and volume.	Student understands the relationship between area (2-D) and volume (3-D).	Student is able to apply strategies to determine the volume of right prisms and cylinders.	Student is able to solve problems involving volume.

1. What is the difference between area and volume?

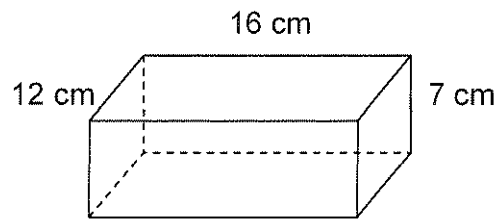
Area is the surface of a flat plane, for example, the top surface of a table.
Volume is how much space is contained inside a 3-dimensional object, like a cereal box.

2. Find the volume of the prism.

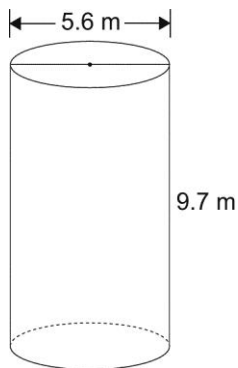
$$V = L \times W \times H$$

$$V = 12 \times 16 \times 7$$

$$V = 1344\text{cm}^3$$



3. Find the volume of the cylinder below. Round to two decimal places.



$$V = \pi r^2 \times h$$

$$V = (3.14)(2.8)^2(9.7)$$

$$V = 238.79\text{m}^3$$

Teacher Information

Level 1

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1, #2, and #3 correctly.

Level 4

Student answered #1, #2, #3, and #4 correctly.

4. Maria's backyard pool is in the shape of a rectangular prism. The pool is 5 m wide and 8 m long. It holds 60 m^3 of water.

a) What is the depth of the water?

$$\begin{aligned}V &= L \times W \times H \\60 &= (8)(5)H \\ \mathbf{1.5 \text{ m} = H}\end{aligned}$$

b) Maria has to decrease the depth of water by 0.5 m for the winter. How much water does she take out?

$$\begin{aligned}V &= L \times W \times H \\V &= (8)(5)(1) \\ \mathbf{V = 40\text{m}^3}\end{aligned}$$

So Maria takes out $60 - 40 = \mathbf{20\text{m}^3}$

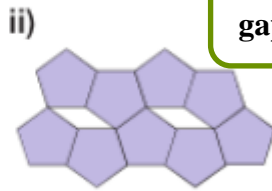
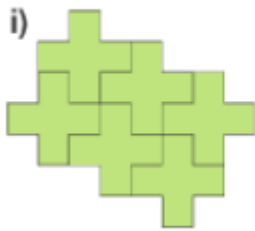
Teacher Information

Part C: Shape & Space Strand

SS8.4 Demonstrate an understanding of tessellation by: ••explaining the properties of shapes that make tessellating possible ••creating tessellations ••identifying tessellations in the environment.

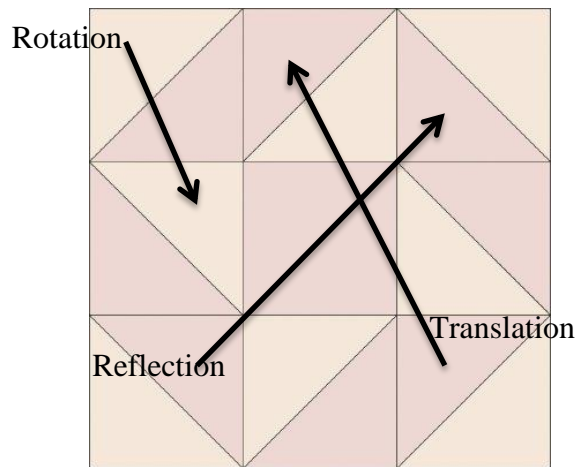
Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance understanding what a tessellation is.	Student can define what a tessellation is.	Student can identify translations, rotations, and reflections or any combination of the three in a tessellation.	Student can design and create a tessellation involving more than one shape and explain how it tessellates.

1. Which of these designs are tessellations? Justify your answer.

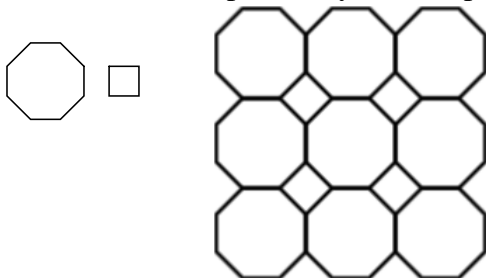


i, because there are no gaps.

2. Find and label transformation in the following quilt pattern (one of each-reflection, translation, and rotation). Please include arrows.



3. Show how this regular octagon and this square combine to form a shape that tessellates. Explain why the composite shape tessellates.



The sum of interior angles are multiples of 180°.

Teacher Information

Level 1
Student was not able to complete #1 independently.

Level 2
Student answered #1 correctly.

Level 3
Student answered #1 and #2 correctly.

Level 4
Student answered #1, #2, and #3 correctly.



Name: _____

Part D: Statistics & Probability Strand

SP8.1 Analyze the modes of displaying data and the reasonableness of conclusions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to interpret a graph.	Student identifies which graph is the best for a situation.	Student identifies graphs that mislead the information and can suggest alternatives to remove the bias.	Student is able to represent a given situation using a graph that would bias the interpretation.

1. Match each description of data to the appropriate type of graph to display the data.

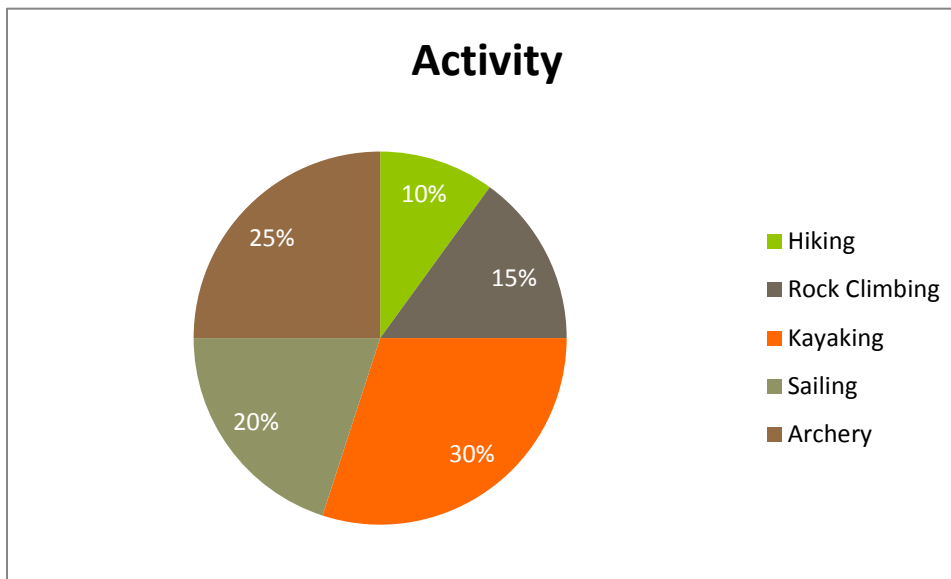
- A. The number of candy bars sold in 1 week by grade levels
- B. The ice cream bars of different flavours sold in 1 week
- C. The weekly sales of juice boxes over a period of 4 weeks
- D. The percent of each flavour of potato chips sold in 1 week

 C Line graph D Circle graph B Pictograph A Bar graph

2. Students attending outdoor school were required to select an activity for the first afternoon. This table shows the results.

Activity	Hiking	Rock Climbing	Kayaking	Sailing	Archery
Number of Students	4	6	12	8	10

a) Draw a circle graph to display the data. (You may use the provided template.)



Teacher Information

Level 1
Student was not able to complete #1 independently.

Level 2
Student answered #1 correctly.

Level 3
Student answered #1 and #2a) correctly.

Level 4
Student answered #1 and #2 correctly.

Name: _____

b) Draw another graph to misrepresent the same data.

Answers will vary.

c) Justify your choice.

Answers will vary.

Part D: Statistics & Probability Strand

SP8.2 Demonstrate understanding of the probability of independent events concretely, pictorially, orally, and symbolically.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs assistance to determine probability.	Student is able to solve a problem with two independent events.	Student is able solve a problem with three independent events.	Student is able to create and solve a problem including two or more independent events.

1. A six sided die is rolled and a coin is flipped. Find the probability of each event:

a) A tail and a 5.

$$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$$

b) A number more than 2.

$$\frac{4}{6} = \frac{2}{3}$$

c) A head and an even number.



$$\frac{1}{2} \times \frac{3}{6} = \frac{3}{12} = \frac{1}{4}$$

2. Rocco chooses a 3-letter password for his e-mail account. He can use a letter more than once. What is the probability that someone else can access his e-mail by randomly choosing 3 letters?

$$\frac{1}{26} \times \frac{1}{26} \times \frac{1}{26} = \frac{1}{17576}$$

Not very likely

3. You have a coin, a die, and a cup. Create a probability question based on these three items. Solve the problem.

What are the chances the cup lands down, the coin lands tails and you roll a 5. $\frac{1}{2} \times \frac{1}{6} \times \frac{1}{2} = \frac{1}{24}$

Teacher Information**Level 1**

Student was not able to complete #1 independently.

Level 2

Student answered #1 correctly.

Level 3

Student answered #1 and #2 correctly.

Level 4

Student answered #1, #2, and #3 correctly.

Name: _____

Percent Circle

