O'BRIEN GROUP ARENA MATHEMATICS CURRICULUM

Victorian Curriculum and Assessment Authority Levels Addressed: Levels 7, 8

At level 7, students are working towards level 8 standards
At level 8, students are working towards level 9 standards

Integers Game

To play the game:

- *Get a set of **three dice** and roll them **all together***
- *You get 5 rolls each round*
- *If the sum of the dice is between or including 3 and 10, opposition scored against you while you were on the ice! **Take away two points***
- *If the sum of the dice is between or including 11 – 18, a team mate scored a goal with your assistance! **Give yourself +1 point***
- *When you land a double or triple, you have scored a goal! **Add +2 points to your score***
- *Jot down how many points you get throughout the round then add them up*
- *The player with the highest amount of points wins!*

Example: *Amy rolls*

2,3,6 ~ 4,3,2 ~ 5,5,1 ~ 1,2,3 ~ 6,4,3

	Points awarded / lost					TOTAL
Example:	+1	-1	+ 2	-1	+1	**+ 2**
Round 1						
Semi Final						
Grand Final						
					TOTAL:	

Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Number and Algebra:** Number and Place Value	Numeracy Creative and Critical Thinking	**Level 7:** Compare, order, add and subtract integers **Level 8:** Use index notation with numbers to establish the index laws with positive integral indices

Geometry: Angle Properties

1. *Calculate the angle at which the puck hits the boards and goes into the net (x).*

Students have two ways of retrieving answer:

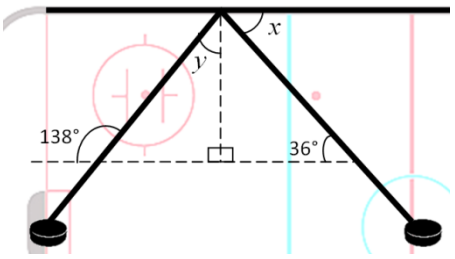
- ***Realising that the angle x and 36° are alternate angles, therefore are congruent***

  ∴ x = 36°

  OR

- ***Determine the third angle of the triangle:***
  180° – 36° – 90° = 54°
  Subtract this angle from 90 to solve x

  ∴ 90° - 54° = 36° = x



2. *Using this answer and the other angles given, calculate angle y.*

To calculate y, students must first find the opposite angle of 138° by subtracting from 180° and then using that answer with the knowledge that all angles in a triangle adding up to 180° calculate y

∴ y =180° - [(180°-138°) + 90°]

∴ y = 180° - 132°

∴ y = 48°

Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Measurement and Geometry:** Geometric Reasoning	Literacy Numeracy Creative and Critical Thinking	**Level 7:** Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal. Demonstrate that the angle sum of a triangle is 180° **Level 8:** Define congruence of plane shapes using transformations. Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning

Data Analysis and Representation

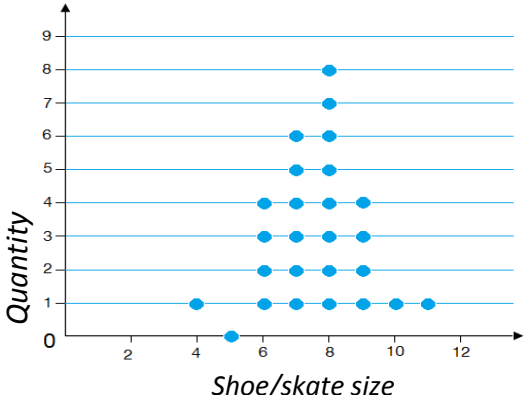
Shoe Size	*Tally Marks*	*Total*
3	||||	*4*

Extra Activity

After your visit at the O'Brien Group Arena, use this table to tally your classmates' skate sizes!

Note: skate size = shoe size

On the axis below, plot this data as a dot plot.
Example (this can be done either using the plane provided or using digital technologies):



Calculate the mode, mean, median and range

Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Statistics and Probability:** Data Representation and Interpretation	Literacy Numeracy Creative and Critical Thinking	**Level 7:** Construct and compare a range of data displays including stem-and-leaf plots and dot plots. Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data **Level 8:** Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data.

Numbers: Algebraic Equations and Substitution

During an AIHL match, there are 983 seats in the O' Brien Group Arena grandstand.
If 63 of these are reserved for VIP and 189 seats have been pre-purchased

1. *Write an equation to solve for x, where x is the amount of remaining seats in the grandstands*
   $x = 983 - (63 + 189)$

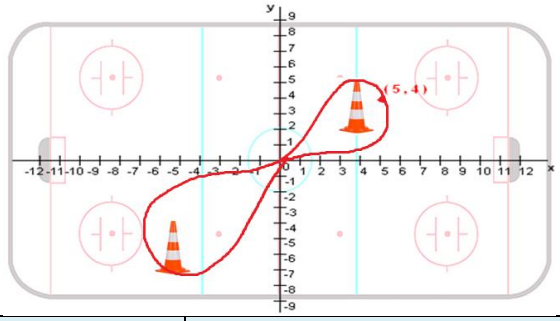
2. *Solve the equation*
   $\therefore x = 983 - 252$
   $\therefore x = 731$

3. *If $x = 946$, calculate the new total of grand stand seats*
   $946 = y - (63 + 189)$
   $\therefore y = 946 + (63+189)$
   $\therefore y = 946 + 252$
   $\therefore y = 1198$

Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Number and Algebra:** Patterns and Algebra	Numeracy Creative and Critical Thinking	**Level 7 & 8:** Create algebraic expressions and evaluate them by substituting a given value for each variable and extend and apply the distributive law to the expansion of algebraic expressions

Cartesian Planes

1. *Label the x and y axis on the Cartesian plane*
2. *Add a number scale from -10 to 10 on both x and y axis*
3. *As a drill, hockey skaters are required to skate around these cones in a figure 8 pattern, passing through (0,0) twice. Draw this pattern on the graph and write down four more points the skater will skate through.*
   E.g. (5 , 4), (-4, -1), (-1, 3) (-7, -4)



Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Statistics and Probability:** Data Representation and Interpretation	Literacy Numeracy Creative and Critical Thinking	**Level 7:** Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point**.** Investigate, interpret and analyse graphs **Level 8:** Plot linear relationships on the Cartesian plane with and without the use of digital technologies

Money and Financial Mathematics

There are 40 lights above each rink. Each light omits 1,000 watts of energy per hour.

1. *How much energy does it take to run all of them for one hour?*

   1,000 * 40 = 40,000 watts

2. *To run all the lights costs $38.00 per hour. How much would it cost to run three quarters of the lights for 3 hours?*

   Calculate 3/4 of $38.00

   0.75 x $38

   = $28.50

   Multiply by three for three hours

   = $28.50 x 3

   = $85.50

3. *The cost for a concession to skate is $24.00. Use your answer from question 2 to help find out how many concession skaters would need to come in in order to cover the cost of running 3/4 of the lights for three hours.*
   Give your answer as a fraction and as a whole number rounded up to the next whole one

   $85.50 / 24

   = 3.56

   =4 concession skaters would need to come in to cover the cost of lighting

Domain	Content Strand	Proficiency Strand	Key Elements of Standards
Mathematics	**Number and Algebra:** Money and financial mathematics	Literacy Numeracy Creative and Critical Thinking	**Level 7 & 8:** Solve problems involving profit and loss, with and without digital technologies

	Number and Algebra: Real numbers	Information and communication technology capability	**Level 7:** Express one quantity as a fraction of another, round decimals to a specified number of decimal places, find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies. **Level 8:** Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies. Solve a range of problems involving rates and ratios, with and without digital technologies