**North East School Division Planning Organizer**



**Mathematics Grades 6 - 9**

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| **Stage 1 – Begin With the End In Mind** |
| **Big Ideas** What do we want students to remember 40 years from now? |
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| **Processes** |
| Communication | Connections |
| Reasoning | Technology |
| Visualization | Problem Solving |
| Mental Math and Estimation |

* Most real life measurements are fractions/decimals.
* Understanding square roots improves mental calculations.
* Many containers are composite objects.
* Surface Area is used in many real-life scenarios especially in carpentry & renovation work.
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| **Outcomes** Circle the verbs or skills, underline the qualifiers |
| **Strands are: Number (N), Patterns & Relations (P), Shape & Space (SS) and Statistics & Probability (SP)**N 9. 3 Extend understanding of square roots to include the square root of positive rational numbers.SS 9.2 Extend understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms & composite 3-D objects. |
| **Understandings** What do we hope students will come to understand as a result of learning? Think: Students will understand that… | **Essential Questions** Questions for deeper understanding that invite deep thinking about the ideas and issues throughout the unit. |
| * A fraction in simplest form is a perfect square if it can be written as a product of 2 equal fractions.
* A decimal is a perfect square if it can be written as a fraction as a perfect square.
* The square root of a non-perfect square can be approximated using roots of perfect squares as benchmarks.
* Even using a calculator, the square root of a non-perfect square is just an approximate.
* To calculate Surface Area of a composite object, add up the area of the faces except those that overlap.
 | * What is a perfect square?
* What is a non-perfect square?
* How do we calculate the surface area of composite objects?
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| **Students need to know:** What is essential knowledge for students to have in order to demonstrate their understanding of the outcomes?  | **And be able to do:** What should they eventually be able to do as a result of their learning experiences in order to achieve the outcome? Should reference the indicators. Think: verb.  |
|  **. Define “rational numbers”, “perfect squares”.** * **Pre-requisite skills of multiplying decimals and fractions, reducing fractions to lowest terms and their times tables.**
* **The square root of a number can be demonstrated using the area of a square and that square’s side length.**
* **Pre-requisite Skill – Solving triangles using Pythagorean theorem**
* **Finding the square root of a number and squaring a number are opposite operations.**
* **How to use their calculators to determine the square root of a number and the square of a number.**
* **Define “non-perfect squares” & “benchmarks”**
* **How to use their calculators to determine if a number is a perfect square or a non-perfect square.**
* **Pre-requisite skill – rounding to the tenths or hundredths fr calculator displays**
* **Pre-requisite skills – lowest common denominator and converting to equivalent fractions**

* **Define “composite objects” “surface area” “overlap”**
* **Overlap has to be taken into account and subtracted out.**
 | * Generalize a statement about what type of number results from the squaring of a rational number.
* Describe strategies for determining if a rational number is a perfect square.
* Determine the square roots of a rational number that is a perfect square.
* Determine the rational number for which a given rational number is its square root.
* Explain and apply strategies involving benchmarks for determining an estimate of the square root of a rational number that is not a perfect square.
* Determine, with the use of technology, an approximate value for the square root of a rational number that is not a perfect square.
* Explain why the value shown by technology may only be an approximation of the square root of a rational number.
* Determine a rational number whose square root would be between two given rational numbers and explain the reasoning used.
* Analyze a composite 3-D object to identify areas of overlap and explain the impact of these areas on determining the surface area of the composite 3-D object
* Critique the statement: “To find the surface area of a composite 3-D object, add together the surface areas of the individual 3-D objects from which the composite 3-D object is comprised.”
* Determine the surface area of composite 3-D objects
* Solve situational questions involving the surface area of composite 3-D objects
* Approximate the surface area of a 3-D object from the natural environment using composites of standard 3-D objects such as right rectangular prisms, right cylinders, and right triangular prisms.
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