**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 |

Math is about relationships.Who cares about measurement? |
| **Outcomes** Circle the verbs or skills, underline the qualifiers |
| **Strands are: Number (N), Patterns & Relations (P), Shape & Space (SS) and Statistics & Probability (SP)*****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 solving problems.***••***[C, CN, PS, R, T V]*****SS8.2 *Demonstrate Understanding of Surface Area limited to right prisms and cylinders (concretely, pictorially, symbolically) by:**** **Analyzing Views**
* **Sketching and constructing 3-D objects**
* **Constructing nets**
* **Generalizing strategies and formulae**
* **Analyzing the effect of orientation**
* **Solving problems**

***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 solving problems.***••***[CN, PS, R, V]*** **SS8.3 *Demonstrate understanding of volume limited to right prisms and cylinders (concretely, pictorially, symbolically*)** **by:*** **Relating area to volume**
* **Generalizing strategies and formulae**
* **Analyzing the effect of orientation**
* **Solving problems**
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| **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. |
| 1. **There is a relationship between the area of the base of a right prism or cylinder and the volume of a 3-D object**
2. **Formulae simplify work**
3. **Formula come from a deep understanding about mathematical relationships**
4. **That changing orientation of a 3-D object does not change the volume.**
5. **A three dimensional object can be built from a two dimensional pattern called a net.**
6. **The surface area and the volume of right prisms and cylinders can be calculated by using their nets.**
7. **The volume of any right prism and right cylinder is given by the base area x height.**
 | 1. **How is the base of a right prism or cylinder related to the volume of the object?**
2. **Why are formulae valuable?**
3. **How do we arrive at a formula?**
4. **How does orientation impact volume/surface area?**
5. **How can I solve problems?**
6. **How do nets help us to calculate surface area?**
7. **What does circumference have to do with the surface area of cylinders?**
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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.  |
|  Vocabulary:Volume, right prism, right cylinder, area, strategy, formula, orientation, 3-D, baseHow to:* Recognize a right cylinder and right prism
* Show understanding concretely, symbolically, pictorially
* Describe, explain, create
* Identify, draw, and construct nets of objects.
* Build objects from nets.
* Find the surface area of a right rectangular prism.
* Find the surface area of a right triangular prism.
* Develop and use a formula to calculate the volume of a right rectangular prism.
* Develop and use a formula to find the volume of a right triangular prism.
* Find the surface area of a right cylinder.
* Develop and use a formula to find the volume of a right cylinder.
 | * Manipulate concrete 3-D objects to identify, describe, and sketch top, front, and side views of the 3-D object on isometric paper.
* Sketch a top, front, or side view of a 3-D object that is within the classroom or that is personally relevant, and ask a peer to identify the 3-D object it represents.
* Predict the top, front, and side views for a 3-D object that is to be rotated by a multiple of 90°, discuss the reasoning for the prediction, and then verify concretely and pictorially.
* Identify and describe nets of 3-D objects that are used in everyday experiences (e.g., such as patterns or materials for clothing and banker boxes).
* Relate the parts (using one-to-one correspondence) of a net to e. the faces and edges of the 3-D object it represents.
* Create a net for a 3-D object, have a peer predict the type of 3-D object that the net represents, explain to the peer the reasoning used in designing the net, and have the peer verify the net by constructing the 3-D object from the net.
* Build a 3-D object made of right rectangular prisms based on the top, front, and side views
* Demonstrate how the net of a 3-D object (including right rectangular prisms, right triangular prisms, and cylinders) can be used to determine the surface area of the 3-D object and describe strategies used to determine the surface area.
* Generalize and apply strategies for determining the surface area of 3-D objects.
* Create and solve personally relevant problems involving the surface area or nets of 3-D objects.
* Identify situations from one’s home, school, or community in which the volume of right prism or right cylinder would need to be determined.
* Describe the relationship between the area of the base of a. right prism or right cylinder and the volume of the 3-D object.
* Generalize and apply formulas for determining the area of a right prism and right cylinder.
* Explain the effect of changing the orientation of a right prism or right cylinder on the volume of the 3-D object.
* Create and solve personally relevant problems involving the volume of right prisms and right cylinders.
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