**North East School Division Planning Organizer**



**MathematicsGrades 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? | | |
| |  |  | | --- | --- | | **Processes** | | | Communication | Connections | | Reasoning | Technology | | Visualization | Problem Solving | | Mental Math and Estimation | |   Is math like art? Or is it vice versa? How?  How is math useful to builders? planners? | | |
| **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 (Content – Surface area of 3-D right prisms  and cylinders, Method – concretely, pictorially, and  symbolically)  Analyzing 🡪 views  Sketching 🡪 3-D objects, nets, views  Constructing 🡪 3-D objects, nets, views  Generalizing 🡪 strategies and formulae  Analyzing 🡪 effect (of orientation)  Solving 🡪 problems  SS8.4 Demonstrate an understanding of tessellation by:  • explaining the properties of shapes that make tessellating possible  • creating tessellations • identifying tessellations inthe environment.  SS8.4 Demonstrate 🡪 understanding (Content – tessellation)  Explain 🡪 properties  Creating 🡪 tessellations  Identifying 🡪 tessellations (environment) | | |
| **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. Different two-dimensional views of a three dimensional object can be drawn. 2. When a three Dimensional object is rotated, the views of the object may change. 3. The Views of an object can be used to build the object. 4. A Shape tessellates if congruent copies of the shape cover a plane with no gaps or overlaps. 5. Some shapes may be transformed repeatedly to create a tessellation. 6. Under a transformation, the area of a shape does not change. | 1. How can you create a two dimensional picture that looks like it has three dimensions? What are dimensions? 2. How many ways can an object be rotated? How can we use numbers to govern those rotations? How does a tire rotate? How does the earth rotate? 3. Can you build a house from a blueprint? How? 4. Can you cover a roof with different shaped shingles? How many ways can you think of? Does the area it covers change when you turn the shingle? | |
| **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. | |
| 1. **How to draw the front, top, and side views of objects from models.** 2. **How to use technology to sketch views of objects.** 3. **How to draw views of objects that result from a given rotation.** 4. **How to build an object given the different views of the object.** 5. **Use a computer to build an object, given it’s views.** 6. **How to Recognize transformation images.** 7. **How to construct and analyze Tessellations.** 8. **How to Create and analyze tessellations using transformations.** | | a. Identify, describe (in terms of translations, reflections, rotations, and combinations of any of the three), and reproduce (concretely or pictorially) a tessellation that is relevant to self, family, or community (e.g., a Star Blanket or wall paper).  b. Predict and verify which of a given set of 2-D shapes (regular and irregular) will tessellate and generalize strategies for determining whether a new 2-D shape will tessellate (i.e., an angle must be a factor of 360°).  c. Identify one or more 2-D shapes that will tessellate with a given 2-D shape and explain the choice (e.g., knowing that the sum of the measures of one angle from each of the 2-D shapes must be a factor of 360°, and if the given shape has an angle of 12°, then two shapes with angles of 13° and 5° can be used to tessellate with the original shape because 12+13+5=30 which is a factor of 360 – these shapes would need to be repeated at least 12 times because 30 x 12 is 360).  d. Design and create (concretely or pictorially) a tessellation involving one or more 2-D shapes, and document the mathematics involved within the tessellation (e.g., types of transformations, measures of angles, or types of shapes).  e. Identify different transformations (translations, reflections, rotations, and combinations of any of the three) present within a tessellation.  f. Make a new tessellating shape (polygonal or non-polygonal) by transforming a portion of a known tessellating shape and use the new shape to create an Escher-type design that can be used as a picture or wrapping paper. |