

Ohio Mathematics Correlation (Grade 7)

Reference: [Academic Content Standards \(PDF\)](#)

Introduction

This document correlates Yenka Mathematics software to the content performance indicators of the Ohio mathematics core curriculum. It highlights specific areas of the curriculum that are covered by Yenka Mathematics and points to resources that will be useful when teaching the material.

The terminology we have used in this document is as follows:

- **Product:** this is the relevant Yenka Mathematics product, either [Yenka 3D Shapes](#) or [Yenka Statistics](#). More information about these products can be found on the Yenka web page by following the links.
- **Model:** a pre-made Yenka simulation with step-by-step instructions, which will either teach the pupils part of the curriculum, or give them opportunity to apply the knowledge they already have. These models are found under *Content* when you open Yenka itself, and they are linked to through our website.
- **Tutorial:** a model that explains how to use a particular aspect of the Yenka software. These can be found under *Getting Started* in the *Content* tab of Yenka.

Since the Yenka Mathematics titles are simulators, they will help you to cover other areas of the curriculum too. The final column of the table gives some possible *examples* of how you, or the students, can use Yenka Mathematics to create your own models and cover a wider scope of material. You may wish to look at the *tutorials*, and [training videos](#) provided on the website, to explore more of the potential uses of the software, and show you how to create your own models.



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Measurement Standard

Area	Indicator	Product	Content (Model)	Example
<i>Use Measurement Techniques and Tools</i>	4. Solve problems involving proportional relationships and scale factors; e.g., scale models that require unit conversions within the same measurement system.	Yenka 3D Shapes	<ul style="list-style-type: none"> - Similar triangles - Similar cuboids - Find the similar triangle 	
	6. Use strategies to develop formulas for finding area of trapezoids and volume of cylinders and prisms.	Yenka 3D Shapes	<ul style="list-style-type: none"> - Prisms - Volume of a cylinder - Volume of a prism - Which cylinder has the greatest volume? 	
	7. Develop strategies to find the area of composite shapes using the areas of triangles, parallelograms, circles and sectors.	Yenka 3D Shapes	<ul style="list-style-type: none"> - Area of rectangles and triangles - Wallpapering 	
	8. Understand the difference between surface area and volume and demonstrate that two objects may have the same surface area, but different volumes or may have the same volume, but different areas.	Yenka 3D Shapes		Pupils can interact with a variety of the <i>3D Shapes</i> available in Yenka, and use <i>Measurement Tools</i> to measure surface area and volume. In this way they can learn, and visualize, the difference between these two properties. Additionally, you could set up a model with two objects of the same surface area but different volumes, or vice versa, and ask students to measure their properties and comment on the difference.
	9. Describe what happens to the surface area and volume of a three-dimensional object when the measurements of the object are changed; e.g., length of sides are doubled.	Yenka 3D Shapes	Related tutorial: <ul style="list-style-type: none"> - Rotating and resizing shapes 	

Geometry and Spatial Sense Standard

Area	Indicator	Product	Content (Model)	Example
<i>Characteristics and Properties</i>	1. Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.	Yenka 3D Shapes		Create similar and congruent figures by resizing and rotating <i>2D Shapes</i> . Use <i>Presentation</i> objects to label parts of the figures, and set questions asking students e.g. to determine the length of the side of a figure similar to another with known properties, to determine whether or not two figures are similar by measurement of their properties etc.
	2. Determine sufficient (not necessarily minimal) properties that define a specific two-dimensional figure or three-dimensional object. For example: a. Determine when one set of figures is a subset of another; e.g., all squares are rectangles. b. Develop a set of properties that eliminate all but the desired figure; e.g., only squares are quadrilaterals with all sides congruent and all angles congruent.	Yenka 3D Shapes		Yenka 3D Shapes could be very useful in allowing students to visualise the properties of the figures and objects they are learning about. As an example, you could set up a model with several different quadrilaterals, and using a <i>Presentation multiple choice question</i> ask pupils to decide what properties that set a square apart from the other shapes.
	3. Use and demonstrate understanding of the properties of triangles. For example: a. Use Pythagorean Theorem to solve problems involving right triangles. b. Use triangle angle sum relationships to solve problems.	Yenka 3D Shapes		To give pupils practice in the use of Pythagorean Theorem create a model with several <i>right-angled triangles</i> of different sizes, orientations etc. Use labels to give the lengths of two sides of a triangle and ask students to calculate the third. Then they can use the length <i>Measurement tool</i> to check their answer, or you can use a <i>Question</i> presentation object where the pupils can enter their answer and see if they are correct.

	4. Determine necessary conditions for congruence of triangles.	Yenka 3D Shapes		Using the <i>triangles</i> in <i>2D Shapes</i> students can resize, and rotate different rectangles to investigate the conditions for congruence.
	5. Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.	Yenka 3D Shapes	- Similar triangles See also: - Find the similar triangle	
<i>Spatial Relationships</i>	6. Determine and use scale factors for similar figures to solve problems using proportional reasoning.	Yenka 3D Shapes	Related models: - Similar triangles - Similar cuboids - Find the similar triangle	
<i>Transformations and Symmetry</i>	8. Perform translations, reflections, rotations and dilations of two-dimensional figures using a variety of methods (paper folding, tracing, graph paper).	Yenka 3D Shapes		Translations, rotations and dilations of <i>2D Shapes</i> are easily performed on Yenka (see tutorial Rotating and resizing shapes).
<i>Visualization and Geometric Models</i>	9. Draw representations of three-dimensional geometric objects from different views.	Yenka 3D Shapes	Related tutorial: - Rotating and resizing shapes	

Patterns, Function and Algebra Standard

Area	Indicator	Product	Content (Lesson kit)	Example
<i>Analyze Change</i>	10. Analyze linear and simple nonlinear relationships to explain how a change in one variable results in the change of another.	Yenka Statistics	Related model: - Correlation	

Data Analysis and Probability Standard

Area	Indicator	Product	Content (Lesson kit)	Example
<i>Data Collection</i>	1. Read, create and interpret box-and-whisker plots, stem-and-leaf plots, and other types of graphs, when appropriate.	Yenka Statistics	Graphs: <ul style="list-style-type: none"> - Box plot - Stem and leaf - Bar chart - Histogram 	
<i>Statistical Methods</i>	3. Analyze a set of data by using and comparing combinations of measures of center (mean, mode, median) and measures of spread (range, quartile, interquartile range), and describe how the inclusion or exclusion of outliers affects those measures.	Yenka Statistics	Averages and Spread: <ul style="list-style-type: none"> - Mean - Median with odd number - Median with even number - Mode - Quartiles and interquartile range <p>See also:</p> <ul style="list-style-type: none"> - Comparing averages - Calculating mean of grouped data 	
	5. Compare data from two or more samples to determine how sample selection can influence results.	Yenka Statistics		Use the <i>Normal distribution</i> or <i>Uniform distribution</i> from <i>Data Sources</i> . Add a <i>frequency polygon</i> to the model. Generate a sample and view the graph. Then resample the data several times, and the students can see clearly that the results change with each sampling.

<i>Probability</i>	7. Compute probabilities of compound events; e.g., multiple coin tosses or multiple rolls of number cubes, using such methods as organized lists, tree diagrams and area models.	Yenka Statistics	Probability: - Probability scale See also tutorials: - Using the probability tree - Playing probability games	
	8. Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences.	Yenka Statistics	Probability: - Probability and relative frequency - More trials better results	

If you have any questions about Yenka or this document, please contact [Esther Droop](#) or visit www.yenka.com