

Wallenpaupack Area School District

Planned Course Curriculum Guide

Department

Fine Art Department

Art for Sciences

Course Description: Art for Sciences is designed as an integrated course for the study of visual representation for scientific application and the use of art across multiple disciplines in the sciences. Students will explore the elements and principles of art and design while experiencing various methods and materials in both 2-D and 3-D. Opportunity is provided for the student to develop visual representation of scientific applications. The relationship of art to other disciplines will be discussed where applicable. Students will develop career focused artifacts.

Initial Creation Date (if applicable) and Revision Dates: 12/2025

Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12
UNIT 1: Foundations of Scientific Visualization	TIMEFRAME: ~ 5 classes

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media

UNIT OBJECTIVES (SWBATS):

Students will understand elements and principles of art and design in scientific contexts.

Students will explore historical and contemporary examples of scientific illustration and visualization.

Key Concepts:

Visual communication in science. Accuracy vs. aesthetics. Line, shape, color, and scale in diagrams.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Activities could include:

- Analyze examples of medical, botanical, and technical illustrations.
- Create a labeled scientific diagram (e.g., anatomy, plant structure).
- False-Color Artworks, Explore how scientists use false color to visualize the invisible.
- Artistic interpretation of microscopic structures. Pollen grains, crystals, microbes, plant tissue.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Project grades 75- 100 points

Class work, practice with new material 10 – 20 points

Sketchbook 10 points (per assignment)

Tests 50 – 100 points

The following criteria are assessed for each of the projects:

Daily Work - Class work: Project work done during class time

Technique - Mastery of the skills that are covered in each unit, varies by unit

Craftsmanship - Neatly crafted and completed

Creativity - Original use of an idea, theme, concept or unique use of materials or principles

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

Demonstration

Small group

Practice activities

Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

YouTube

Student examples

KEY VOCABULARY:

Scientific Illustration, scale, proportion, diagram, infographic, color palette, mood, tone, electromagnetic spectrum, image enhancement, style transformation, observational drawing microstructures, form, function

Wallenpaupack Area School District Curriculum

COURSE: Art for Sciences

GRADE/S: 9-12+

UNIT 2: Botanical and Biological Illustration

TIMEFRAME: ~ 5 classes

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media

UNIT OBJECTIVES (SWBATS):

Students will apply observational drawing techniques to represent biological forms.

Students will understand the role of illustration in biology and environmental sciences.

Key Concepts:

Observation and detail. Texture and value for realism. Positive/negative space in natural forms

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Activities could include:

- Sketch live or preserved specimens.
- Create a detailed botanical plate using ink and watercolor.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Project grades 75- 100 points

Class work, practice with new material 10 – 20 points

Sketchbook 10 points (per assignment)

Tests 50 – 100 points

The following criteria are assessed for each of the projects:

Daily Work - Class work: Project work done during class time

Technique - Mastery of the skills that are covered in each unit, varies by unit

Craftsmanship - Neatly crafted and completed

Creativity - Original use of an idea, theme, concept or unique use of materials or principles

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

Demonstration

Small group

Practice activities

Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.)

Scientific illustrations

YouTube

Student samples

KEY VOCABULARY:

Specimen, cross-section, texture, value, contour, accuracy, proportion, scale, rendering, composition, annotation

Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12+
UNIT 3: Data Visualization and Infographics	TIMEFRAME: ~ 5 classes

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media

UNIT OBJECTIVES (SWBATS):

Students will be able to Apply core design principles (color, typography, contrast, alignment, visual hierarchy, and simplicity) to create charts, graphs, diagrams, and infographics with both clarity and aesthetic impact.

Students will be able to evaluate the effectiveness of visualizations using criteria such as accuracy, clarity, design quality, and audience understanding.

Students will explore design principles for charts, graphs, and infographics.

Key Concepts: Hierarchy and emphasis on data. Color coding for clarity. Typography in scientific communication.

Activities could include:

- Design an infographic explaining a scientific process or dataset.
- Use digital tools (Canva, Adobe Illustrator) for layout.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Project grades 75- 100 points

Class work, practice with new material 10 – 20 points

Sketchbook 10 points (per assignment)

Tests 50 – 100 points

The following criteria are assessed for each of the projects:

Daily Work - Class work: Project work done during class time

Technique - Mastery of the skills that are covered in each unit, varies by unit

Craftsmanship - Neatly crafted and completed

Creativity - Original use of an idea, theme, concept or unique use of materials or principles

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

Demonstration

Small group

Practice activities

Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Internet resources

YouTube Student samples
KEY VOCABULARY: Infographic, legend, axis, scale, contrast

Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12+
UNIT 4: Scientific Photography and Digital Imaging	TIMEFRAME: ~5 classes

PA COMMON CORE/NATIONAL STANDARDS: 9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • color • form/shape • line • space • texture • value
UNIT OBJECTIVES (SWBATS): Students will learn photographic techniques for documenting scientific subjects. Students will explore editing for clarity and emphasis. Students will be able to compare different types of scientific imagery (microscopy, field documentation, specimen photos, observational photography). Students will create a photo-based scientific illustration or infographic that combines original images, labels, and annotations. Key Concepts: Lighting and focus for detail. Composition in scientific photography Ethical considerations in image manipulation.
INSTRUCTIONAL STRATEGIES/ACTIVITIES: Activities could include: • Photograph specimens or experiments. • Edit images for publication-quality presentation.
ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative): Project grades 75- 100 points Class work, practice with new material 10 – 20 points Sketchbook 10 points (per assignment) Tests 50 – 100 points The following criteria are assessed for each of the projects Daily Work - Class work: Project work done during class time Technique - Mastery of the skills that are covered in each unit, varies by unit Craftsmanship - Neatly crafted and completed Creativity - Original use of an idea, theme, concept or unique use of materials or principles
DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment): Demonstration Small group Practice activities Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

YouTube

Student samples

KEY VOCABULARY:

Macro Photography, resolution, depth of field, exposure, digital enhancement

Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12
UNIT 5: Ceramic Modeling for Scientific Concepts	TIMEFRAME: ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media

UNIT OBJECTIVES (SWBATS):

Students will understand the properties of clay and its relevance to scientific modeling.

Students will be able to apply ceramic sculpting techniques to create accurate representations of scientific forms.

Students will explore how 3-d ceramic models aid in understanding complex scientific concepts.

Key Concepts:

Clay preparation and structural integrity. Scientific accuracy in 3-D representation. Form and Volume. Structural integrity in the models.

Activities could include:

- Demonstrate clay preparation and basic hand-building techniques.
- Students design and sculpt a ceramic model of a scientific concept (e.g., anatomical organ, molecular structure, geological formation).
- Discuss how models aid scientific understanding.
- Discuss real-world applications of ceramics in science (e.g., lab equipment, heat-resistant materials).
- Apply surface treatments (texture, glaze) for functional and aesthetic qualities.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Project grades 75- 100 points

Class work, practice with new material 10 – 20 points

Sketchbook 10 points (per assignment)

Tests 50 – 100 points

The following criteria are assessed for each of the projects:

Daily Work - Class work: Project work done during class time

Technique - Mastery of the skills that are covered in each unit, varies by unit Craftsmanship - Neatly crafted and completed Creativity - Original use of an idea, theme, concept or unique use of materials or principles
DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment): Demonstration Small group Practice activities Accommodations outlined in students' IEPs
RESOURCES (Technology Based Resources, Text Resources, etc.): YouTube Student samples
KEY VOCABULARY: Clay Body, Wedging, Slab Construction, Coil Building, Kiln, Bisque, Glaze, Structural Integrity Armature, Relief, Volume, Texture, Model, Dimension.

Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12
UNIT 6: Ceramic Sculpture for Scientific Visualization	TIMEFRAME: ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS: 9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media
UNIT OBJECTIVES (SWBATS): Students will investigate ceramic materials in scientific and technological contexts. Students will create sculptural forms that illustrate scientific principles and processes. Students will experiment with additive and subtractive sculpting techniques for precision. Key Concepts: Clay preparation and structural integrity. Scientific accuracy in 3-D representation. Form and Volume. Structural integrity in the models.
Activities could include: • Research real-world uses of ceramics in science (e.g., space shuttle tiles, biomedical implants). • Students design and sculpt a ceramic prototype for a scientific application (e.g., lab apparatus, educational model). • Explore advanced surface finishes and glazing techniques. • Group critique focusing on accuracy, functionality, and visual clarity. Key Concepts: Industrial ceramics and heat resistance. Ergonomics and design for scientific tools.

Integration of art and science in educational models.	
ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative): Project grades 75- 100 points Class work, practice with new material 10 – 20 points Sketchbook 10 points (per assignment) Tests 50 – 100 points The following criteria are assessed for each of the projects: Daily Work - Class work: Project work done during class time Technique - Mastery of the skills that are covered in each unit, varies by unit Craftsmanship - Neatly crafted and completed Creativity - Original use of an idea, theme, concept or unique use of materials or principles	
DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment): Demonstration Small group Practice activities Accommodations outlined in students’ IEPs	
RESOURCES (Technology Based Resources, Text Resources, etc.): YouTube Student samples	
KEY VOCABULARY: Slip, Score and Slip, Greenware, Firing, Oxidation, Reduction, Industrial Ceramics.	
Wallenpaupack Area School District Curriculum	
COURSE: Art for Sciences	GRADE/S: 9-12
UNIT 7: Career-Focused Scientific Art Portfolio	TIMEFRAME: ~ 8 classes
PA COMMON CORE/NATIONAL STANDARDS: 9.1.12B Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: • paint • draw • craft • sculpt • print • design for environment, communication, multi-media	
UNIT OBJECTIVES (SWBATS): Students will compile a portfolio showcasing integrated art and science projects. Students will reflect on interdisciplinary applications and career pathways. Students will present work professionally with annotations and artist statements. Key Concepts: Professional presentation, sequential organization, artist statement for scientific context.	
Activities could include: • Assemble works from previous units into a cohesive portfolio. • Write an artist statement connecting art and science. • Peer critique and final presentation.	

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Project grades 75- 100 points

Class work, practice with new material 10 – 20 points

Sketchbook 10 points (per assignment)

Tests 50 – 100 points

The following criteria are assessed for each of the projects:

Daily Work - Class work: Project work done during class time

Technique - Mastery of the skills that are covered in each unit, varies by unit

Craftsmanship - Neatly crafted and completed

Creativity - Original use of an idea, theme, concept or unique use of materials or principles

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

Demonstration

Small group

Practice activities

Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Internet resources

Student samples

KEY VOCABULARY:

Portfolio, layout, annotation, edition, narrative, curation, artifact, reflection, process documentation, revision