# ARCHITECTURE DATA SHEET WORKBOOK

Arts Impact/TPS AEMDD Grant 2008-12

MATH ARTISTIC PATHWAYS

Student’s Name:

Instructor’s Name:

Period: \_\_\_\_\_\_\_\_\_\_\_

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Architecture Data Sheet Workbook

11-2

Image from Tacoma Art Museum

Armin Landek, City Lane, 1945, Drypoint

What drawing techniques has Armin Landek used in his drypoint print City Lane to create a sense that you

can walk down this street into his picture? Share your ideas:

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ARTS IMPACT—Math Artistic Pathways

EIGHTH GRADE—LESSON ONE: One-Point Perspective: Buildings in Cities

Session I, Teaching and Learning Strategy 1: Generic Cityscape

Indicate the vanishing point, horizon line, an example of vertical/horizontal fascia lines, and diminishing

orthogonal line in the following examples.

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Review Your Work

Use this checklist to track your art and math progress. Check each box after you have correctly completed

the criteria. If you did not complete something correctly, go back and fix your work! Did you:

£ Use a ruler for all lines.

£ Draw a vanishing point on the horizon line.

£ Draw a vanishing point at the origin of the grid.

£ Draw vertical and horizontal lines for facade.

£ Draw orthogonal lines leading to the vanishing point.

£ Label all coordinate pairs (X and Y) for the facade.

Review A Friend’s Work

Use this checklist to check a friend’s work. Work together to make sure both of you are successful. Write

down any changes, thoughts or observations that you find together. Did s/he:

£ Use a ruler for all lines.

£ Draw a vanishing point on the horizon line.

£ Draw a vanishing point at the origin of the grid.

£ Draw vertical and horizontal lines for facade.

£ Draw orthogonal lines leading to the vanishing point.

£ Label all coordinate pairs (X and Y) for the facade.

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Session II, Teaching and Learning Strategy 1: Complementary and Supplementary Angles

Use your knowledge of one point perspective, complementary/supplementary angles, parallel lines, and

transversals to determine all angles that are circled above.

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11-6

Image from Tacoma Art Museum

Chester Arnold, Addition, 2002, Lithograph

Describe perspective you see in Chester Arnold’s lithograph print, Addition.

Why is this an example of bird’s eye or worm’s eye perspective?

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Tacoma Art Museum

Tacoma, Washington

1997/2003

http://www.predock.com/Tacoma/tacoma.html

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ARTS IMPACT—Math Artistic Pathways

EIGHTH GRADE—LESSON TWO: Transformations: Building Designs

Architectural Firm Associates

List the colleagues in your architectural firm. Name your firm.

1. (BUILDING ONE and TWO)

2. (BUILDING THREE)

3. (BUILDING FOUR)

4. (BUILDING FIVE)

Architecture Firm Name:

Instructional Strategy 2: Coordinates of BUILDING ONE:

List the Coordinates for your building design. Plot only the facade!

Front Face Coordinates

Example: Top Left (20, -15)

Top Left:

Top Right:

Bottom Left:

Bottom Right:

Building Designer:

Write your name.

Building’s Purpose:

What is this building for? What is it?

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Architecture Data Sheet Workbook

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Reflected Building/BUILDING TWO:

Perform a reflection on the facade coordinates for your building.

Building One Corners & Coordinates

Coordinates: Reflected:

Dilations and Translations for BUILDINGS THREE, FOUR and FIVE:

BUILDING THREE:

Building Designer:

Write your friend’s name.

Building’s Purpose:

What is this building for? What is it?

Building 3 Coordinates: Dilated by 1.5: Translated (X-5, Y-10):

Top Left:

Top Right:

Bottom Left:

Bottom Right:

Top Left: Top Right:

Top Right: Top Left:

Bottom Left: Bottom Right:

Bottom Right: Bottom Left:

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Architecture Data Sheet Workbook

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BUILDING FOUR:

Building Designer:

Write your friend’s name.

Building’s Purpose:

What is this building for? What is it?

Face Coordinates: Dilated by 2: Translated (X-20, Y-20):

Top Left:

Top Right:

Bottom Left:

Bottom Right:

BUILDING FIVE:

Building Designer:

Write your friend’s name.

Building’s Purpose:

What is this building for? What is it?

Face Coordinates: Dilated by 1.5: Translated (X-40, Y-15):

Top Left:

Top Right:

Bottom Left:

Bottom Right:

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Architecture Data Sheet Workbook

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Review Your Work

Use this checklist to check your art and math progress. Check each box after you have correctly completed

the criteria. If you did not complete something correctly, go back and fix your work! Did you:

o Plot pairs of numbers (X- value—left or right +/- and Y- value—up or down +/-)

for points in a plane relative to the origin: vertices of the front face.

o Reverse X- coordinates relative to the origin and graph the reflected building.

o Multiply the coordinates by the dilation factor and record in the Architecture Data

Sheet.

o Graph and maintain congruence (same side lengths and angle measurements) and

orientation.

o Use orthogonal lines leading to a (0, 0) vanishing point from building face/facade

vertices on coordinate plane.

o Measure for accuracy; align tools with grid lines; use straight edges for drawing all

shapes/figures.

Review A Friend’s Work

Check the calculations on your collegue’s Architecture Data Sheet. Double check that the math is correct and

the new coordinates are plotted correctly. Record any changes, thoughts or new learnings below:

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Architecture Data Sheet Workbook

11-12

ARTS IMPACT—Math Artistic Pathways

EIGHTH GRADE—LESSON THREE: Combining Mathematical Figures: City Planning

Review Your Work

Use this checklist to check your art and math progress. Check each box after you have correctly completed

the criteria. If you did not complete something correctly, go back and fix your work! Did you:

o Use the origin, coordinate plane, orthogonal lines within the coordinate plane to

combine building designs.

o Overlap to tape together building designs at origin/vanishing point.

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Architecture Data Sheet Workbook

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ARTS IMPACT—Math Artistic Pathways

EIGHTH GRADE—LESSON FOUR: Depth through Use of Light and Color

Review Your Work

Use this checklist to check your art and math progress. Check each box after you have correctly

completed the criteria. If you did not complete something correctly, go back and fix your work! Did you:

o Use rulers and pencils to replicate/trace the pre-images and images accurate to

original design.

o Use the color wheel to mix secondary and tertiary colors, black and gray from

primary colors.

o Paint to a line using watercolor and brush, lightly and evenly adding color to

building and detail planes and shapes.

o Paint facade different (lighter or darker) than sides to establish depth.

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ARTS IMPACT—Math Artistic Pathways

EIGHTH GRADE—LESSON FIVE: Coordinate Planes, Vertex, and Perspective: City

in Motion

Teaching and Learning Strategy 2 and 3

Your Name:

Student’s Name Building Two:

Student’s Name Building Three:

BUILDING THREE Coordinates Dilated by .25

Facade Bottom Left (20, -20) (5, -5)

Facade Bottom Right

Facade Top Left

Facade Top Right

Back Bottom Left

Back Bottom Right NOT VISIBLE NOT VISIBLE

Back Top Left

Back Top Right

BUILDING TWO Coordinates Dilated by .5

Facade Bottom Left (20, -20) (10, -10)

Facade Bottom Right

Facade Top Left

Facade Top Right

Back Bottom Left

Back Bottom Right NOT VISIBLE NOT VISIBLE

Back Top Left

Back Top Right

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Review Your Work

Use this checklist to check your art and math progress. Check each box after you have correctly completed

the criteria. If you did not complete something correctly, go back and fix your work! Did you:

o Plot a point that is 15 spaces down and 2 spaces across on a vertical 8.5 x 11”

sheet of 4x4 graph paper and draw a horizontal and vertical line intersecting at

that point.

o Plot a point at (20, -20).

o Draw face/facade left, bottom vertex at (20, -20) and add the illusion of depth by

using vertical lines and orthogonal lines leading to the origin.

o Measure for accuracy; align tools with grid lines: use straight edges for drawing all

shapes/figures.

o Plot pairs of numbers (X- value—left or right +/- and Y- value—up or down +/-)

for points in a plane relative to the origin: vertices of the front face, side face, top

face (if applicable), and details of the buildings.

o Multiply coordinates by .25 and .5 and record the calculations.

o Use color values: tones/shades and tints using colored pencil to consistently

illustrate the direction of the light source from the top left corner of the image.

o Hand another building drawing to the classmate, draft and color the .5 dilation on

a classmate’s paper, continue the sequence with a subsequent hand-off to the

right; draft and color the .25 dilation.