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Integrating Art and STEM Education

ENGLISH VERSION

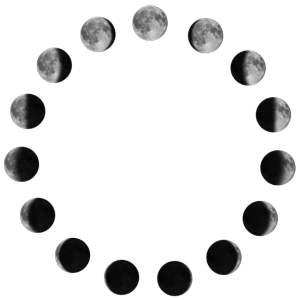
ArtSTEM Module: SCIENCE
Title: Why Does the Moon Change Shape?
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
Date: 2025
Language: English
Confidentiality: Public (PU)
Project Reference: 2024-2-DE03-KA210-SCH-000285057

Moon Phase Group Model

Module: Why Does the Moon Change Shape?
Use: Print-friendly or digital editing for visual arts & modeling activities
Title: “Our Moon Phase Model”

- Draw or attach Oreo/paper model
- Write the name of each phase
- Add arrows to show the lunar cycle
- Use recycled paper/cardboard!.



TIP: You can make a round or line model

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Comic Storyboard Template
“From the Moon’s Perspective”

Module: Why Does the Moon Change Shape?

Title: “If the Moon Could Talk...”

- Use the 4 boxes to create a comic about the moon explaining its phases to Earth.
- Make sure each panel shows a different phase.
- You may use speech bubbles or narration.
- Assign emotions to each phase (e.g., Full Moon = Proud, New Moon = Shy)

Sketch Panel
Caption: _____

Sketch Panel
Caption: _____

Sketch Panel
Caption: _____

Sketch Panel
Caption: _____

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Student Self-Reflection Sheet

Name: _____
Date: _____

1- Which moon phase do you find the most interesting and why?

2- Did the modeling or the art activity help you understand the phases better? Why?

3- How did you contribute to your group's work?

4- One thing I learned that surprised me:

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Creative Writing Frame

What do you think causes the moon to change shape in the sky? Write your answer below:

“Which Moon Are You Today?”

Which phase of the moon best shows your mood today? Draw it and write a sentence:

Drawing:

“Today, I feel like a _____ Moon because…”

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Creative Writing Frame

Write a short poem. a story or a letter:

"The Moon Explains Itself to Earth": Minimum 3 sentences or 1 short poem. Be creative!

"Dear Earth, I've noticed you look at me differently each night..."

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Moon Phase Cards – Cut and Match Set

Title: *"Moon Phase Memory Match"*
Use: *Flashcards for games / review*

Card Front	Card Back
Picture of phase Short fact (e.g., "Fully lit")	Name of the phaseBlank for matching activity

Card List:

- New Moon
- Waxing Crescent
- First Quarter
- Waxing Gibbous
- Full Moon
- Waning Gibbous
- Last Quarter
- Waning Crescent

Suggested Activity:

- Shuffle cards and match picture to name
- Use in small groups or as a station rotation game

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Integrating Art and STEM Education

ENGLISH VERSION

ArtSTEM Module: SCIENCE
Title: Rainbow
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
Date: 2025
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Poster Template
Rainbow Science

Module: Rainbow
Use: Print-friendly or digital editing (Google Slides / Canva / Jamboard)
Title: “How a Rainbow is Born

Step	Drawing Space	Labels
Sunlight enters raindrop		Reflection begins
Light bends inside droplet		Refraction
Light splits into colors		Spectrum appears
Colors form an arc		Rainbow visible

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Comic Storyboard Template
“The Journey of Sunlight”

Module: Rainbow

Title: “The Journey of Sunlight”

- Sunlight travels
- Meets Raindrops
- Splits into colors
- Rainbow forms in the sky

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Student Self-Reflection Sheet

Name: _____
Date: _____

1- What part of the activity helped me understand rainbows best?

2- What role did I play (scientist, artist, narrator, sunlight, raindrop, color)?

3- One question I still have about rainbows:

4- One thing I learned that surprised me:

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Experiment – Make a Mini Rainbow

Materials: Flashlight, glass of water, white paper.

Steps:

1- Shine light through the water.

2- Place the paper so that light projects onto it.

3- Look for colors!

Draw your rainbow here:

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Integrating Art and STEM Education

ENGLISH VERSION

ArtSTEM Module: TECHNOLOGY
Title: Humanoid Robot Design
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
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Poster Template
Humanoid Robot Design

Module: Humanoid Robot Design
Title: “Designing My Humanoid Robot”

- Draw or attach your robot model here.
- Label each component with the corresponding function (e.g., sensors for seeing, actuators for movement).
- Use colors for different parts (e.g., blue for sensors, red for actuators).

Robot Component	Illustration Box	Description
Sensors (Eyes/Cameras)		
Actuators (Joints/Motors)		
Processor (Brain)		

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Comic Storyboard Template “Robot and Human Interaction”

Module: Exploring Humanoid Robots: Design and Emotion

Title: My Robot's First Day

- Frame 1: Introduce the robot to the human character.
- Frame 2: Show the robot helping the human with a task.
- Frame 3: Continue the interaction with the robot helping again.
- Frame 4: Show the human and robot saying goodbye.

Robot is introduced to the human	Robot helps with a task
Robot helps with another task	Robot says goodbye

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Comic Storyboard Template “Robot and Human Interaction”

Module: Exploring Humanoid Robots: Design and Emotion

Title: My Robot's First Day

- Use the 4 boxes below to make a comic strip showing a person meeting your robot.
- What happens in their first conversation?
- How does your robot help?
- Use speech bubbles to show what they say.

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Creative Writing Frame

Robot Personality Design

Title: "Design My Robot's Personality"
Instructions:
Draw your robot's face showing a specific "emotion" (e.g., happy, thinking, listening).

Activity Steps:

- Draw your robot's face to convey an emotion or personality trait (e.g., happy, excited, thoughtful).
- Add labels to explain what features of the face (e.g., eyes, mouth) help convey the emotion.

Title of Artwork:
Emotion/Personality:

Explanation:
My robot is feeling.....
Because:.....

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Creative Writing Frame

"Welcome to Your New Robot!" – User Manual Entry

If you could build a robot to help you, what job would you give it? Write your answer below:

Write a short introduction for your robot, like you're giving it to someone new!

Model Name: _____

Primary Function: _____

How to interact safely:

1.
2.
3.
4.
5.
6.

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Design and Modeling: "Build-a-Bot"

Design your own robot!

- Label its parts in your drawing.
- Think about what your robot can see, hear, do, and say.
- You can draw OR attach a photo of your real-life model made from materials.

Robot Profile

Robot's Name:

Its Purpose:

Key Parts – Fill in or label in drawing:

Part	Role
Sensors (Eyes/Cameras)	Helps your robot "see" the world.
Actuators (Motors)	Let it move arms, legs, head.
Processor (Brain)	Makes decisions and solves problems.
Speaker/Microphone	Lets it talk and listen to humans.

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Integrating Art and STEM Education

ENGLISH VERSION

ArtSTEM Module: ENGINEERING
Title: Build a Bridge
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
Date: 2025
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Poster Template
Build a Bridge

Module: Build a Bridge – Connecting Art and Engineering
Title: “Our Bridge Design”
Draw or attach photo of the group’s bridge model
– Label each part of the bridge
– Add arrows to show tension and compression
– Use recycled materials for your model!

Bridge Part	Drawing Space	Description
Deck (Roadway)		
Support Pillars		
Beams/ Trusses		
Special Features		

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Comic Storyboard Template
“If a Bridge Could Talk…”

Module: Build a Bridge – Connecting Art and Engineering

Title: “I am a Bridge!”

- Give your bridge a name and personality
- Tell a simple story from the bridge’s perspective
- Include engineering ideas (structure, strength, weather, etc.)
- Use humor or emotion if you want!

I was designed to…	People use me to…
My proudest moment was when…	Even in storms, I…

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Bridge Structure Cards Cut and Match Set

Title: *"Bridge Types Memory Match"*
Use: *Flashcards for games, review or station activity*

Card Front	Card Back
Picture of Bridge Type (e.g., Suspension, Beam)	Name of Type Fun Fact (e.g., "Used for long distances")

Bridge Types List:

- Beam Bridge
- Arch Bridge
- Truss Bridge
- Suspension Bridge
- Cable-Stayed Bridge

Suggested Activity:

- Shuffle and match the name to the correct image
- Add engineering facts or materials used
- Use in pairs or rotate through groups

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Creative Writing Frame

1) What Kind of Bridge Are You?

If you were a bridge, what kind would you be? Why?
Draw yourself as a bridge, then write 1–2 sentences explaining:

Drawing:

"I would be a _____ bridge because _____."

2) ***Write a short User Manual for your bridge:***

Welcome to the Future Bridge!

Model Name:
Material:
How it works:

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Comic Strip
“My Robot Bridge Saves the Day!”

Use the 4 boxes to draw a story where a person uses your bridge design to cross a challenge (a river, a canyon, traffic, etc.)

- Frame 1 – The problem
- Frame 2 – The bridge is introduced
- Frame 3 – The crossing
- Frame 4 – Success!

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Integrating Art and STEM Education

ENGLISH VERSION

ArtSTEM Module: MATHEMATICS
Title: Geometric Shapes
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
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Poster Template
Geometric City Design

Module: Learn the Geometrical Figures

Title: “Our Geometric City”

- Draw or attach your model of geometric solids used in a city design.
- Label each solid (cube, cylinder, pyramid, etc.).
- Include at least one pair of parallel lines and one set of perpendicular lines in your design.

Geometric Solid	Illustration Box	Description
Cube		
Cylinder		
Pyramid		

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Comic Storyboard Template “Geometry in Everyday Life”

Module: Mathematics Geometrical Figures

Title: Exploring Geometry

- Illustrate how geometric shapes are used in buildings or architecture.
- Show symmetry in a natural object like a flower or leaf.
- Represent geometric patterns used in artwork or design.
- Depict how geometric principles can be used in modern design or technology.

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Creative Writing Frame
Shape Art Design

"Create with Shapes"

- *Use geometric shapes to create a new artwork (drawing, collage, or model).*
- *Activity Steps:*
  a. *Sketch your shapes and design your art piece.*
  b. *Think about symmetry and color patterns as you work.*

Title of Artwork: _____

Shapes Used: _____

Mathematics in Art: _____

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Creative Modeling

Create Your Shape Art

Use drawing or cut-and-paste shapes. Pay attention to symmetry, colors, and patterns.

Title of your artwork:

Which shapes did you use?

Why does mathematics fit with art in your picture?

(Optional drawing space)

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Student Self-Reflection Sheet

Name: _____
Date: _____

1- Which shape do you like the most and why?

2- Was it easy or difficult to draw precise shapes? Why?

3- How did teamwork help you during this activity?

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HomeWork: Geometry in Everyday Life

Name: _____
Date: _____

At home, take photos of three objects and describe:

1- Object:
2- Shape:
3- Is it symmetrical?
4- Edges & Surfaces:

1- Object:
2- Shape:
3- Is it symmetrical?
4- Edges & Surfaces:

1- Object:
2- Shape:
3- Is it symmetrical?
4- Edges & Surfaces:

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Integrating Art and STEM Education

ENGLISH VERSION

ArtSTEM Module: MATHEMATICS
Title: Fractions
Target Group: Middle School Students

Coordinator: Wilhelmstadt Gymnasium (Germany)
Partners: Pangea (Germany), Art4Work (Poland), Wellnist Academy (Türkiye)
Prepared by: ArtSTEM Research Team
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Poster Template
Fraction Mosaics

Module: Learn Fractions Through Art and Mathematics
Title: “Creating Fraction Mosaics"

- Draw or attach your fractional mosaic here.
- Label each fraction used and indicate the equivalent fractions.

Fraction	Illustration Box	Description
1/2		
1/4		
1/3		

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Comic Storyboard Template “Fractions in the Real World”

Module: Learn Fractions Through Art & Mathematics

Title: “How Fractions Work in Everyday Life”

- Frame 1: Show a pizza divided into equal slices (fractions).
- Frame 2: Depict the fractional parts of a cake.
- Frame 3: Illustrate how fractions are used when shopping (discounts, portion sizes).
- Frame 4: Show the use of fractions when sharing a sandwich.

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Creative Writing Frame
Fraction Artwork

"Create with Shapes"

Create an artwork using geometric shapes that visually represents fractions. Activity Steps:

- *Sketch and design your shapes.*
- *Label each fraction clearly and add color.*

Title of Artwork: _____

Shapes Used: _____

Mathematics in Art: _____

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Observation and Design

"Find the Shapes!"

- *Look around your classroom or schoolyard.*
- *List three objects and the fractions you can identify in them.*

Object	Fraction(s)	Why?	Fraction(s)
Example: window	1/4, 1/8	It is divided into equal parts	1/4, 1/8

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Creative Modeling

Creative Modeling

Use a simple shape (circle, square, rectangle). Shade one fraction in color.

- ***The fraction:*** _____
- ***One equivalent fraction:*** _____
- ***The decimal:*** _____
- ***The percentage:*** _____

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Student Self-Reflection Sheet

Name: _____
Date: _____

1- What was the most interesting thing you learned about fractions?

2- Did creating the fraction models help you understand fractions better? Why?

3- How did teamwork contribute to your group's success?

4- What would you change about your fraction design?

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