STEAM & VISUAL ARTS PROJECT



FAVORITE PETS SCULPTURE

• PAPER MACHE •

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The Favorite Pets Papier-Mâché Sculpture workshop transforms simple drawings into vibrant 3D masterpieces, teaching students how to translate 2D concepts into spatial reality. Students choose their favorite pets to draw them on a sheet of paper as a guide to making their own papier-mâché pets. Then, they have encouraged to think about forms to build the structure of their pet and select the materials needed to join the body parts together with tape or other assembly techniques.

Students need to create a sturdy base to hold paper mache. Not all the pieces maybe can fit together neatly. But they can practice being a structural engineer as figure out how to fill in areas that do not fit together nicely.

This project is a great way to explore how shapes fit together and to practice troubleshooting skills in real life. Papier-mâché is an exceptionally forgiving medium. Mistakes in the underlying frame can be re-wrapped, reinforced, or built out through additional layers. This process fosters growth mindset and emotional resilience—teaching students that design challenges are opportunities for innovative troubleshooting rather than failures. The end product is a high-quality, personalized work of art that integrates Visual Arts, Engineering, Science, and Language Arts.



General Goals

- **Learning**: Students will learn about basic Sculptures techniques. They can experiment using some materials to create an object to express their ideas, feelings, imagination and creativity in connection with Steam Magnet.
- **Spatial Thinking:** Translate two-dimensional drawings and proportional plans into three-dimensional, balanced armature forms.
- **Structural Engineering Application:** Identify structural vulnerabilities in a sculpture's armature and apply corrective engineering solutions (e.g., cross-bracing, counterweighting, gussets) using low-cost or recycled materials.
- **Material Understanding:** Demonstrate knowledge of media properties, specifically understanding how paper strips and adhesive binders dry to form a rigid composite shell.

Affective & Experiential Objectives

- **Perseverance & Problem Solving:** Build creative resilience by troubleshooting structural sagging, balance issues, or adhesive excess during the sculptural process.
- **Personal Connection & Self-Expression:** Communicate emotional connection to an animal or pet through deliberate artistic choices in color, texture, stance, and embellishment.
- **Classroom Responsibility:** Practice proper studio etiquette, tool safety, and clean-up routines to maintain an efficient, collaborative workshop environment.



- **VA.3.S.3.3 / VA.5.S.3.3 (Skills, Techniques, and Processes):** Use tools, media, techniques, and processes in a safe and responsible manner. (Applies to students safely handling wire/cardboard armatures, scissors, and managing wet papier-mâché paste and paint). **Project Application:** Applies safely handling scissors, cardboard assembly tools, managing wet paste, and maintaining safe brush and paint practices.
- **VA.5.F.1.1 (Innovation, Technology, and the Future)**: Examine and experiment with traditional or non-traditional uses of media to apply imaginative techniques in two- and/or three-dimensional artworks. (Applies to using recycled materials like newspaper and plastic bottles to construct an imaginative 3D pet sculpture). **Project Application:** Applies to repurposing everyday recyclables (plastic bottles, cardboard, cups) to build imaginative 3D animal sculptures.
- VA.4.O.1.1 (Organizational Structure): Use structural elements of art and organizational principles of design to develop content in artwork. (Applies to students translating their 2D drawings into balanced 3D forms using elements like shape, form, and texture). **Project Application:** Applies to translating 2D design plans into balanced 3D forms using structural elements like shape, form, space, and surface texture.
- VA.68.F.1.1 (Innovation, Technology, and the Future - Middle School): Use non-traditional thinking and various techniques to create two-, three-, and/or four-dimensional artworks. (Applies to the innovative engineering required to join different body parts together with tape to make a freestanding animal). **Project Application:** Applies to engineering rigid joints and cantilevered forms (tails, ears, snouts) using tape and structural bracing.
- VA.3.O.3.1 (Organizational Structure): Use symbols, visual language, and/or structural elements of art to express ideas in artwork. (Applies to students choosing specific visual details—like fur texture, color, and posture—to express the personal identity and characteristics of their favorite pet). **Project Application:** Applies to using visual details—such as fur pattern, expressive posture, and decorative features—to convey pet character and identity.



Course Outline & Implementation Overview

This unit is designed for delivery across six 45-minute class sessions, providing ample time for assembly, drying, and painting.

Session	Focus Area & Activity
Session 1	2D Sketching, Proportional Planning & Material Selection
Session 2	Armature Construction (Bottles, Cardboard, Tape, Foil)
Session 3	Papier-Mâché Application (Layers 1 & 2)
Session 4	Papier-Mâché Reinforcement (Layers 3 & 4) & Texture Prep
Session 5	Base Painting, Detailing, & Color Mixing
Session 6	Surface Sealing, Assembly of Features, & Peer Reflection

STEP-BY-STEP GUIDE

Session 1: Sketch your design



- **Duration:** 45 Minutes
- **Objective:** Students will sketch their favorite pet and identify the geometric solids needed for its 3D armature.

Step-by-Step Implementation Guide

1. **Visual Motivation (10 Mins):** Display images of animal anatomy alongside simple geometric forms (cylinders, spheres, cones). Demonstrate how a dog's body can be analyzed as a cylinder (torso), four smaller tubes (legs), and a sphere or block (head).

2. **Sketching Plans (20 Mins):** Distribute 9x12 drawing paper. Instruct students to draw their chosen pet (dog, cat, bird, rabbit) in profile (side view). Require students to draw at 1:1 scale relative to their intended sculpture size.

3. **Draw its sketch on a sheet**. It's a good idea to have a simple sketch of your character or sculpture, with the proportions and pose you want, to use as a guide. Write its name and color it. This is your guide to making your fluffy animal paper Mache.

4. **Material Selection & Planning (15 Mins):** Think about and select some materials you need to build the structure of your animal. Creating a Form for the animal according to the teacher's instructions. Tape on body parts securely. Have students annotate their drawings, mapping out which recycled items (plastic bottles, cardboard tubes, paper balls) will form each anatomical part.

Session 2: Creating an armature



- **Duration:** 45–60 Minutes
- **Objective:** Students will construct a freestanding, rigid 3D armature using recycled materials, masking tape, and foil based on their blueprint.

Step-by-Step Implementation Guide

1. **Core Assembly Demonstration (10 Mins):** Demonstrate how to attach legs to a plastic bottle core. Show how cutting notch tabs ("feet/flanges") into cardboard tubes creates flat surfaces for masking tape adhesion.
2. **Bulk Form Construction (20 Mins):** Have students crumble newspaper or aluminum foil to form rounded heads, snouts, or ears, binding them tightly with masking tape.
3. **Structural Stabilization (15 Mins):** Guide students in testing their armature's stability on a flat surface. If the form wobbles, instruct them to add counterweight or widen the stance of the legs using cardboard cross-braces.

Session 3 and 4: Papier-Mâché Layering & Textural Application



- **Duration:** Two 45-Minute Sessions (each one)
- **Objective:** Students will apply 3 to 4 overlapping layers of papier-mâché strips using proper glue-management techniques to create a smooth, durable shell.

Step-by-Step Implementation Guide

1. **Glue Mess-Management Setup (5 Mins):** Set up shallow trays with wate-glue mixture, along with damp sponges and wide paintbrushes.
2. **Technique Demonstration (10 Mins):** Demonstrate the "strip-wipe" method: dip a newspaper strip into glue, wipe excess liquid using index and middle fingers, lay the strip across the armature,

and smooth it down completely. Highlight the importance of cross-hatching (alternating strip directions per layer) to achieve structural rigidity.

3. **Application & Monitoring (25 Mins):** Students apply layers 1 and 2 during the first session, let dry completely, and repeat layers 3 and 4 during the second session.
4. **Drying Phase:** Place finished sculptures on plastic-lined drying racks for 24–48 hours.

Session 5 and 6: Surface Painting, Sealing, & STEAM Reflection



- **Duration:** Two 45-Minute Sessions (each one)
- **Objective:** Students will paint their dried sculptures with acrylics, apply decorative surface details, seal with varnish, and complete a written structural reflection.

Step-by-Step Implementation Guide

1. **Base Coat Application (20 Mins):** Students paint an acrylic base coat over the dried papier-mâché shell.
2. **Textural & Expressive Details (25 Mins):** Apply fur textures, skin features, and markings using varied brushwork, fabric scraps, or plaster cloth accents.
3. **Sealing (10 Mins - Teacher Assistance):** Apply a clear acrylic finish or varnish to seal the surface and protect the sculpture.
4. **Engineering & Art Reflection (15 Mins):** Students complete a short reflection answering:
    - *What structural challenge did you encounter when building your pet's armature?*
    - *How did you resolve balance or joint issues using your materials?*



- **Books:**
    - *Sculpting with Papier-Mâché* by Model & Form Press.
    - *Animals in Motion* by Eadweard Muybridge (Visual anatomical reference).
    - *The Art of Clean 3D Design* (STEAM Instructional Guide).
- **Apps & Digital Media:**
    - *Autodesk Tinkercad* (3D modeling exploration for elementary/middle students).
    - *Visual Arts Visualizer / Document Camera* (For teacher demonstrations of strip-wiping and armature construction).
- **Web Resources:**
    - Paper Mache sculptures: https://wilsonmapevanegas.wixsite.com/arteacher-papermache
    - Dog Sculpture Paper Mache Lesson Plan: https://wilsonmapevanegas.wixsite.com/arteacher-papermache/doglessonplan
    - Dog Sculpture Paper Mache Video: https://www.youtube.com/watch?v=Yu_pXaLuNuY

Supplies, Vendors, & Budget Breakdown

The table below outlines a complete $400-budget kit capable of supporting 120–150 students (4–5 class periods):

Material / Item Description	Primary Vendor / Source	Unit / Quantity	Approx. Cost
Masking Tape (1-inch rolls)	School Specialty / Amazon	24 Rolls	$38.00
PVA Art Glue / Papier-Mâché Paste	Blick Art Materials	4 Gallons	$62.00
Acrylic Paint Set (Primary & Secondary Colors)	Sargent Art / Sax Fine Art	12 Pint Bottles	$75.00
Assorted Paintbrushes (Flat & Round)	School Specialty	72 Pack	$32.00
Plaster Cloth Rolls (For textural details)	Blick Art Materials	6 Rolls	$45.00
Acrylic Gloss Varnish / Sealer	Liquitex / Utrecht	2 Quarts	$34.00
Plastic Trays &	Dollar Tree / Local Sourcing	30 Sets	$30.00
Sponge Containers	Dollar Tree / Local Sourcing	30 Sets	$20.00
Recycled Core Items (Bottles, Tubes, Boxes)	Community / Student Sourced	Bulk	$0.00
Newspaper & Shredded Paper	School / Community Donations	Bulk	$0.00
Detail Scraps (Fabric, Yarn, Wiggle Eyes)	Craft Stores	Assorted Lot	$25.00
Heavy-Duty Scissors	Classroom Stock	30 Pair	$45.00
TOTAL ESTIMATED COST			**$406.00**

Self-Assessment and Reflection

(Formative Assessment)

Teacher Name: _____ Art Lesson: _ **Favorite Pet's Paper Mache** _ Date: _____

Student Name: _____ **Grade:** _____

Objective: Students will learn about basic Sculptures techniques. They can experiment using some materials to create an object to express their ideas, feelings, imagination and creativity in connection with Steam Magnet.

Take your Artwork made by yourself during this lesson and consider it:

1. **Rate your development** of the following skills/abilities in your artwork, from 1 to 9, 1 little developed up to 9 your maximum: **(Only those that apply).**

Drawing	1	2	3	4	5	6	7	8	9
Painting	1	2	3	4	5	6	7	8	9
Composition	1	2	3	4	5	6	7	8	9
3D Sculpture	1	2	3	4	5	6	7	8	9
Digital Art	1	2	3	4	5	6	7	8	9
Other:	1	2	3	4	5	6	7	8	9

2. What **elements of art and/or principles of design** do you highlight in your artwork?

☐ Color ☐ Form ☐ Line ☐ Texture ☐ Shape ☐ Space ☐ Value

☐ Balance ☐ Contrast ☐ Emphasis ☐ Movement ☐ Pattern ☐ Rhythm ☐ Unity

3. Answer the following questions about your artwork

What is the title of your artwork? What kind of art did you create?	
What did you learn and how did you create your artwork? What techniques did you use to build it?	
What is the most successful Thing about your artwork? What was your favorite part of making it?	
What would you Think about Your artwork? Any changes or modifications?	

4. Do you think your artwork is ready to be exhibited or to participate in a contest?

☐ Yes ☐ No ☐ I'm not sure

If you have any observations for your art teacher, write here:

GENERAL RUBRIC

(Formative Assessment)

Date: _____ Student Name: _____ Grade: _____

Art Lesson: _____ Favorite Pet's Paper Mache _____

Objective: Students will learn about basic Sculptures techniques. They can experiment using some materials to create an object to express their ideas, feelings, imagination and creativity in connection with Steam Magnet.

CRITERIA	4	3	2	1
Knowledge and technique **Apply Knowledge and technique gained**	Artwork shows complete and detailed knowledge and/or techniques gained in an artwork class.	Artwork shows most of knowledge and/or techniques gained in an artwork class.	Artwork shows some of knowledge and/or techniques gained in an artwork class.	Artwork shows need improvement to applying knowledge and/or techniques gained in an artwork.
Elements of art and Principles of Design **Does it make good use of the EA?**	Artwork shows the elements of art and principles of design worked on in the class lesson to reinforce the theme, meaning, mood, or feeling of the artwork.	Artwork shows a couple of the elements of art and principles of design worked on in the class to reinforce the theme, meaning, mood, or feeling of the artwork.	Artwork shows some of the elements of art or principles of design worked on in the class lesson but has difficulty relating the meaning or feeling of the artwork.	Artwork shows need improvement to picking out the elements of art and principles of design.
Follow directions and Use art supplies	Artwork shows a high expectation about the step-by-step directions and use art supplies properly.	Artwork shows medium expectation about the step-by-step directions and use art supplies.	Artwork shows low expectation about the step-by-step directions and use art supplies.	Artwork shows need improvement to follow directions step by step and Use art supplies properly.
Composition **Is this Artwork Neat, careful, clean and consistent?** **Are you sure it's Completed?**	Artwork shows a high level of neat, careful, clean, space filled and completed composition.	Artwork shows a medium level of neat, careful, clean, space filled and completed composition.	Artwork shows a low level of neat, careful, clean, space filled and completed composition.	Artwork shows the need Improvement of neat, careful, clean, space filled and completed composition.
Effort and Creativity **Is this artwork your best?** **Has this artwork made some effort?**	Artwork shows high effort, and a high level of creativity demonstrated by unique, detailed, interesting and student's own ideas.	Artwork shows medium effort and uses a couple of criteria and options to recreate an artwork.	Artwork shows minimal effort and tries to use aesthetic criteria and options to recreate an artwork.	Artwork does not show effort and evaluates work as good or bad based on personal taste.
Total Result	☐ Excellent (16-20)	☐ Good (11-15)	☐ Satisfactory (6-10)	☐ Needs Improvement (1-5)


THANK YOU!