PALO ALTO Junior MUSEUM & ZOO

2024-25 SCIENCE MENU

NGSS-aligned (Next Generation Science Standards)

TABLE OF CONTENTS

Key

1 Requires two class periods.
2 Large open room required.
3 Large outdoor space required (not available at JMZ)
4 Seasonal
5 Sustainability, conservation or renewable energy focus

Contact

jmzinterpretive@cityofpaloalto.org
650-329-2111

Updated: September 4, 2024

PALO ALTO Junior MUSEUM & ZOO

KINDERGARTEN SCIENCE MENU

Relationships in Ecosystems

Science Topic	Lesson Description
Rainforest Biome	Students will learn about what makes a rainforest unique. They will smell and taste food products and be introduced to real rainforest flora and fauna. *Please advise instructor of any allergies in advance.*
Riparian Biome	Students will learn about what makes the riparian biome unique. They will create a scientific model of a river corridor habitat and meet some riparian flora and fauna. *Seasonal: Sunshine is ideal for the lesson, best in early Fall or late Spring.*
Mini-Habitats	Students will learn about what most animals need to survive. In groups, students will build a temporary terrarium to maintain and observe in the classroom.
Zoo Animal Program	Students will meet a variety of different animals from the Junior Museum and Zoo. The lesson could include a general overview, or a focus on a specific group, such as reptiles, mammals, insects, etc. *If you have a special request, please speak with the instructor.*

Earth's Systems

Science Topic	Lesson Description
Thermometers	Students will use various types of thermometers and learn about their value as a scientific measuring tool. Students will use these tools to measure and compare the temperature of various locations in the area.

Forces & Interactions

Science Topic	Lesson Description
Balance	Students will explore the concept of balance through balancing their own bodies and the construction of a balance toy
Roller Coasters	Students will discover the effects of gravity's pull on the motion of marbles through experimenting with different configurations of roller coaster tracks.
ENGINEERING - Paper Bridges	In this two-part introduction to the engineering process, students will learn how to manipulate paper to increase its strength. They will work in groups building paper bridges, testing them, and then redesigning and retesting based on their new knowledge. *Requires two class periods.*

PALO ALTO Junior MUSEUM & ZOO

FIRST GRADE SCIENCE MENU

Life Science

Science Topic	Lesson Description
Adaptations	Students will use their own bodies in a simulation to experience how animals' physical traits and behavior affect their survival. Students will also meet a zoo animal and discuss its adaptations.
ENGINEERING - Biomimicry	In this two-part engineering lesson, using live carnivorous plants as a model, students will observe and mimic the methods these plants use to capture their prey in order to design a hex-bug trap. *Requires two class periods. Only available Sept-Oct and Apr-June.*

Space Systems

Science Topic	Lesson Description
Starlab Planetarium	Students will learn about the patterns of the night sky by entering a portable planetarium and observing our local stellar neighborhood. Starlab requires a large indoor empty space 18 feet in diameter and 12 feet high.
Orbits	Students will explore the patterns of motion of planets and stars using marbles and funnels as a model for orbital motion.

Light & Sound

Science Topic	Lesson Description
Illumination	Students will make observations using light and mirrors in a darkened space to discover that objects can be seen only when illuminated.
Light Exploration	Students will use colored lights, mirrors and various objects to discover that light interacts with materials and can be directed, reflected, transmitted and absorbed.
Periscopes	Students will discover the potential applications of mirrors by each building their own periscope.
Sound Exploration	Students will perform various investigations to explore the relationship between vibrating materials and sound.

PALO ALTO Junior MUSEUM & ZOO

SECOND GRADE SCIENCE MENU

Life Science

Science Topic	Lesson Description
Plants of Different Habitats	Students will witness the diversity of life by making observations of real plants specimens from different habitats.
Deserts	Students will meet real plants and animals of the desert as they explore the diversity of life in this unique and challenging environment.
Salt Marsh	Students will explore the diversity of life within our unique local ecosystem of the San Francisco Bay estuary.
ENGINEERING – Seed Pods	In this two-part engineering lesson, students will learn about the needs and challenges plants face in reproduction. Students will then build and test their own individual seed dispersal designs. *Requires two class periods.*

Earth Science

Science Topic	Lesson Description
Volcanoes and Igneous Rocks	Students will discover how Earth events can occur both quickly and slowly through the phenomena of volcanoes and igneous rock. They will handle and identify a variety of real rock specimens.
Weathering and Erosion	Students will learn about how Earth structures break apart and move. They will create a model demonstrating how water erodes sand.

Structures & Properties of Matter

Science Topic	Lesson Description
Making Recycled Paper	Students will discover how the many small fibers that make up plants are removed and rearranged to form paper. Students will take deconstructed scrap paper and recycle it into new paper. *Parent volunteers required.*
Viscosity	Students will learn about the physical property of liquids knows as "viscosity". They will perform an experiment and record data in order to determine the viscosity of several different liquids.
Phase Change	Students will learn about how a substance can change from one phase to another. They will perform an investigation and observe examples of phase change.

PALO ALTO Junior MUSEUM & ZOO

THIRD GRADE SCIENCE MENU

Life Science

Science Topic	Lesson Description
Bees	Students will learn about honeybees and their unique behavior and social life. They will see artifacts, taste honey, and observe specimens under microscopes.
Camouflage	Students will perform an experiment and collect data in order to demonstrate that animals with better camouflage are more likely to survive. Students will also meet a live animal that is a master of camouflage.
Fossils	Students will handle a variety of real fossils and learn about their value as evidence of organisms and environments from Earth's distant past.

Weather & Climate

Science Topic	Lesson Description
Storms	Students will learn about severe weather events that occur in different climates of the world and what causes them. The lesson will focus on tornados, lightning, and hurricanes.
Sand Erosion Mitigation	Students will use a variety of materials (natural and man-made) to experiment in mitigating wind erosion.

Forces & Interactions

Science Topic	Lesson Description
Bouncing and Rolling	Students will conduct a scientific experiment and record and analyze data in order to discover what makes an object bounce and roll.
Straw Rockets	Students will manually adjust the strength and direction of an air launcher to conduct an investigation comparing the effects of these variables on the motion of straw rockets. *Requires a large empty indoor space approx. 25ft by 30ft.*
Magnetic Levitation	Students will learn about the non-contact nature of magnetism, and use it to help reduce friction as they work to engineer a simple levitating train.
Static	Students will learn how electricity is present in more than just electronics. They will perform static experiments and interact with a Van de Graaff generator.
ENGINEERING - Marble Paths	In this two-part lesson, students will work in groups to design and build a marble ramp in order to meet a specific challenge. They will learn about energy and forces. Students will need substantial time in class between lessons to work on their projects. *Requires two class periods.*

PALO ALTO Junior MUSEUM & ZOO

FOURTH GRADE SCIENCE MENU

Life Science

Science Topic	Lesson Description
Squid Dissection	Students will learn about squid internal and external morphology by dissecting real squid specimens.
Eye Dissection	Students will learn to identify the major parts of the mammalian eye and describe the process in which our sense of sight works. They will dissect and examine real cow eyes. *Parent volunteers needed.*
Lung Model	Students will learn about the mammalian respiratory system and construct an interactive model of the lungs and diaphragm.

Earth Science

Science Topic	Lesson Description
Rock Identification	Students will learn about the rock cycle and how to accurately identify rocks by their scientific category.
Sand Investigation Lab	Students will learn about the diversity of sand across the Earth. They will use microscopes and careful observation to explore the color, size, and special properties of sand.
ENGINEERING - Earthquake Construction	In this two-part lesson, students will learn about earthquakes, in order to design, test, and redesign/re-test a model building to withstand the shaking of the Earth. *Requires two class periods.*

Energy

Science Topic	Lesson Description
Potential vs. Kinetic Energy	Students will learn about mechanical energy and its two forms. Each student will create a toy that is powered by elastic potential energy.
Chemical Energy	Students will learn about how chemicals can be used to make things work. They will perform some chemical reactions and observe the energy released in the process.
ENGINEERING - Wind Power	In this two-part lesson, students will work in groups to design, build, and test a wind powered mechanism with the goal of lifting an object. *Requires two class periods.*

PALO ALTO Junior MUSEUM & ZOO

FIFTH GRADE SCIENCE MENU

Life Science

Science Topic	Lesson Description
Plankton Exploration	Students will learn about plankton to discover how the biosphere, atmosphere, and climate interact.
Carnivorous Plants	Students will be introduced to several real carnivorous plants and learn how they differ from other plants. They will record observations on each plant to determine how they capture their prey. *Only available Sept-Oct and Apr-June.*

Earth Science

Science Topic	Lesson Description
Water Pollution	Students will learn about the Earth's fresh water and how so much of it becomes polluted. Students will create their own model of polluted water.
Water Filtration	Students will learn about how we treat polluted water to make it safe for consumption. Students will learn to filter polluted water using real-world techniques.
ENGINEERING - Submarines	In this two-part lesson, students will explore the concept of buoyancy as they build, modify, and test individual small submarines. Each student will keep their submarine. Substantial class time is needed between lessons to test materials for their projects. *Requires two class periods.*

Space Systems

Science Topic	Lesson Description
Starlab Planetarium	Students will enter a portable planetarium to learn about our local stellar neighborhood and seasonal patterns in the night sky. *Starlab requires a large indoor empty space 18 feet in diameter and 12 feet high.*
The Reasons for the Seasons	Students will conduct an investigation using a scientific model of the Earth-Sun system to understand the annual pattern of seasons. Students will record measurements and explore how Earth's axis and orbit generate the seasons.
Solar Ovens	Students will discuss the many forms of energy and Earth's primary energy source, the sun. Each student will build a mini solar cooker to keep. These ovens will remain in the classroom for post-lesson use.

Continued on next page ➔

Properties of Matter

Science Topic	Lesson Description
Periodic Table Chemistry	Students will learn about the different elements and how they combine to form the world around us. Students will create molecular models and perform chemical reactions of specific chemicals.
Conservation of Mass	Using highly accurate scales, students will investigate various experiments testing the law of conservation of mass.
Mineral Identification	Students will use scientific instruments to measure and calculate density and assess other physical properties in order to differentiate and identify specific mineral samples.
Chemical Identification	Students will use chemistry to analyze several properties (pH, solubility, and reactivity) of various powdered kitchen chemicals and use their new knowledge to identify a “mystery” chemical.

PALO ALTO Junior MUSEUM & ZOO

FIELD TRIP SCIENCE MENU

Topic & Location	Lesson Description
Explore the Salt Marsh at Palo Alto Baylands	Students discover the inner workings of the salt marsh ecosystem through exploration of microorganisms, plants, birds, and fish in this exciting hands-on program. Go birding to discover the amazing adaptations of our bay birds; spend time in the lab learning about the microscopic life at the base of this ecosystem; discover unique plants that are adapted to living in the salt marsh. Grade Levels: 1st through 6th grade (max 30 students plus 1 chaperone per 5 students). Fishing available for 3rd - 6th graders. Time: 1-3 hours (2.5 hour minimum with fishing)
Amazing Life of Birds at Palo Alto Baylands	Bay birds offer an opportunity for experiential discovery of food chains, ecosystems, and adaptations. Students head outside with binoculars to study bay birds in their natural habitat, play a game of bird beak buffet to understand the importance of beak adaptations, and inspect and discuss our authentic collection of wings, feathers, skulls, and bird mounts with an experienced naturalist. Grade Levels: 1st through 6th grade (max 30 students plus 1 chaperone per 5 students) Time: 2 Hours
Unlock the Secrets of the Foothills at Foothills Park or Arastradero Park	Soak up the sights, sounds, and smells of the local foothills on an engaging mile hike through beautiful natural parklands. Students take on the role of nature detectives and search for clues to discover the secrets of oak woodland, chaparral, riparian, or grassland ecosystems. Grade Levels: 1st through 6th grade (max 30 students plus 1 chaperone per 5 students) Time: 2 Hours
Can You Survive as an Ohlone? at Foothills Park	Wake up to a day filled with fire-making drills, acorn grinding, stories, and Ohlone games. Students will experience life as an Ohlone child by reenacting their daily activities at our 'trailside village'. End the day with a mile hike to a lake to twist cattails into cordage. Grade Levels: 3rd through 5th grade (max 24 students plus 1 chaperone per 5 students) Time: 2 ½ Hours
Museum Visit at Palo Alto Junior Museum and Zoo	Bring your students to our onsite classroom for a standards-based science lesson of your choice and stay to enjoy the museum, zoo, and nearby park afterwards. (Includes 50% discount on JMZ entrance fee) Grade Levels: pre-K through 5th grade (max 24 students plus 1 chaperone per 5 students) *Advance registration for group museum visits is required. Please call: 650-329-2111.*

Updated: September 4, 2024

PALO ALTO Junior MUSEUM & ZOO

SCIENCE PROGRAM FEES

2023-24 School Year

School Programs

Number of Programs	Resident Fee	Per Program	Non-Resident Fee	Per Program
1	$200	$200	$230	$230
2	$382	$191	$442	$221
3	$567	$189	$654	$218
4	$748	$187	$868	$217
5	$930	$186	$1,075	$215
6	$1,110	$185	$1,278	$213
7	$1,281	$183	$1,477	$211
8	$1,456	$182	$1,680	$210
9	$1,629	$181	$1,881	$209
10 or more	$1,800	$180	$2,080	$208

Field Trips

Field Trip	Program Length	Resident Fee	Non-Resident Fee
Explore a Salt Marsh (with fishing)	2.5 hours 3 hours	$387 $466	$445 $536
Explore a Salt Marsh (no fishing)	2 hours 2.5 hours 3 hours	$288 $340 $387	$331 $390 $445
Can You Survive as an Ohlone?	2.5 hours	$378	$434
Unlock the Secrets of the Foothills	2 hours	$288	$331
Amazing Life of Birds	2 hours	$288	$331
Junior Museum & Zoo visit with classroom lesson	50 min	$200 +$5 per person	$230 +$5 per person

Updated: September 4, 2024