



FOSS AND CALIFORNIA STANDARDS

The **Wood and Paper Module** supports the following Physical and Earth Sciences Content Standards for kindergarten.*

PHYSICAL SCIENCES

PS1 *Properties of materials can be observed, measured, and predicted.*

As a basis for understanding this concept, students know

- PS1a objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).
- PS1b water can be a liquid or a solid and can be made to change back and forth from one form to the other.
- PS1c water left in an open container evaporates (goes into the air) but water in a closed container does not.

EARTH SCIENCES

ES3 *Earth is composed of land, air, and water.*

As a basis for understanding this concept, students know

- ES3c how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

*“Standard Set 1 begins the study of the properties of matter and its transformations. . . The three standards call attention to the properties of common objects (most of which are solids) and to the properties of water. Teachers introduce the term **physical property** to students by asking them to observe the properties of a variety of objects. Students will be able to predict on the basis of some initial observations what will happen under different conditions rather than make random guesses.”[†]*

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

[†]*Science Framework for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2003), page 26.


The **Wood and Paper Module** supports the following Investigation and Experimentation Content Standards for kindergarten.*

INVESTIGATION AND EXPERIMENTATION

I&E4 *Scientific progress is made by asking meaningful questions and conducting careful investigations.*

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

- I&E4a observe common objects by using the five senses.
- I&E4b describe the properties of common objects.
- I&E4c describe the relative position of objects by using one reference (e.g., above or below).
- I&E4d compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).
- I&E4e communicate observations orally and through drawings.

A large, stylized sunburst or spiral graphic is positioned on the right side of the page, overlapping the yellow background. It consists of many thin, curved lines radiating from a central point, creating a sense of movement and energy.

“The ability to observe and describe common objects develops early and is enhanced by kindergarten instruction when students are introduced to the properties of solids and liquids, plants and animals, and landforms and weather conditions. Students can also be taught to compare and sort objects on the basis of the objects’ properties and be encouraged to use mathematics to communicate some of their observations.”[†]

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

[†]*Science Framework for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2003), page 30.

WOOD AND PAPER MODULE MATRIX

SYNOPSIS

CA SCIENCES STANDARDS

CA I&E STANDARDS

1. GETTING TO KNOW WOOD

Students work with five different wood samples to observe their properties. They begin with free exploration, go on a hunt for matching samples, drop water on the samples, and float them in basins. They test the wood to find out how many paper clips it takes to sink it, then organize their results by making a concrete graph.

PS1a Objects can be described in terms of the materials they are made of and their physical properties.

I&E4a Observe common objects by using the five senses.
I&E4b Describe the properties of common objects.
I&E4c Describe the relative position of objects by using one reference.
I&E4d Compare and sort objects by one physical attribute.
I&E4e Communicate observations orally and through drawings.

2. CHANGING WOOD

Students use sandpaper to change the shape of wood. They compare sawdust and shavings and how they interact with water. They simulate the manufacture of two kinds of wood they observed in Investigation 1, particleboard and plywood.

PS1a Objects can be described in terms of the materials they are made of and their physical properties.

PS1c Water left in an open container evaporates, but water in a closed container does not.

I&E4a Observe common objects by using the five senses.
I&E4b Describe the properties of common objects.
I&E4c Describe the relative position of objects by using one reference.
I&E4e Communicate observations orally and through drawings.

3. GETTING TO KNOW PAPER

Students observe and compare the properties of ten kinds of paper and go on a hunt for matching samples. They test the papers for different properties, comparing how well they fold and which has the best surface for writing. They drop water on the samples to compare absorption, then soak the samples overnight.

PS1a Objects can be described in terms of the materials they are made of and their physical properties.

PS1c Water left in an open container evaporates, but water in a closed container does not.

I&E4a Observe common objects by using the five senses.
I&E4b Describe the properties of common objects.
I&E4d Compare and sort objects by one physical attribute.
I&E4e Communicate observations orally and through drawings.

4. CHANGING PAPER

Students learn two ways to transform paper, making it stronger and more durable. They make a piece of recycled paper and papier-mâché bowls. They work with water, freezing and melting it to see the change in its properties. They evaporate water.

PS1a Objects can be described in terms of the materials they are made of and their physical properties.

PS1b Water can be a liquid or a solid and can change from one form to another.

PS1c Water left in an open container evaporates, but water in a closed container does not.

ES3c Identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

I&E4a Observe common objects by using the five senses.
I&E4b Describe the properties of common objects.
I&E4e Communicate observations orally and through drawings.

5. CONSTRUCTIONS

Students explore a variety of techniques for making things from paper and wood. They combine all the processes to make a free-form wood, paper, and cloth sculpture.

PS1a Objects can be described in terms of the materials they are made of and their physical properties.

ES3c Identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

I&E4b Describe the properties of common objects.
I&E4c Describe the relative position of objects by using one reference.
I&E4e Communicate observations orally and through drawings.

- Wood is a resource that comes from different kinds of trees and it can be conserved.
- Some woods are processed and transformed by people.
- Wood is used for many everyday things.
- Wood has many observable physical properties.
- Wood floats in water. Some kinds of wood sink more easily than others.
- Wood absorbs water.

- Wood has many observable properties.
- Wood that is waterlogged sinks.
- Sanding can change the shape of wood.
- Sawdust can be recycled into usable wood.
- Gluing thin sheets of wood together produces much stronger wood.
- Some objects occur in nature. Others are made by people.
- Water left in the open evaporates into the air.

- Paper has many observable properties.
- Many objects are made from paper.
- The properties of different papers determine their use.
- People make paper from wood. Wood is a resource that comes from trees. Resources can be conserved.
- Water left in the open evaporates into the air.

- New paper can be made from old paper.
- Recycling extends the use of trees and other resources from the earth.
- The properties of recycled paper can be compared to those of new paper.
- Objects can be made from paper.
- Water left in the open evaporates into the air.
- Water changes to a solid when it freezes and to a liquid when ice melts.

- Knowledge of the properties of wood, paper, and fabric can be used to make useful or artistic constructions.
- Paper containers we use every day began as flat pieces of paper.
- Paper can be woven by using an under-over alternating pattern.
- Some fabrics are woven.

- *Science Resources: Wood and Paper, "The Story of a Chair"*
- Science Notebook: Students draw and write about the properties of wood and how it interacts with water.

- *Science Resources: Wood and Paper, "Are You a Scientist?"*
- Science Notebook: Students draw and write about ways to change wood and how to make particleboard and plywood.

- *Science Resources: Wood and Paper, "The Story of a Box"*
- Science Notebook: Students draw and write about different kinds of paper, their properties, and what happens when they get wet.

- *Science Resources: Wood and Paper, "Land, Air, and Water"*
- Science Notebook: Students draw and write about their experiences making paper and recycling materials.

- *Science Resources: Wood and Paper, "I Am Wood"*
- *FOSS Science Stories: Fabric*
- Science Notebook: Students draw and write about their experiences making things from wood, paper, and fabric.

Teacher Observation

- Knows wood has observable physical properties.
- Compares properties of wood.
- Knows wood is a resource that comes from trees.
- Communicates observations orally and in drawings.
- Incorporates new vocabulary.

Teacher Observation

- Knows wood has observable properties.
- Knows that some objects occur in nature; others are made by people.
- Communicates observations orally and in drawings.
- Uses relative position words appropriately.
- Knows that water in an open container evaporates.

Teacher Observation

- Knows paper has observable properties.
- Compares properties of papers.
- Knows that paper is a resource that comes from trees.
- Knows that many objects are made from paper.
- Communicates observations orally and in drawings.

Teacher Observation

- Knows that many objects are made from paper.
- Knows that paper is a resource that comes from trees and that recycling extends the use of the trees.
- Knows that resources from Earth are used in everyday life.
- Communicates observations orally and in drawings.

Teacher Observation

- Knows that paper is a resource that comes from trees and that recycling extends the use of the trees.
- Knows that resources from Earth are used in everyday life.
- Communicates observations orally and in drawings.



FOSS AND CALIFORNIA STANDARDS

The **Animals Two by Two Module** supports the following Life Sciences Content Standards for kindergarten.*

LIFE SCIENCES

LS2 *Different types of plants and animals inhabit the earth.*

As a basis for understanding this concept, students know

- LS2a how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).
- LS2b stories sometimes give plants and animals attributes they do not really have.
- LS2c how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

“Kindergarten students expand their observational skills and vocabulary by learning to describe the appearance and behavior of different animals and plants. They have the opportunity to discuss the principles of structure and function at a simple level.”[†]

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

[†]*Science Framework for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2003), page 28.


The **Animals Two by Two Module** supports the following Investigation and Experimentation Content Standards for kindergarten.*

INVESTIGATION AND EXPERIMENTATION

I&E4 *Scientific progress is made by asking meaningful questions and conducting careful investigations.*

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

- I&E4a observe common objects by using the five senses.
- I&E4c describe the relative position of objects by using one reference (e.g., above or below).
- I&E4d compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).
- I&E4e communicate observations orally and through drawings.



“The ability to observe and describe common objects develops early and is enhanced by kindergarten instruction when students are introduced to the properties of solids and liquids, plants and animals, and landforms and weather conditions. Students can also be taught to compare and sort objects on the basis of the objects’ properties and be encouraged to use mathematics to communicate some of their observations.”[†]

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ANIMALS TWO BY TWO MODULE MATRIX

SYNOPSIS

CA LIFE SCIENCES STANDARDS

CA I&E STANDARDS

1. GOLDFISH AND GUPPIES

Students observe the structures and behaviors of goldfish. They feed the fish and enrich the environment in which the fish live. They compare the structures and behaviors of the goldfish to those of other fish, guppies. Students compare photos of fish and read about fish.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2b Stories sometimes give plants and animals attributes they do not really have.
- LS2c Identify major structures of common plants and animals.

- I&E4c Describe the relative position of objects using one reference.
- I&E4e Communicate observations orally and through drawings.

2. LAND AND WATER SNAILS

Students observe the structures and behaviors of land snails. They race the snails. Water snails are compared to land snails. Students work with a variety of shells, discussing similarities and differences in their size, shape, color, and texture. Students match shell pairs, make designs, and create patterns. They read about snails.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2b Stories sometimes give plants and animals attributes they do not really have.
- LS2c Identify major structures of common plants and animals.

- I&E4c Describe the relative position of objects using one reference.
- I&E4d Compare and sort common objects by one physical attribute.
- I&E4e Communicate observations orally and through drawings.

3. BIG AND LITTLE WORMS

Students dig for red worms, rinse them off, and look at their structures. They study their behavior. They compare the red worms to night crawlers, which are much larger. Students compare photos and read about worms.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2c Identify major structures of common plants and animals.

- I&E4e Communicate observations orally and through drawings.

4. PILL BUGS AND SOW BUGS

Students begin by observing structures of the two kinds of isopods. They learn to identify which are pill bugs and which are sow bugs. They may have isopod races. Students make a terrarium in which all the land animals live together. Students compare photos and read about isopods. They read about and compare illustrations of a variety of animals.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2c Identify major structures of common plants and animals.

- I&E4c Describe the relative position of objects using one reference.
- I&E4d Compare and sort common objects by one physical attribute.
- I&E4e Communicate observations orally and through drawings.

CONCEPTS

- Fish have identifiable structures.
- Fish behavior is influenced by conditions in the environment.
- Fish have basic needs.
- Fish change their environment.
- Each kind of fish has unique structures and behaviors.
- All animals deserve respect and gentle care.

- Snails have identifiable structures and behaviors.
- Snails have senses.
- Snail behavior is influenced by conditions in the environment.
- Snails have basic needs.
- There is great diversity among snails.

- Worms have identifiable structures.
- Worm behavior is influenced by conditions in the environment.
- Worms have basic needs.
- Each kind of worm has unique structures and behavior.

- Isopods have identifiable structures and behaviors.
- Animals have similar needs.
- Each kind of isopod has unique structures and behavior.
- Isopod behavior is influenced by conditions in the environment.

READING AND WRITING

- *Science Resources: Animals Two by Two*, “Learning about Animals” and “Goldfish and Guppies”
- *A Fish out of Water* by Helen Palmer
- Science Notebook: Students draw the structures of a goldfish. They write about how goldfish and guppies are the same and different.

- *Science Resources: Animals Two by Two*, “Land and Water Snails”
- *Some Smug Slug* by Pamela Duncan Edwards
- Science Notebook: Students draw a land snail. They write about how land snails and water snails are the same and different.

- *Science Resources: Animals Two by Two*, “Big and Little Worms”
- Science Notebook: Students draw an earthworm. They write about how red worms and night crawlers are the same and different.

- *Science Resources: Animals Two by Two*, “Isopods,” “Eggs and Chicks”
- *Animals Two by Two* by Larry Lowery
- Science Notebook: Students sort pill bugs and sow bugs and write about how they are the same and different.

ASSESSMENT

Teacher Observation

- Knows animals have structures and behaviors.
- Knows animals have needs.
- Communicates observations orally and by drawing, dictating, and writing.
- Uses relative position words appropriately.
- Knows that sometimes stories give animals attributes they don’t have.

Teacher Observation

- Knows animals have structures and behaviors.
- Compares structures and behaviors of animals.
- Communicates observations orally and by drawing, dictating, and writing.
- Incorporates new vocabulary.
- Uses relative position words appropriately.
- Knows that sometimes stories give animals attributes they don’t have.

Teacher Observation

- Knows animals have structures and behaviors.
- Knows animals have needs.
- Compares structures and behaviors of animals.
- Communicates observations orally and by drawing, dictating, and writing.
- Incorporates new vocabulary.

Teacher Observation

- Knows animals have structures and behaviors.
- Knows animals have needs.
- Compares structures and behaviors of animals.
- Communicates observations orally and by drawing, dictating, and writing.
- Incorporates new vocabulary.
- Uses relative position words appropriately.

FOSS AND CALIFORNIA STANDARDS

The **Trees Module** supports the following Life Sciences Content Standards for kindergarten. *

LIFE SCIENCES

LS2 *Different types of plants and animals inhabit the earth.*

As a basis for understanding this concept, students know

- LS2a how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).
- LS2c how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

The **Trees Module** supports the following Earth Sciences Content Standards for kindergarten. *

EARTH SCIENCES

ES3 *Earth is composed of land, air, and water.*

As a basis for understanding this concept, students know

- ES3a characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.
- ES3b changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.
- ES3c how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

“Science study provides children in kindergarten with a unique opportunity to explore the world around them...Students begin their study of science by observing and noting the similarities, differences, and component parts of materials, plants, and animals, and the earth. They also observe processes and changes over time.” †

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†*Science Framework for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2003), page 26.


The **Trees Module** supports the following Investigation and Experimentation Content Standards for Kindergarten. *

INVESTIGATION AND EXPERIMENTATION

I&E4 Scientific progress is made by asking meaningful questions and conducting careful investigations.

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

- I&E4a observe common objects by using the five senses.
- I&E4b describe the properties of common objects.
- I&E4d compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).
- I&E4e communicate observations orally and through drawings.



“The ability to observe and describe common objects develops early and is enhanced by kindergarten instruction when students are introduced to the properties of solids and liquids, plants and animals, and landforms and weather conditions. Students can also be taught to compare and sort objects on the basis of the objects’ properties and be encouraged to use mathematics to communicate some of their observations.” †

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TREES MODULE MATRIX

SYNOPSIS

CA SCIENCE STANDARDS

CA I&E STANDARDS

1. FALL TREES

Students begin their study of trees by going on a walk to look at the variety and structure of trees in the schoolyard. A living tree becomes part of the classroom for 2 weeks, and students work with representational materials to look more closely at the shapes of trees and their parts. Students adopt trees to observe changes throughout the year, and complete the activity by planting their class tree on the school grounds.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2c Identify major structures of common plants and animals.

- I&E4a Observe common objects by using the five senses.
- I&E4b Describe the properties of common objects.
- I&E4e Communicate observations orally and through drawings.

2. LEAVES

Students take a schoolyard walk, focusing on the leaves of trees. They match leaves with geometric shapes, go on a leaf hunt to compare leaves, work at centers with representational materials, and make a leaf book. They study photos on sets of cards showing different landforms and look for similarities and differences. Students read about where and how trees grow. This investigation concludes with a book, *Our Very Own Tree*.

- LS2a Observe and describe similarities and differences in the appearance and behavior of plants and animals.
- LS2c Identify major structures of common plants and animals.
- ES3a Identify characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

- I&E4a Observe common objects by using the five senses.
- I&E4b Describe the properties of common objects.
- I&E4d Compare and sort objects.
- I&E4e Communicate observations orally and through drawings.

3. TREES THROUGH THE SEASONS

Students extend their understanding of trees as a growing, changing, living part of their world. They keep a class calendar monitoring weather conditions each day. During each season, they visit the schoolyard trees and observe their twigs, leaves, flowers, and seeds. They compare tree structures at different seasons. Students read about trees through the seasons.

- LS2c Identify major structures of common plants and animals.
- ES3b Changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.
- ES3c Identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

- I&E4a Observe common objects by using the five senses.
- I&E4b Describe the properties of common objects.
- I&E4e Communicate observations orally and through drawings.

- Trees are a resource.
- Trees are identifiable by their shapes.
- Trees have identifiable structures.
- Individual trees can be described by their properties, including size, shape, and texture.
- Trees are growing, living organisms.

- *A Tree Comes to Class*
- Science Notebook: Students draw and write about trees in their schoolyard. They focus on how people and animals use trees, what trees need to live, the shapes of trees, and the parts or structures of trees.

Teacher Observation

- Knows trees are resources that we use in our everyday life.
- Knows trees are plants and have structures.
- Compares structures of trees.
- Know trees are living things and have basic needs.
- Communicates observations orally and by drawing.
- Incorporates new vocabulary.

- Leaves have identifiable structures.
- Leaves grow on the tips and sides of small branches.
- Many kinds of trees lose their leaves in the fall.
- Leaves from the same trees have the same shapes.
- Leaves have many properties that can be compared.
- Leaves can be identified by their shapes, edges, tips, and colors.
- Earth has different landforms.

- *FOSS Science Resources: Trees, "Where Do Trees Grow?"*
- *How do we learn?*
- *Our Very Own Tree*
- Science Notebook: Students draw and write about where leaves grow on trees, how leaves can be sorted by shape, how leaves are different, and different landforms where trees grow.

Teacher Observation

- Observes leaves, using five senses.
- Describes properties of leaves.
- Compares and sorts leaves by one physical property (color, shape, texture, size, edge).
- Communicates observations orally and by drawing, dictating, and writing.
- Can identify different kinds of landforms (mountains, valleys, rivers, ocean, desert, swamps).
- Incorporates new vocabulary.

- Trees are resources from the earth that provide humans and other animals with food.
- Trees are growing, living organisms.
- Fruits and nuts provide protection and food for the seeds.
- Trees change through the seasons as the weather changes.
- Some trees lose their leaves in winter, while others do not.
- Evergreen trees can be identified by the properties of their leaves (or needles).

- *FOSS Science Resources: Trees, "My Apple Tree"*
- *FOSS Science Resources: Trees, "Orange Trees"*
- *FOSS Science Resources: Trees, "Maple Trees"*
- Science Notebook: Students draw and write about food that comes from trees, write about why some trees are called evergreens, and draw a picture of the same tree in different seasons.

Teacher Observation

- Demonstrates respect for living things.
- Knows trees are living things and have basic needs.
- Knows trees change through the seasons as the weather changes.
- Communicates observations orally and by drawing, dictating, and writing.
- Incorporates new vocabulary.
- Knows trees have structures.