OUTDOOR EDUCATION CURRICULUM SUMMARY

THE BASICS

It is the goal of Alliance Redwoods to provide students with a positive and interdisciplinary educational experience through interactions with each other and the outside world. Below is a summary of the different courses we offer and the standards we strive to cover with our hands-on and active curriculum in an effort to assist our teachers before and after their visit to Alliance Redwoods.

Course Description

Arrival and Departure Activities

These classes are designed for either the Arrival Day or Departure Day. The length of time allotted for each class is dependent upon the time the school arrives at either Alliance Redwoods or the field trip location.

Armstrong Woods

Description: Located 10 miles from Alliance Redwoods, Armstrong Woods has become a popular site for people to walk among some of the tallest and oldest redwoods in this part of California. The students will explore the ecosystem of this old growth redwood grove and learn many different aspects of redwood ecology, the difference between Armstrong Woods and Alliance Redwoods, and have a chance to visit Col. Armstrong and Parson Jones, the two oldest and tallest trees in Armstrong Woods.

Objective:

- Explore the natural redwood grove at Armstrong Woods.
- Learn basic redwood ecology.

Standards:

Explore differences between Armstrong Woods and Alliance Redwoods.

Structure and Properties of Matter

- **Grade 5-PS1-3.** Make observations and measurements to identify materials based on their properties.
- Matter and Energy in Organisms and Ecosystems
- **Grade 5-LS1-1.** Support and argument that plants get the materials they need for growth chiefly from air and water. Earth's Systems
- **Grade 5-ESS3-1.** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Growth, development, and reproduction of organisms

- **Middle School-LS1-5.** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Goat Rock

Description: Near the mouth of the Russian River, Goat Rock is one of the most popular beaches in Sonoma County. For this field trip, students will have an opportunity to explore the beach in search of different birds (Pelicans, Scoters, Gulls, etc.) and marine mammals (Seals, Sea Lions, etc.) while learning about beach formation, tides, and the relationship between the Russian River and Pacific Ocean.

Objective:

- Explore the beach for marine animals.
- Compare and contrast characteristics of these animals.

Standards:

Earth's Systems

- Grade 5–ESS3–1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- Middle School-ESS2-4. Develop a model to describe the cycling of water diverse systems driven by energy from the sun and force of gravity.

Interdependent Relationships in Ecosystems

- Middle School-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Salmon Creek

Description: Salmon Creek is a large sandy beach that provides students with an opportunity to have fun playing games on the beach while learning about beach formation, tides, and the relationship between freshwater and saltwater.

Objective:

- Actively explore the mid-tidal zone.
- Engage in learning activities about tide types, water testing, and sand formation.

Standards:

Earth's Systems

- Grade 5–ESS3–1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- Middle School-ESS2-4. Develop a model to describe the cycling of water diverse systems driven by energy from the sun and force of gravity.
- Interdependent Relationships in Ecosystems
- Middle School-LS2-2. Construct an exploration that predicts patterns of interactions among organisms across multiple ecosystems.

Writing Standards K-5

- Grade 5-W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Tide-pooling

Description: Tide pooling is the act of exploring rocky pools that are exposed only during low tide. During this field trip, the students will be lead to a popular tide pooling location where they will search the rocky habitat for crabs, jellies, sea stars, sea anemones, and other signs of life.

Objective:

- Explore the unique tidal ecosystem.
- Hypothesize why tides occur.

Standards:

Learn how tides continually shape this ecosystem.
Interdependent Relationships in Ecosystems

- Middle School-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Earth's Systems

- Grade 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- Middle School-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

Stewardship Rotations

Description: Stewardship is the idea of responsible planning and management of resources for an extended period of time. Stewardship is caring for shared resources, such as trees, water, and oil, in light of the future. In this class, students will learn about environmental stewardship and simple ways they can care for and protect the world around them now and into the future.

Standards:

Identify basic principles of environmental stewardship through fun and interactive games.
Matter and Energy in Organisms and Ecosystems

- LS2.A. Interdependent relationships and ecosystems.
- Natural Selection and Adaptations
- LS 4.D. Biodiversity and humans.

Earth's Systems

- Grade 5–ESS3–1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Human Impacts

- Middle School-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Middle School-ESS3-4. Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth system.

Regular Rotations

Description: Regular Rotations is a collection of fun and interactive games facilitated by our naturalists allowing the students to escape their shell and let loose. Our games range from simple sports activities for those students with excessive energy to creative or imaginative games for those with minds that tend to drift into another world.

Objective:
Run, hop, and skip about as they release energy in a low stress environment and bond with one another through light-hearted fun.

Day Classes
These classes last two-and-a-half hours and occur on various locations at Alliance Redwoods, rain or shine.

Forest Ecology

Description: The redwood ecosystem contains an extensive and complex assortment of plants and animals. In this class students will have an opportunity to learn how to identify and recognize the different plants found at Alliance Redwoods and how ecological processes shape the forest.

Objectives:
- Explore the redwood ecosystem through activities and lessons.
- Note the characteristics of and identify plants in a redwood forest.
- Participate in discussions about the unique attributes of redwood trees.

Standards:
Matter and Energy in Organisms and Ecosystems
- Middle School-LS2-3. Develop a model to describe the cycling of matter and full of energy among living in nonliving parts of the ecosystem. Scientific knowledge assumes an order and consistency in natural systems. Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.
- MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Interdependent Relationships in Ecosystems
- Middle School-LS2-2. Construct an exploration that predicts patterns of interactions among organisms across multiple ecosystems.

Earth's Systems
- Grade 5-ESS3.C. Human impacts on Earth systems.

Growth, Development and Reproduction of Organisms
- MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

Healthy Forest

Description: A healthy forest is defined by its adaptability, diversity, and resources. In this class, the students will learn about the factors that set the redwood forest apart and how identifying the different elements of a healthy forest aid the students in visualizing the changes in a seemingly unchanging forest.

Objectives:

- Learn the lifecycle of trees through skits and discussion.
- Discuss the meaning of diversity in a forest and apply that discussion to our redwood forest.
- Discuss and experience through activities how forests change over time.
- Define what resources are found in a forest.

Standards:

Structure, Function, and Information Processing

- Grade 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

Earth's Systems

- Grade 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Human Impacts

- Middle School -ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Matter and Energy in Organisms and Ecosystems

- Middle School-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Middle School-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Growth, Development, and Reproduction of Organisms

- Middle School-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structure affect the probability of successful reproduction of animals and plants respectively.
- Middle School-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Animal Ecosystems

Description: Animals play a crucial role in the flow of energy and nutrients within their ecosystem. Through activities and discussion, students will learn how energy from the sun enters an ecosystem and is transferred from producers to consumers and decomposers.

Objectives:

- Participate in discussions about the different animals in the forest.
- Hypothesize and or play an active role in explaining the different ways animals interact (predator/prey, etc.).

- Participate in a discussion/activity about where animals obtain their energy (food, sunlight, etc.).
- Explore Alliance Redwoods for the presence of wildlife.

Standards:

Matter and Energy in Organisms and Ecosystems

- Grade 5–PS3–1. Use models to describe that energy and animals food (use for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- Grade 5–LS2–1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- Middle School-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- Middle School-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability in organisms and populations of organisms in an ecosystem.
- MS-LS2-3. Developed a model to describe the cycling of matter and flow of energy among living in nonliving parts of an ecosystem.
- MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Chemical Reactions

- Middle School–PS1–5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

Herpetology

Description: Herpetology is the study of reptiles and amphibians. Reptiles and amphibians are found in most ecosystems on every continent except Antarctica. The students will learn about the different characteristics and adaptations that help these animals survive in the wild. Students will be given an opportunity to see and hold live animals in a fun and engaging environment.

Objectives:

- Discuss the characteristics and adaptations of reptiles and amphibians.
- Discuss and understand the differences between venomous and non-venomous snakes.
- Understand the benefits of reptiles and amphibians to humans and the environment.

Standards:

Natural Selection and Adaptations

- Middle School-LS4-4: Construct an explanation based on evidence that describes how genetic variations of traits in population increase some individual's probability of surviving and reproducing in a specific environment.

Matter and Energy in Organisms and Ecosystems

- MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Growth, Development, and Reproduction of Organisms

- Middle School-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structure affect the probability of successful reproduction of animals and plants respectively.

Pond and Stream

Description: In this class students will use two approaches to studying the different aquatic ecosystems. The first is an exploration-based approach that teaches students about the water cycle and water chemistry while collecting and studying different aquatic organisms. The second is a scientific method based approach that introduces students to water chemistry, aquatic health, and aquatic invertebrates while studying the Coho Salmon and what the salmon need to survive.

Objectives:

- Collect and identify aquatic organisms.
- Identify and define the various habitats at the pond and the stream.
- Understand and be able to explain the various stages in the water cycle.
- Understand how different factors affect the health of an ecosystem.

Standards:

Structure and Properties of Matter

- Grade 5-PS1-1. Develop a model to describe that matter is made of particles two small to be seen.

Earth's Systems

- Middle School-ESS2-4. Develop a model to describe the cycling of water through Earth system driven by energy from the sun and the force of gravity. Interdependent Relationships in Ecosystems
- Middle School-LS2-2. Construct an exploration that predicts patterns of interactions among organisms across multiple ecosystems.

Matter and Energy in Organisms and Ecosystems

- Middle School-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability in organisms and populations of organisms in an ecosystem.
- Middle School-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Mathematics

- Grade 5-MP.2. Reason abstractly and quantitatively.

Geology and Stream

Description: Geology and Stream is an earth science-based class with two key subject areas. The first is a study of geology and how the theory of plate tectonics can help us understand what the Earth is made of and how it is constantly changing. Second, the students will use the scientific method to develop an understanding of a watershed, how they are formed, and how water shapes the landscape.

Objectives:

- Discuss and use the scientific method to study the stream formation and watersheds.
- Discuss and answer questions about the shaping of the earth through plate tectonics and erosion.
- Discuss what a watershed is and participate in a hands-on activity explaining it.
- Explain how water shapes the landscape.

Standards:

Structures and Properties of Matter

- Grade 5-PS1-3. Make observations and measurements to identify materials based on their properties.
- Earth's Systems
- Middle School-ESS2-1. Develop a model to describe the cycling of Earth materials and the flow of energy that derives this process.
- MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Interdependent Relationships in Ecosystems

- Middle School-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Mathematics

- Grade 5-MP.2. Reason abstractly and quantitatively.

Team Building

Description: Team Building is a class that seeks to develop teamwork through various challenges presented to the group by the facilitator. The group must use problem-solving skills to complete each challenge while learning to think outside the box, communicate, and trust one another.

Objectives:

- Describe what skills are needed for teamwork and living in a community.
- Analyze how cooperation, observation, communication, etc. will assist in life issues.
- Investigate how to make decisions as a collective group.
- Work collaboratively towards a common goal.

Standards:

Speaking and Listening Standards

- Grade 4-SL-4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 5-SL-4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 6-SL-1. Engage effectively in a range of collaborative discussions with diverse partners on grade 6 topics, texts, and issues, building on others; ideas and expressing their own clearly.
- Grade 6-SL-4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details and nonverbal elements to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Physical Education Standards

- PE Model Content Standards Grade 6 Standard 5: Students demonstrate and utilize knowledge of psychological and sociological concepts, principles, and strategies that apply to the learning and performance of physical activity. (Self-Responsibility, Social Interaction, Group Dynamics)

Challenge Courses

Climbing Wall/Climbing Tower: Both climbing structures challenge students to make a personal goal and to strive to attain it and are a lot of fun. (30-45ft)

Vertical Playpen/ Y-Axis: This course has various vertical challenges for the climbers which include: a rope ladder, tires, a cargo net, and vertical/horizontal beams. It is a great team-building activity. (35ft)

Leap of Faith/ North Pole/ South Pole: Put your trust to the test. Climb 75 feet up a giant redwood tree, take a deep breath, and leap for the trapeze.

Flying Squirrel/ Gecko Glider/Redwood Express: A 200-300 foot zip line challenges students to overcome fear and to support their classmates.

Rope Rocket/ Sky Swing/Piñata: This giant swing enables students to work through their fear while encouraging their classmates. (50ft)

Night Activities

Adaptation Transformation

(Additional) The purpose is to teach the kids to think of adaptations in terms of their function and to strengthen cabin relationships, encourage creativity, and teamwork.

Growth, Development, and Reproduction of Organisms

- Middle School-LS1-4. Use argument based on empirical and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structure affect the probability of successful reproduction of animals and plants respectively.
- Middle School-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- Natural Selection and Adaptations
- Middle School-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- Interdependent Relationships in Ecosystems
- Middle School-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Speaking and Listening Standards

- CCSS.ELA-LITERACY.SL.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Night Hike

(Guaranteed) The main objective of this class is to explore the forest at night. Students will learn about their five senses through activities, games, and story-telling.

Structure, Function, and Information Processing

- Middle School-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
- Middle School-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Middle School-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
- Interdependent Relationships in Ecosystems
- Middle School-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Orienteering

(Additional) To teach students how to identify parts of a compass, use a compass to find North, South, East and West and use the compass to navigate an orienteering course.
Reading Standards for Literacy in Science and Technical Subjects

- Middle School-RST6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- Middle School-RST6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

Campfire

Speaking and Listening Standards

- Grade 4-SL-4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 5-SL-4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 6-SL-4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details and nonverbal elements to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Habitat Clue

(Additional) We put a twist on the traditional came of Clue for this activity. Students participate in a detective game to determine the predator, prey, and habitat. Student creativity, cabin team building, and quick thinking are elements of this activity
Interdependent Relationships in Ecosystems

- Middle School-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Other Standards

The Common Core and Next Generation Standards listed here are those that are, or can be, covered in many of our classes.

Speaking and Listening Standards

- Grade 4-SL-4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 5-SL-4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Grade 6-SL-1. Engage effectively in a range of collaborative discussions with diverse partners on grade 6 topics, texts, and issues, building on others; ideas and expressing their own clearly.
- Grade 6-SL-4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details and nonverbal elements to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Earth's Systems

- Grade 5–ESS3–1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Writing Standards K-5

- Grade 5-W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finish work, and provide a list of sources.