

# JK Science Curriculum

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*FALL SESSION- MONTHS OF SEPTEMBER, OCTOBER, NOVEMBER*

*WELCOME TO THE LAB!*

## **Physical Science: what will we learn and why will we do that.**

### **Colors: mix them up!**

Painting and color mixing supports children's personal, social and emotional development by providing opportunities to show curiosity, develop new skills, develop confidence and autonomy, make choices and sometimes become involved for long periods of time. In painting themselves and friends, children can enhance their self-confidence (e.g. about appearance, hair, eye and skin color) and feeling of belonging.

Painting and color mixing also help children develop communication, language, and literacy as they vocalize, make sounds, talk about what they are doing, and collaborate with others. Children will sometimes negotiate as they paint on a large scale together and talk about their ideas. When learning about mixing colors, children will need to listen carefully and follow instructions, and as their competence develops, they may talk about what they are doing and what they observe. Painting with fingers, feet, hands, and brushes enables children to make marks and to talk about the different marks and what they stand for. Children can use brushes and tools with increasing control, making lines and circles and starting to draw letter-like shapes and conventional letters.

Children can develop their problem solving, reasoning and numeracy by exploring quantity as they paint, covering space, and making shapes. They may paint an intended number of objects and count these, and represent size and position in their painting. When mixing colors, they will need to solve problems involving quantity in order to make the color they want.

Painting and color-mixing are also contexts for children to expand their knowledge and understanding of the world, exploring materials (paint, brushes and other tools, paper and other materials to paint on) with all their senses. Whilst painting, children can observe changes, including how the paper becomes damp, how paint behaves when it is thicker and thinner, how different techniques of applying paint have different results, and how colors change when mixed.

Their physical development is enhanced with opportunities to develop large and small motor skills and hand-eye co-ordination using their whole body, hands, feet, fingers, and tools including brushes.

Their creative development is supported as they enjoy and respond to experiences by painting, enjoying the texture of the paint and paper, making different types of movements, shapes, and representations on large and small scales and carefully differentiating and mixing colors.

## Kitchen Chemistry

Cooking helps children's personal, social, and emotional development by providing opportunities for exploration, developing skills, confidence, and autonomy, and sometimes involvement for long periods of time with or without adult support. Cooking can be difficult, so children feel a sense of pride and satisfaction when they eat or take home what they have made. Older children can cook independently, following a recipe, selecting ingredients and tools themselves and asking for support if they need it from other children or adults.

Cooking also supports children's developing communication, language, and literacy as they talk about what they are doing and collaborate with others. Children will often have to follow precise instructions from adults, and use talk to organize, order and clarify what they are doing. In following recipes, children are learning how to select and retrieve information from books.

Children develop their problem-solving, reasoning and numeracy by finding out about quantity, starting with ideas of "more", "a lot", and over time developing more sophisticated ideas of exact measurement (of quantity, weight, size and time). Cooking presents a "real context" for the use of number – counting out the spoons of sugar, for example, correctly reading a number in a recipe, or placing muffin mixture into cases to experience division and one-to-one correspondence.

Cooking is a good context for children to expand their knowledge and understanding of the world, finding out about different ingredients, what happens when things are mixed together and how heat and cold changes substances. Through preparing and eating food, children can find out about other cultures and traditions. Whilst cooking, children can observe materials closely and explore them with all their senses, and talk about what they see and how things change. They can gain first-hand experience of cause-effect relationships, and observe which changes are one-way and which are reversible (you can melt ice, but can't get the flour and butter back from a cake you have baked).

They can use tools for a purpose, supporting their physical development, and learn about keeping safe whilst experiencing risks (e.g. cutting with sharp knives). They can find out how substances can be changed by tools, for example by whisking egg whites.

Children's creative development is supported as they develop their own ideas and tastes in cooking (e.g. choosing to make a chocolate or plain cake, cutting cookies like animals, or into mathematical shapes). They can talk about and evaluate what they have done.

## **Social Science: what will we learn and why will we do that**

### **Where in the World: Basic Geography**

Young children learn through their senses and experiences. They touch, feel, smell, and taste things. They run and jump and climb. They play imaginary games, and they ask a million questions. In an everyday walk, these children are beginning to understand how people relate to the Earth, how they change the environment, how weather changes the character of a place, and how one place relates to another through the movement of people, things, and ideas. Children's everyday play and experiences give them the basis for the geographic knowledge that they will learn in school. With just a little encouragement and some direction, young children will develop the vocabulary, awareness, and curiosity that will help them better understand and learn geography- the study of the Earth and its human, animal, and plant population.

Our activities and games will focus on the following topics developed by professional geographers:

1. Where are things located?
2. What characteristics make a place special?
3. What are the relationships among people and places?
4. What are the patterns of movement of people, products, and information?
5. How can the Earth be divided into regions for study?

### **People and Places in the Past: Basic History**

We are who we are today, because of those who have gone before us. By teaching children history, we give them a basic idea about time continuum and how time works. Studying history encourages intellectual growth, as well as serving an important civic and moral function. "History is the grandest vehicle for vicarious experience: it truly educates...young minds and obliges them to reason, wonder, and brood about the vastness, richness, and tragedy of the human condition." If history is taught in an engaging way, children learn about the significance of past events and personalities, and can relate them to their own lives. History also teaches how to become responsible, contributing citizens in a society. With knowledge of history, young children have the opportunity to learn from the tragic mistakes of past individuals and societies, and to prevent the same mistakes being made over again. They can also be inspired by great figures of the past to dream bigger dreams and do greater things in their own lives. Munson adds, "It's the knowledge of liberal arts that gives them knowledge necessary to go out in the world" – and, hopefully, make wiser choices.

## **Life Science: what will we learn and why will we do that**

### **Gardening**

Gardening and outdoor play helps children's personal, social and emotional development by providing opportunities for exploring the environment with interest, finding and enjoying new features, developing skills, confidence and autonomy, and sometimes involvement for long periods of time with or without adult support. The garden provides physical challenges, which children will enjoy at first with support, and then independently, managing a small number of rules and boundaries, gaining confidence in their own abilities and recognizing risks and dangers. The garden provides large-scale experiences, which encourage children to link up with others and work collaboratively, and in using bikes and other individual equipment children learn about how to share resources and to be appropriately assertive.

Gardening and outdoor play also supports children's developing communication, language and literacy as they talk about what they are doing and collaborate with others. Children will often have to follow instructions from adults, and when they work and play collaboratively, they need to listen carefully to each other, respond to each other's ideas, and negotiate. Gardening particularly provides a context for learning new vocabulary, and supports mark-making (putting in labels) and early reading. Children can also enjoy making marks in the sand, and developing large and fine motor skills, which will support their emergent writing.

Children develop their problem solving, reasoning and numeracy by exploring capacity (sand and water), length (e.g. observing the growth of a plant) and counting and sharing out items (e.g. when planting seeds or seedlings). Children also have opportunities to sort when they select a particular seedling or bulb to plant. The environment is rich in different shapes and textures to observe, enjoy and identify. There are many different materials to enjoy putting in and tipping out of containers.

Whilst climbing, running and crawling, children experience being in, out, under and over, and can develop their understanding and use of positional language.

The outdoor area is also a good context for children to expand their knowledge and understanding of the world, exploring the greater space and number of materials, sometimes focusing on specific features or processes and observing actions and their effects. Outdoors, children can find out and talk about the features of different living things, notice and talk about patterns and become aware of change (both immediate, e.g. what happens when you add water to soil, and also over time, e.g. noticing the leaves drop in autumn, the growth and harvesting of vegetables year-round). The outdoors also provides a space for large-scale construction, making dens, and using pulleys and the water pump to explore forces and structures.

## **Backyard Animals and Creatures**

### **Birds**

Children will be excited to learn all about their fine feathered friends when they take an up-close look at birds. They will discover how birds find their mates, investigate differences in bird eggs, learn how a bird's beak is a tool, and how to identify different bird's songs.

### **Bugs**

We will explore the world's most abundant animals and learn the difference between an insect and a bug. We will also learn how insects defend themselves, and take home "bugs" that grow in water!

### **Butterflies**

Children will discover all about butterflies – where they come from, stages of their growth, how they eat, and even make some of their own to take home during this workshop. We will even grow our own caterpillars and look at the brand new butterflies hatch!

### **Worms**

Children will use magnifying glasses and other scientific tools to explore the fascinating life of a worm! Take home a worm to help replenish the nutrients in the soil of your yard.

## **Additional Topics during the School Year**

### **Healthy Choices**

Students will learn about the different food groups, eating healthy and exercising. Through hands on activities, students will discover how fun making healthy choices can be.

### **Human Body**

Children learn all about the human body, especially the part we cannot see like the skeleton and the heart. In class we will find out where all of our organs are located and what they do!

### **Keep In Touch**

Children will learn first-hand how sensitive the tips of their fingers are. They will see just how difficult it is to identify objects using only their sense of touch.

### **Taste & Smell**

This topic introduces children to smell and taste, and how these senses help them enjoy all of their favorite foods and smells...and the ones they do not like as well!

### **Weather Wonders**

Make a cloud appear in a bottle, and mini lightning appear right in front of your eyes! Children will be amazed by the power of weather and make their own wind sock to take home.