

# Microbiology (Grades 7–12)

## Course Overview

This Microbiology course introduces students to the fascinating world of microscopic life. Students will study microbes such as bacteria, protists, fungi, viruses, and microscopic animals, learning how these organisms live, grow, and interact with the world around us. The course emphasizes observation, scientific thinking, and hands-on learning rather than rote memorization.

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## Class Structure

This course meets on **two separate days each week**:

- **1-hour lesson class**
- **1½-hour lab class**

The lesson and lab components are designed to work together, giving students both a strong conceptual foundation and meaningful practical experience.

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## Lesson Classes

Lesson sessions focus on clear, engaging instruction using discussion, visuals, demonstrations, and guided explanation. Students will learn:

- What different types of microbes are and how they differ
- Where microbes are found and how they grow
- How scientists study organisms that cannot be seen with the naked eye

There are **little to no worksheets** during lesson classes. Instead, time is spent understanding concepts, asking questions, and preparing students for lab work.

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## Lab Classes (Hands-On Focus)

Lab sessions are highly hands-on and inquiry-based. Students will:

- Use microscopes to observe bacteria, fungi, protists, and other microorganisms
- Grow and observe microbial cultures
- Conduct simple, guided experiments
- Record and analyze observations like real scientists

Each lab includes a **lab packet**, which students complete during class. Lab packets typically include:

- Observations and data collection
- Guided questions
- Hypotheses and predictions
- Basic data analysis
- Written conclusions

These packets provide structured scientific practice without busywork and help students build critical thinking and lab skills.

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## **Academic & Content Guidelines**

Instruction is **age-appropriate** and focused strictly on microbiology and the scientific process. Lessons are presented in a respectful, neutral manner and are designed to support homeschooling families. Topics unrelated to the academic subject are not introduced.

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## **Who this Class Is For**

This class is appropriate for middle and high school students (grades 7–12). Older students will naturally engage with the material at a deeper level, while younger students will gain strong foundational exposure. No prior lab experience is required

## **Parent FAQ – Microbiology Lab**

### **Is this lab safe for students?**

Yes. All lab activities are carefully selected for middle and high school students and are conducted under direct instructor supervision. Procedures are structured, guided, and age-appropriate. Students are taught proper lab behavior and safety expectations before participating in any hands-on work.

Only basic, classroom-appropriate materials are used, and all microbial work is handled using standard safety practices designed for educational settings.

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### **What kind of microorganisms will students work with?**

Students will work with **common, non-harmful microorganisms** typically used in educational labs, such as environmental bacteria, fungi, and protists. No pathogenic or dangerous organisms are used in this class.

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## **How are microbes handled and disposed of?**

Students are instructed in proper handling techniques, and all cultures are managed and disposed of safely by the instructor following established classroom safety guidelines. Students do not take cultures home.

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## **Will students use real microscopes?**

Yes. Students will use **student-grade compound microscopes** and will be taught how to handle, focus, and care for them properly. Instruction includes:

- How to carry and store microscopes safely
- Proper focusing techniques
- How to prepare and view slides
- How to clean lenses correctly

No prior microscope experience is required.

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## **Will students work independently or in groups?**

Depending on the activity, students may work individually or in small groups. Group work is structured, supervised, and focused on the lab task.

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## **Is protective equipment required?**

Basic lab safety practices are followed. When appropriate, students may use items such as gloves or eye protection. All safety expectations are explained clearly before each lab activity.

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## **Will students be exposed to inappropriate content?**

No. Lab activities and discussions remain focused strictly on microbiology and scientific observation. Instruction is age-appropriate and respectful of families, with no unrelated or sensitive topics introduced.

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## **Do students need prior lab experience?**

No. All necessary skills, including microscope use and lab procedures, are taught step by step.

# Earth Science (Grades 4–6)

## Course Overview

This Earth Science enrichment class is designed to build curiosity and understanding about how the natural world works. Students explore Earth and physical science topics through guided discussion, age-appropriate explanations, hands-on activities, and structured written work. The emphasis is on asking good questions, thinking critically, and developing a strong foundation in scientific understanding.

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## Class Structure

- **Meets once per week for 1½ hours**
- Each topic is covered over **two weeks**

This format allows students time to explore ideas deeply while keeping lessons engaging and manageable for upper elementary students.

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## How Lessons Work

Each topic is centered around **two guiding questions** that help students explore how and why things work. For example, during a unit on electricity, students might investigate questions such as:

- Where does lightning come from?
- Why do electrical cords have metal plugs?
- How does flipping a switch light up a light bulb?
- How does a battery make electricity?

These questions are explored through instructor-led explanation, discussion, **hands-on activities**, simple demonstrations, and **educational games** designed to reinforce key ideas. Students complete a **guided worksheet packet** during class as concepts are introduced.

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## Hands-On Activities & Games

Hands-on activities and games are used regularly to reinforce learning and keep students actively engaged. These may include:

- Simple experiments or demonstrations
- Interactive models or building activities
- Review games that reinforce vocabulary and concepts

Activities are structured, purposeful, and directly connected to the lesson goals.

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## Written Work & Worksheets

Students use a worksheet packet for each topic, which includes:

- Guided questions
- Short written responses
- Diagrams or labeling activities

All written work is completed during class. There is **no required homework**.

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## Optional At-Home Assignments

Students may be sent home with **optional enrichment activities**, such as:

- Looking up an answer to a related question with a parent's help
- An optional quiz connected to the topic

These assignments are intended to reinforce learning without adding pressure.

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## Academic & Content Guidelines

Instruction is age-appropriate and focused on Earth and physical science topics. Lessons remain within the scope of the subject matter and are presented in a respectful, neutral way that supports homeschooling families. Topics unrelated to the course content are not introduced.

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## Who This Class Is For

This class is designed for students in grades 4–6 and is appropriate for a wide range of learning styles and experience levels.

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## Parent FAQ – Earth Science

### Is this class hands-on?

Yes. Lessons periodically include hands-on activities, demonstrations, and educational games designed to reinforce key concepts. These activities help students apply what they are learning in an engaging way. While this is not a formal lab course, students are actively involved throughout the class rather than listening to long lectures.

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### How much writing is required?

Writing is limited to short answers and guided responses completed during class. There is no required homework.

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## **Are at-home assignments required?**

No. Any at-home assignments or quizzes are optional and designed as enrichment for families who would like extra reinforcement.

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## **Will the content be appropriate for younger students?**

Yes. All topics are selected and taught with the 4th–6th grade age range in mind.

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## **Is the class respectful of family beliefs?**

Yes. Instruction remains focused on academic science content and is presented in a way that respects homeschooling families and their values.

## Strange Animals (Grades 1–3)

### Course Overview

Strange Animals invites young students to explore some of the most unusual animals in the world. Each week, children discover animals with surprising body parts, behaviors, or abilities and learn what makes them special. Through guided discussion, stories, and hands-on activities, students build curiosity, observation skills, and an early love of science while bringing learning to life.

### Class Structure

- **Meets once per week for 1 hour**
- Each week features **one new animal**

Example animals include platypuses, axolotls, geckos, and many other fascinating creatures from around the world.

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### How Lessons Work

Each class begins with a short, age-appropriate introduction to the featured animal. Students learn where the animal lives, what makes it unusual, and how its traits help it survive. Lessons include: where the animal lives, what makes it unusual or unique, how its body or behavior helps it survive helping children explore each animal's unique traits in a fun and engaging way.

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### Hands-On Activities

Every class includes a hands-on craft project related to the featured animal to reinforce learning and engage young students. Activities may include coloring, cutting, and pasting. Occasionally, a project may be sent home unfinished so students can complete it with a parent's help.

On the back of each project, there is space for the student to write down a fact they learned about the animal. This allows families to continue learning at home and helps reinforce what the children have learned!

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### Written Work

There is very little formal written work in this class. The primary writing comes on the back of each hands-on project, where students have the opportunity to write down a fact they learned about the animal. This is designed to be completed with a parent at home, allowing children to reflect on what they've learned without requiring extensive independent writing. Aside from this, the only writing during class is minimal, such as writing their own name on projects.

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## **Academic & Content Guidelines**

Instruction is age-appropriate and focused on animal life and basic science concepts. Lessons are presented in a respectful, neutral manner and are designed to support homeschooling families. Topics unrelated to the course content are not introduced.

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## **Who this Class Is For**

This class is designed for students in grades 1–3. No prior science experience is required, and the class is well-suited for young learners who enjoy animals, art, and hands-on activities.

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## **Parent FAQ – Strange Animals**

### **Is this class hands-on?**

Yes. Every class includes a hands-on craft of the animal being studied and includes activities such as coloring, cutting, and pasting.

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### **Will the content be appropriate for young children?**

Yes. All animals and topics are chosen with early elementary students in mind, and lessons focus on observable traits and simple explanations.

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### **Is there homework?**

No. All activities are completed during class.

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### **Will this class respect family values?**

Yes. Instruction remains focused on animal science and observation and is presented in a way that respects homeschooling families and their values.

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## **Supplies**

All necessary supplies for class will be on hand in class, but students are also welcome to bring their own materials, such as crayons, colored pencils, markers, glue sticks, or scissors. Bringing personal supplies is helpful but optional!

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## Science with Art (TK–K)

### Course Overview

Science with Art is a playful, hands-on class designed for our youngest learners. Children explore simple science concepts through creative crafts, games, and interactive activities, building curiosity and observation skills while having fun. Each week offers a new project or activity that encourages experimentation and imagination in a safe, engaging environment.

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### How Lessons Work

Each class begins with a short, age-appropriate introduction to a science topic. Students then participate in hands-on crafts, art projects, and interactive games that bring the topic to life. Activities are designed to be engaging and fun while helping children notice and explore the world around them.

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### Hands-On Activities

Crafts and projects are the heart of this class. Activities may include coloring, cutting, pasting, or simple building projects, all designed for little hands. Students will often work on activities during class, with occasional take-home projects for continued creativity and learning with a parent. Games and interactive experiments are used regularly to reinforce the lesson and keep children actively engaged.

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### Written Work

There is very little formal writing. Any writing is optional and simple, such as labeling a project with a child's name or drawing a picture related to the science topic. Activities focus on creativity, exploration, and hands-on learning rather than formal worksheets.

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### Supplies

All necessary supplies for class will be on hand in class, but students are also welcome to bring their own materials, such as crayons, colored pencils, markers, glue sticks, or scissors. Bringing personal supplies is helpful but optional!

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## **Parent FAQ – Science with Art**

### **Is this class hands-on?**

Yes! The class centers on hands-on crafts, projects, and games. Children actively explore science concepts in a fun, interactive way.

### **Will the content be appropriate for my young child?**

Absolutely. Activities are designed specifically for TK–K children and focus on safe, age-appropriate science exploration.

### **Is there homework?**

No. All activities are completed during class, though occasional take-home crafts may be provided for optional family fun.

### **Will this class respect family values?**

Yes. Instruction is focused on age-appropriate science and creative exploration, with no unrelated or sensitive topics.

### **Do students need to bring supplies?**

No. All materials are provided, but students may bring optional personal supplies such as crayons or scissors.