Science

What Every Child Should Know

6th Grade
Physical, Earth, Life Sciences and Ecology

6th Grade Science provides an introduction to the extraordinary world of science. Your child will explore life, physical and earth sciences in addition to ecology through various investigations. By the end of 6th Grade Science your child will be able to:

- Identify factors affecting photosynthesis and plant growth
- Apply Newton's Laws to life events.
- Determine cause and effect relationships with an object in motion.
- Create a model illustrating the water cycle's significance on all matter.
- Explain how weather and climate are influenced by the sun, oceans, landforms and atmosphere
- Ask questions to frame a hypothesis.
- Employ scientific principles to formulate a conclusion

SLPS will prepare your child with outdoor learning experiences, field trips as well as classroom learning labs. They will also explore online science simulations to enrich learning. These opportunities will allow your child to investigate life with a wider lens. Science connects all living organisms with the space around them. Your child will appreciate the amazing dynamics of life.

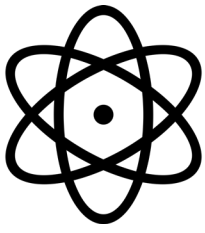
Helping Your Scholar Succeed:

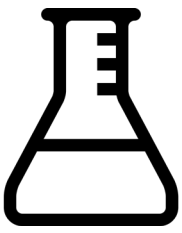
6th Grade is a transitional year. Managing social structures with the course scheduling can be overwhelming. Help your scholar with organization.

- Purchase a planner to organize assignments and activities.
- Review the planner with your child at least 2-3 times per week.
- Ask about homework, projects and assessments.
- Review Graded material and determine areas of support.
- Ensure your child reviews scientific vocabulary as often as possible.

Knowledge Skills Learned by the End of 6th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with classmates and teacher
- Ability to obtain and process information
- Ability to identify general laboratory equipment
- Proficiency with computer software programs
- Ability to create and/or edit written reports



Science

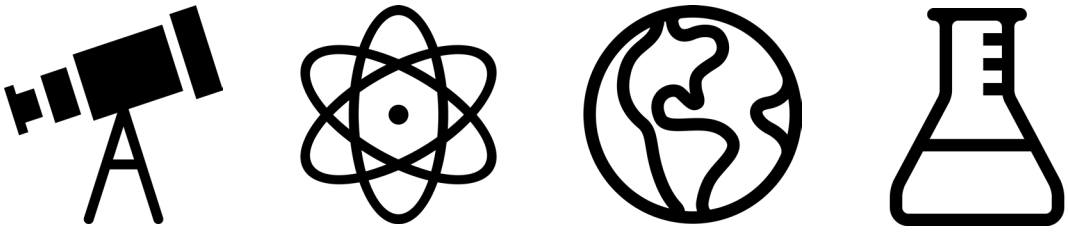
What Every Child Should Know

7th Grade
Physical, Earth and Life Sciences

In 7th Grade science, your child will investigate the relationship between environment and the world in which he/she views daily. Inquiry based activities will be used to promote critical thinking. All students will maintain a log of explorations. Your 7th Grade Scientist will be able to:

- Use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities
- Interpret data from laboratory experiences
- Determine if and how a chemical reaction occurred
- Design an experiment manipulating thermal or chemical energy
- Provide evidence of how all living things are made up of cells.
- Apply scientific ideas to explain the anatomical similarities and differences of species
- Examine electric and magnetic forces and its interactions with objects.
- Use mathematical equations to determine the frequency, wavelength and amplitude of a sound wave.

SLPS will prepare your child by offering outdoor learning experiences, field trips as well as classroom learning labs. Your child will also navigate throughout GIZMOS science simulations to extend learning. The 7th grade science exploration will prepare your child for long term successes in the sciences. Each lesson will provide knowledge needed to form critical evaluations of science systems. For example, your child will be able to explain how sound travels from difference locations. Or, he will be able to explain the similarities and differences between chipmunks and squirrels. Lastly, your child will be able to assess how thermal energy impacts various aspects of life.



Science

What Every Child Should Know

7th Grade
Physical, Earth and Life Sciences

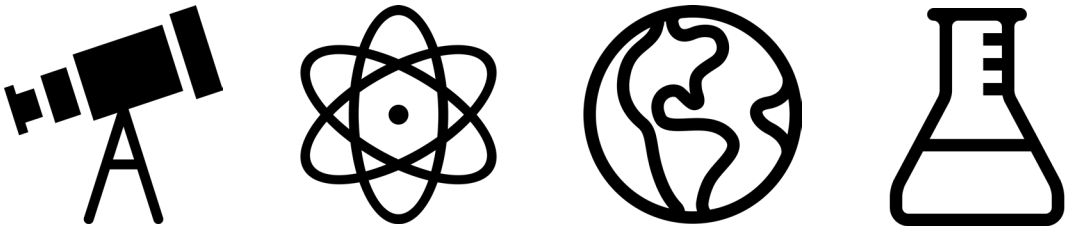
Helping Your Scholar Succeed:

Time management and organization is increasingly critical. Help your child form habits.

- Review the planner for assignments, projects and assessments.
- Review Graded material and determine areas of support.
- Set study times in a specific location of your home.
- It is very important to read over vocabulary and practice math problems.
- Provide opportunities for your child to read newspapers, magazines or books with science related topics.
- Talk about the topics.
- Research science programs at the local universities, Zoo, Science Center and Missouri Botanical Gardens.
- Activities offered enhance understanding of concepts learned throughout the year.

Knowledge Skills Learned by the End of 7th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with classmates, teacher and individuals around the school
- Ability to obtain and process information
- Ability to analyze compute math problems associated with science, such as Density = mass/volume
- Ability to identify and utilize general laboratory equipment
- Proficiency with computer software programs
- Ability to create and/or edit written reports
- Ability to sell and influence others



Science

What Every Child Should Know

8th Grade
Earth and Life Sciences

The 8th grade science curriculum highlights specific components of Earth, Space and Life Sciences to prepare your child for the investigations of high school sciences. Your child's ability to formulate questions and models will require higher order thinking skills. To be successful, your 8th grader will need to:

- Analyze rock strata to determine geologic time.
- Investigate water cycles, energy and matter to explain Earth processes
- Present evident to support the claim that gravity depends on interactions of masses
- Provide an explanation of genetic variation
- Use reasoning skills to explain how characteristic behaviors determine the probability of reproduction.
- Describe why changes in DNA structure may cause beneficial or harmful effects to the function of an organism.
- Conduct research on technical allowing advances in science.
- Gather, read and synthesize information from multiple sources to support a scientific claim.
- Interpret data to forecast future environmental events.

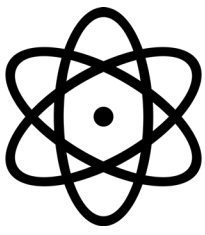
Helping Your Scholar Succeed:

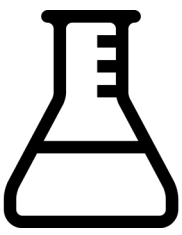
Time management and organization will be increasingly significant. Continue to provide structure in planning. Help your child organize his/her binders and assist in the purging of papers. These skills are critical for the success of the 9th grade student.

- Review Graded material and determine areas of support.
- Set study times in a specific location of your home.
- Provide opportunities for your child to read newspapers, magazines or books with science related topics.
- Talk about the topics.
- Additionally, there are numerous science Apps to provide extended learning opportunities.
- Your child will have fun while learning science.
- Research science programs at the local universities, Zoo, Science Center and Missouri Botanical Gardens.
- Activities offered enhance understanding of concepts learned throughout the year.

Knowledge Skills Learned by the End of 8th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with people inside and outside an organization
- Ability to obtain and process information
- Ability to analyze quantitative data
- Technical knowledge related to the job
- Proficiency with computer software programs
- Ability to create and/or edit written reports
- Ability to produce a claim and justify it with evidence



Science

What Every Child Should Know

9th Grade
Physics First

Physics First will give your scholar the foundational skills to design simple and complex machines. Students will be able apply scientific ideas to design and refine a device to minimize and maximize energy input/output. Emphasis will be placed on kinesthetics – motion, force and energy. Your child will be able to:

- Evaluate Newton's Laws to explain an event.
- Investigate or describe a system, the boundaries and initial conditions of the system.
- Communicate how some technical devices transmit and capture energy.
- Manipulate mathematical equations to justify mechanical designs.
- Calculate the change in energy in any given system.
- Use electronic equipment to design, evaluate and refine a machine that minimizes or maximizes force on an object.
- Communicate how mechanical systems are designed by presenting evidence through scientific analysis (reports).

SLPS is preparing your scholar by performing tasks in mechanics, force and motion labs. You can expect your child to learn about how wind (energy) and weight (force) impact the acceleration and deceleration of all locomotives, such as cars, airplanes and bicycles. Your child will also learn the engineering behind rollercoasters, wind turbines and solar panels.

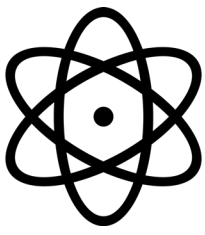
Helping Your Scholar Succeed:

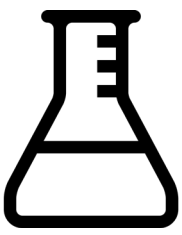
The social structures of high school are difficult to manage for the 9th Grade student. To successfully complete 9th grade, organization, time management as well as study skills are increasingly paramount. Even though, your child may appear to have it under control. Each course has different requirements and may be difficult to manage.

- Help your child get organized by reviewing his/her binder and planner.
- Review online grade checks, at least weekly.
- In this course, math practice and experimental analysis is a daily requirement. Thus, writing and math practice is needed to enhance learning.
- Allow time for your child to practice math problems at home at least 2-3 times per week.
- Research summer science programs to extend understanding of concepts.
- Ask your teacher or counselor for more information.

Knowledge Skills Learned by the End of 9th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with people inside and outside an organization
- Ability to obtain and process information
- Ability to analyze quantitative and qualitative data
- Ability to conduct an experiment and communicate findings
- Proficiency with computer software programs
- Ability to create scientific laboratory reports
- Ability to collaborate with peers on projects
- Ability to produce a claim and justify it with evidence



Science

What Every Child Should Know

9th or 10th Grade
Biology

Biology explores life processes. In this course, students will investigate biological systems affecting life processes. Students will apply their knowledge of course concepts by conducting laboratory exercises related to Genetics, Evolution, Ecology and Technology.

SLPS is preparing your scholar for successful completion of the Biology End of Course Exam by employing the following objectives and performance tasks:

- ***Investigate biotic and abiotic factors affecting cellular reproduction (growth) or apoptosis (cell death) of plants and animals.***
- ***Employ critical thinking skills to communicate DNA structure, its function and mutations in DNA impacts my genetics (heredity).***
- ***Make and defend a claim based on reliable and valid evidence about the evolution of species.***
- ***Manipulate technology to conduct research and experiments.***
- ***Communicate how technology can advance scientific exploration.***
- ***Explain experimental (qualitative and quantitative) data for experimental analysis***

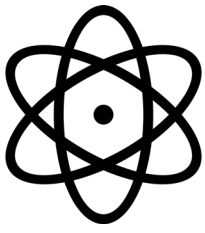
Helping Your Scholar Succeed:

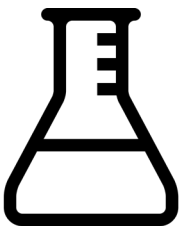
Through the course of the academic year, your child will learn over 100 biology related terms.

- It is critical to review terms outside of school.
- Each student will maintain a binder to organize the individual concepts as well as course assignments.
- Review the binder periodically and asks questions related to homework, quizzes or labs.
- Allow 15 minutes of vocabulary review, at least 2-3 times per week.
- When possible, afford your child time for after school tutoring to enrich learning of concepts.

Knowledge Skills Learned by the End of 10th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with people within the school and agencies outside the school
- Ability to obtain and process critical information
- Ability to analyze quantitative and qualitative data
- Proficiency with computer software programs to research scientific events
- Ability to create and/or edit scientific reports
- Ability to collaborate with peers
- Ability to produce a claim and justify it with evidence



Science

What Every Child Should Know

10th and 11th Grade
Chemistry

Students examine the fundamental principles of chemistry by describing and distinguishing between the properties of matter and how it reacts. SLPS is preparing your child for successful completion of Chemistry through in-depth qualitative and quantitative analysis of chemical reactions. Students will explore various labs to promote problem solving and critical thinking skills.

- Evaluate trends on the periodic table.
- Illustrate the release and absorption of energy (during chemical reactions) through various models
- Predict the properties of elements based on patterns of electrons in the outermost energy level.
- Employ my knowledge of gas, pressure and volume laws in laboratory experiments.
- Utilize critical thinking skills to plan and conduct an experiment using proper laboratory technique to produce qualitative and quantitative data.
- Support a claim by applying mathematical representations of chemical reactions.

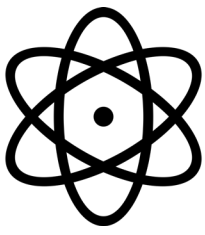
Helping Your Scholar Succeed:

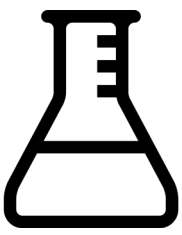
Chemistry investigates chemical reactions of all matter.

- Your child must understand the trends of elements on the periodic table to predict outcomes.
- He/She must also be knowledgeable of gas, pressure and volume laws needed to design and conduct laboratory research.
- Lastly, Chemistry utilizes mathematical analysis to communicate findings and support a claim.
- Your child must practice writing chemical equations at least 2-3 times per week.

Knowledge Skills Learned by the End of 11th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with people inside and outside an organization
- Ability to obtain and process information
- Ability to analyze quantitative and qualitative data
- Ability to manipulate scientific equipment to design an experiment
- Proficiency with computer software programs
- Ability to summarize observations and data in a scientific report
- Ability to collaborate with peers
- Ability to produce a claim and justify it with researched based evidence



Science

What Every Child Should Know

12th Grade (Upper Level Sciences)
Zoology, Anatomy/Physiology, Environmental

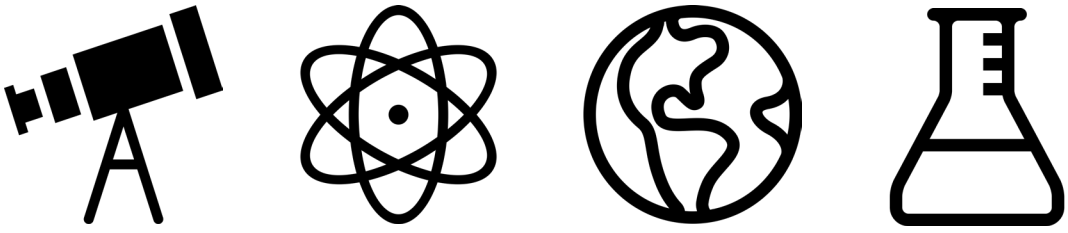
The goal of upper level sciences is to prepare your child for critical analysis of scientific concepts. Each course is designed to afford him/her the ability to communicate experimental findings through field and laboratory research and analysis:

- Utilize proper laboratory techniques to conduct experiments.
- Evaluate evidence supporting claims.
- Design and refine a solution to a problem.
- Provide statistical evidence to support and defend a claim.
- Communicate experimental findings.
- Manipulate the latest technologies in the field, provided by programs at local universities.

SLPS will help your child prepare for careers in the sciences by providing rigorous course activities to enhance learning. Your child will be given opportunities to manipulate the latest technologies in science. Field Trips to extend learning objectives will be offered.

Helping Your Scholar Succeed:

Students typically taking these courses have an interest in careers in the sciences. Extend learning through learning programs, work or volunteer opportunities at local universities, the Zoo, Botanical Gardens or the Science Center. Please ask your teacher or counselor for more information.



Science

What Every Child Should Know

Advanced Placement
AP Biology, AP Chemistry, Environmental Science and AP Physics

Advanced Placement (AP) Courses afford students an opportunity to earn college credit, avoiding introductory courses during their freshman year of college. To earn college credit, your child must obtain a passing score in the 3-5 range. Even if your child does not meet the minimum requirement, colleges and universities review transcripts for the AP experience. AP courses build problem solving and critical thinking skills through rigorous a course workout. Taking the AP course prepares your child for the rigor of the college course.
The goal of AP Science courses is to provide intense study of scientific research, experimental exploration and evaluation of qualitative and quantitative data. More specifically, by the end of the AP Science course, your child will be able to:

- Become an independent investigator through student-directed laboratory investigations.
- Pose higher order thinking questions and determine variables to potential outcomes.
- Design my own procedures to conduct an experiment.
- Work collaboratively to think analytically about problems, identify experimental questions, and design experiments to provide evidence of claims.

SLPS has provided professional development to all AP teachers to ensure your child is successful in the selected AP Course. SLPS will provide study materials as well as after school tutoring to expound upon concepts. AP Science Courses will provide your child with a rigorous scientific experience through experimental analysis. Extended learning opportunities will be offered by partnerships with local universities.

Helping Your Scholar Succeed:

Advanced Placement Courses are college courses.

- Select courses strategically.
- Significant study time is needed for the full learning experience.
- Try to designate a room for your child to study, at least an hour per AP course, 3 times per week.
- In addition, allow your child to collaborate with other students to activate knowledge and communicate findings.
- Students learn more when they are able to communicate ideas.
- Lastly, be proactive in researching college entrance requirements, applications and deadlines.

Knowledge Skills Learned by the End of 12th Grade

- Ability to plan, organize and prioritize work
- Ability to communicate verbally with people inside and outside an organization
- Ability to obtain and process information
- Ability to analyze quantitative and qualitative data
- Ability to manipulate scientific equipment to design an experiment
- Proficiency with computer software programs
- Ability to summarize observations and data in a scientific report
- Ability to produce a claim and justify it with researched based evidence
- Ability to analyze data from scientific journals