**Welcome to Fourth Grade Computer Science!**

**Course Description:**

Get ready to tackle more advanced computer science concepts! This course empowers fourth graders to deepen their coding skills, solve complex problems, and explore the real-world applications of technology. Students will learn about loops, conditionals, variables, and new concepts like functions and debugging strategies. They will design and code interactive games, simulations, and projects while collaborating with peers to brainstorm and troubleshoot. This course promotes innovation, critical thinking, and digital citizenship, preparing students to navigate and contribute to the technological world confidently.

**Learning Outcomes:**
By the end of this course, students will be able to:

1. Explain and use core coding concepts, including functions, conditionals, and variables.
2. Design, build, and debug multi-step programs with interactive elements.
3. Apply problem-solving skills to tackle computational challenges independently and collaboratively.
4. Use logical reasoning to optimize and improve existing programs.
5. Develop creative coding projects, including games, stories, and simulations.
6. Reflect on the impact of technology on society and practice responsible technology use.

**Syllabus:**

**Unit 1: Revisiting Foundations and Introducing Functions**

- Reviewing key concepts: loops, conditionals, and variables.
- Introduction to functions: What they are and how they simplify coding.
- Writing simple functions in coding projects.

**Unit 2: Decomposing Problems and Algorithm Design**

- Breaking down large problems into smaller, manageable steps.
- Designing algorithms for real-world and digital problems.
- Practicing flowcharts and pseudocode as planning tools.

**Unit 3: Variables and Data in Action**

- Understanding how to use variables to store and manipulate data.
- Exploring real-world examples of variables in action.
- Creating projects with dynamic data changes.

**Unit 4: Advanced Debugging Techniques**

- Developing strategies for identifying and fixing complex bugs.
- Collaborating with peers to troubleshoot effectively.
- Celebrating mistakes as opportunities for learning and growth.

**Unit 5: Game Development Projects**

- Designing interactive games with user inputs and dynamic rules.
- Incorporating multiple coding concepts, including loops, variables, and functions.
- Testing and refining games through peer feedback.

**Unit 6: Exploring Simulations and Real-World Applications**

- Creating coding projects that simulate real-world scenarios (e.g., ecosystems, weather).
- Understanding how simulations help solve real-world problems.
- Reflecting on the power of technology in different fields.

**Unit 7: Team Collaboration and Creative Projects**

- Working in teams to design and execute a large-scale project.
- Combining storytelling, logic, and interactivity in creative ways.
- Practicing teamwork, communication, and project management skills.

**Final Unit: Showcase, Reflection, and Celebration**

- Presenting projects to classmates, families, or a broader audience.
- Reflecting on progress, challenges, and successes throughout the course.
- Celebrating learning with certificates, feedback, and future goal-setting.

This course is designed to inspire innovation and build confidence, equipping students with the skills and mindset needed to excel in computer science and beyond.

**This course is meticulously designed to align with state standards and targeted learning objectives, ensuring comprehensive coverage of essential knowledge and skills required for student success.**