

# Third Grade Curriculum

**Theme:** Forces, Coding, and the Environment

**Duration:** 3 Months (Approximately 12 weeks)

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## Curriculum Overview

- **Unit 1: Aerodynamics and Flight** (Weeks 1–4)
  - **Unit 2: Introduction to Scratch Programming** (Weeks 5–8)
  - **Unit 3: Ecosystems and Habitats** (Weeks 9–12)
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## Unit 1: Aerodynamics and Flight

**Duration:** 4 Weeks

### Unit Objectives

- Understand the basic principles of aerodynamics.
- Explore how different designs affect the flight of paper airplanes.
- Apply the engineering design process.
- Develop data collection and analysis skills.
- Enhance collaborative and communication skills.

### Week 1: Introduction to Aerodynamics

#### Lesson 1: The Four Forces of Flight

- **Duration:** 60 minutes
- **Activities:**
  - **Interactive Presentation:**
    - Introduce lift, weight (gravity), thrust, and drag.
    - Use visuals and videos to illustrate concepts.
  - **Class Discussion:**
    - Relate forces to everyday experiences (e.g., riding a bike).
- **Assessment:**
  - Participation in discussion.
  - Completion of a worksheet matching forces to definitions.

## Lesson 2: Paper Airplane Basics

- **Duration:** 60 minutes
- **Activities:**
  - **Demonstration:**
    - Show how to fold a basic paper airplane.
    - Discuss how different folds affect flight.
  - **Hands-On Activity:**
    - Students make their own basic paper airplanes.
- **Assessment:**
  - Proper construction of the airplane.
  - Ability to identify airplane parts (wing, nose, tail).

## Week 2: Designing and Testing Airplanes

### Lesson 3: The Engineering Design Process

- **Duration:** 60 minutes
- **Activities:**
  - **Explanation:**
    - Introduce steps: Ask, Imagine, Plan, Create, Improve.
  - **Group Activity:**
    - In small teams, brainstorm ideas for airplane designs.
- **Assessment:**
  - Engagement in brainstorming.
  - Completion of a design plan.

### Lesson 4: Building Prototype Airplanes

- **Duration:** 60 minutes
- **Activities:**
  - **Construction:**
    - Students build their airplane designs using paper and materials.
  - **Customization:**
    - Encourage creativity with decorations and modifications.
- **Assessment:**
  - Adherence to the design plan.
  - Creativity in design.

### Lesson 5: Flight Testing

- **Duration:** 60 minutes
- **Activities:**
  - **Testing Procedures:**
    - Establish a safe testing area.

- Review rules for fair testing.
  - **Data Collection:**
    - Measure flight distance and time aloft.
    - Record data in science journals.
- **Assessment:**
  - Accuracy in data recording.
  - Safe and respectful behavior during testing.

## Week 3: Data Analysis and Improvement

### Lesson 6: Analyzing Flight Data

- **Duration:** 60 minutes
- **Activities:**
  - **Graphing Activity:**
    - Create bar graphs of flight distances.
  - **Math Integration:**
    - Calculate averages and identify outliers.
- **Assessment:**
  - Correctness of graphs.
  - Ability to interpret data.

### Lesson 7: Improving Designs

- **Duration:** 60 minutes
- **Activities:**
  - **Review Data:**
    - Discuss which designs performed best and why.
  - **Redesign:**
    - Modify airplanes based on data.
    - Document changes in journals.
- **Assessment:**
  - Thoughtfulness in redesign.
  - Clarity in documentation.

### Lesson 8: Retesting and Final Analysis

- **Duration:** 60 minutes
- **Activities:**
  - **Retest Modified Airplanes:**
    - Repeat flight tests.
  - **Compare Results:**
    - Analyze improvements or declines in performance.
- **Assessment:**
  - Updated data recording.

- Ability to draw conclusions from results.

## **Week 4: Culminating Activities**

### **Lesson 9: Presentation Preparation**

- **Duration:** 60 minutes
- **Activities:**
  - **Creating Posters:**
    - Summarize the project, including the design process and results.
  - **Practice Presentations:**
    - Rehearse explaining their work to others.
- **Assessment:**
  - Quality of posters.
  - Preparedness for presentation.

### **Lesson 10: STEM Showcase**

- **Duration:** 60 minutes
- **Activities:**
  - **Presentations:**
    - Students share their projects with the class or invited guests.
  - **Peer Feedback:**
    - Provide constructive comments on others' work.
- **Assessment:**
  - Clarity and confidence in presentation.
  - Respectfulness during peer feedback.

### **Lesson 11: Reflection and Evaluation**

- **Duration:** 60 minutes
- **Activities:**
  - **Reflection Writing:**
    - Students write about what they learned, challenges faced, and how they overcame them.
  - **Class Discussion:**
    - Share reflections and discuss the importance of perseverance.
- **Assessment:**
  - Depth of reflection.
  - Participation in discussion.

### **Lesson 12: Extension Activity (Optional)**

- **Duration:** 60 minutes
- **Activities:**

- **Exploring Real Aircraft:**
  - Research different types of aircraft and their uses.
- **Creative Project:**
  - Design a futuristic airplane with unique features.
- **Assessment:**
  - Creativity and imagination.
  - Research effort.

## Ongoing Assessments Throughout Unit

- **Science Journals:** Regular entries documenting the design process and reflections.
- **Participation:** Engagement in activities and discussions.
- **Quizzes:** Short assessments on aerodynamics concepts.

## Standards Alignment

- **NGSS 3-PS2-1:** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
  - **CCSS.MATH.CONTENT.3.MD.B.4:** Represent and interpret data.
  - **CCSS.ELA-LITERACY.SL.3.4:** Report on a topic with appropriate facts and relevant details.
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# Unit 2: Introduction to Scratch Programming

**Duration:** 4 Weeks

## Unit Objectives

- Learn basic coding concepts: sequences, events, loops, and conditions.
- Create interactive stories, games, and animations using **Scratch**.
- Develop problem-solving and logical thinking skills.
- Understand the importance of debugging in programming.
- Enhance creativity and expression through digital projects.

## Week 5: Getting Started with Scratch

### Lesson 1: Introduction to Scratch Interface

- **Duration:** 60 minutes
- **Activities:**
  - **Computer Lab Orientation:**
    - Ensure all students can access **Scratch** (online or offline editor).
  - **Tour of Scratch:**

- Navigate the interface: Stage, Sprites, Scripts area, Blocks palette.
  - **Hands-On Exploration:**
    - Experiment with moving sprites and changing backgrounds.
- **Assessment:**
  - Ability to navigate the interface.
  - Engagement during exploration.

### Lesson 2: Basic Motion and Looks

- **Duration:** 60 minutes
- **Activities:**
  - **Guided Tutorial:**
    - Create a project where a sprite moves and changes costumes.
  - **Experimentation:**
    - Encourage students to try different motion and looks blocks.
- **Assessment:**
  - Completion of the tutorial project.
  - Creativity in sprite customization.

## Week 6: Events and Interactive Projects

### Lesson 3: Using Events

- **Duration:** 60 minutes
- **Activities:**
  - **Concept Introduction:**
    - Explain how events (e.g., "when green flag clicked") trigger actions.
  - **Activity:**
    - Create a simple animation that starts with an event.
- **Assessment:**
  - Correct use of event blocks.
  - Ability to explain how events work.

### Lesson 4: Creating an Interactive Story

- **Duration:** Multiple sessions totaling 120 minutes
- **Activities:**
  - **Planning:**
    - Outline a story with a beginning, middle, and end.
  - **Coding:**
    - Implement the story using sequences and events.
    - Add dialogues and character interactions.
- **Assessment:**
  - Coherence of the story.
  - Effective use of events and sequences.

## Week 7: Introducing Loops and Sounds

### Lesson 5: Understanding Loops

- **Duration:** 60 minutes
- **Activities:**
  - **Explanation:**
    - Introduce loops to repeat actions.
  - **Practice:**
    - Create a sprite that moves continuously using loops.
- **Assessment:**
  - Correct implementation of loops.
  - Creativity in movement patterns.

### Lesson 6: Adding Sounds and Music

- **Duration:** 60 minutes
- **Activities:**
  - **Exploration:**
    - Discover the sound library in **Scratch**.
  - **Activity:**
    - Program sprites to make sounds or play music in response to events.
- **Assessment:**
  - Incorporation of appropriate sounds.
  - Engagement with the activity.

### Lesson 7: Debugging and Problem-Solving

- **Duration:** 60 minutes
- **Activities:**
  - **Common Errors:**
    - Discuss typical mistakes and how to fix them.
  - **Debugging Practice:**
    - Provide buggy projects for students to fix.
- **Assessment:**
  - Ability to identify and correct errors.
  - Persistence in problem-solving.

## Week 8: Creating Games and Final Projects

### Lesson 8: Designing a Simple Game

- **Duration:** Multiple sessions totaling 180 minutes
- **Activities:**
  - **Game Elements:**

- Introduce concepts like scoring, levels, and user input.
  - **Project Development:**
    - Students plan and create their own simple game (e.g., maze game, catch game).
- **Assessment:**
  - Functionality of the game.
  - Use of programming concepts (events, loops, conditions).

### **Lesson 9: Peer Review and Testing**

- **Duration:** 60 minutes
- **Activities:**
  - **Playtesting:**
    - Students play each other's games and provide feedback.
  - **Improvement:**
    - Make revisions based on peer suggestions.
- **Assessment:**
  - Quality of feedback given.
  - Implementation of improvements.

### **Lesson 10: Final Presentations**

- **Duration:** 60 minutes
- **Activities:**
  - **Showcase:**
    - Students present their games to the class.
    - Explain the programming concepts used.
- **Assessment:**
  - Clarity of presentation.
  - Understanding of programming concepts.

### **Lesson 11: Reflection and Future Learning**

- **Duration:** 60 minutes
- **Activities:**
  - **Reflection Writing:**
    - Write about challenges faced and skills learned.
  - **Goal Setting:**
    - Discuss interest in pursuing more advanced coding.
- **Assessment:**
  - Depth of reflection.
  - Articulation of future goals.

### **Ongoing Assessments Throughout Unit**

- **Coding Journals:** Documenting progress, ideas, and challenges.



- **Participation:** Active engagement in coding sessions.
- **Quizzes:** Assess understanding of coding concepts.

## Standards Alignment

- **CSTA K-12 Computer Science Standards:**
    - **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.
  - **ISTE Standards for Students:**
    - **1.1 Empowered Learner:** Students leverage technology to take an active role in choosing, achieving, and demonstrating competency.
  - **CCSS.ELA-LITERACY.SL.3.5:** Create engaging audio recordings or visual displays.
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## Unit 3: Ecosystems and Habitats

**Duration:** 4 Weeks

### Unit Objectives

- Understand the components of ecosystems and how organisms interact.
- Explore different habitats and the organisms that live there.
- Recognize the importance of biodiversity.
- Develop research and presentation skills.
- Foster environmental stewardship.

### Week 9: Introduction to Ecosystems

#### Lesson 1: What Is an Ecosystem?

- **Duration:** 60 minutes
- **Activities:**
  - **Interactive Presentation:**
    - Define ecosystems, habitats, biotic and abiotic factors.
  - **Class Discussion:**
    - Brainstorm examples of local ecosystems.
- **Assessment:**
  - Participation in discussion.
  - Completion of a vocabulary worksheet.

#### Lesson 2: Food Chains and Webs

- **Duration:** 60 minutes
- **Activities:**

- **Explanation:**
  - Introduce producers, consumers, and decomposers.
- **Activity:**
  - Create a simple food chain diagram.
- **Assessment:**
  - Accuracy of food chain diagrams.
  - Understanding of organism roles.

## **Week 10: Exploring Different Habitats**

### **Lesson 3: Forest Habitats**

- **Duration:** 60 minutes
- **Activities:**
  - **Video Viewing:**
    - Watch a documentary segment on forests.
  - **Note-Taking:**
    - List animals and plants found in forests.
- **Assessment:**
  - Completeness of notes.
  - Participation in post-video discussion.

### **Lesson 4: Desert Habitats**

- **Duration:** 60 minutes
- **Activities:**
  - **Interactive Lesson:**
    - Explore adaptations of desert organisms.
  - **Creative Writing:**
    - Write a short story from the perspective of a desert animal.
- **Assessment:**
  - Creativity and factual accuracy in stories.
  - Engagement during lesson.

### **Lesson 5: Aquatic Habitats**

- **Duration:** 60 minutes
- **Activities:**
  - **Hands-On Activity:**
    - Build a mini-pond ecosystem in a jar.
  - **Observation:**
    - Note changes over time.
- **Assessment:**
  - Proper setup of the mini-ecosystem.
  - Detailed observations.

## **Week 11: Research and Projects**

### **Lesson 6: Habitat Research Project Introduction**

- **Duration:** 60 minutes
- **Activities:**
  - **Project Assignment:**
    - Students choose a habitat to research (rainforest, tundra, grassland, etc.).
  - **Research Planning:**
    - Develop questions to guide research.
- **Assessment:**
  - Approval of research plan.
  - Initial gathering of resources.

### **Lesson 7: Conducting Research**

- **Duration:** Multiple sessions totaling 180 minutes
- **Activities:**
  - **Library and Internet Research:**
    - Collect information on chosen habitat.
  - **Note-Taking:**
    - Organize facts about climate, organisms, and environmental issues.
- **Assessment:**
  - Quality and organization of notes.
  - Use of credible sources.

### **Lesson 8: Creating Habitat Dioramas**

- **Duration:** 60 minutes
- **Activities:**
  - **Artistic Representation:**
    - Build a diorama showcasing the habitat and key organisms.
  - **Inclusion of Details:**
    - Label components and provide brief descriptions.
- **Assessment:**
  - Accuracy and creativity of diorama.
  - Inclusion of essential habitat elements.

## **Week 12: Presentations and Environmental Stewardship**

### **Lesson 9: Presenting Research Projects**

- **Duration:** 60 minutes
- **Activities:**
  - **Oral Presentations:**

- Share research findings and dioramas with the class.
  - **Peer Questions:**
    - Answer questions from classmates.
- **Assessment:**
  - Clarity and confidence in presentation.
  - Depth of knowledge displayed.

### **Lesson 10: Human Impact on Ecosystems**

- **Duration:** 60 minutes
- **Activities:**
  - **Discussion:**
    - Explore how human activities affect ecosystems.
  - **Case Studies:**
    - Examine examples like deforestation and pollution.
- **Assessment:**
  - Participation in discussion.
  - Ability to suggest solutions.

### **Lesson 11: Environmental Stewardship Project**

- **Duration:** Multiple sessions totaling 120 minutes
- **Activities:**
  - **Community Action:**
    - Plan and execute a class project (e.g., school garden, recycling program).
  - **Reflection:**
    - Write about the importance of caring for the environment.
- **Assessment:**
  - Contribution to the project.
  - Insightfulness of reflections.

### **Lesson 12: Unit Review and Celebration**

- **Duration:** 60 minutes
- **Activities:**
  - **Jeopardy Game:**
    - Review key concepts through an interactive game.
  - **Certificates:**
    - Award "Ecosystem Explorer" certificates.
- **Assessment:**
  - Correct answers during the game.
  - Demonstrated understanding of unit content.

## **Ongoing Assessments Throughout Unit**

- **Research Notes:** Quality and thoroughness.
- **Participation:** Engagement in discussions and activities.
- **Quizzes:** Periodic assessments of understanding.

## Standards Alignment

- **NGSS 3-LS4-3:** Construct an argument with evidence that in a particular habitat some organisms can survive well.
  - **CCSS.ELA-LITERACY.W.3.7:** Conduct short research projects that build knowledge about a topic.
  - **CCSS.ELA-LITERACY.SL.3.1:** Engage effectively in collaborative discussions.
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## Additional Notes for Educators

- **Differentiation:**
  - Provide additional support or enrichment as needed.
  - Adapt activities for students with special needs.
- **Integration:**
  - Incorporate art, music, and literature to enhance learning.
- **Parental Involvement:**
  - Encourage parents to participate in projects or share expertise.
- **Technology Use:**
  - Utilize educational software and online resources responsibly.