Channel Cruiser

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will develop a sequence to solve a problem. We will decompose problems into smaller parts. We will recount an experience using relevant facts and descriptive details. 	 Standards: 4.AP.M.01: Decompose a large problem into smaller, manageable sub-problems to facilitate the program development process. NGSS 3-5 ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. ISTE1.5d: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)

Taxi Cab

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will identify and fix errors in a program (test and debug). We will explore two-dimensional shapes and angles. We will recount an experience using relevant facts and descriptive details. 	 Standards: 5.AP.PD.03: Create, test, and debug a program that includes sequencing, repetition, and variables in a programming language to ensure it runs as intended. NGSS 3-5 ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. ISTE1.5c: Students break problems into component parts, extract key information and develop descriptive models to understand complex systems or facilitate problem-solving.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)

Mega Bus

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will improve a program to meet a specific need. We will test and evaluate solutions to determine whether they meet a specific need. 	 Standards: 3-5.AP.PD.01: Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences while solving simple problems. NGSS 3-5 ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. ISTE1.5a: Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)

Swamp Skimmer

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will identify the parts of an existing program that should be modified. We will carry out tests to identify where a problem can be modified. We will recount an experience using relevant facts and descriptive details. 	 Standards: 3-5.AP.M.02: Modify, remix, or incorporate portions of an existing program into one's own work, to develop or add more advanced features (grade-level appropriate). NGSS 3-5 ETS1-3: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. ISTE1.5d: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)

Extra: Hover Heli

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will describe the choices we've made when creating a program. We will create and test automated solutions. We will recount an experience using relevant facts and descriptive details. 	 Standards: 3-5.AP.PD.04: Communicate and explain program development to peers and adults using comments, presentations, and demonstrations. NGSS 3-5 ETS1-3: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. ISTE1.5b: Students collect data or identify relevant data sets, use digital tools to analyze them and represent data in various ways to facilitate problem-solving and decision-making.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)

Extra: Sky Tram

Subject: STEAM, Science	Topic or Unit of Study: Computer Science
Grade/Level: Grades 3-5	Time Allotment: 1.5 hours
 Objectives: We will use sequences and loops to program models. We will identify and fix errors in a program to ensure it works as intended (test and debug). 	 Standards: 3-5.AP.V.01: Create programs that use variables to store and modify grade-appropriate data. NGSS 3-5 ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. ISTE1.5d: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Synopsis: This unit will develop your students' understanding of computer science as they create sequences and loops, decompose problems, and improve programs to meet specific needs. They'll investigate ways of accurately describing the decisions they've made when creating a program, carry out fair tests, and develop their ability to generate and debug multiple solutions. Your students will recount experiences using relevant facts and descriptive details. This will help them to improve their communication skills.	 Materials: Teacher/instructor lesson plan Teacher/instructor Google Slides presentation Teacher computer with access to internet and teacher presentation Student computers with LEGO Education SPIKE App LEGO Spike Essential kit (one per two students) LEGO Minifigure Bio copy (one) Printed building instructions (optional)