SUBJECT: STEAM Applications	GRADE: 7
Unit Title: Getting Started with SPIKE Prime	**Time Frame: 5 Days**
UNIT OVERVIEW	
Within this unit students will learn how to quickly get started with the LEGO SPIKE Prime system and LEGO Education SPIKE programming environment.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Collaboration and Teamwork: I can assemble my robot with my partner. (S1B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals. **2-AP-10:** Use flowcharts and/or pseudocode to address complex programs as algorithms **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can approach a challenge with computational thinking.	● I can use computational thinking to solve problems. (K1CSA2I4) ● I can change and improve code that already exists. (K1CSA2I3) ● I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) ● I can use the iterative process to solve a problem. (K1CSA2I1)

SUBJECT: STEAM Applications	GRADE: 7
Unit Title: Programming the Hub with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to control the Light Matrix with sequential programming. Students will program the lights to make shapes and display text to give their robot the ability to communicate with the outside world!	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Communication and Empathy: I can program the robot to display messages. (S2B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

	3B-AP-10: Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	● I can use and apply abstraction. (K1CSA1I1) ● I can understand the purpose and outcome of a program. (K1CSA1I2) ● I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	● I can use computational thinking to solve problems. (K1CSA2I4) ● I can change and improve code that already exists. (K1CSA2I3) ● I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) ● I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	● I can gather and use data (K1CSA3I1) ● I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Robot Movement with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to control the basic movement of their SPIKE Prime robot through sequential programming. Students will program their robot to perform simple maneuvers and manipulate objects in its environment.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Critical Thinking and Problem-Solving: I can program my robot to navigate its environment and perform simple tasks. (S4B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**

I can code a program to express an idea or solve a problem.	● I can use and apply abstraction. (K1CSA1I1) ● I can understand the purpose and outcome of a program. (K1CSA1I2) ● I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	● I can use computational thinking to solve problems. (K1CSA2I4) ● I can change and improve code that already exists. (K1CSA2I3) ● I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) ● I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	● I can gather and use data (K1CSA3I1) ● I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Wait Until & Sensors with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to use the sensors on the SPIKE Prime robot. Students will program their robot to perform simple sensing behaviors and respond to objects in its environment.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Adaptability and Flexibility: I can program my robot to adapt to its changing surroundings and accomplish tasks. (D1B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms **2-AP-12:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-DA-05:** Use data analysis tools and techniques to identify patterns in data representing complex systems. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	● I can use and apply abstraction. (K1CSA1I1)

	• I can understand the purpose and outcome of a program. (K1CSA1I2) • I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	• I can use computational thinking to solve problems. (K1CSA2I4) • I can change and improve code that already exists. (K1CSA2I3) • I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) • I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	• I can gather and use data (K1CSA3I1) • I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Loops with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to program the robot to repeat sequences of commands.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Critical Thinking and Problem-Solving: I can program my robot using repeats to more efficiently complete a task. (S4B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms **2-AP-12:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-DA-05:** Use data analysis tools and techniques to identify patterns in data representing complex systems. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	• I can use and apply abstraction. (K1CSA1I1) • I can understand the purpose and outcome of a program. (K1CSA1I2)

	• I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	• I can use computational thinking to solve problems. (K1CSA2I4) • I can change and improve code that already exists. (K1CSA2I3) • I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) • I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	• I can gather and use data (K1CSA3I1) • I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Discrete Directions with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to program the robot to make one-time decisions, repeated decisions, and detect obstacles.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Creativity and Innovation: I can program my robot to make decisions and make decisions based on its environment. (S3B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms **2-AP-12:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-DA-05:** Use data analysis tools and techniques to identify patterns in data representing complex systems. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	• I can use and apply abstraction. (K1CSA1I1) • I can understand the purpose and outcome of a program. (K1CSA1I2) • I can use a variety of variables to store and recall different values. (K1CSA1I3)

I can approach a challenge with computational thinking.	• I can use computational thinking to solve problems. (K1CSA2I4) • I can change and improve code that already exists. (K1CSA2I3) • I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) • I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	• I can gather and use data (K1CSA3I1) • I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Subterranean Challenge with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will demonstrate their ability to decompose an open-ended problem into small pieces, and then iterate on a robust solution to the problem.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Critical Thinking and Problem-Solving: I can break down a large problem into smaller, more manageable chunks. (S4B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms **2-AP-12:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **2-AP-19:** Document programs in order to make them easier to follow, test, and debug. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-DA-05:** Use data analysis tools and techniques to identify patterns in data representing complex systems. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	• I can use and apply abstraction. (K1CSA1I1) • I can understand the purpose and outcome of a program. (K1CSA1I2)

	• I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	• I can use computational thinking to solve problems. (K1CSA2I4) • I can change and improve code that already exists. (K1CSA2I3) • I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) • I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	• I can gather and use data (K1CSA3I1) • I can design and develop a mobile application. (K1CSA3I2)

SUBJECT: STEAM Applications	**GRADE: 7**
Unit Title: Continuous Decisions with SPIKE Prime	**Time Frame: 6 Days**
UNIT OVERVIEW	
Within this unit students will learn how to program the robot to detect obstacles and line track with the use of continuous decisions.	
LRG SKILLS AND DISPOSITIONS	**PA STANDARDS**
Continual Learning and Growth Mindset: I can program my robot to learn about its environment and make decisions accordingly. (D2B)	**1A-AP-14:** Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.. **2-AP-10:** Use flowcharts and/or pseudocode to address complex problems as algorithms **2-AP-12:** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-14:** Create procedures with parameters to organize code and make it easier to reuse. **2-AP-19:** Document programs in order to make them easier to follow, test, and debug. **3A-AP-16:** Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. **3A-AP-17:** Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. **3B-DA-05:** Use data analysis tools and techniques to identify patterns in data representing complex systems. **3B-AP-10:** Use and adapt classic algorithms to solve computational problems. **3A-AP-21:** Evaluate and refine computational artifacts to make them more usable and accessible.
COMPETENCIES	**LEARNING TARGETS**
I can code a program to express an idea or solve a problem.	• I can use and apply abstraction. (K1CSA1I1)

	● I can understand the purpose and outcome of a program. (K1CSA1I2) ● I can use a variety of variables to store and recall different values. (K1CSA1I3)
I can approach a challenge with computational thinking.	● I can use computational thinking to solve problems. (K1CSA2I4) ● I can change and improve code that already exists. (K1CSA2I3) ● I can create programs by creating and testing code in an incremental approach. (K1CSA2I2) ● I can use the iterative process to solve a problem. (K1CSA2I1)
I can navigate various digital devices as a tool.	● I can gather and use data (K1CSA3I1) ● I can design and develop a mobile application. (K1CSA3I2)