LESSON PLAN: Joslin/DeFreece Lesson 1

GENERAL INFORMATION

Lesson Title & Subject(s): Traffic Light Guest Speaker

Topic or Unit of Study: Traffic Light Programing
Grade/Level: 3-8

STANDARDS AND OBJECTIVES

Your State Core Curriculum/Student Achievement Standard(s):

5.AP.C.01 Using grade-appropriate content and complexity, create programs that include sequences, events, loops, and conditionals, both individually and collaboratively.
5.AP.V.01 Using grade-appropriate content and complexity, create programs that use variables to store and modify data.

Lesson Goals:

Students will use active listening and inquiry skills to learn about traffic lights.

Lesson Objective(s):

I can ask and answer questions about traffic lights and how their programmed to be the most effective for their location.

MATERIALS AND RESOURCES

Instructional Materials:

KWL Chart
Guest Speaker (Taylor McCort, District 1, Traffic Engineer)
Pencil/Pen

Resources:

Going Green Video https://youtu.be/7nI57gjhVd8

INSTRUCTIONAL PLAN

Sequence of Instructional Procedures/Activities/Events (provide description and indicate approximate time for each):

1. **Identification of Student Prerequisite Skills Needed for Lesson:**
   What is a finite machine-A finite-state machine (FSM) is simply a state machine, is a mathematical model of computation.
   What is a side channel attack-a side-channel attack is any attack based on information gained from the implementation of a computer system, rather than weaknesses in the implemented algorithm itself

2. **Hook: (5 min)**
   As a class, watch the video Going Green.

3. **Introduction/Direct Instruction:**
   Guest Speaker Taylor McCort, District 1, Traffic Engineer.
   Students will write down as many things that they can about what they know about know about traffic lights. Students will write 3 questions about what they wonder about traffic lights. During the speaking students will check off any questions that were answered and then ask any that they still wonder about. Then they will summarize what they learned about traffic lights.

4. **Culminating or Closing Procedure/Activity/Event:**
   Have each student share out 1 thing that they learned from the guest speaker.

LESSON PLAN: Joslin/DeFreece Lesson 2

GENERAL INFORMATION

Lesson Title & Subject(s): Arduino Traffic Light
Topic or Unit of Study: Traffic Light Programing
Grade/Level: 3-8

STANDARDS AND OBJECTIVES

Your State Core Curriculum/Student Achievement Standard(s):

5.AP.C.01 Using grade-appropriate content and complexity, create programs that include sequences, events, loops, and conditionals, both individually and collaboratively.
5.AP.V.01 Using grade-appropriate content and complexity, create programs that use variables to store and modify data.

Lesson Goals:

Students will code an Arduino traffic light code and then build an Arduino traffic light simulator and test it.

Lesson Objective(s):

I can write a code for a traffic light simulator
I can build a traffic light simulator
I can test my code using my simulator.

MATERIALS AND RESOURCES

Instructional Materials:

Arduino Unos
Red, Yellow, and Green LEDs
3x100 Ohm resistors (color Brown Black Brown)
Computers
Bread Board
Bread Board Wires

Resources:

Arduino Traffic Light Tutorial - YouTube
Arduino UNO Tutorial #2 - Street Light Project (Basic) - YouTube
Arduino Tutorial - #2 Traffic Light LED Project with Code for #beginners - YouTube

Student

INSTRUCTIONAL PLAN

Sequence of Instructional Procedures/Activities/Events (provide description and indicate approximate time for each):

1. **Identification of Student Prerequisite Skills Needed for Lesson:**
   What is a finite machine-A finite-state machine (FSM) is simply a state machine, is a mathematical model of computation.
   What is a side channel attack-a side-channel attack is any attack based on information gained from the implementation of a computer system, rather than weaknesses in the implemented algorithm itself

2. **Introduction/Direct Instruction:**
   Students will start a KWL chart (students need to list as many things as they can under K (what I know), and list at least 3 things in the W (What I wonder).
   As a class, watch the Arduino videos.

Walk the students step by step through building a traffic light simulator.

3. **Independent Work:**
   Students will test their code by uploading their code to their simulator.
   If their code does not work, they need to go back into the code and debug it. If it does work, they will go back into their code and change the timing variables and run it again.

4. **Culminating or Closing Procedure/Activity/Event:**
   Students will complete the KWL chart by checking the things that were answered in the what I wonder section and will complete the L section by summarizing what they learned during the lesson.