

## 3rd and 4th Grade Lesson Plan - Hour of Code

**Objective:** Students will learn and reinforce that a loop is “The action of doing something over and over again.”

### **Standards:**

Strand E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

K-2 Computational thinking and computer programming as tools used in design and engineering.

- 8.2.2.E.1 List and demonstrate the steps to an everyday task.
- 8.2.2.E.2 Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
- 8.2.2.E.3 Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze).
- 8.2.2.E.4 Debug an algorithm (i.e., correct an error).
- 8.2.2.E.5 Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm).

3-5 Computational thinking and computer programming as tools used in design and engineering.

- 8.2.5.E.1 Identify how computer programming impacts our everyday lives.
- 8.2.5.E.2 Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.
- 8.2.5.E.3 Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.
- 8.2.5.E.4 Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).

### **Materials Provided:**

- Graph paper

### **Materials Needed:**

- Colored pencils or crayons
- Chromebooks

### **Mini-Lesson:**

1. Start by showing the movie “Hour of Code Video” that can be found on the PortaPortal under STEM → Coding → Hour of Code → 3rd and 4th Grade.
2. Tell students that we will be starting with an UNPLUGGED lesson. This means that we will be learning about coding but not using a computer.
3. State: Let’s consider a situation when you want to type Hello, World! five times on the computer. That’s pretty simple, but again, let’s consider another situation when you want to type Hello, World! a thousand times. Almost all the programming languages provide a concept called **loop**, which helps in executing one or more statements up to a desired number of times.

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### Procedures:

1. Today, we will be doing an activity similar to the one you did with Mrs. Whittle. There is a mystery picture hidden on the graph paper and you will need to follow the code to make your “robot” arm color in the right boxes on the graph paper to reveal the picture. Are you up for the challenge? You can choose either an easier picture or a harder but more exciting picture. Which will you choose?
2. Allow students to choose whichever one they want. DO NOT reveal the solution picture that is on the PortaPortal. The mystery pictures are a heart and Mario with the heart being the easier one. You can find what these completed pictures look like by going to the PortaPortal then click on STEM → Coding → Hour of Code → 3rd and 4th Grade then click on Easier Heart Solution or Harder Mario Solution.
3. For your reference, if you see a 6 [ → ↘ Red ], this means that 6 times they need to move forward to the next box on the graph and then color in the square they landed on in Red. This is called a “loop”. The one they most often miss is if it reads 6 [ ↘ → ] because they forget to move that last one forward after they color.
4. Have students get started on their pictures. They should be able to do this on their own but...
5. **Make sure to leave about ½ hour for them to work on their chromebooks actually coding.**
6. For their Hour of Code, I have found a new program for them to try. They can find it on the PortaPortal under STEM → Coding → 3rd Grade and STEM → Coding → 4th Grade. I have put a WOW next to it. It should be fun and they should be able to figure it out as there are directions to get them started. If they can't figure it out, they need to drop their “code” into the “Main” box. For the beginning couple of levels, they give pretty clear directions about what to do.
7. When the hour is up, **show them the Mystery Pictures** so they can see what they could have done if they finished as some might not finish. Be sure to congratulate the students on having participated in the Hour of Code. Make sure they bring home their Graph Picture and the code that went with it so they can share their accomplishment with their parents.