All About Butterflies	Kindergarten

Lesson Plan

Coding Tool	Offline coding
Cross-curricular	Literacy & Mathematics

Big Ideas

- Learn the basics of Binary Code
- Learn/Review the life cycle of a butterfly
- Butterfly identification
- Spell out the different cycles of a butterfly's life using binary code

Specific Expectations

- Demonstrate an ability to use problem-solving in a variety of contexts, including social contexts.
- Participate actively and regularly in a variety of activities that require the application of movement concepts
- Use technological problem-solving skills, on their own and with others, in the process of creating and designing (i.e.: questioning, planning, constructing, analysing, redesigning, and communicating).
- Apply the mathematical processes to support the development of mathematical thinking, to demonstrate understanding, and to communicate thinking and learning in mathematics, while engaged in play-based learning and in other contexts.

Description

In this lesson, students will use a binary chart to identify every step pertaining to the life cycle of a butterfly. The objective is for the student to learn the basics of binary coding while learning about butterflies, their life cycle and the different types. They will spell out the steps of the cycle in binary code using the patterns provided on the worksheet and using the binary chart. They will also be identifying different types of butterfly's where they will write the names in binary.

Materials

- Binary Chart (provided)
- Life cycle Handout (provided)
- Worksheet (provided)
- Butterfly Identification sheet (provided)

Computational Thinking Skills

- Identifying the important details needed to solve the problem
- Break the problem down into small, logical steps

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Introduction

- The goal of this activity is to learn/review the stages of a butterfly's life and spell out each step of the cycle using binary code.
- Discuss the life cycle of a butterfly with the students and the different types of butterfly's (you can refer to the life cycle handout and Butterfly identification sheet).
- Next, introduce the word binary. It indicates two. Meaning only two options. (ex: ON/OFF, up/down, or left/right) This is used for computers; however, they only use two numbers: 0 and 1's.
- Share the binary code chart with the students.
- Just like us, computers learn how to read too. They read letters by creating patterns with 8 boxes (called a byte) and every letter has a different pattern. (you can refer to the binary chart handout). When referring to the binary chart, explain that there are 8 boxes, but they are separated into two groups. Each group is called a nibble, and together it is a byte.
- A computer will use combinations of opposites to show a letter but in our case, instead of 0 and 1's, the blank and colored squares will represent a letter.
- Explain that in this activity, the dark box and light box are the combinations for each letter.

Action

Activity 1

- Handout *Worksheet 1* and explain that the binary code is already identified.
- The goal is to find the corresponding letters for each step of the cycle of a butterfly's life and determine the mystery word.
- Handout the Binary Code Chart and complete an example with the first step in the cycle "egg" (refer to reference photos)
- Repeat until they have completed all of the steps for the life cycle of a butterfly.
- We will use the binary code chart to identify each letter for every step of the cycle.

Activity 2

- The goal of this activity is to learn different types of butterfly's and spell out their names using binary code. (They can use colors when completing the worksheet)
- We will use the binary code chart to identify the code to use when spelling out the type of butterfly.
- Handout *Worksheet 2* and explain that the "x" is where they will color in. (refer to reference photos)

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<u>**Accommodations**</u>
- **Activity 1**: The letters can already be in place and the student will simply need to trace over the letter.

Consolidation/Extension

Wrap-Up
- Review the life cycle of a butterfly and ask students to identify different butterflies.
- Binary is a language that computers can use to create letters.

Extension
- Explore the different letters by writing a variety of words that the students will write in binary
- Once the students understand the concept more, remove the x's in the worksheet

Assessment
- Gather all the worksheets
- Observe the correct use of the binary chart
- Ask students if they can identify the different steps in the life cycle of a butterfly
- Ask students if they can name two different types of butterfly's

Additional Resources
- Cited images attached
- Reference photos

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