Unplugged Coding

STEM:
Frog Pond Programming

Kindergarten to 3rd Grade

More Coding Activities:

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Frog Pond Programing

Preparation:
Print all the Pond Cards and if desired laminate them for durability. Print the command cards, cut them out and laminate them. To help the cards stay in place during the activity, you could place magnets on the back of the cards and put the Pond Card on a cookie sheet. Another option is to use velcro dots on the Pond Cards and Command Cards. Create the frog player piece following the directions on the page with the player piece.

Instructions:
In this activity students create a series of commands that move a frog across the pond.

How to Play the Game:
Objective: To get the frog from the Start Block to the Finish Block in as few moves as possible.

Rules:
1) The frog starts on the the green Start Block facing into the pond.
2) The frog can only jump from Lily Pad to Lily Pad.
3) The frog can only do one movement at a time.

Commands Cards (movement descriptions):
1) **Forward:** Move one square forward in the direction the frog is facing.
2) **Turn Right:** Rotate to the right while staying on the same square.
3) **Turn Left:** Rotate to the left while staying on the same square.

Playing the Game
Version 1:
Have the student place the frog on the green Start Block facing into the pond. Then have the students select a Command Card and place it in the first square of the Command Sequence Box. Then have the student move the frog following that command. Then have the student select and place a second command and again have the frog follow that command. Continue this process until the frog reaches the red Finish Block. Then have the students place the frog at the start block again and follow the command sequence they created. If you have more than one student working on the activity, have student trade their completed sequences and then try to follow their classmates commands sequence.

Version 2:
Have the student place the frog on the green Start Block facing into the pond. Then have the students select a Command Card and place it in the first square of the Command Sequence Box. Have the students continue to select and place cards that they think will move the frog across the pond correctly. Once they have created a complete sequence, then move the frog forward following their sequence to see if they can successfully reach the red Finish Block. If there is an error, have the students remove all cards from that point on and try to create a new ending sequence. Then have students move the frog back to the Start Block and complete the new sequence. Continue until they reach the red End Block without any errors.

Pond 1:

Going up
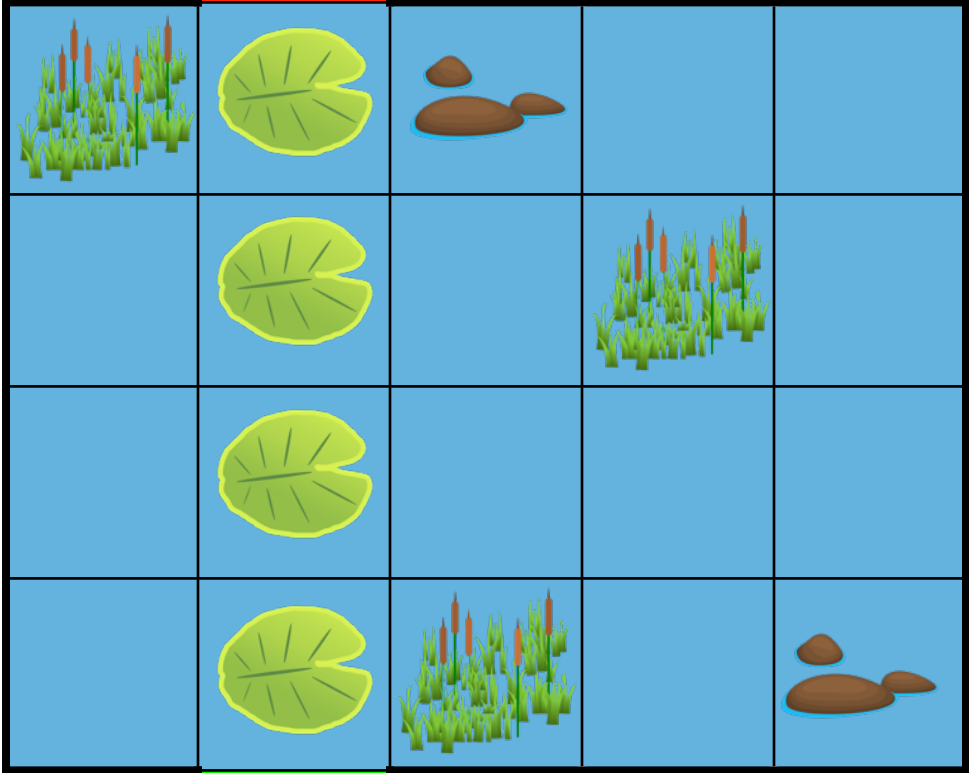
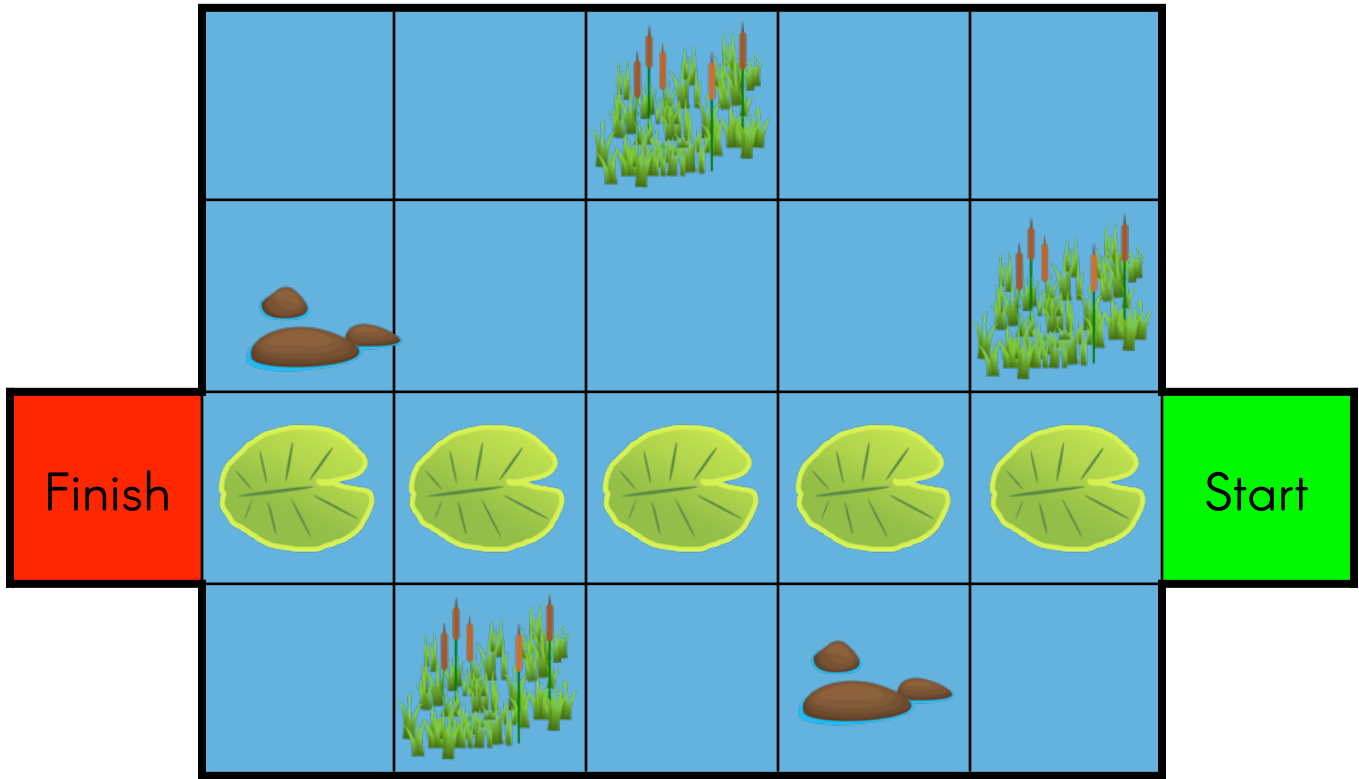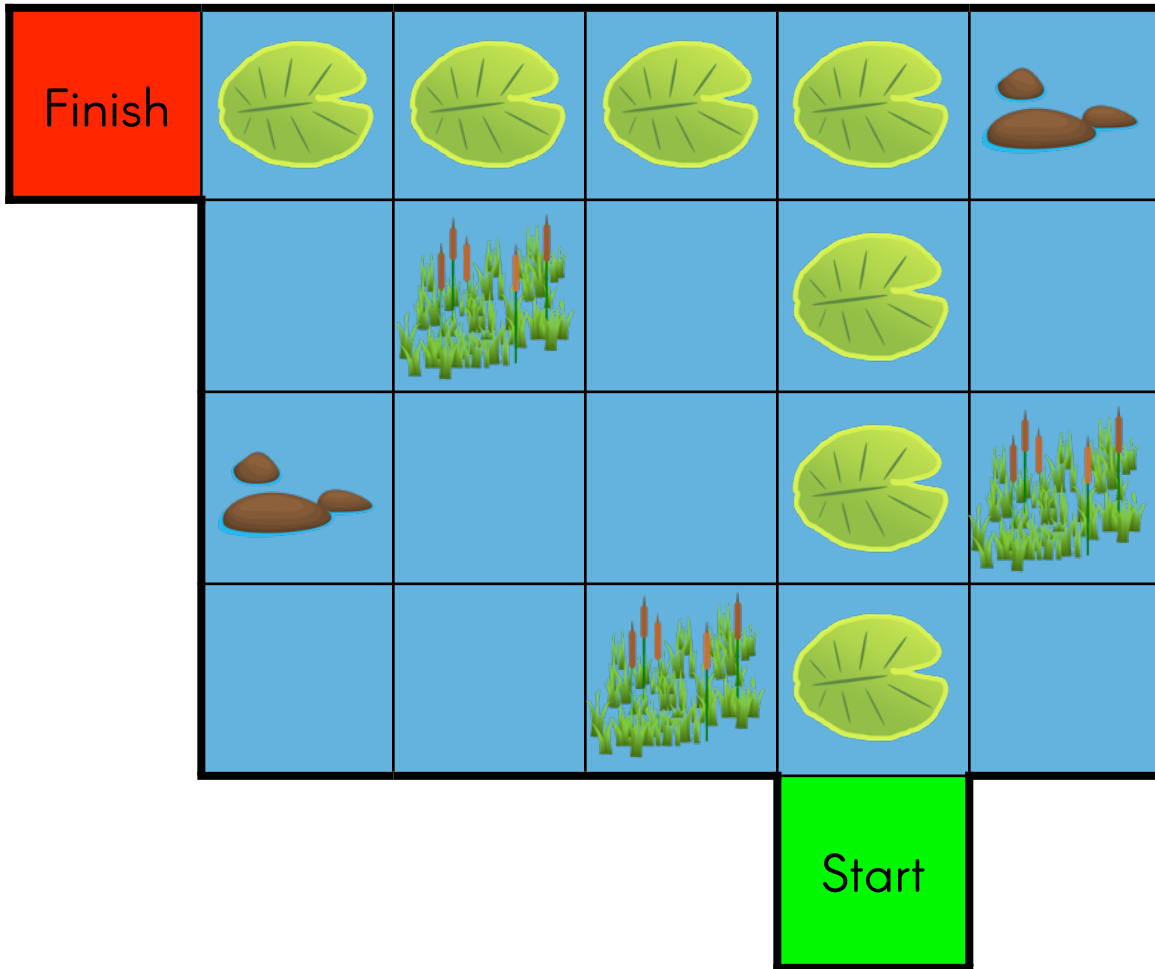## Command Sequence Box:

Pond 2:
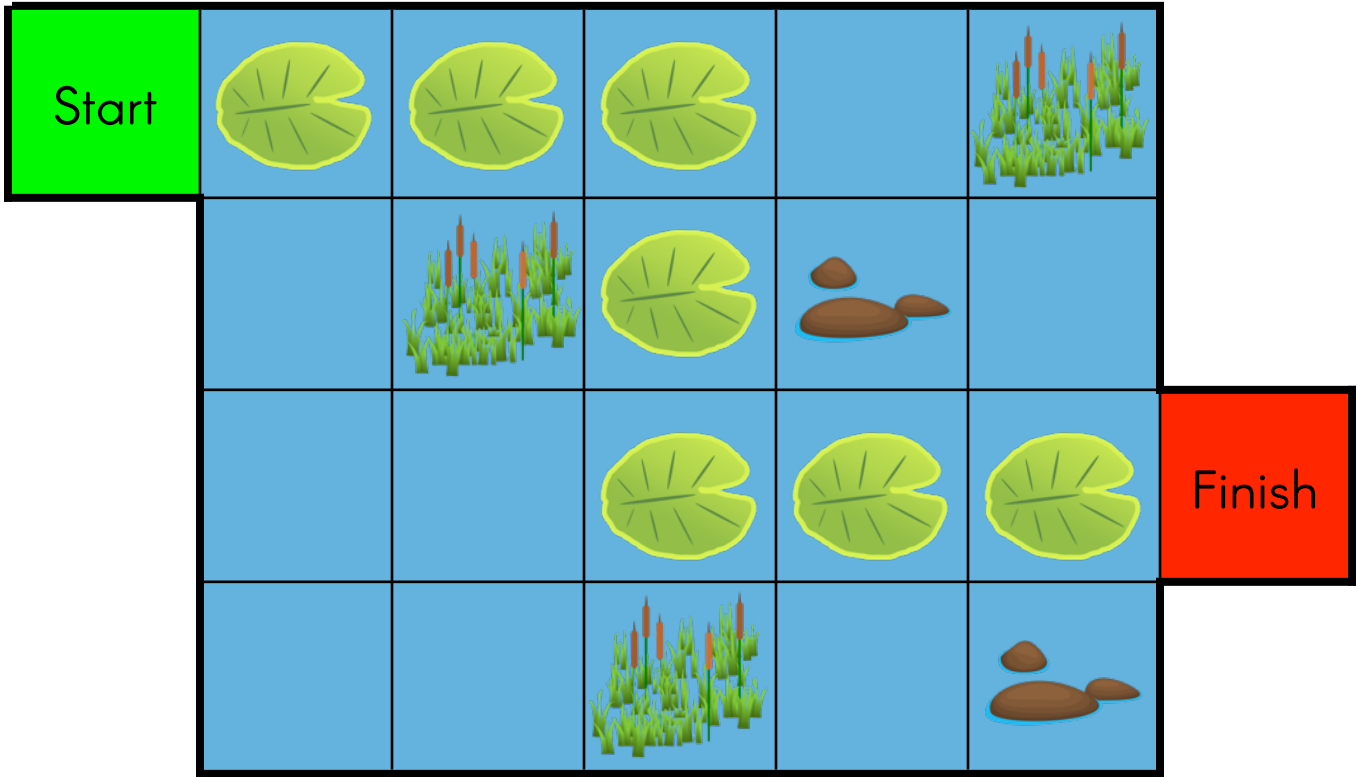
Getting Across

Command Sequence Box:

Pond 3:

Around the Bend

Finish

Start

Command Sequence Box:

Pond 4:

Double Turn

Command Sequence Box:

Start

Pond 5:
Watch the Detour
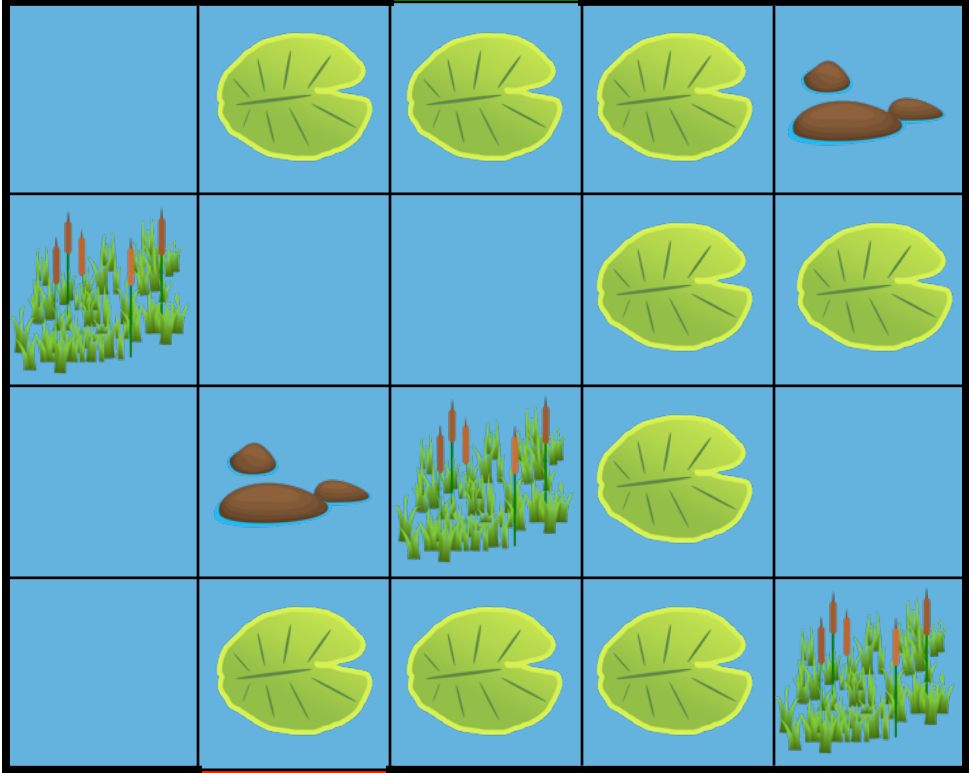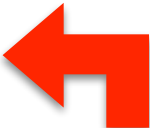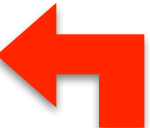
Finish

Command Sequence Box:

Print and cut out the command cards below. Print and cut out the frog player piece alone the solid lines. Fold along the dotted lines and glue the back of the two frog pictures together to create a playing piece that stands up and has a base of one square block.

Command Cards:

↑ Forward	↑ Forward	↑ Forward	↑ Forward
↑ Forward	↑ Forward	↑ Forward	↑ Forward
↑ Forward	↑ Forward	↱ Turn Right	↱ Turn Right
↱ Turn Right	↰ Turn Left	↰ Turn Left	↰ Turn Left
↑ Forward	↑ Forward	↑ Forward	↑ Forward

Player Pieces:

Answer Key

Possible Solution for crossing the Ponds.

Pond 1: Going Up

Forward ↑	Forward ↑	Forward ↑	Forward ↑
Forward ↑			

Pond 2: Getting Across

Forward ↑	Forward ↑	Forward ↑	Forward ↑
Forward ↑	Forward ↑		

Pond 3: Around the Bend

Forward ↑	Forward ↑	Forward ↑	Forward ↑
Turn Left ←	Forward ↑	Forward ↑	Forward ↑
Forward ↑			

Pond 4: Double Turn

Forward ↑	Forward ↑	Forward ↑	Turn Right →
Forward ↑	Forward ↑	Turn Left ←	Forward ↑
Forward ↑	Forward ↑		

Pond 5: Watch the Detour

Forward ↑	Turn Left ←	Forward ↑	Turn Right →
Forward ↑	Forward ↑	Forward ↑	Turn Right →
Forward ↑	Forward ↑	Turn Left ←	Forward ↑