PUPPY PROGRAMMING

Learn to program without a computer!

Curriculum topics

- Programming
- Spatial Thinking
- Problem Solving
- Patterns

Subjects

- Computer Science
- Physical Science
- Mathematics

Grade range: 3 – 8

Who we are: Resource Area for Teaching (RAFT) helps transform the learning experience by inspiring joy through hands-on learning.

Lead the puppy to the tennis ball by giving exact directions, programming the puppy's path. This fun and easy activity reinforces programming techniques such as planning, sequencing, testing, debugging, and creating procedures and loops.

Share Your feedback!
http://bit.ly/RAFTkitsurvey

Materials

Materials in the kit may vary but generally, this kit contains the following:

- Program board with holes (1)
- Corks or equivalent cylindrical items (13)
- Basic direction card set, white (1), visit https://bit.ly/3rWTDR5
- Advanced direction card set, yellow (1), visit https://bit.ly/3rWTJbp
- Game pieces: Puppy pattern (1), Ball pattern (2), visit https://bit.ly/3u4Rq8R
- Adhesive circles or equivalent (2)
- Game token, flat (1)

To Do and Notice

1 Cut the puppy and ball patterns apart. Fold the puppy pattern along the dotted lines (see below). Use an adhesive circle to secure the puppy to a cork. Attach the ball pattern to the flat game token.

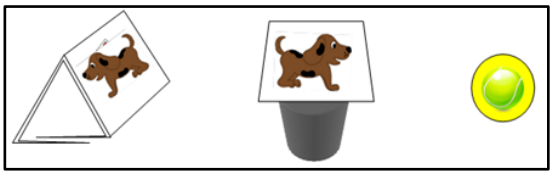
2 Place the puppy game piece at the desired starting point and the ball token at a finish point. **Note:** The direction the puppy game piece faces only matters if using the advanced direction cards.

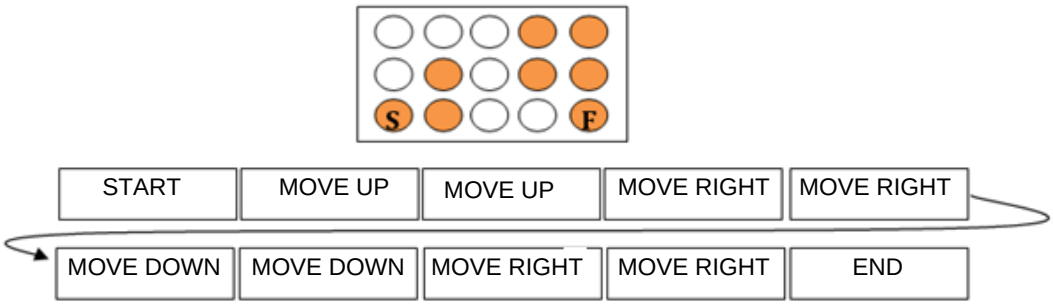
3 Create an open maze by using the corks as barriers to fill some of the spots and create turns in the path. The path should not require diagonal movement (see below).

4 Arrange the direction cards (basic or advanced) in the correct order to direct the puppy from start to finish without running into any spots that are blocked. The program completes when the puppy lands on top of the ball. Stack the ordered cards, which represent a program.

5 Follow the directions on your stacked set of cards and see if the puppy can land on the tennis ball. If the program does not work, correct (debug) the program so the puppy gets the ball.

6 **Share** your Puppy Programming exploration with RAFT! Submit photos/video via email at education@raft.net or on social media (Facebook, Twitter, Instagram).





Core Content Skills:

Science & Engineering (NGSS)

Developing and Using Models, Analyzing and Interpreting Data, Developing Possible Solutions, Constructing Explanations, Engaging in Argument from Evidence, Optimizing the Design Solution

Social Emotional Learning

- Self-awareness
- Self-management
- Responsible decision-making

The Content behind the activity

A **program** is a set of exact instructions that a programmer writes to tell a computer how to do a task. A **procedure** is a list of step-by-step instructions within the program that the computer executes. A **loop** is a set of instructions that are repeated.

Using the basic cards reinforces the importance of order. The advanced cards add the element of direction, along with a repeat function. The repeat card introduces the student to **loops**, which repeat a set of instructions a given number of times or until a certain condition is reached.

Writing a good program requires planning and foresight to anticipate how the computer will react to a command or set of instructions. Occasionally, though the program follows the instructions, it does not get the desired result. It is up to the programmer to **debug** the program by going over the instructions and correcting any errors.

Reuse

This kit uses 100% reusable materials designed for other uses. To continue making a positive impact in reducing waste, reuse these materials in other projects. Additionally, any unused materials can be collected and delivered back to RAFT.

Feedback

Please comment on this kit by taking this short survey: http://bit.ly/RAFTkitsurvey. Let us know of any material concerns (missing, broken, or poorly fitting parts) as well as any suggestions for improvement.

Visit https://raft.net to view related activities!

Caesar Cipher Disc
Puzzling Directions
Binary Dots
Binary Birthday Bracelets

Resources

- Learn to code - http://code.org/learn
- Community for coding and support - https://www.madewithcode.com/