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UNPLUGGED CODING ACTIVITIES FOR PRE-SCHOOLERS

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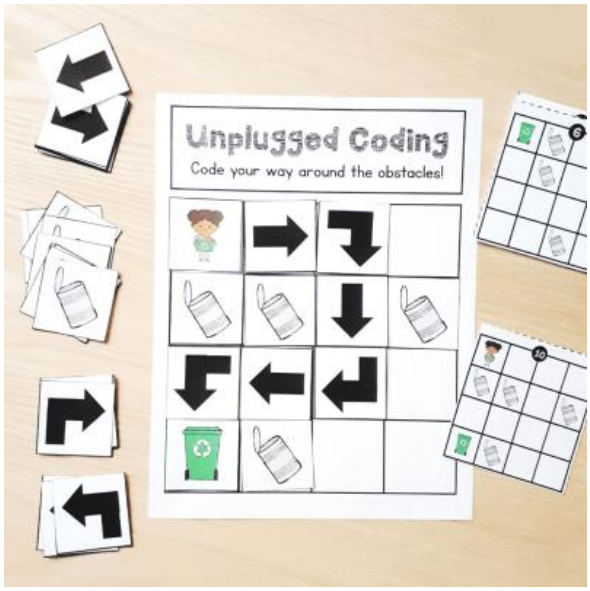
„CALL – Creating A Learning Love“

Created by:
Spain - Pilar Rodríguez Buendía, CEIP Mª Luisa Cañas
Turkey - İsa Reşber, Adnan Menderes Primary School
North-Macedonia - Ljiljana Krstevska, JUDG Detska Radost
Bulgaria - Svetla Popova, Kindergarten “Latinka”
Estonia - Anneli Mõtsmees, Lohkva Kindergarten

UNPLUGGED CODING ACTIVITIES FOR PRE-SCHOOLERS

A- What is coding?

Put simply, Coding is the method of communicating with a computer. It is using a language that a computer understands to give a computer instruction in order to perform specific functions. Coding allows us to create things such as computer software, websites, apps, and video games. Growing up in a digital world, coding for pre-schoolers is just as important as it is for them to learn to read and learn math. Preschool coding activities can set down the foundation for helping kids start to think like computer programmers.



Anyone can learn to code. Coding is giving your computer instructions using a language it understands, that can then produce a specific result. There are various types of different code, depending on what you want to develop. Moreover, different "programming languages" that each have their own set of rules. Many seem to think it is just for adults but that is not the case. Coding can also be for children as young as pre-schoolers.

B- How can we introduce coding for pre-schoolers?

At a preschool level, we need to first lay down the foundations for children to think like computer programmers. You don't even need a computer for our unplugged preschool coding activities.

C- What are the benefits of learning to code?

Coding helps teach problem-solving skills. Coding helps children develop new ways of thinking by breaking up big problems into smaller steps. Coding helps take the fear out of making mistakes or failing. It teaches persistence in finding a way to solve your problem. Coding for pre-schoolers is generally best introduced through fun hands-on games and activities that make kids think like computer programmers. Therefore, activities that promote logical thinking, and have a problem to solve are a perfect choice. Children learn best when they are having fun. Through fun and engaging activities, they won't even realize they are learning the skills needed to code.

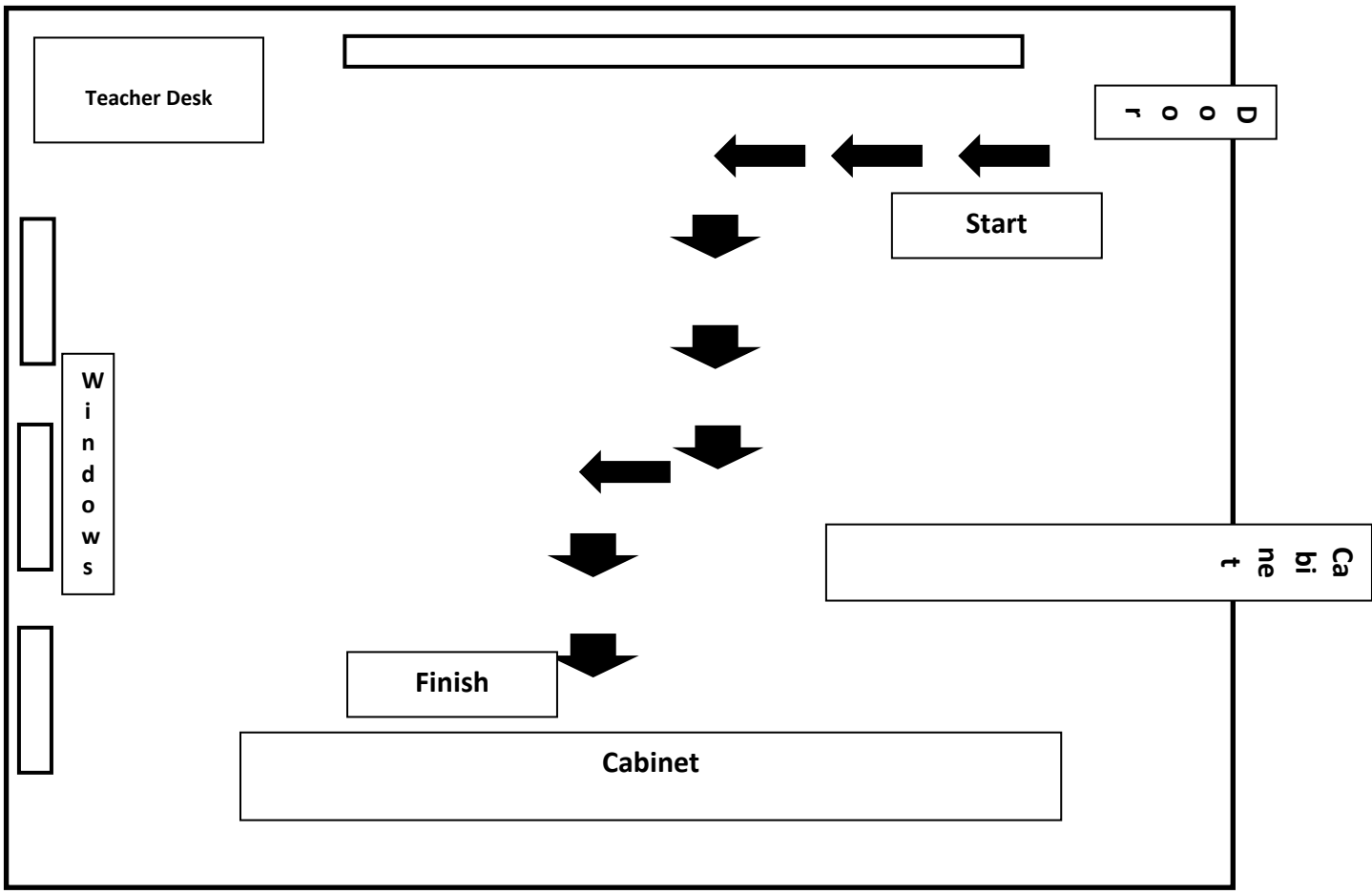
ACTIVITIES

1. Go on a Treasure Hunt

A treasure hunt requires many of the skills that computer programmers use when coding. By creating a treasure hunt with instructions and directions, children can follow to find their treasure. This teaches children about algorithms, a set of instructions to help a computer perform a specific task. There is no preparation required for this activity! Simply place "treasures" anywhere in the classroom or playing area, then draw a map with instructions using an arrows mark.

Example:

Take 3 steps STRAIGHT, turn LEFT and take 3 steps
Turn RIGHT and take 1 step, turn LEFT and take 3 steps
Lift the cover to find the treasure.
If they make a mistake they must go back and start again (debug the code!) until they find where the treasure is hidden.



2. Team Work

Materials: None

Teaching-Learning Activities

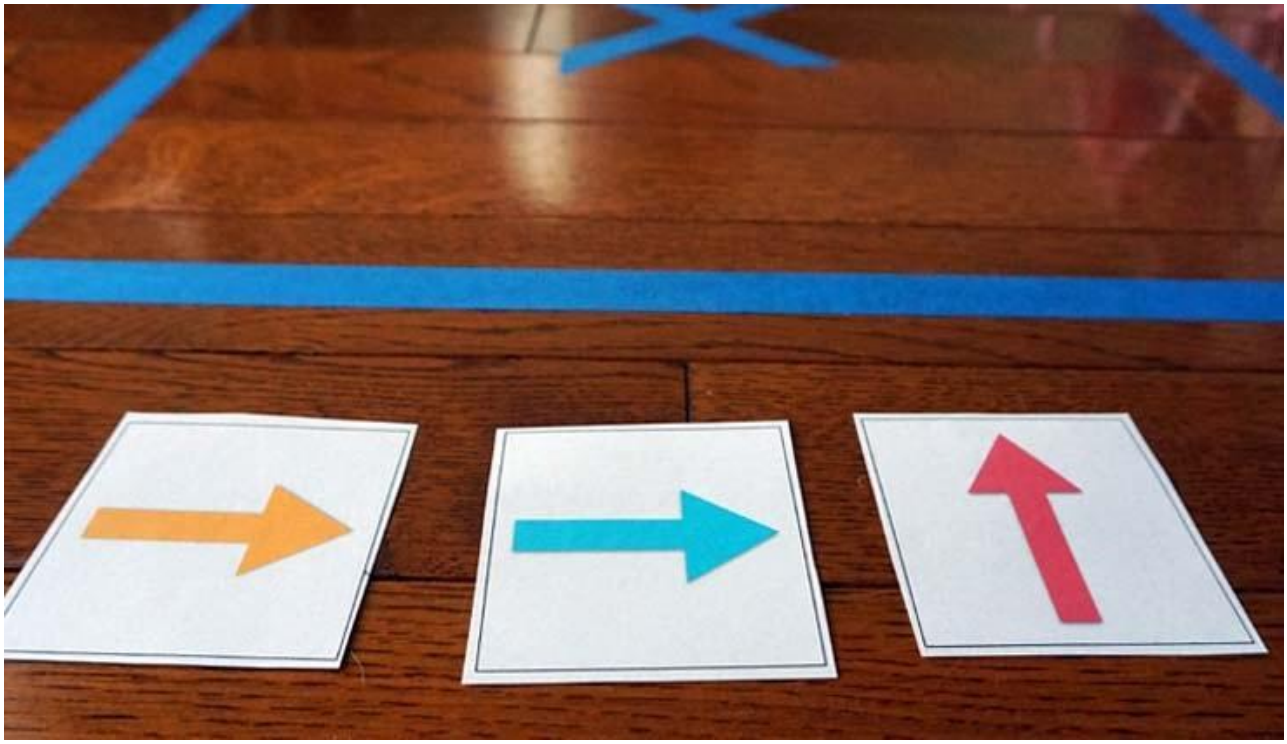
- One partner is the “coder” and one partner is the “robot”.
- The coder decides on a simple task for their partner “robot” to do; the simpler the task, the better, like “walk across the room.”

-Next, the coder gives their partner “robot” step-by-step instructions, also known as an algorithm, to complete the task. “Robots” need to remember that they can only do exactly what their coder tells them to do.

-If one of the steps is incorrect or not specific enough, this will result in a bug in their algorithm and it will need to be redone.

-Switch places when finished.

Coding Connection: Computers need an explicit sequence of instructions to do anything. As a result, there will be bugs and the program won’t work correctly if instruction (code) is not clear enough.



3. Follow the Leader

Materials: None

Teaching-Learning Activities

- Teacher is the leader and the pupils are the followers.

- The leader starts by giving simple instructions in the format of an If…Then…statement. For example: "If I touch my nose, then you touch your nose" or "If I jump once, then you jump once" etc. Try out a few actions.

- To increase difficulty, the leader can specify outcomes that are different from the condition. For example: "If I jump once, then you jump three times" or "If I spin in a circle, then you clap your hands".

- The leader can perform them at random! In addition, the leader follows all the pupils.

- One pupil will be a leader when finished.

Coding Connection: A new condition from the leader can change the action performed by the follower, just as if a condition in code can change the path a computer program takes.

4. Beaded Bracelets

Individual

Materials: Multi-coloured beads, string

- Cut a piece of string so it is just longer than wrist-size. Tie a knot at the end of a string.

-Decide on a pattern of 3 beads that you want to repeat multiple times in your bracelet. For example, Pink–Blue–Pink. We can call this set of beads a “function”.

-Start stringing beads onto the yarn. After 5 beads, add your first “function”. In this example, this means the pattern of Pink-Blue-Pink.

-Add 5 more beads. Then, add your function again. Repeat this process until the string is full with beads.

-Tie a knot on the other end and display your finished bracelet!

Observe – How many times were you able to repeat the function beads?

Coding Connection: Each bead represents a line of code. Programmers will often want to use certain lines of code repeatedly throughout a program, so they store that code in a function. The repeating bead pattern is one easy way to visualize this process! Throughout a program, so they store that code in a function. The repeating bead pattern is one easy way to visualize this.

5. Nature Scavenger Hunt

Individual, Pairs, or Groups

Materials: Basket for collecting (optional)

How to Play

- Head outside into nature.
- First, pick a specific property by which you want to categorize nature objects. Examples include colour, shape, texture, smell, etc.
- Then, choose a value that you will search for. For example, if the property is “colour”, then the value could be “yellow” or “purple“.
- Collect nature objects based on the property and value selected
- When finished, challenge a partner or family member to guess the property value you identified. Did they guess right?
- As an extension, try instead to collect a wide range of natur objects. Bring them back to a work space, and categorize them by different properties. For example, first sort by colour, then sort by shape, and by texture. How many categories can you identify?

Coding Connection: In code, properties can determine the output of a program, or what a user sees. Similarly, an objects’ properties in the real world can impact how we see and compare them.

6. Feed the Mouse

This game teaches children about algorithms, which is a group of instructions written by the programmer to tell the computer what to do. They will also learn the concept of debugging, which is how to fix a problem in a program. In this game, teachers and parents can design a path for the mouse using a deck of cards and place some yummy treats for him throughout the path. The objective of the game is to move the mouse through the path without missing any treats on its way.

Materials: A deck of cards, a toy mouse, a few toy yummy treats

How to play

One child acts as the Computer (who moves the mouse by listening to the programmer's instructions). The other child acts as the Programmer (who gives the commands). The Programmer gives verbal instructions like "move forward" (state how many card spaces), "move backward" (state how many card spaces) and "turn right" or "turn left" to guide the computer/mouse throughout the path without missing any of the yummy treats.

The challenge level of the game can be increased by creating a more complex maze and putting obstacles in pathways that the mouse has to escape from or maneuver around.

7. Tricky Tower

Every child needs a set of six different coloured DUPLO bricks.

Children separate their bricks and lay them out in any order. Then they balance all their six bricks, short end to short end, building a tower. Children try changing the hand they use when building. Try different ways to balance the bricks to create a tower without clicking the studs together. Try using left or right hand, only one or two fingers to pick up bricks.

Then try to Build towers in pairs. In pairs, children combine all their bricks to build a tower by balancing bricks.

Guiding questions

• How did you balance your bricks? (in turn, let some of the children explain what they did)

• If you have to try a new way of balancing the bricks, what will you do?

• How did you build your tower? (Let the children explain and demonstrate with their bricks)

• What makes a tower stable? How do you make the highest or shortest towers?

• What is different about a building with 12 bricks?

• What is helpful or hard about working in Pairs?

8. In the big, big house with small, small rooms

Team game / Individual game

Materials: Worksheets, colored felt-tip pens

How to play

- The teacher is the "coder" and the children are the "robots".

- The encoder gives worksheets on which in a square / "house", divided into 9 small squares / "rooms", 9 different objects / symbols are depicted. This is a common big "house" in which the objects / symbols live in different "rooms" = 9 small squares in the big one.

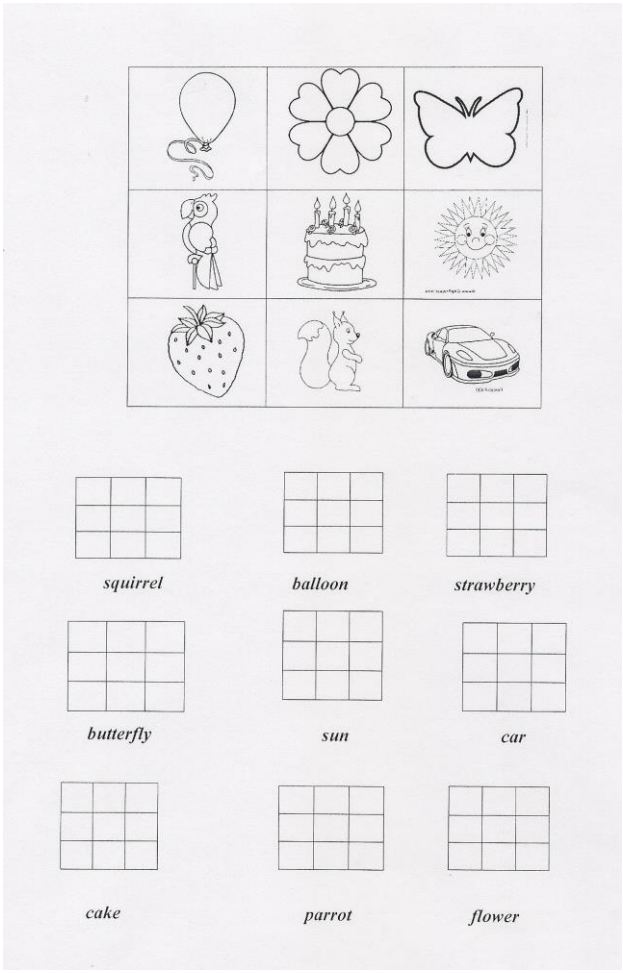
- In the lower half of the worksheet there are scaled-down versions / "houses" of the upper big "house". The big "house" is multiplied 9 times in a reduced version.

- The robots / teams on a given task from the encoder look for the exact room of the specific object / symbol in this large "house" and colour the corresponding "room" in the lower small grids.

The team / child is free to choose one colour to colour the lower small squares.

Option 2 - The coder defines a different colour for each individual "room" in which the 9 objects / symbols live.

Coding Connection: The teams / the child need very clear instructions on how to find and mark certain items. They need consistent instructions to follow step by step. If the instruction is violated, the program will not work properly.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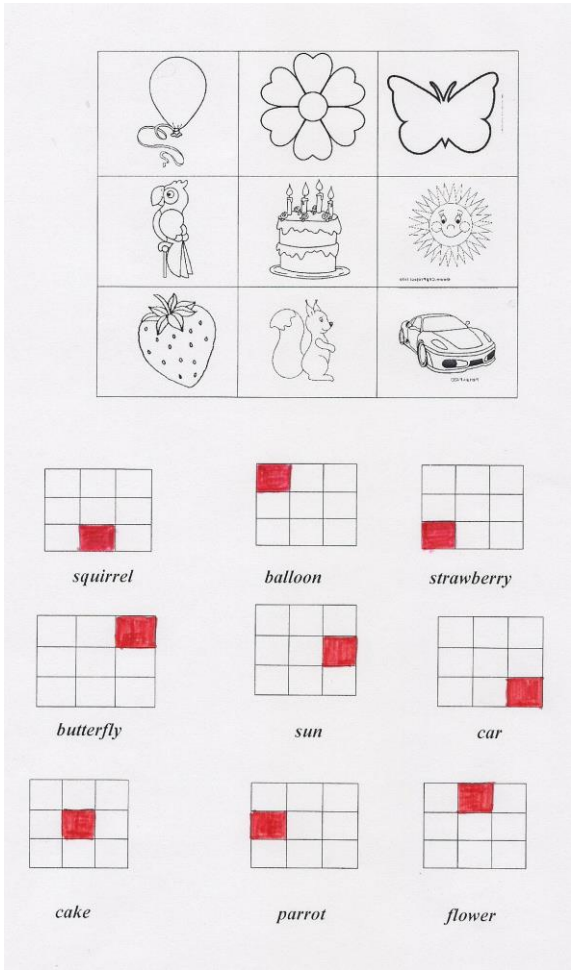
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9. Hidden messages

Team game / Individual game

Materials: alphabet letters and codes

How to play:

It is a proposal suitable for students of any age. It is only necessary for the teacher (programmer) to develop more complex codes.

The master is the encoder. The teacher provides the students with symbols associated with letters of the alphabet.

The teacher also provides a simple message that the students must encode.

Mode 1: The children must discover the message that is encoded.

Mode 2: Children must code their own messages.

Children must pay attention to the code that corresponds to each of the letters of the alphabet. Then all the students in the classroom can play to create and decipher their own encrypted messages.

Coding connection: The instructions to create computer programs are designed from systems of numerical codes and symbols. Any error in the encoding or decoding of the message will cause a crash in the execution of the instruction.

10. Follow the rabbit footprints

Type of activity: Movable activity

Goal:

- Development the ability for initiation of something or somebody, ability for grouping the objects with common features
- Enhancing attention and tracking directions
- Respecting the rules of the game
- Participants: 25 children

Age: 5-6 years old

Materials: Chalks in color.

Duration: 25 minutes

Description of the game: We draw signs (animal footprints), geometrical forms and letters with colored chalks on a concrete path. The children are lined up. On a given sign by the teacher, the activity starts. The child stands on the animal footprint. Then the child should follow the signs on the path and to do as marked, to spin in a circle, jump like a rabbit.

Instructions: The activity ends when the last child go throw the path.


EAGLE

11. Then yes/ then no

Materials: coloured pencils, scissors, glue and cardboard.

How to play:

Students will develop their creativity through their oral expression. Together, they will decide, with the help of the teacher, the message they want to transmit, that is, the order that the rest of their classmates have to carry out.

The teacher asks the children some simple conditional sentences that are known to them, such as: “If I go to school on a Sunday, the door will be closed”

The boys and girls try to express what two things could happen:

THEN….

• The school gate will be closed

• The school gate will be open

They represent it on cardboard.

Coding Connection: The programming of computers, based on codes, has to follow logical routes. If any of the paths are not logical, the response is wrong.