

# Puzzle game

*The puzzle game is intended to teach young children how a Python coding language turtle works. It does this by using a variety of different types of puzzles as well as repetition and association based memory exercises.*

## Definition of Puzzle game

The puzzle game is an activity which tests a person's knowledge and ingenuity. The player is expected to logically combine each piece together, to achieve the correct solution of the puzzle game. Puzzle games generally include shapes, symbols and colours, the learner has to make them into a definite pattern. (Playwithbeb.2012)

The puzzle game is often be used as an entertainment activity that can engage learners in a fun and creative way, it can also teach learners some serious mathematical and logistical problems.

## What is the turtle function of python?

Python turtle graphics can be considered as a feature to let users to draw programmatically. Or it can be clearly described that it is a function that let the computer draws an image automatically by after received directional commands (Forward, Left, Right and Backward).

## Type of Puzzle game

There are different types of puzzle game which can be divided based on its content.

Type	Environment to play	Brief description
Action/Arcade puzzles	Real-time, time-limited	Requires player to manipulate pieces within a real-time environment. Limited time to solve
Hidden object puzzles	Paper/Picture based, indoor	Find an item from the item list in the picture
Reveal the picture puzzles	Paper/Picture based, indoor	Piece by piece to reveal a picture
Physics puzzle game	Outdoor, APP based, online(optional)	Use physics of the game to complete
Traditional puzzle	Any	Such as mahjong solitaire, word puzzles

(Playwithbeb.2012)

## Confirm target participants

Based on the table from the last paragraph, the puzzle game directly aims young learners coming from the beginning level. The puzzle game helps young learners understand basic STEM principles. The reason why selects beginning level is:

1. Young learners can easily accept a puzzle game since the puzzle game does not contain complex steps and rules.
2. Young people are more likely to participate in the puzzle game since the colours, images and blocks are attractive at that age.

3. Young students can study with their daily experience comfortably instead of losing motivation. (For example, if young learners have no experience about “linear equation in two unknowns” and they have to study from textbook directly, they are easy to be confused since nothing related to the math content in their daily life at that age.)  
(Joshua, December 2013)

## Planning of Puzzle game

The outline of the puzzle game is at the table below.

**Outdoor Puzzle game outline**

Game name	# of learners in a group	Expected finish time	+ Outcome	Risk might happen	Behind Concept
Go to the point!	10 people per group	5 mins preparation, 15 mins walking	Know how to use the programming language to achieve the goal	Some participants cannot find group member, lost	Python turtle graphic. e.g. forward (), left ().
Matching words body exercises	3 people per group	5-8 mins	Know the basic structure of programming, improve body health	Same as above	Basic programming structure. e.g. Print (“hello world”)
Which part is missing?	Whole class	10 mins	Able to use knowledge from the last two acts in this game, learn to use	Some participant might not engage / cannot identify	Basic programming structure & Turtle graphic

## Content Proposal – go to the point

The camping and school trip would be the best two activities for us to engage young learners with our STEM activities. Here is the expected planning example:

Step 1: While we are walking to the camping, we used the paper card with symbols and words to let young learners remember the relationship between the symbols and coding words.

For example, the “↑” = forward () = go straight, the “→” = left () = turn left

Step 2: We give students small map and paper with text description which has coding language on it. We want students to find the camping location by using the paper and draw the symbol on the paper for recording route. Students have to be divided into

different groups in order to make sure they are safe. Each team has a tutor who just follows rather than give any information.

Description example:

Looking at the map! Identify the start point first! Here we go! From the start point, forward (100 meters), when you see the first corner, left (), then forward (50 meters), when you see me, sit down and circle ()......

### Content Proposal – Matching words body exercises:

I know kids are so hungry, let's eat lunch first! After lunch, we suggest young learners do body exercise activities. Here is an example of how to do:

I will hold the paper card which is from the last activity.

Hold

Both Forward (1 step) and circle (2 times), the young learner will go straight 1 step and do self-rotation 2 times

Hold card of "pen down ()", students will crouch.

### Content Proposal – Which part is missing?

The tutor will show paper cards first, but some parts are missing. The tutor will now do an action as same as the student does from the last activity. Then, the students need to identify which paper card should be added based on the tutor's motion. For example:

The tutor goes straight 2 steps, crouch, stand up and

Cards that tutor shows: Forward(?),? , pen up()

Students: first "?" is 2, second "?" is pen down ().