Lesson Plan: Let's make polyomino

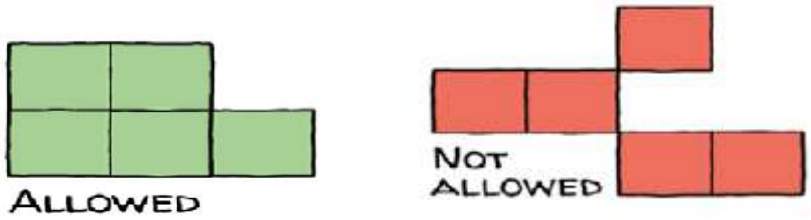
Teacher: Eray Demirçelik

Subject: Maths

Title : Lesson	**Time :** 40 minutes
Subject : Let's make polyomino	
Aim: Ability to make polyomino applications	
Key CS elements: decomposition, pattern spotting, abstraction, practicing algorithms	
Age group : 7th graders, 13 year olds	
Learning situations: classrooms, ICT lab	**Activity type :** critical thinking
Resources : computer, cubes, mental map.	

Learning development:

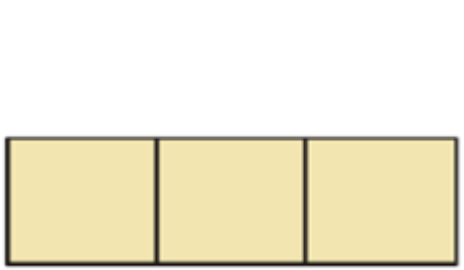
A polyomino is a polyform which consists of squares. Each square shares at least one side with another square and the squares are connected by their shared sides.

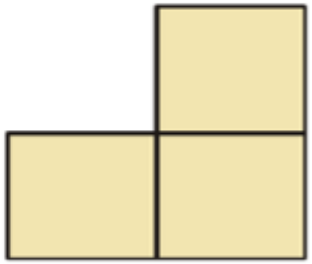


First we identify the problem: a. Draw a polyomino using three squares. b. How many different polyominoes can you draw?

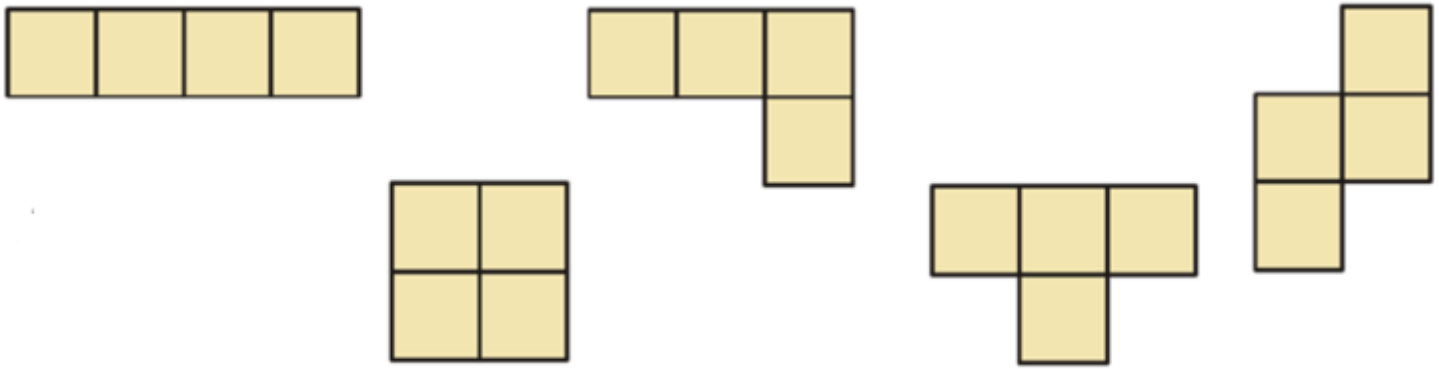
1. **Decomposing:** We break down the problem into smaller, manageable segments.
   Finding all polyominoes formed in 3 squares

2. **Model recognition:** Showing polyominoes in 3 frames
   Two different polyominoes.

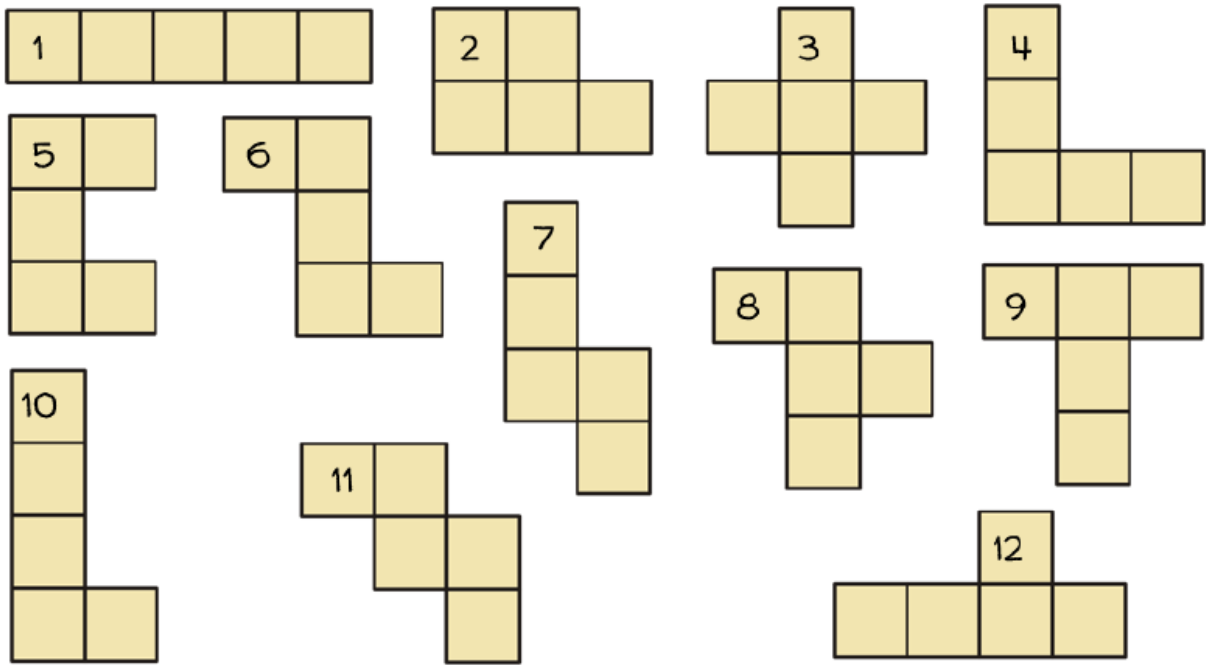




3. Abstraction: Draw all polyominoes that consist of four squares. b. How many different polyominoes can you draw?



4. Practicing algorithms: a. Draw all polyominoes that consists of five squares. b. How many different pentominos can you think of?
12 different pentominos. Number your own solutions as in the picture under.



Steps:

Step 1. We pay attention to signs (causes).

Step 2. We need to know what the polyominoes

Step 3. We need to find quick solutions:

Problem identification: A clear definition of the problem should be made.

• Dimension identification: Dimensions to be considered to solve the problem What are they? The dimensions of the problem are analyzed, the different perspectives put forward can reveal possible parameters for solving the problem.

• Features: It is necessary to reveal the different features of the dimensions of the problem. Generating as many ideas as possible and

thinking flexibly here is important.

• Combination: Solutions are produced by combining different qualities and different dimensions.

• Evaluation: Produced possible solutions and ideas are evaluated. Which solutions Is it more likely and feasible? Which solutions are dysfunctional? (the non-functional X is used in the matrix for solutions and is not included in the evaluation).

• Implementation: The solution/idea chosen in the context of the criteria can be put into practice

Assessment: Monitoring the students responses

Expected results: Students learn about polyominoes. Know how many polyominoes can be created using different numbers of times.

Notes:

Students know from previous lessons information about the listed polyominoes

- We begin by formulating the problem in such a way as to challenge the students to find the solution through a new method.
- We explain to them that in order to solve the problem we have to follow several stages:

1. break it down into smaller segments;
2. find common elements;
3. eliminate unnecessary information and keep only the essential;
4. find the steps that help us reach the final solution;

- Students should be encouraged to come up with as many ideas as possible;
- At the end, the students must feel the satisfaction of having reached the correct solution.