

<b>Title</b>	<b>Learning Etamin Embroidery with Computational Thinking</b>	<b>Time</b>	2 hours
<b>Subject:</b>		<b>English Language, Art/Computer Science/Interdisciplinary</b>	
<b>Aims</b>		<b>General competence<sup>1</sup></b> : Awareness of computational thinking concepts to create a etamin embroidery. <b>Specific competence<sup>2</sup></b> : Allowing students to deepen their understanding of computational concepts by making a handcraft. <b>Aim of the activity:</b> <b>How to make etamin embroidery with Computational Thinking</b>	
<b>Key CS elements:</b>		Decomposition; Pattern recognition; Abstraction; Algorithm design.	
<b>Age group :</b>		<b>12-14 year old</b>	
<b>Learning place:</b>	<b>Çetin Şen Science and Art Center</b>	<b>Activity type:</b>	<b>extracurricular</b>
<b>Resources:</b> <ol style="list-style-type: none"><li>1. Websites or apps about handcrafts.</li><li>2. Computer/ mobile phones with internet access.</li><li>3. Etamin cloth</li><li>4. Embroidery thread (different colors)</li><li>5. Embroidery needles</li><li>6. Scissors</li><li>7. Design templates (simple patterns for beginners)</li><li>8. Graph paper for planning design</li></ol>			

## Learning development:

### Problem definition:

Students will learn the basics of etamin embroidery and apply computational thinking methods such as decomposition, pattern recognition, abstraction, and algorithm design to plan and execute their own embroidery project.

### Introduction

1. Briefly introduce Etamin embroidery, its history, and significance.
2. Show examples of Etamin embroidery pieces and explain the basic stitches used.
3. Explain that today's lesson will focus on learning Etamin through computational thinking principles.

### Four Principles of Computational Thinking:

1. **Decomposition:** Breaking down complex steps into smaller, manageable parts.
2. **Pattern Recognition:** Identifying identifying similarities or patterns within data.
3. **Abstraction:** - Discuss abstraction: focusing on essential details while ignoring unnecessary information
4. **Algorithm Design:** Creating a step-by-step plan for creating the handcraft.

### I.Decomposition:

1. Activity: Break down the embroidery process into smaller tasks.
  - Example tasks: Choosing a design, selecting colors, threading the needle, following the pattern, and finishing the piece.
2. Discussion: Discuss how breaking down the project into steps makes the task more manageable, like how decomposing a problem in computer science helps in solving it effectively.

Break down each step for the students, showing how manageable tasks build up to the final product.

- **Example:** Select a small pattern (like a flower), explain how to stitch each petal first, then the leaves, and finally add details.

### II. Pattern Recognition

1. Activity: Identify patterns in embroidery designs.
  - Example: Discuss how many embroidery patterns repeat certain geometric shapes, lines, symmetry, colors, or stitches.
2. Hands-On: Let students examine a simple etamin pattern and identify the repeating elements.
3. Discussion: Explain how recognizing patterns in embroidery is similar to recognizing patterns in data or coding, which can help in creating more efficient designs or solutions.
  - **Example:** A square grid in the pattern is repeated in different sections—ask students how this can be applied elsewhere.

### III. Abstraction

1. Activity: Focus on the essential elements needed to create a basic embroidery design, like color contrast and the types of stitches.
  - Example: Consider what parts of the design are crucial (e.g., the main shapes or motifs) and which details can be simplified.
2. Discussion: Discuss how abstraction helps in focusing on the most important elements of the design, just as in computational thinking, where unnecessary details are removed to solve a problem more efficiently.  
Ask students to abstract general rules from their pattern—what makes it visually appealing? What is the simplest way to represent a flower?  
Encourage them to focus on the essential elements of the design, while ignoring unnecessary details.
  - **Example:** A simple cross-stitch can represent a petal instead of a more complex shape.

### IV. Algorithm design:

**Activity:** Guide students to create a step-by-step process (algorithm) to complete their Etamin design.

- They will outline the steps they need to follow: drawing the pattern on graph paper, selecting thread, stitching the outline, and filling in the pattern.

#### Example:

- Step 1:** Choose the design.
- Step 2:** Draw the pattern on graph paper.
- Step 3:** Select the appropriate colors.
- Step 4:** Begin stitching the outline.
- Step 5:** Fill in the pattern with chosen colors.
- Step 6:** Finish the design with detailing and knotting.

#### Conclusion

Discuss the importance of computational thinking in everyday tasks like handcrafts.


- Review the key principles learned: decomposition, pattern recognition, abstraction, and algorithm design.
- Reflect on how computational thinking helped in planning and starting the embroidery project. How did it make the process easier or more organized?
- Encourage students to apply these principles in other topic.

#### Homework/Extension:

- Research another type of traditional embroidery and create a simple algorithm for making a pattern.

#### Assessment:

- Participation in discussions and activities.
- The clarity and feasibility of the algorithm created by each student or pair.

	- Evaluation of the progress on the embroidery project, based on the student's algorithm.
<b>Expected results:</b>	<p>Students will learn the basics of Etamin embroidery techniques.</p> <p>Students will decompose the embroidery process into smaller, manageable tasks.</p> <p>Students will recognize patterns in Etamin designs and apply them to their own projects.</p> <p>Students will abstract key concepts of embroidery to apply to different patterns.</p> <p>Students will design a step-by-step process (algorithm) to create a simple Etamin design.</p>
<b>Notes:</b>	<p>- Students will get necessary materials to create the handcrafts by using computational thinking.</p>  <p><b>Materials:</b></p> <ul style="list-style-type: none"><li>- Etamin (Aida cloth)</li><li>- Embroidery needles</li><li>- Embroidery floss (various colors)</li><li>- Embroidery hoops (optional)</li><li>- Graph paper</li><li>- Pencils and erasers</li><li>- Printed examples of simple etamin patterns</li></ul>