

<b>Title</b>	<b>Making Ebru Art</b>	<b>Time</b>	2 hours
<b>Subject:</b>		<b>English Language, Art and Technology Integration</b>	
<b>Aims</b>		<b>General competence<sup>1</sup>:</b> Awareness of computational thinking concepts to create Ebru Art. <b>Specific competence<sup>2</sup>:</b> Allowing students to deepen their understanding of the cultural aspect of Ebru Art and computational art. <b>Aim of the activity:</b> <b>How to make Ebru Art via computational thinking</b>	
<b>Key CS elements:</b>		Decomposition; Pattern recognition; Abstraction; Algorithm design.	
<b>Age group :</b>		<b>08-10 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> 1. Websites or apps about Ottoman Art. 2. Computer/ mobile phones with internet access.			
<b>Learning development:</b>			
<b>Problem definition:</b> Creating the right steps to make Ebru Art (Turkish paper marbling) using computational thinking principles.			
<b>Introduction</b> - Explain the history and cultural significance of Ebru art. - Show examples or a short video demonstrating Ebru art techniques. - Explain that students will create their own Ebru art using computational thinking methods.			
<b>Four Principles of Computational Thinking:</b> 1) Decomposition: Breaking down the Ebru art-making process into smaller, manageable steps. 2) Pattern Recognition: Identifying patterns within the marbling process. 3) Abstraction: Focusing on the essential features of the Ebru design while simplifying details. 4) Algorithm Design: Creating a step-by-step plan for making the Ebru art.			

### **I. Decomposition:**

Have students brainstorm the steps involved in creating Ebru art. Break the process down into tasks (e.g., preparing the water tray choosing colors, applying paint, creating patterns, etc.).

List these steps on the board as students contribute.

### **II. Pattern Recognition**

Discuss the common patterns and techniques used in Ebru art, such as flowers, spirals, and waves.

Ask students to identify patterns they want to create in their own artwork.

### **III. Abstraction**

Focus on the key elements of Ebru art (paint application, pattern creation, and paper transfer)

Ask students to decide which tools and techniques they will use to achieve their desired patterns.

### **IV. Algorithm design:**

- Students write down their algorithm (step-by-step plan) for creating their Ebru art.

- Example Algorithm:

**Step 1:** Prepare the water tray with carrageenan.

**Step 2:** Choose paint colors.

**Step 3:** Use a brush or dropper to apply drops of paint onto the water surface.

**Step 4:** Use an awl or stick to swirl the paint into patterns.

**Step 5:** Lay absorbent paper gently on top of the water to transfer the design.

**Step 6:** Carefully remove the paper and let it dry.

## Reflection and Discussion

### Testing

- Have students observe their transferred patterns and compare them to their original plan.
- Discuss whether their patterns turned out as expected and how their algorithms worked.

### Reflection

- Encourage students to share any challenges they faced and how they overcame them.
- Discuss how the CT process helped them in creating their Ebru art.

### Conclusion

- Summarize the lesson by highlighting the importance of computational thinking in both art and other problem-solving scenarios.
- Encourage students to think about how they could apply CT principles to other artistic or creative projects.

### Homework/Extension:

- Students can experiment with creating different types of marbling patterns, using the same CT approach to refine their techniques and outcomes.

### Assessment:

- Observing students' engagement during the planning and creation process.
- Reviewing the written algorithms and the final Ebru artworks for creativity and adherence to the plan.
- Evaluating students' reflections on how the CT process influenced their art-making experience.

### Expected results:

Students will have gained an understanding of the cultural significance of Ebru art and its historical roots. They will apply computational thinking by breaking down the process into smaller, manageable steps and recognizing recurring patterns in the techniques. Students will simplify the creation process by focusing on key elements such as water, paint, and patterns, and will use an algorithmic approach to design their own Ebru artwork.

### Notes:

Students will also learn the importance of the historical importance of Ebru Art.



**Materials:**

- Ebru tray or a shallow basin filled with water mixed with carrageenan (a thickening agent)
- Ebru paints (oil-based or water-based with a surfactant)
- Brushes or droppers for applying paint
- Awls, combs, and sticks for creating patterns
- Absorbent paper (for transferring the design)
- Aprons and gloves (optional)
- Paper and pencils for planning