TEACHING MATHEMATIZING THROUGH STORIES FROM THE HISTORY OF MATHEMATICS: PROMOTING CULTURALLY RESPONSIVE AND SUSTAINABLE MATHEMATICS EDUCATION

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The session will start with a presentation showcasing the use of a children's story as a context for mathematizing (Freudenthal, 1991). We will model the teacher's role in initiating a lesson through storytelling. Participants will then actively engage by responding to questions related to the story and solving embedded mathematical tasks. This will serve as a foundation for discussing key aspects of our methodology (Haydar & Durmaz, 2022) focusing on the integration of mathematics and storytelling (Sims Bishop, 2011), the utilization of contexts for mathematizing, and the incorporation of the history of mathematics in a framework of culturally responsive/sustainable pedagogy (Djebbar et al., 2009).

In the second half, we will work in two groups and analyze two instructional units:

Al Kindi and Cryptography:

The unit begins with notice and wonder routines introducing code-breaking, followed by an online game. A historical storytelling context delves into Julius Caesar's coded messages during wars, leading to mini-lessons on inverse operations and functional rules. The literacy connection includes a reading on the House of Wisdom, featuring the Arab philosopher and mathematician Al Kindi and his work on cryptography. This sets the stage for an investigation guiding students to reconstruct Al Kindi's frequency analysis method. Social studies connections explore the history of Baghdad and the scientific contributions from the House of Wisdom.

Ibn Al Haytham and Visual Proofs:

The unit begins with a children's story about Cubey Cake, using a birthday cake and dice context to introduce a guided proof of adding consecutive whole numbers 1 to 6. A task follows on constructing Ibn Al Haytham's visual proof using Cuisenaire rods investigations. A video story narrating Ibn Al Haytham's biography leads to interdisciplinary connections around his journey and imprisonment in Egypt and his seminal work on Optics. The following mathematical investigation leads to generalizing the formu-

la for the sum of consecutive numbers and culminates with the story of Gauss.

We will conclude with participants' feedback and general discussion.

REFERENCES

Djebbar, A. De Hosson, C. & Jasmin, D. (2009). *The Discoveries in Islamic Countries*. Paris: Le Pommier.

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Sims Bishop, R. (2011). Windows, mirrors, and sliding glass doors. Perspectives: Choosing and Using Books for the Classroom, 6(3), ix-xi.