MULTICULTURAL BOOK ACTIVITY: CULTURE & SYMMETRY

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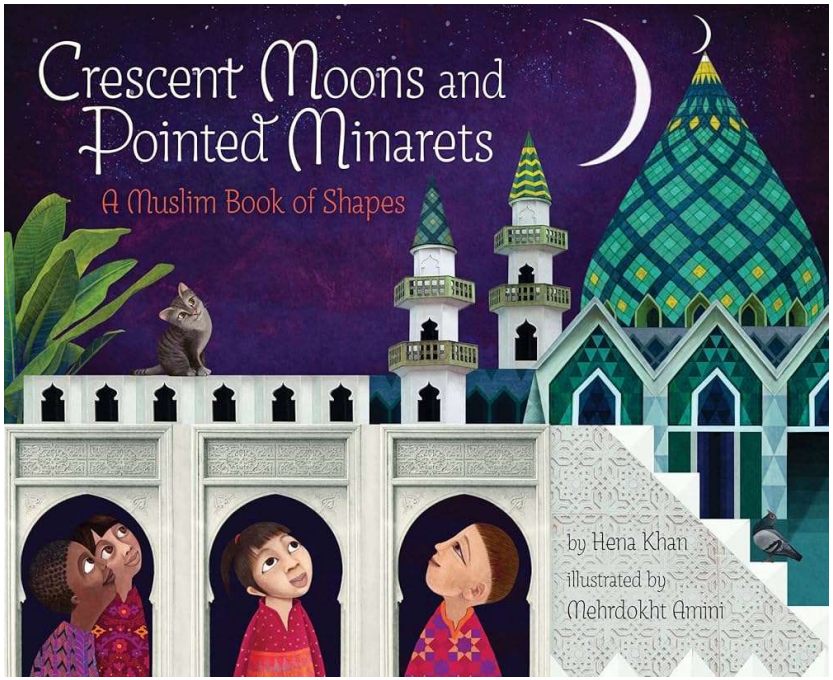
MULTICULTURAL BOOK: CRESCENT MOONS AND POINTED MINARETS



- Book Title: Crescent Moons and Pointed Minarets: A Muslim Book of Shapes by Hena Khan
- Summary: This book shows different shapes and geometric patterns in the context of Islamic architecture, clothing, and other cultural artifacts. It also shows religious practices & traditions.
- Read-along: https://www.youtube.com/watch?v=HgUkbkN3jlE

MULTICULTURAL CONTENT

- Multicultural Concept: Cultural identity – Nieto and Bode (2018, p. 137) define *culture* as "the values, traditions, worldview, and social and political relationships created, shared, and transformed by a group of people bound together by a common history, geographic location, language, social class, religion, or other shared identity." A key part of multicultural education is recognizing and welcoming the diversity of cultural perspectives in our classrooms and the world and incorporating those perspectives to advance learning for all students.
- Book Connection: *Crescent Moons and Pointed Minarets* shows some specific Islamic cultural elements. But more importantly, it can be used as the starting point for an activity that lets students learn about different cultures while sharing and celebrating their own.

CLASSROOM ACTIVITY

- Content Area: Geometry
- Grade Level: High School
- Topic: Geometric transformations and symmetry: rotations, reflections, and translations
- Standards: ALCOS Standards MA19.GDA.21 and MA19.GDA.22

- First, share with students that geometric patterns and symmetry show up in clothing, architecture, and art all around the world. Read *Crescent Moons and Pointed Minarets* as an example to provide a jumping-off point.
- Group students into pairs and have them use the internet to research products of a particular culture (perhaps one they have a personal connection to, or simply one they want to learn more about) and find a cultural artifact with a geometric pattern.
- Ask students to research the background & significance of their artifact and identify all the symmetries (rotations, reflections, and translations) in its patterns. Provide students with tracing paper and graph paper so they can copy their patterns and physically experiment with transformations to identify symmetries. Ask students to describe at least one symmetry using a mathematical function. To help with this, graph paper can be used to assign numerical points to the figures in their pattern.
- Have students compile images with explanations on a shared Google Slides document. This way while each group studies one example in depth, all students can see examples from various cultures with many different types of symmetry.
- Time permitting, have each group share a short (1-2 minute) description of their findings with the rest of the class.

LEARNING GOALS & PHILOSOPHY

- This activity strengthens students' skills with geometric transformations and symmetries with a hands-on activity while giving them opportunities to express their culture and learn about the cultures of their classmates and others around the world. This approach helps to promote cultural literacy and diversity without detracting from the content-area curriculum.
- This activity also shows students how mathematics is embedded in art and culture. I hope that this approach can engage students who might not otherwise be excited about mathematics and help create self-motivated learners.

REFERENCES

- Khan, H., & Amini, M. (2018). *Crescent moons and pointed minarets: A Muslim book of shapes*. Chronicle Books LLC.
- Nieto, S., & Bode, P. (2018). *Affirming diversity: The sociopolitical context of multicultural education*. Boston, Massachusetts: Pearson Education, Inc.