Humanizing Math:

Grounding Mathematics in the Stories of the People Who Saw Its Beauty

FACILITATOR GUIDE

To utilize this video and its materials as a professional learning opportunity, consider the following recommendations and guidelines:

The Administrative Rules of Montana (ARM) define legal parameters for professional development of educators in the following items:

- 10.55.714
- 10.57.215
- 10.57.216

Although informational, the video does not meet the requirements outlined in ARM and therefore does not qualify for Professional Development Unit Certificates. There are, however, many ways in which the video could be utilized strategically by a facilitator in order to elevate it to a professional learning opportunity. Here are some suggestions for how this may work:

FOR ADMINISTRATORS AT PUBLIC SCHOOLS:

- Consider using this video with the adjoining facilitator outline (page 3) as a school-wide professional learning opportunity for your staff. Some appropriate groups include:
  - all elementary educators;
  - cross-curricular PLC groups (K-12 appropriate);
  - mathematics department educators (6-12 appropriate);
  - special-education teachers (k-12 appropriate); and
  - librarians.
- At a minimum, this video, paired with a 20-minute discussion period, could be translated to a 1 PDU certificate. However, there are examples where this could be extended into further professional learning. Some examples include:
  - an ongoing cross-curricular task force meeting regularly to develop and implement a standards-aligned lesson plan integrating concepts from the video;
  - educators meeting to develop further mini-lessons to use for abbreviated school days;
  - a follow-up group discussion and check-in where conversations around humanizing mathematics and its application in the classroom take place; or
  - educator development of exploratory lessons, aligned to standards, where students 're-discover' milestone developments in the field of mathematics.
- If you are a registered provider of professional development for your school, you can issue professional development unit certificates to educators who have completed the session in compliance with your expectations, district policies, and the Administrative Rules of Montana items provided above. If you are not yet a provider and would like to become one, please visit the "Become a Professional Learning Provider" webpage

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Facilitator Guide Continued

FOR EDUCATORS WORKING IN PUBLIC SCHOOLS:

- Submit a request to your building administrators to see if they can issue you a professional development unit certificate for completing this work. Consider sharing this facilitator guide with them and review any relevant district policies for submitting such requests.
- With your administrator, consider potential applications for this professional learning. Some suggestions include:
  - An independent professional learning experience where you watch the video and participate in a 20-minute conversation with your administrator about the topic, what you learned, some key resources you discovered, and some ways you'd like to experiment with this topic in your classroom instructional practice.
  - A department-wide professional learning experience where you share this video with your department and discuss its content during your regularly scheduled PLC time, following the facilitator outline on page 3.
  - A professional learning event where you practice your teacher-leader skills and host a session for interested individuals in your school or district.

FOR EDUCATORS NOT CURRENTLY WORKING IN PUBLIC SCHOOLS OR THOSE WHO ARE BUT WHOSE REQUESTS HAVE BEEN DENIED BY THEIR ADMINISTRATORS:

- Unfortunately, a pathway does not yet exist for these individuals to receive OPI Professional Development Unit Certificates for watching this video. However, keep an eye out on the Teacher Learning Hub and the Math Standards Webpage for new updates and opportunities.
- Although they may not receive formal units for this, educators can still learn from this video by simply watching and reflecting on the prompts. We hope these educators will still consider engaging in this learning for the intrinsic value it presents.

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Facilitator Guide Continued

The following outline is recommended for instances where 'traditional' professional learning is taking place. That is - where a 'host' or 'facilitator' is conducting a professional learning event for participants and where a conversation is happening between participants and the facilitator. Please note that modifications may need to be made dependent upon the chosen application of this training.

ACTIVITY:	TIME ALLOTTED:
Open the session, welcome educators, and provide background information on humanizing mathematics and this session's creation.	2 Minutes
Begin the video.	~ 5 Minutes, 30 Seconds
Pause the video at 5:30 and allow participants time to select a mathematician that they are drawn to.	1 Minute
Re-start the video, and allow participants to self-assess the questions. *Note that these questions are for self-reflection only and should not be collected by the facilitator or shared out to the group unless the facilitator uses an anonymous tool to collect the data.*	~12 minutes, 40 seconds
Pause the video at 18:08 and allow educators to address the prompts: ◦ How can you help your students see themselves as mathematicians? In other words, how can you humanize math for your students? ◦ What are some ideas you have? ◦ What have to tried or would like to try? ◦ What are some strategies you have seen used effectively? ◦ What are some barriers you have run into?	15 Minutes
Pause the video at 30:37 and allow educators to examine the materials provided. While reviewing these materials they should consider and discuss: ◦ The level of time commitment for the educator to implement the material or something similar to it. ◦ Initial thoughts about the feasibility, barriers, or interest in the materials. ◦ Further ideas that develop and arise during the conversation.	15 Minutes

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Facilitator Guide Continued

FACILITATOR MATERIALS:

- The facilitator will need the following items to be successful -
  - The facilitator outline
  - A projector screen
  - Access to the participant materials
- The facilitator may choose to use -
  - An anonymous data capture tool to gather responses from the mathematician demographic questions at time 5:30.
  - Printed copies of the materials for reference, either for personal or participant purposes.

PARTICIPANT MATERIALS:

Participants will need access to the following files:

- Webinar video (if self-guided)
- Slide show
- Humanizing Mathematics: Mini-Lessons to Inspire
- Pathways from the Past Series:
  - Berlinghoff & Gouvea Packet 1
  - Berlinghoff & Gouvea Packet 2
- Integrating History of Mathematics into the Classroom (Panasuk & Bolinger Horton)
- The Mathematician Project Links to Anne Perkins' and NCTM Resources
- Mathematician Classroom Poster Series
- Dan Meyer Blog Post: Teaching Math Like the Humanities
- Non-Fiction Children's Books that Humanize Mathematics
- Visual Timeline of Mathematical Discoveries - Mathigon
- Math History Databank - St. Andrew's College

MATERIALS NOTE:

Please keep an eye out for these great materials, currently in development:

- Teacher Learning Hub Course
- K-12 Standards-Aligned Discovery-Based Lesson Plans with Cross-Curricular Integrations
- Additional Posters for the Poster Series
- Additional Mini-Lessons to Inspire

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Facilitator Guide Continued

RESOURCES:

Birlinghoff, W. & Gouvea, F. (2010) *Pathways from the Past- I: Using History to Teach Numbers, Numerals, & Arithmetic.* colby.edu. https://personal.colby.edu/~fqgouvea/PftP/Pathways1.pdf

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Perkins, A. (2017). *Mathematicians Are Not Just White Dudes* [PowerPoint slides]. Google Docs. https://docs.google.com/presentation/d/1nO6lJhmR2Z7V7D3eC5VWf7FLR3ljFmvqN_r-YhJGAaw/edit#slide=id.

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Perkins, A., (2016, September 12) *The Mathematician Project*. nctm.org. https://www.nctm.org/Publications/MTMS-Blog/Blog/The-Mathematician-Project/

Perkins, A., (2016, September 26) *How to Enact the Mathematician Project. nctm.org.* https://www.nctm.org/Publications/MTMS-Blog/Blog/The-Mathematician-Project/

Perkins, A. (2016, October 11) *What I Learned About My Students*. nctm.org. https://www.nctm.org/Publications/MTMS-Blog/Blog/What-I-Learned-about-My-Students/

Perkins, A., (2016 October 24) *Extensions of the Mathematician Project*. nctm.org. https://www.nctm.org/Publications/MTMS-Blog/Blog/Extensions-of-the-Mathematician-Project/

University of St. Andrews. (2024, June) *MacTutor Index*. st-andrews.ac.uk. https://mathshistory.st-andrews.ac.uk/