

Authenticity in Math: Digital Breakouts

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Time Frame 150-180 minutes

Essential Question(s)

How can an authentic, technology-enriched learning environment increase student engagement and academic performance?

Summary

This professional development session reinforces authentic instructional practices and authentic technology integration that is aligned to Oklahoma math standards. Participants will experience an authentic activity that integrates technology and reflect on this experience to determine relevant components of authenticity. The interactive session will give participants the tools they need and provide the opportunity to create lesson activities using technology to increase students' depth of knowledge, engagement, and academic performance.

Learning Goals

- Identify instructional strategies modeled that support authentic instruction and Oklahoma Math State Standards.
- Analyze an authentic activity integrating technology and reflect on this experience to determine the relevant components of authenticity.
- Create a plan for authentically integrating technology into a lesson.

Attachments

- Authentic Lesson Reflection Tool—Authenticity in Math Digital Breakouts.pdf
- Breakout Brainstorm—Authenticity in Math Digital Breakouts.docx
- Breakout Brainstorm—Authenticity in Math Digital Breakouts.pdf
- How to Build a Breakout—Authenticity in Math Digital Breakouts.pdf
- Presentation Slides—Authenticity in Math Digital Breakouts.pptx
- You Broke Out—Authenticity in Math Digital Breakouts.docx
- You Broke Out—Authenticity in Math Digital Breakouts.pdf

Materials

- Presentation Slides (attached)
- How to Build a Breakout handout (attached)
- You Broke Out handout (attached)
- Breakout Brainstorm handout (attached)
- Authentic Lesson Reflection Tool (attached)
- Computers or other devices with internet connectivity
- Cardstock for name tents

Engage

Use the attached **Presentation Slides** to facilitate this session. As participants enter, display **slide 2**, which asks them to prepare a name tent. After everyone is seated, move to **slide 3** and introduce yourself and this session.

Go to **slide 5** and show participants the short video clip about traditional ways of teaching.

After the video, move to **slide 6**. Have participants use the Elbow Partners strategy to pair up and reflect on the following questions:

1. Was there a time in your life that you felt this way in the classroom?
2. What was happening in the classroom that made you feel that way?
3. Even though content standards were being addressed, does this environment increase academic performance and engagement?

After participants have discussed these questions in pairs and then in small groups, go to **slide 7** and pass out the attached **Authentic Lesson Reflection Tool** to each participant. Ask participants about their prior experience with authenticity and guide them to look at the questions on the handout. Take a brief moment to talk about the importance of an authentic classroom for engaging all learners in higher-order thinking.

Go to **slide 8** to present the essential question. Go to **slide 9** to highlight the session's learning objectives.

Explore

Transition to **slide 11**. Ask participants to self-assess by giving themselves one point for each of the statements that describe them.

Go to **slide 12**. Have each participant use their score to pair up with someone who had a different point total. Once paired, partners can get to know each other by answering the following questions:

1. How have you used Google Suite in your classroom so far?
2. What questions or hopes do you have about Google Suites?

Go to **slide 13** to introduce the breakout theme and show participants the epidemic outbreak video clip. Briefly discuss breakouts, the variety that exist within this format, and where this particular breakout could fit in a lesson.

Go to **slide 14** and provide participants with the link to this K20 LEARN lesson on exponents: "Can You Save the World in Time?" Read through the lesson snapshot with participants. The lesson contains a breakout for participants to explore further on their own if they wish. Inform participants they also can find the lesson by accessing the K20 LEARN repository and searching for the lesson title.

Presenter's Note: Lesson Snapshot

The purpose of showing the lesson snapshot is to provide context for the lesson so they connect what they are doing to the bigger context. After this, participants will work in pairs to try to break out of a digital breakout.

Transition to **slide 15** and review some of the features of a breakout. Provide each participant with the attached **You Broke Out** handout as an example of what they will give their students. The handout helps students stay organized as they find answers to clues in the breakout.

Go to **slide 16** and provide participants with the link to the "Can You Save the World?" breakout. Give them time to explore and walk through it as if they were students.

Presenter's Note: Facilitating the Breakout

While participants explore the breakout, walk around and guide them through some of the barriers they might encounter when working in Google. For example, participants may not be familiar with using the tools in Google Draw. If you sense that participants are feeling overwhelmed about the breakout and the use of technology, scaffold the use of basic Google tools before participants work with their partners to break out.

Explain

After participants complete the breakout, take a quick poll to gauge their feelings about the activity. Use the following prompts:

1. Raise your hand if you enjoyed the breakout.
2. Raise your hand if you hated the breakout.
3. Raise your hand if you believe your students would like the breakout.

Display **slide 18**. After conducting the poll, ask participants who worked on the breakout together to reflect on the following questions:

1. What was your experience with the activity and lesson?
2. How can you implement a breakout into your classroom that aligns with standards?

Go to **slide 19**. Have participants revisit the Authentic Lesson Reflection Tool and analyze the digital breakout through this lens. Ask participants to use the lesson reflection tool to think about the ways in which this activity aligns with the components of authenticity.

Go to **slide 20** and ask participants to answer the following questions:

1. How could this activity be modified to make it even more authentic?
2. How could this activity have been done without the use of technology?

After participants have had a few moments to reflect on these questions, ask for a few volunteers to share out.

Extend

Display **slide 22** and pass out the attached **Breakout Brainstorm** handout to each participant.

Have participants spend a few minutes working with this standard organizer to help them decide what content they want to incorporate and the math problems associated with it. Let them know they are not expected to finish this process today, but the goal is to establish a starting point for future use in their classrooms.

Presenter's Note: Using the Exponent Lesson as an Example

If participants are struggling to get started, walk them through the process of how the exponent breakout lesson was created. For example, the breakout content was divided into adding exponents, subtracting exponents, multiplying exponents, dividing exponents, and exponents with a degree of zero. Once the content was separated into those components, the lesson writer created questions related to each component.

Pass out the attached **How to Build a Breakout** handout to each participant. Have participants work in the same pairs as before to support each other in the following activity.

Walk participants through the process of creating a digital breakout. One at a time, transition through **slides 23–26** to provide step-by-step instructions and useful tools for building a digital breakout. As you progress through each slide, point out the resources available for participants to use in designing their own digital breakouts.

Participants should begin by setting up a Google Site and then creating a Google Form. Next, guide participants through creating a color lock and forced copy. The handout will serve as a reference guide for those who fall behind, choose to work ahead, or wish to revisit the process at a later time.

Evaluate

Display **slide 28**. Using the tools they acquired in the previous sections, participants should begin to create their own digital breakouts. Have participants revisit the Breakout Brainstorm handout and begin to implement the plan they created there, using the How to Build a Breakout document to guide them as necessary.

Presenter's Note: Protected Time and Collaborative Learning Support

Participants should use any additional time in the session to plan their breakouts at a comfortable pace. Depending on their level of expertise with Google, some participants will want to get started utilizing these tools and the digital technology right away, while others have difficulty knowing where to begin. Walk around and help meet participants' needs where they are.

If possible, break participants into groups for support. For example, group participants in one corner who are working on the Google Sites portion of the breakout; group those working on Google Forms in another corner. This will allow participants to work through portions of the breakout and learn together.

Revisit the Authentic Lesson Reflection Tool on **slide 29** to have participants consider the digital breakout they are creating and evaluate its effectiveness with regard to authenticity.

Follow-up Activities

Remind participants to visit the LEARN lesson repository (shown and linked on **slide 30** as well as in the Resources below) for more examples of authentic lessons. Participants will implement a digital breakout or at least a component of a digital breakout, such as Google Forms, in their classrooms. Participants will reflect on the activity and how they will continue to grow their use of technology moving forward.

Research Rationale

Authenticity can be implemented in all content areas and all grade levels. Authentic teaching has four components: construction of knowledge, disciplined inquiry, value beyond school, and student-centered learning. These four components are created and apparent through authentic tasks. Authentic tasks, as defined by Herrington, et al. (2014), are ill-defined, requiring students to define the tasks and subtasks needed to complete the activity. They are investigated by students over a sustained period of time. Tasks can be applied to different subject and content areas and lead with open-ended outcomes. These tasks are seamlessly integrated with assessment and create accomplished products valuable in the student's own right. They allow for competing solutions and a diversity of outcomes.

Authentic lessons allow opportunities for collaboration, which leads to the exploration of multiple perspectives and various points of view to be heard during a lesson. By forming collaborative groups, students are able to construct knowledge. Through the use of essential, open-ended questions, teachers provide the opportunity for students to reflect and articulate thoughts and the processes of their learning. "Authentic learning environments need to provide collaborative learning where, for example, more able partners can assist with scaffolding and coaching, and where teachers provide appropriate learning support" (Herrington, 2014; Collins et al., 1989; Greenfield, 1984).

Resources

- Epidemic Outbreak. (n.d.). http://bit.ly/exponentsbreakout
- Izzo, D. (2007, July 29). Bacteria Growth. https://www.youtube.com/watch?v=gEwzDydciWc
- K20 Center. (n.d.). Authentic lessons for 21st-century learning. https://learn.k20center.ou.edu/
- K20 Center. (n.d.). Elbow partners. Strategies. https://learn.k20center.ou.edu/strategy/ccc07ea2d6099763c2dbc9d05b00c4b4
- K20 Center. (n.d.). Exponent rules: Digital breakout. Can you save the world in time? Lessons. https://learn.k20center.ou.edu/lesson/b5aef944bb8300a7bdb6f1a67f02c303
- Kholoud.almulla. (2011, October 22). Traditional teaching [Video]. YouTube. https://youtu.be/aWYcOR18-x0