



Less is More Math Professional Learning Series: Peer Coaching (Part 3 of 4)



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Published by K20 Center

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Time Frame 95

Essential Question(s)

How can I intentionally incorporate movement to my math lessons to deepen students' understanding, engagement, and problem-solving skills?

How can we strategically leverage movement to manage cognitive load?

Summary

This professional learning is the third in a four-part series. In this professional learning session, participants identify areas of disengagement in traditional lessons. Educators examine the different cognitive levels of physical movement strategies in mathematics. Participants then construct a lesson aligning depths of knowledge with movement strategies.

Learning Goals

Standards

InTASC Model Core Teaching Standards (K-12th)

7a: The teacher individually and collaboratively selects and creates learning experiences that are appropriate for curriculum goals and content standards, and are relevant to learners.

7b: The teacher plans how to achieve each student's learning goals, choosing appropriate strategies and accommodations, resources, and materials to differentiate instruction for individuals and groups of learners.

7c: The teacher develops appropriate sequencing of learning experiences and provides multiple ways to demonstrate knowledge and skill.

8a: The teacher uses appropriate strategies and resources to adapt instruction to the needs of individuals and groups of learners.

8e: The teacher provides multiple models and representations of concepts and skills with opportunities for learners to demonstrate their knowledge through a variety of products and performances.

Attachments

- [Lesson Planning Tool—Peer Coaching.docx](#)
- [Lesson Planning Tool—Peer Coaching.pdf](#)
- [Linear Equation Cards—Peer Coaching.docx](#)
- [Linear Equation Cards—Peer Coaching.pdf](#)
- [Movement Strategies Card Sort—Peer Coaching.docx](#)
- [Movement Strategies Card Sort—Peer Coaching.pdf](#)
- [Presentation Slides—Peer Coaching.pptx](#)
- [Webb's Depths of Knowledge—Peer Coaching.pdf](#)

Materials

- Presentation slides (attached)
- Webb's Depths of Knowledge handout (attached; one per participant)
- Movement Strategies Card Sort handout (attached; one per pair)
- Linear Equation Cards handout (attached; see Preparation note)
- Lesson Planning Tool handout (attached; one per participant)
- Chalk or painters tape
- Scrap paper
- Pens/ Pencils

15 minutes

Engage

Use the attached **Presentation Slides** to guide the session. Welcome participants. Display **slide 2** and introduce yourself and the session. Transition through **slides 3-4** to introduce the essential question and the learning objectives for today's professional learning activities.

Move to **slide 5** and introduce participants to the instructional strategy [Round Robin](#). Explain that the purpose of this strategy is to brainstorm ideas around a question or a prompt. You will ask participants to answer the question individually first. Next, instruct participants to each share an idea from their list. While another participant is sharing, the group must refrain from interrupting. Go around the room until all participants have shared an idea from their list. If an idea has already been shared, invite participants to say, "Pass." Show participants **slide 6** with the following prompt:

What are specific stagnant hotspots in a traditional lesson structure? Create a list that identifies when disengagement occurs. Allow participants time to create their list.

Facilitator Note: Guiding the Activity

As participants share their ideas, write them on a board or poster paper for future reference.

After everyone has shared their ideas, display **slide 7** and ask participants the following question:

Looking at this list, what are some reasons students would be disengaged?

20 minutes

Explore

Facilitator Note: Human Scatter Graph

If you prepared the floor graphs ahead of time, continue with the narrative as is. If not and you want participants to practice creating the floor graphs, unhide **slide 8** and allow them time to create their graphs.

Show **slide 9**. Invite participants to explore a student-experience simulation. State the math objective on the slide:

Students will physically model a linear equation on a coordinate plane to represent the constant rate of change and the initial value.

Divide participants in small groups. Pass out the prepared **Linear Equation** cards by making sure each group has one card with a linear equation on it. Introduce the [Human Scatter Graph](#) strategy. Ask participants to graph the linear equation physically on the floor grid. Everyone in the group must be a part of the graph.

Once all groups have accomplished their first set of coordinates, ask each finished group to show the exact opposite or inverse of what they built. If they had a positive linear equation, it will now be negative. Allow participants time to work.

When all groups seem to have finished, ask participants to freeze in their final position for 30 seconds. Tell them to notice silently what mathematical part they represent in the linear equation. Have everyone sit down.

Display **slide 10**. As a group, debrief using the following questions:

- Where did you feel the productive struggle in the activity?
- What did your brain have to do during physical activity?

25 minutes

Explain

Explain to participants that physical movement can increase engagement, but to make it truly beneficial it should be in alignment to the depth of understanding and mental processing it takes a student to complete the activity.

Transition to **slide 11**. Introduce the modified [Card Sort](#) activity. Divide participants into pairs. Provide each pair with a set of **Movement Strategies Card Sort** cards and everyone with **Webb's Depths of Knowledge** handout. Explain that four of the cards are to be used as column headers. Invite participants to lay out each card, which presents a physical movement strategy. Then, invite them to sort each card into the category it belongs to. The categories are the different depths of knowledge: Level 1 (Recall and Reproduce), Level 2 (Skills and Concepts), Level 3 (Strategic Thinking), and Level 4 (Extended Thinking).

Participants must come to a common agreement before going on to the next card. They can use the handout as a guide. Start the [K20 5-Minute Timer](#). Once complete, have pairs share out their card sort and why they made the choices they did.

After participants have shared their rationales, transition to **slide 12** and facilitate a group discussion of the following questions:

- Looking at your card sort, what patterns do you see?
- How can this help you when you are designing a lesson?

25 minutes

Extend

Display **slide 13**. Invite participants to choose a concept that is upcoming or will be addressed within the next 2 to 3 weeks. Have participants silently brainstorm on a scrap piece of paper about the following questions:

1. What is the math concept?
2. What part of the concept is your physical activity highlighting: activating prior knowledge, introducing the concept, reviewing, etc.?
3. What depth of knowledge would your students engage in?
4. What physical movement strategy aligns with that depth of knowledge?

Allow participants time to brainstorm. Ask participants to share their brainstorm with an [Elbow Partner](#). After both partners share, move to **slide 14** and have participants begin constructing their upcoming lesson using the **Lesson Planning Tool** handout. Allow participants time to work.

10 minutes

Evaluate

Transition to **slide 15**. Ask participants to give their Lesson Planning Tool handout to a peer. Invite participants to use the modified [Plus Delta Chart](#) strategy to share their thoughts, ideas, or questions about the lesson. Pass out two different colors of sticky notes to each participant. Have participants write one “plus” of their peer’s lesson on one sticky note and one “delta” for their peer’s lesson on the other sticky note.

Use the [K20 2-Minute Timer](#). Once the time is up, have participants pass their paper to the person to their left. Repeat the process for 3 rounds. After the third round, ask participants to pass the lesson plan back to the original participant. Review the comments written on their paper.

Research Rationale

Physical movement incorporated into existing math lessons can increase student motivation, engagement, retention, and cooperation skills. Rather than focusing solely on knowledge retention, PAL (Physically active learning) emphasizes the learning process, creating opportunities for students to explore, experience, and interact with mathematical concepts through movement (Mandelid et al., 2023). Research shows that the pedagogical approach of combining physical activity and academic learning creates a cognitive bonding process that allows for enhanced comprehension and retention (González-Pérez et al, 2025).

Both González-Pérez et al. (2025) and Norris et al. (2018) found that adolescents, particularly secondary students, tend to spend a majority of their school day on sedentary behaviors, but provide hope that schools can provide a structure to integrate physical movement into academics, increasing students' activity and attention. Mandelid et al. (2023) argue teachers play a central role in designing activities that connect movement with clear mathematical goals, structuring tasks, and guiding reflection so that students understand the purpose behind the activity.

By purposefully integrating kinesthetic learning into math, educators design opportunities for students to shift their perceptions of math ultimately creating classrooms that increase student's concentration, motivation, and increase academic performance.

Resources

- González-Pérez, M., et al. (2025). Less is more: Qualitative insights into physically active learning in secondary math education. *PLOS ONE*, 20(11), e0336641. <https://doi.org/10.1371/journal.pone.0336641>
- K20 Center. (n.d.). Card sort. Strategies. <https://learn.k20center.ou.edu/strategy/147>
- K20 Center. (n.d.). Elbow partners. Strategies. <https://learn.k20center.ou.edu/strategy/116>
- K20 Center. (n.d.). Human scatter graph. Strategies. <https://learn.k20center.ou.edu/strategy/172>
- K20 Center (n.d.). Plus delta chart. Strategies. <https://learn.k20center.ou.edu/strategy/2904>
- K20 Center. (n.d.). Round robin. Strategies. <https://learn.k20center.ou.edu/strategy/2183>
- K20 Center. (2021). 2-Minute timer. YouTube. <https://youtu.be/HcEEAnwOt2c?si=KGD2iBg1LSLOGQQq>
- K20 Center. (2021). 5-Minute timer. YouTube. https://www.youtube.com/watch?v=EVS_yYQoLjg
- Mandelid, M. B., Thurston, M., Reinboth, M., Resaland, G. K., & Tjomsland, H. E. (2023). “Just because it’s fun, it’s not without purpose”: Exploring the blurred lines of physically active learning. *Teaching and Teacher Education*, 133, 104297. <https://www.sciencedirect.com/science/article/pii/S0742051X23002858>
- Norris, E., Dunsmuir, S., Duke-Williams, O., Stamatakis, E., & Shelton, N. (2018). Physically active lessons improve lesson activity and on-task behavior: A cluster-randomized controlled trial of the “Virtual Traveller” intervention. *Health Education & Behavior*, 45(6), 945–956. <https://doi.org/10.1177/1090198118762106>
- Webb, N. L. (2002). Depth-of-Knowledge levels for four content areas. Madison, WI: Wisconsin Center for Education Research.