Elements of Engaged Learning

Science of Learning and Development (SoLD) is an interdisciplinary body of research drawing from neuroscience, developmental science, psychology, education, and the learning sciences. At its core, SoLD helps us understand how young people learn best by emphasizing that learning is not just cognitive. It is shaped by relationships, identity, emotion, culture, and the physical environment. Rather than focusing only on content or instruction, SoLD invites adults to pay close attention to the conditions we create for learning. When environments support safety, belonging, meaning, and regulation, young people are more likely to engage deeply, persist through challenge, and take healthy risks in their learning. The four elements of engaged learning below describe key conditions that consistently support learning and development across ages and contexts.

1. Relationships

Stable, caring relationships with adults and peers are foundational to learning and development. Research from the Science of Learning and Development and Search Institute's Developmental Relationships Framework highlights that young people are more likely to learn, grow, and thrive when they experience relationships that express care, challenge growth, provide support, share power, and expand possibilities. When young people experience trust, belonging, and emotional safety, their brains are better able to focus, take risks, and persist through challenge. Relationship-centered environments are trauma-informed, healing-centered, and culturally responsive, recognizing that identity, culture, language, and lived experience shape how young people show up and engage.

In practice, this can look like:

- Regular check-ins and predictable opportunities for connection
- Adults who both care deeply *and* hold high expectations
- Shared power through voice, choice, and co-created norms or agreements
- Valuing and affirming young people's cultures, languages, and identities

2. Peer & Collaborative Learning

Learning is inherently social. Opportunities to learn with and from peers strengthen motivation, deepen understanding, and build skills such as communication, leadership, and problem solving. Collaborative learning also supports young people who are more attuned to relational or communal ways of knowing, rather than individual performance.

In practice, this can look like:

- Small group problem-solving or project-based learning
- Shared roles and interdependent tasks
- Structures that value cooperation alongside individual growth

3. Play, Creativity, & Imagination

Play is not extra, it is essential. The LEGO Foundation's learning through play research highlights five core characteristics: learning is iterative, joyful, meaningful, socially interactive, and actively engaging. Play and creativity expand imagination, support problem-solving, and increase persistence, particularly when young people are invited to explore real-world questions or ideas that matter to them.

In practice, this can look like:

- Hands-on, exploratory activities that allow for experimentation and revision
- Creative expression through art, storytelling, movement, or design
- Making space for joy, humor, and youth-generated ideas

"Without imagination, there is no hope. No chance to envision a better future. No place to go. No goal to reach." – Bessel Van der Kolk

4. Movement

Movement increases oxygen to the brain, supports emotion regulation, and strengthens memory, language, and attention. When learning is paired with physical activity, retention and engagement increase significantly. Movement is especially important for regulation, focus, and accessibility.

In practice, this can look like:

- Frequent opportunities for stretching, walking, or physical play
- Learning activities that incorporate gestures, role-play, or embodied expression
- Normalizing movement as a support, not a distraction

"Learning doesn't happen from the neck up, but from the feet up." – Michael Kuczala

Bringing the Elements Together

These elements are most powerful when they work together. Relationships create safety, collaboration builds meaning, play invites curiosity, and movement supports regulation and focus. When intentionally designed, engaged learning environments support not only academic growth, but also belonging, agency, and well-being.

References

1. Science of Learning and Development Alliance. (2020). *How the science of learning and development can transform education*. https://scienceoflearningdevelopment.org/what-is-the-science-of-learning-and-development/
2. Search Institute. (2018). *Developmental relationships: A framework for cultivating powerful relationships with young people*.
3. The LEGO Foundation. *Learning Through Play Framework*. https://learningthroughplay.com
4. Kuczala, M. (TEDxAshburn). *The Kinesthetic Classroom*.

For this collaborative activity, you will use this handout to explore strategies to support literacy and math skills in afterschool and summer programs as well as tips for virtual learning and engagement. Look at the name or number of your Breakout Room (usually in the top left corner of the zoom window) to see which skill area you will focus on. Even numbered rooms will look at Literacy Activities and odd numbered rooms will look at Math Skills.

Individually: Take 5 minutes (or more) to read about the strategies to support either Literacy or Math.

As a Small Group (Take approx. 15 minutes total to complete all steps)

Step 1: Assign Roles

- Facilitator – will help ensure everyone has had a chance to share thoughts
- Presenter(s) – will share out highlights or examples when we return to the whole group
- Notetaker – will track any questions to bring back to the full group

Step 2: Discussion

Discuss the activities that stand out to you the most. What other activities are you doing in your program to support math or literacy? Go to Page 5 for the Reflection & Discussion section to see additional questions to discuss as a group.

Step 3: Shared Goal

Prepare to share one activity or idea your group came up with to support math or literacy. Prepare to share any questions that came up as well.

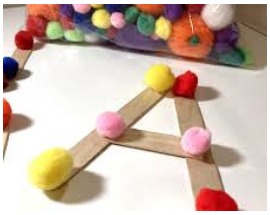
BONUS: Review the strategies for supporting learning in virtual programs on Page 4 of this handout. When you prepare to share about literacy or math, include a virtual programming tip or activity to support your assigned skill area (i.e. math or literacy).

SUPER BONUS – Have a team member create a drawing (with group member input) using Sketchpad to visually share about your highlight, takeaways, or questions. Note: Screen share within your breakout group so everyone can see the drawing.

Supporting Literacy

There are many ways to support literacy skills for youth of all ages during afterschool and summer programs. The sample literacy activities below incorporate different learning elements including fun, movement, peer learning, or youth choice. For each activity, think about adaptations or adjustments you would make to meet the unique needs and interests of the youth in your program.

Creative Alphabet Letters & Words



Invite children to form alphabet letters using their bodies or different materials (e.g. Legos, foam noodles and balls, or popsicle sticks and pom poms). Have older youth form words as teams with each person forming a letter with their body. Or provide materials to spell out words.

Word Relays

In teams, youth race to write words related to a theme (e.g. “community,” “travel,” “foods”). Teams take turns adding one word at a time. There are many ways to adapt the relays to adjust the difficulty or challenge level to meet varying skill levels or ages of youth. Instead of writing words on a board, youth could relay to different stations around the room to complete reading or writing tasks before tagging the next youth on their team. For younger ages, staff members can say a specific letter or make the letter sound for children to search for around the room or in a pile of letters (e.g. pre-written on notecards, magnet letters, flashcards, etc.).

Paper Cup Letters

Write the alphabet on the bottom of paper cups. Create at least two sets of cups with the full alphabet (one letter per cup with a mix of capital and lower case letters). Play a memory matching game by having all the cups flipped up so the letters are hidden. Then, youth flip individual cups over to look for matching letters (or matching Capital and lowercase letters). Another option includes having youth randomly pick 3 or 4 cups to create words. To incorporate youth voice and play, co-create new games or challenges using the cups.

Story Circles

For this activity, youth simply sit in a circle and co-create a story together with each person adding one sentence at a time. To incorporate elements of reading, write different verbs, nouns, or adjectives on notecards and pass one card to each youth. Ask youth to use their word in at least one sentence. Add playfulness by inviting youth to share their sentences in silly voices or pick different themes for the stories.

Dialogue Skits

Youth write short dialogues (2-3 lines) and act them out. To infuse additional opportunities for youth voice, you can co-create themes for the dialogues with youth. Add complexity or challenge by asking youth to incorporate a specific number of adjectives, adverbs, or other language elements into their dialogues. For youth who may need more support, write or find pictures of nouns and verbs to put on notecards. Then, invite youth to pick 2-3 notecards to use as prompts for their dialogue.

Supporting Math Skills

There are many ways to support math skills for youth of all ages during afterschool and summer programs. The sample math activities below incorporate different learning elements including fun, movement, peer learning, or youth choice. For each activity, think about adaptations or adjustments you would make to meet the unique needs and interests of the youth in your program.

Dice Games

Use 6-sided, 12-sided, or 16-sided dice to play a variety of cooperative games with youth depending on age and skill level. A simple game includes setting a high target number (e.g. 100, 84, 250, etc.) to have teams take turns rolling dice to add up to the target number. In pairs, youth can play "dice war" where each person rolls two dice and multiplies (or adds) the numbers together. Whoever has the highest product wins that round.

Math Scavenger Hunt

Create a list of math-related tasks (e.g. "find something with a right angle," "measure the width of the room", or "find something that contains 10 smaller items within it"). Have youth work in teams to complete or find all of the items on the scavenger hunt list.

Budget Challenge

Give youth a mock budget and a list of "items" related to a running a project or an event (e.g. a field trip, running a snack stand, etc.). Have youth discuss and make choices about what items or services to purchase or cut to stay within their budget. If available, invite youth to research real-time prices for materials, event spaces, ticket prices, etc.

Math Bingo

Instead of using numbers, use simple math problems in each Bingo square (e.g. "5 x 6," or "Half of 12"). Call out different numbers (i.e. answers), and youth solve the math problems to mark their boards. Extend this activity by having youth create bingo boards for each other.

Math Basketball ("Mathgetball")

Print or write numbers (between 0-10, 0-20, or 0-100 depending on math skill level) on pieces of paper or cardboard. If you have access to a basketball court, tape the numbers to the floor at different places around the basketball hoop. In teams, have youth shoot hoops from the different numbers to reach a sum or product you call out. For example, if you call out "8," youth could shoot hoops from the numbers 6 and 2 or 1, 2, and 5 to add up to a total of 8. Note that youth have to make the basket in order to be able to use the number. If there isn't access to a basketball court, use a small ball or even a crumpled up paper ball to shoot "baskets" into a bucket, empty trash bin, or cardboard box from around the program space.

Virtual Programming Tips & Strategies to Support Math & Literacy

Incorporating fun, movement, peer learning, and youth choice are equally important and possible in virtual programs, and can support young people in developing math and literacy skills in the process. The virtual programming tips below are generally applicable across technology platforms (e.g. zoom, teams, etc.) though each virtual meeting tool will likely have additional interactive tools to support engagement.

General Tips to Support Virtual Engagement

1. **Take frequent breaks** and use energizers, brain break activities, and simple movement activities to support young people's brains and physical bodies. Brain breaks can include inviting young people to:
    - Find 3 different objects around their space that are the color blue, start with the letter A, or have some other characteristic
    - Find something that is at least 20 feet away and stare at it for 30 seconds
    - Stretch – guide young people or play a video with stretch exercises
    - Dance, do jumping jacks, run in place, or some other movement exercise

2. **Incorporate multiple ways to engage** by utilizing chat features, polls, or annotate (on Zoom, the annotate feature that lets you draw directly on the screen). In advance, let youth know that you'll also call on them by name to share (though it's helpful to offer an option to pass).

3. **Use visuals** including multimedia (e.g. videos, songs, podcast clips) and photos or other imagery throughout the session. Encourage youth to have their cameras on, if possible, though some youth may not be in a setting where they feel comfortable being on video. In those instances, encouraging participation through audio and chat will be essential.

4. **Incorporate interactive elements,** including some outside of the virtual meeting platform (e.g. Padlet or Sketchpad). Polls and surveys can be a fun way to engage young people, though it requires additional planning and preparation. External tools, like *Mentimeter* can allow for dynamic summaries of feedback or responses from young people and *Kahoot!* allows you to easily gamify content. Whenever using supplemental virtual tools, it will be important to support staff and youth to become acquainted with the technology, and note that sometimes, simpler is better (i.e. staying within the virtual meeting platform).

Supporting Literacy and Math Skills Virtually

Many of the activities listed on the previous pages could be adapted for a virtual setting (e.g. story circles, dice games using online dice rollers, partner or group challenges using breakout rooms, etc.). Additional activities include:

- **Word games** – rhyming challenges, word association chains, or synonym/antonym challenges
- **Reading activities** – role playing story characters or shared reading using screen share
- **Writing exercises** – free writing sessions, completing or creating your own online mad-libs, or completing sentence prompts
- **Math art projects** – use geometric shapes to create digital art or explore fractals and tessellations with online drawing tools
- **Math storytelling challenge** – use breakout rooms for teams to create math-based stories or word problems for the other teams to solve

Reflection & Discussion

After reviewing the activities on the previous pages, reflect and discuss the following questions.

How are play, peer learning, movement, or youth choice incorporated into the activity?

How might you do some of the activities in a one-on-one setting (e.g. tutor and student)?

Pick one activity from the previous pages. How might you adapt or modify the activity for young people in your program? What could you do to increase or reduce the challenge or skill level?

What are some other math or literacy activities you currently offer young people that incorporate the different learning elements of play, movement, peer learning, or youth choice?

If you run virtual programs, what strategies do you currently use to support youth learning and engagement? What is one new virtual programming tip or activity idea you might use or adapt for your program?