

## Hands On Activities

The moment the brain considers a question that considers a question that includes using our hands the blood flow increases. MRIs show an immediate increase in prefrontal cortical activity. Each day that includes making or finding an object that represents integrates internal motivation and effortless transfer to long-term learning.



Integrate hands-on activities with any and all curriculum and skills: Human development is promoted through play; high levels of thought processing, creativity, and innovation correlate with more playtime as a child and sophisticated movement with our hands and fingers (Brown, 2009) Physics subjects with hands-on *and* virtual showed significant activation and had higher recall than virtual without embodied, hands-on interaction (Johnson-Glenberg et al., 2016).

- Learning in absence of concrete and embodied hands-on experience adds *significant* cognitive load. (Pouw et al. 2014)
- Interactive protects working memory depletion during math (Vallee-Tourangeau et al., 2016)
- Teaching practices that include even a brief physical experience were critical to understanding science concepts like angular momentum. increasing the number of college-level science, technology, engineering, and math graduates by 33% (Kontra et al., 2015).
- Subjects with “embodied cognition” (vs. online or virtual instruction) have greater activation in the sensory and motor systems and superior acquisition for relevant information, learning, and reasoning (Bevill 2021).
- Authentic natural environments bring significant neurobiological benefits to cognition, behavior, emotions and health and healing. Natural increases alpha brainwaves and calm (Lambert et al., 2016)



***Strategies listed on page 2.***

## Strategies:

1. *Make something concrete.* Each day, the human brain needs to perceive “real” so don’t overlook building a 3-D, or physical project.
2. *Find something to demonstrate understanding:* in absence of the on-site learning a student’s environment becomes their laboratory. In their home (with parent approval) or outside environment.
  - *Create a book/project* ...many use Dr. Seuss books as a template.
  - *Publish* a magazine—electronic or print.
  - *Sculpt* an object related to a concept or topic.
  - *Manipulate* something (pick something you can use over and over: Legos, constructs, Lincoln logs, Tinker toys, straws, or any item purchased in bulk) to represent an object relevant to the skill or topic being taught. (Using real-world objects leads to an 82% recall rate.)
3. Present all work to a real audience (families, companies; include writing, projects, research, etc.).
4. Brainstorm and produce an all-encompassing event or project (as a team, company, class, or family).
5. Design a “Patch” or “Special Event” Card. NASA has designed a patch for every mission to outer space. What factors would your class select for your badge to commemorate your year together?
6. Have “achievement” belts: Martial arts classes assign a white belt to each student the moment they begin learning. Adding colored tape to the belt will keep track of their progress. Every business, classroom, and family member can receive a belt-like concept to display colored tape (which correlates with a grade or assessment or particular behavior or achievement).