

What do **GAMES** Have To Do With Standards-Based Math Practices?



HERE'S THE SITUATION...



1,000

Students were asked if they'd rather eat broccoli or do math problems.

Most chose broccoli.

SO...

How do we get students to choose math?

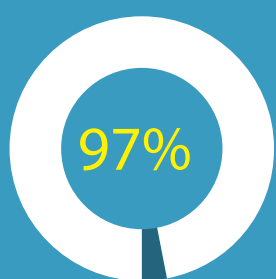


AND...

How do we get them to **go deeper** in their learning and develop the kind of **mathematical practices** described in state standards?

- MULTI-STEP PROBLEM SOLVING**
- PERSEVERANCE**
- ABSTRACT REASONING**
- ARGUMENTATION**
- ANALYZE**
- MAKE PREDICTIONS**

LEVERAGE THEIR LOVE OF DIGITAL GAMES



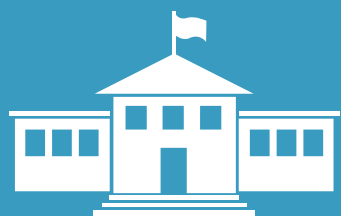
of 2-17 year olds play video games

Both boys and girls!



Nearly **2/3** of young Americans play games while **interacting with friends and family**.

They're communicating and working collectively (A.K.A. constructing viable arguments and critiquing the work of others!)



74%

of K-8 teachers use digital games in instruction

If designed well, game-based learning can harness students' **intrinsic motivation** and **love for play** and lead them toward **complex problem solving**.

HOW?

GAMES MAKE BRAINS

GROW

A study using fMRI technology showed three areas of **brain growth** after two months of playing digital games.

PREFRONTAL CORTEX

- abstract thinking
- analyzing
- making choices
- making predictions

HIPPOCAMPUS

- memory
- spatial navigation
- learning

CEREBELLUM

- movement



PRODUCTIVE STRUGGLE

If you think about it, most of game playing is failing, so why don't players give up?

It's because students **expect to fail** as part of mastering a game. It doesn't make them feel bad. They know that struggle and failure are just **part of the process** toward success.



"... Giving our kids **ample opportunity to fail** will turn them not into abject failures but into **gritty, impassioned, self-reliant learners**."

— Greg Toppo

The Game Believes In You: How Digital Play Can Make Our Kids Smarter



Nearly **3/4** of digital game-using teachers report that games have been effective in **improving students' mathematics learning**.



Teachers who use games **more often** report greater improvement in students' core and supplemental skills.



However, most teachers **need help** finding curriculum-aligned games that lend themselves to deep exploration and **complex problem solving**.

WHAT KIND OF GAMES HELP DEVELOP STRONG MATHEMATICAL PRACTICES?

GAMES THAT

- Create a compelling world of problem-solving
- Allow self-directed exploration
- Deliver scaffolded, mastery-based learning
- Provide data for players to monitor their own progress
- Offer real-time feedback to help players adjust their solution path



To find out more about how game-based learning can build strong mathematical practices, contact MIND Research Institute:

888.751.5443 | info@mindresearch.org | mindresearch.org

