Play Your GAMES: Generating Academic Meaning from Entertainment Systems.

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What is Play Your GAMES (PYG)?

PYG is a gameplay program designed to exploit the interests of students, within the context of reinforcing STEM methodology and problem-solving acuity.
Play Your GAMES: Generating Academic Meaning from Entertainment Systems.

What Does PYG Look Like?
Why Use PYG? (Objectives)

1. Teach/Model problem solving!
2. Engage a diverse population of students in STEM topics (regardless of content area)
3. Use gameplay to propel core content
4. Keep STEM learning/methodology at the forefront
5. Exploit student interests to draw kids to core content
Play Your GAMES: Generating Academic Meaning from Entertainment Systems.

Is It Research-Based?

**Popular Media Exposure:**
- Wired Magazine- *Kids Like to Learn Algebra, if It Comes in the Right App.*  
  [http://wrd.cm/1f98hlZ](http://wrd.cm/1f98hlZ)
- 3 Reasons Your Kids Should Be Playing Video Games (Edutopia):  
  [http://t.co/yi59TQkRUj](http://t.co/yi59TQkRUj)
- How online gamers are solving science's biggest problems.  
  [http://t.co/F7lm8KatFq](http://t.co/F7lm8KatFq)
- Game-based learning to teach STEM:  
  [http://t.co/rJQ55E2IOY](http://t.co/rJQ55E2IOY)
- National STEM Video Game Challenge-  
  [http://bit.ly/1d2tW2m](http://bit.ly/1d2tW2m)

**In Academia:**
- Cultural Studies of Science Education: Leveraging insights from mainstream gameplay to inform STEM game design: great idea, but what comes next?  
- Aligning Problem Solving and Gameplay: A Model for Future Research and Design.  
- The Efficacy of Games and Simulations for Learning (Chapter): Educational Gameplay and Simulation Environments.  
A Typical PYG Session...for Me

Thursday...7:25-7:35am

- PYG groups meet to discuss game platform/choice for week(s)
- Calculate group average, which determines time-in-gameplay

**HOW LONG ARE YOU PLAYING TODAY?**

<table>
<thead>
<tr>
<th>Group Grade Average</th>
<th>&quot;GAME&quot; Time</th>
<th>Review Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.5-100</td>
<td>45 min</td>
<td>Optional</td>
</tr>
<tr>
<td>79.5-89.49</td>
<td>30 min</td>
<td>15 min</td>
</tr>
<tr>
<td>0-79.49</td>
<td>15 min</td>
<td>30 min</td>
</tr>
</tbody>
</table>

Groups using Review Time can use the following resources:
- Quiz/Test Corrections: Turn in for credit!
- Extra Help: Setup an appointment with me!
- Khan Academy: Take notes on what you're learning!
- Mr. K's Google Classroom: Take notes on what you're reviewing!

**Note:** Since grade averages change each day/week, each group will need to calculate their average every Thursday.
A Typical PYG Session...for Me

Friday...8:15-9:00am
-PYG groups meet to get game platform equipment and/or set up their own equipment for gameplay
-Obtain PYG sheet
-Play their chosen game for the timeframe determined by yesterday's average calculation
Efficacy/QA

Pre-/Post-Assessments:
• Focus on problem-solving (single-step is emphasized in ES settings; test is primarily multistep word problems)
• Adapted from the 2009 7th Grade TAKS (Texas Assessment of Knowledge & Skills; http://www.tea.state.tx.us/student.assessment/taks/released-tests/archive/)
• Tests administered September and May
Play Your GAMES: Generating Academic Meaning from Entertainment Systems.

Efficacy/QA

Standardized Test Data Comparisons:

Measures of Academic Progress® (MAP®) Test- RIT scores assigned to measure growth, create progress goals


Fall, Winter, Spring Test Administrations (Sep 2013; Jan 2014; May 2014)

<table>
<thead>
<tr>
<th>Block 1</th>
<th>Low</th>
<th>Low Avg</th>
<th>Avg</th>
<th>High Avg</th>
<th>High</th>
<th>Mean RIT</th>
<th>Median RIT</th>
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</thead>
<tbody>
<tr>
<td>Computation and Estimation</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>7</td>
<td>26%</td>
<td>230-232-235</td>
</tr>
<tr>
<td>Computation and Estimation</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
<td>242-245-247</td>
</tr>
<tr>
<td>Computation and Estimation</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>4%</td>
<td>5</td>
<td>19%</td>
<td>244-246-248</td>
</tr>
</tbody>
</table>

| Block 2       | 9   | 38%     | 5   | 21%      | 1    | 4%       | 207-211-216 | 212  |
| Computation and Estimation | 6   | 27%     | 3   | 14%      | 4    | 15%      | 216-223-228 | 221  |
| Computation and Estimation | 9   | 35%     | 3   | 12%      | 4    | 15%      | 218-221-224 | 225  |

| Block 3       | 5   | 19%     | 5   | 19%      | 12   | 44%      | 215-216-218 | 218  |
| Computation and Estimation | 1   | 4%      | 6   | 23%      | 8    | 31%      | 224-226-229 | 225  |
| Computation and Estimation | 6   | 23%     | 6   | 23%      | 7    | 27%      | 221-223-226 | 223  |
Efficacy/QA

Standardized Test Data Comparisons:
• Local Assessment Data- SOL 6.6/6.7 (most approximate standards)
• 2012-13 School Year

<table>
<thead>
<tr>
<th>SOL 6.6 (Fraction operations; estimation word problems)</th>
<th>1st Test</th>
<th>2nd Test</th>
<th>3rd Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td>Block 2</td>
<td>Block 3</td>
<td>Block 1</td>
</tr>
<tr>
<td>88</td>
<td>56</td>
<td>56</td>
<td>81</td>
</tr>
<tr>
<td>Average</td>
<td>69</td>
<td>53</td>
<td>64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOL 6.7 (Word problems; consumer math applications)</th>
<th>1st Test</th>
<th>2nd Test</th>
<th>3rd Test</th>
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<tbody>
<tr>
<td>Block 1</td>
<td>Block 2</td>
<td>Block 3</td>
<td>Block 1</td>
</tr>
<tr>
<td>88</td>
<td>55</td>
<td>64</td>
<td>85</td>
</tr>
<tr>
<td>Average</td>
<td>69</td>
<td>84</td>
<td>85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Block</th>
<th>Fall MAP</th>
<th>Winter MAP</th>
<th>% change</th>
<th>Spring MAP</th>
<th>% change</th>
<th>Overall Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>232</td>
<td>245</td>
<td>+5.6</td>
<td>246</td>
<td>+0.4</td>
<td>+6</td>
</tr>
<tr>
<td>2</td>
<td>211</td>
<td>223</td>
<td>+5.6</td>
<td>221</td>
<td>-0.8</td>
<td>+4.7</td>
</tr>
<tr>
<td>3</td>
<td>216</td>
<td>226</td>
<td>+4.6</td>
<td>223</td>
<td>-1.3</td>
<td>+3.2</td>
</tr>
</tbody>
</table>
Student Accountability

1. **PYG Sheet**
   Structured to guide students through gameplay as a scientific process, while also providing opportunity to see the game through a “STEM lens”

2. **Time-In-Game Qualification**
   Students qualify for their game time by academic achievement. All students are able to participate, but higher group averages equate to more game time. Groups with less game time use that free time to do review activities, remediation on previous assessments, and/or get peer tutoring.

3. **BYOD!**

4. **Possible Add-Ons**
   It is difficult to help the program “fresh” if you’re not scouting new opportunities/wrinkles to the program.
   - Writing opportunities to further process gameplay
   - Makey Makey kits ([www.makeymakey.com](http://www.makeymakey.com))
   - Game Design potential
Challenges

1. **BYOD**
   - Dependent upon district policy, desire to make waves
   - Increases the # of available inventory of games (see below)

2. **“How do I fit this into my instructional practice?”**
   - A question to ask: “Do I want my kids to be good problem solvers?” “Do I want my kids to understand STEM methodology?”
   - If you can tie this to a skillset that will be needed later in life AND/OR a prescribed standard(s), read on..

3. **Free, Cheap, or Out-of-Pocket?**
   - Depending on funding/grant supports, or if you’re just rich, you may decide to purchase game licenses, systems, etc
   - Keeping it free- games that can be accessed through district filters; BYOD; game platforms that can be obtained (ex. NES, PS2/3/4, etc)

4. **Game Inventory**
   - Vetting of games is IMPORTANT!
   - Clearninghouse for vetted games (website, Drive, etc)
   - “Is the game appropriate for use in the school setting?”

Tim Kubinak
Opportunities for Improvement

Preface: I (probably) don’t have all the answers.

**Assessment** - Using pre/post-testing to quantify problem-solving improvement (did not do this in first year of program)

**BYOD** - Though my district is just beginning to implement a BYOD policy, I have allowed students to use mobile devices for PYG (with caveats); game vetting will be a challenge at times, as students find new games.

**PYG Sheet** - Has gone through 3 revisions since last year, in an effort to maximize its value in STEM methodology, problem-solving process

**Session Scheduling** - Because the first job is ACADEMICS, not every week will be a PYG day; by maximizing my teaching time, and using technology in other ways, time can be made to keep the program a part of the instructional practice.
What Would **YOU** Do?

Am I flexible enough in my instruction? Do my students need this?

What resources/support can I pull together?

How will I communicate this with stakeholders?

When will I do this?

How will I quantify any desired results?

Who can I collaborate with to make this a success?

Where can I get more information about gameplay in the classroom?

Am I ready for kids to be EXCITED about _____ AND STEM!?
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PYG Community

timothykubinak@spsk12.net
Join the GroupMe Chat! (Sign up to be sent an invite)

Check out the PYG website! (games; news; events)
http://pyg.weebly.com

I tweet game ideas, resources, and research when I find them... @MrKteachesSTEM-Hashtag #PYG

Tim Kubinak
Acknowledgements:

The PYG project would not have been possible without the support of the following people/organizations. You should check them out:

VCTM/NCTM
DonorsChoose.org
Mr. Daniel O’Leary, Principal, JYMS
JYMS PTSA
My wife and kids
Bacon

Background Credit: Deviant Art; http://tinyurl.com/mvx2two
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PYG: http://pyg.weebly.com
LinkedIn: Yes, I’m there
Google: Yes, you may Google me.
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