



Play Your GAMES: Generating Academic Meaning from Entertainment Systems.

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<https://twitter.com/mrkteachesstem>

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What is Play Your GAMES (PYG)?

Science **Math** **Gameplay**
Technology **Success** **Engineering**
Problem Solving **Failure**

PYG is a gameplay program designed to exploit the interests of students, within the context of reinforcing STEM methodology and problem-solving acuity.

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**

Is It Research-Based?

Popular Media Exposure:

- **Wired Magazine- *Kids Like to Learn Algebra, if It Comes in the Right App.*** <http://wrd.cm/1f98hIZ>
- **3 Reasons Your Kids Should Be Playing Video Games (Edutopia):** <http://t.co/yiS9TQkRUj>
- **How online gamers are solving science's biggest problems.** <http://t.co/F7Im8KatFg>
- **Game-based learning to teach STEM:** <http://t.co/rJQ55E2IOY>
- **National STEM Video Game Challenge-** <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?** <http://bit.ly/1bNxURW>
- **Marine Technology Society: D.E.E.P. Learning; Promoting Informal STEM Learning through Ocean Research Videogames.** <http://bit.ly/1nPieNN>
- **Aligning Problem Solving and Gameplay: A Model for Future Research and Design.** <http://bit.ly/1gYkAJo>
- **The Efficacy of Games and Simulations for Learning (Chapter): Educational Gameplay and Simulation Environments.** <http://bit.ly/1fiwMVh>

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?

Group Grade Average	"GAME" Time	Review Time
89.5-100	45 min	Optional
79.5-89.49	30 min	15 min
0-79.49	15 min	30 min

Groups using Review Time can use the following resources:

- Quiz/Test Corrections- Turn in for credit!
- Versa-Tiles- See me for ideas; show all work!
- Khan Academy- Take notes on what you're learning!
- Mr. K's Edmodo- Take notes on what you're reviewing!
- Extra Help- Set up an appointment with me!
- Anchor Activities (Hanging file next to whiteboard)
- Have another idea for Review Time? TELL ME!

Note: Since grade averages change each day/week, each group will need to calculate their average every Thursday.

Teacher: Kubinak, Tim
Class: Math 6 Section: 10

Student	Avg
44000434	85.66
380002075	96.93
44000655	82.10
391002230	88.89
440001910	89.66
50000851	73.86
391001750	88.57
80001413	94.61
44000475	93.42
90001443	87.14
80001371	85.05
90001201	77.92
391002091	90.06
44001064	70.43
44000321	90.27
44000973	85.67
380002070	97.55
391002287	92.24
90001539	88.89
90001459	68.38
380002074	89.22
90001365	96.26

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

PYG: "PLAY YOUR GAMES"
(GENERATING ACADEMIC MEANING FROM ENTERTAINMENT SYSTEMS)

GROUP MEMBERS PRESENT: _____
ACTIVITY DATES: _____ BLOCK: _____
GAME PLATFORM/NAME: _____

PART 1: EXPLORATION
Write your observations of the game activity here (objective(s) of game; how to play; type of game)

PART 2: INQUIRY

1. Identify a specific object in/about your game that is in *action* (moving, doing something).

2. What is it doing?

3. How does that action relate to a "successful" game?

4. How do you know you've "succeeded" in the game? | _____

3. If an experiment can be designed around the action of the item in question 1, what material(s) would be needed?
List all of the materials used (game system, objects in game used to accomplish your goal, etc.)

4. If you have the following materials, what could you change to achieve success in the game?

You can list as many items in this blank as possible, but for the following questions, you will choose one of the items above. (Note: something you change in an experiment is called an **independent variable**.)

5. How could that change be **measured**? (Something you measure in an experiment in response to a change is called a **dependent variable**.)

6. What must be kept the **same** in the experiment? These are called **constants**.

PART 3: HYPOTHESIS
The purpose of the experiment is to determine the effect of _____ on _____
_____ in the presence of _____
If _____
then _____

PART 4: PROBLEM SOLVING & REFLECTION

1. In Part 1, you wrote about the objective(s) of the game. During the game, you may fail (not meet the objective goal). What do you do when you fail? Explain an example, using your game experience. Tell how you overcame failure. You can write a paragraph, make a list, or a graphic organizer.

2. Like in daily life, there may be many examples of problems to be solved in games. Some may involve a single step, and some may be multi-step situations. Write examples of them in the space provided below.

Single-Step Problems	Multi-Step Problems
_____	_____
_____	_____
_____	_____

PART 5: STEM RELEVANCE
Many games are rooted in STEM (Science, Technology, Engineering, Mathematics) concepts. Document your STEM findings about your game below. Add spaces if necessary.

Game Situation/Information	STEM Field (S, T, E, or M)	STEM Concept Discovered
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



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**

Efficacy/QA

Standardized Test Data Comparisons:

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

(more info on RIT: <http://bit.ly/Ni7s7A>)

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

Block	Low	Low Avg	Avg	High Avg	High	Mean RIT	Median RIT
Block 1							
Computation and Estimation	0 0%	0 0%	7 26%	6 22%	14 52%	230-232-235	233
Computation and Estimation	0 0%	1 4%	1 4%	6 22%	19 70%	242-245-247	246
Computation and Estimation	0 0%	0 0%	1 4%	5 19%	21 78%	244-246-248	247
Block 2							
Computation and Estimation	9 38%	5 21%	1 4%	4 17%	5 21%	207-211-216	212
Computation and Estimation	6 27%	3 14%	4 18%	2 9%	7 32%	218-223-228	221
Computation and Estimation	9 35%	3 12%	4 15%	7 27%	3 12%	218-221-224	225
Block 3							
Computation and Estimation	5 19%	5 19%	12 44%	5 19%	0 0%	215-216-218	218
Computation and Estimation	1 4%	6 23%	8 31%	7 27%	4 15%	224-226-229	225
Computation and Estimation	6 23%	6 23%	7 27%	5 19%	2 8%	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

	1 st Test			2 nd Test			3 rd Test		
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
SOL 6.6 (Fraction operations; estimation word problems)	88	56	56	81	42	36	78	54	60
Average	69			53			64		
SOL 6.7 (word problems; consumer math applications)	88	55	64	85	81	86	98	75	82
Average	69			84			85		

Block	Fall MAP	Winter MAP	% change	Spring MAP	% change	Overall Change
1	232	245	+5.6	246	+0.4	+6
2	211	223	+5.6	221	-0.8	+4.7
3	216	226	+4.6	223	-1.3	+3.2



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)

-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!**
- Clearinghouse 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?



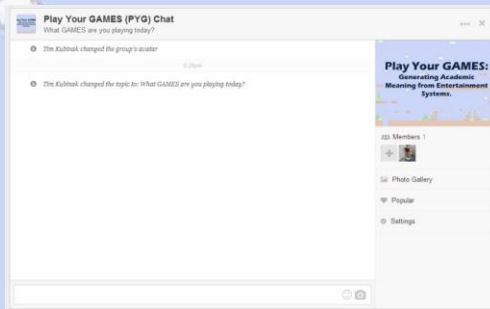
Am I ready for kids to be EXCITED about _____ AND STEM!?

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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

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

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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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