

# 4 Pillars of Digital Game Based Learning



## A Structured Rating System for Games for Learning

*"If we teach today's students as we did yesterday's, we are robbing them of tomorrow."*

— John Dewey

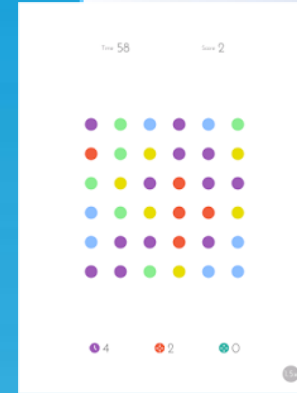


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# What am I playing Now?



# The Challenge

1. Games are complex.

What should we assess?

Gameplay?

All levels or just one?

All modes of play or just one?

In-Game Assessment?

Curricular Ties?



# The Challenge

1. Games are complex.
2. Assessments designed for commercial games miss the mark.

Doesn't look at the right things.

Concerned with fun & engagement  
not learning.

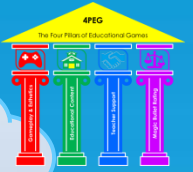


# The Challenge

1. Games are complex.
2. Assessments designed for commercial games miss the mark.
3. Assessments designed for 'traditional' instruction also miss the mark.

Don't really take the medium as  
integral.





# The Challenge

1. Games are complex.
2. Assessments designed for commercial games miss the mark.
3. Assessments designed for 'traditional' instruction also miss the mark.
4. Summative assessment not always an option.

May not have data, or opportunity



# The Challenge

1. Games are complex.
2. Assessments designed for commercial games miss the mark.
3. Assessments designed for 'traditional' instruction also miss the mark.
4. Summative assessment not always an option.
5. Critical reviews are hard to do (and even harder to find).





# The Challenge

Digital Games cannot be assessed in the same way as traditional games, or for that matter, any other modern media form.

1. What do we need from digital games for learning?
2. What criteria are important when assess games?



# What Makes Digital Different?

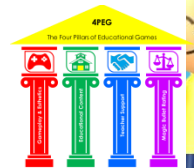
## Digital vs Non-Digital Games

	Digital	Analog			
	Digital Games (and Simulations) (ALL)	Board & Card Games	Analog Simulation Games	Analog Role-Playing Games	Live Action Role-Play (including cosplay)
Model of Original System	Painstakingly and precisely defined.	Many details taken for granted and never made explicit.			
Rule Enforcement	Hard-coded.	Uses 'honor system'.	On the fly.		
Rule Structures	Pre-determined.	Negotiable.			
Roles	Accurate placement into context.	Imagined, personally mediated.	Determined by game rules.		Imagined, personally mediated.
Environment	Dynamic - same for all players.	Static - unchanging.	Combined static physical artifacts (boards & pieces) AND imagined.		Imagined: personalized.
Environment Resolution	Dynamic.	Static physical.	Relatively static.	Relatively static.	Individually mediated.
Game Objects	Can be autonomous.	Either inert or mechanical			Imagined (can include props).
Game Interaction (what people can do with / to the game)	Consistent across all instantiations of the game.	Consistent only if the rules are followed.			Each instantiation can be different.
Participants	There need only be one human participant.	All participants are human.			



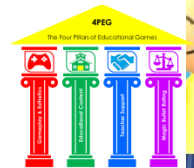
# What Do We Need?

- Structured Approach
  - for comparability
- Concise
  - not too long
- Complete
  - as a game AND as a learning object



# What Criteria Are Important?

- How is it as a game?
- Does it have teacher support?
- Is it well-designed as an educational object?
- Are the various elements appropriately balanced?



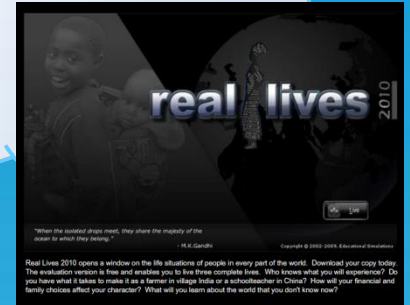
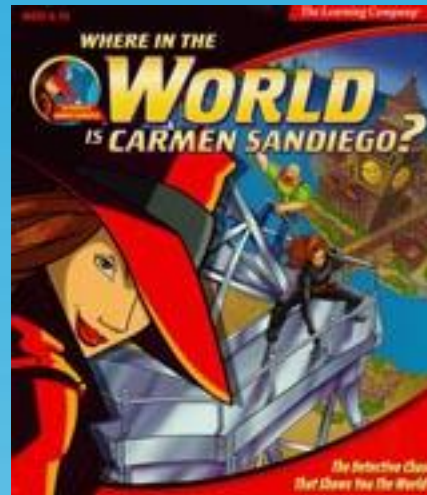
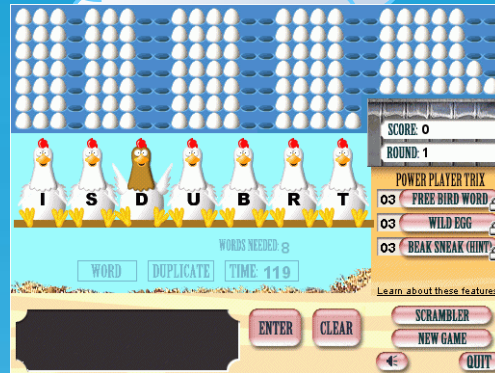


# What Makes A Game Good?



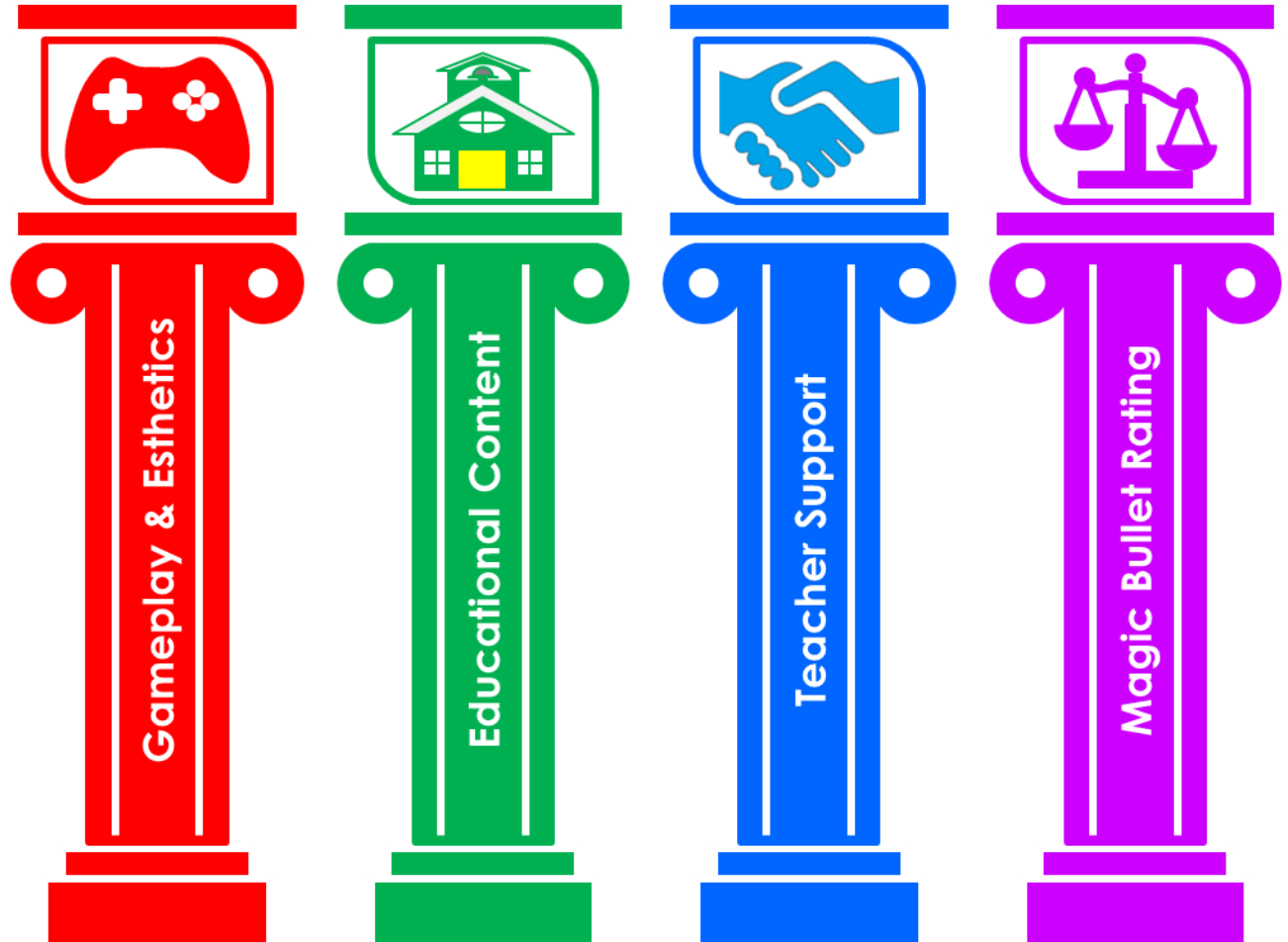


# What Makes a Good Game for Learning?



# 4PEG

## The Four Pillars of Educational Games



A Solution

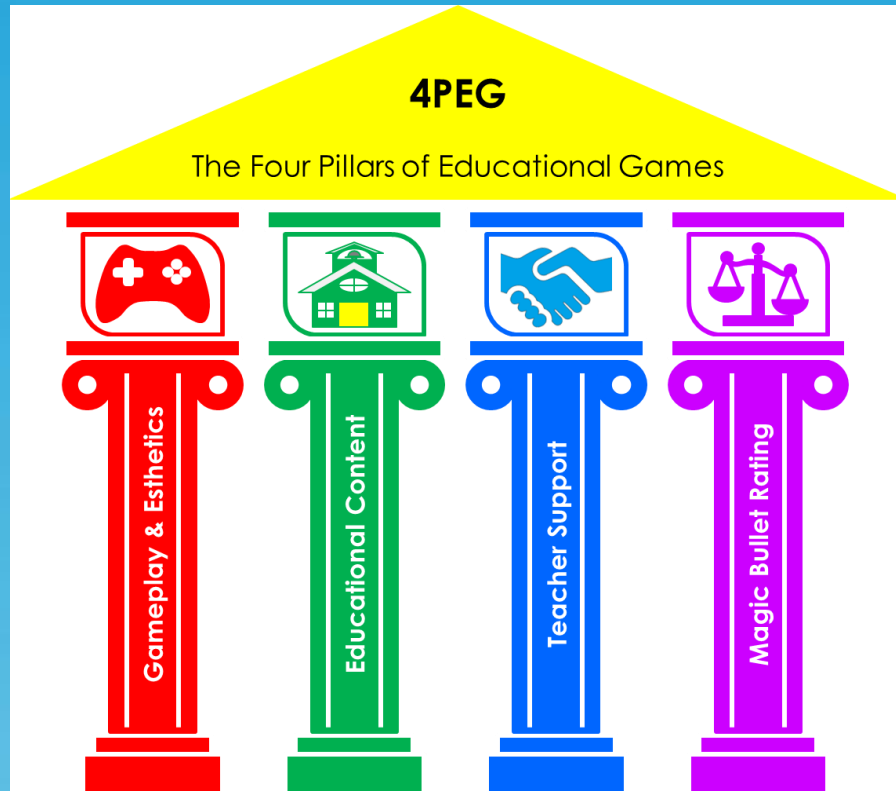
# Overview

- Model for evaluating and assessing games
- Subjective tool
- Learning NEED NOT = education
- Currently developed for single-player games
  - Relative Proportions

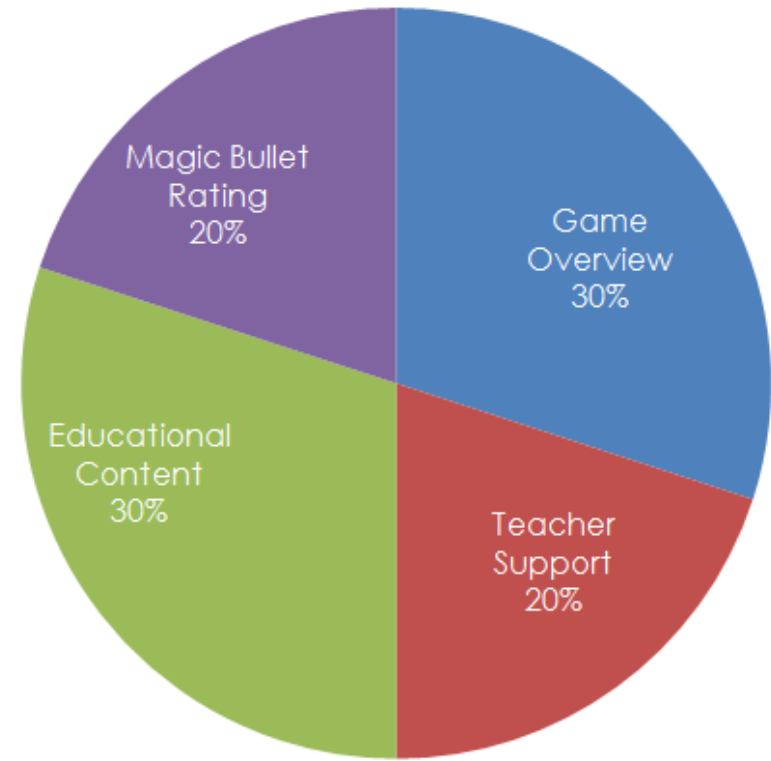




# Four Pillars



**The Four Pillars of Analysis**



# Ratings

[na] Not Applicable

Missing [0]

Poor [1]

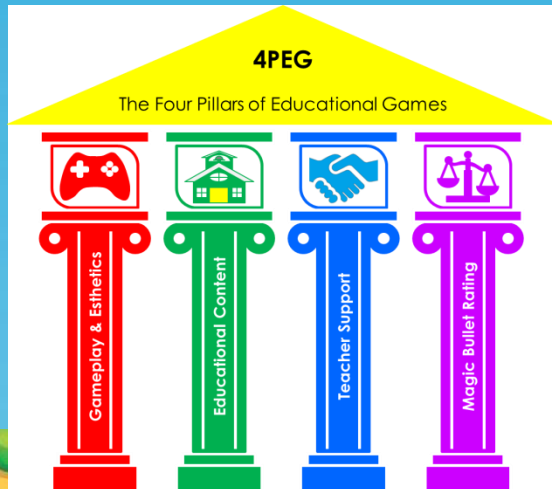
Fair [2]

OK [3]

Good [4]

Excellent [5]

- Common Likert scale.
- Includes missing & N/A



Game Review V5 <GAME>					Fair [2]	OK [3]
Overall Rating		2.5	49	/100		
Summaries						
<b>Game Overview</b>	2.8	14	/30	<b>Educational Overview</b>	2.5	35 /70
Gameplay	2.0	6	/15	Teacher Support	2.5	10 /20
Art & Audio	4.0	8	/15	Educational Content	2.5	15 /25
				Magic Bullet Rating	2.5	10 /25
<b>Game Overview</b>	2.8	14	/30	<b>Educational Content</b>	2.5	15 /30
Content & Originality	1	/5		Instructional Strategies	0	/5
Game Mechanics	2	/5		Instructional Design	1	/5
Game Progression	3	/5		Objectives	2	/5
Artistic Design	4	/5		Integration	3	/5
Setting & Characters	5	/5		Accuracy	4	/5
Audio	-1	/5		Assessment	5	/5
<b>Teacher Support</b>	3	10	/20	<b>Magic Bullet Rating</b>	2.5	10 /20
Guides	1	/5		Overall Balance	1	/5
Plug N' Play	2	/5		Can Learn vs Must Learn	2	/5
Resources	3	/5		Operational vs Educational Learning	3	/5
Community	4	/5		Educational vs Discretionary Learning	4	/5

NOTE: Items marked -1 (na) are not counted

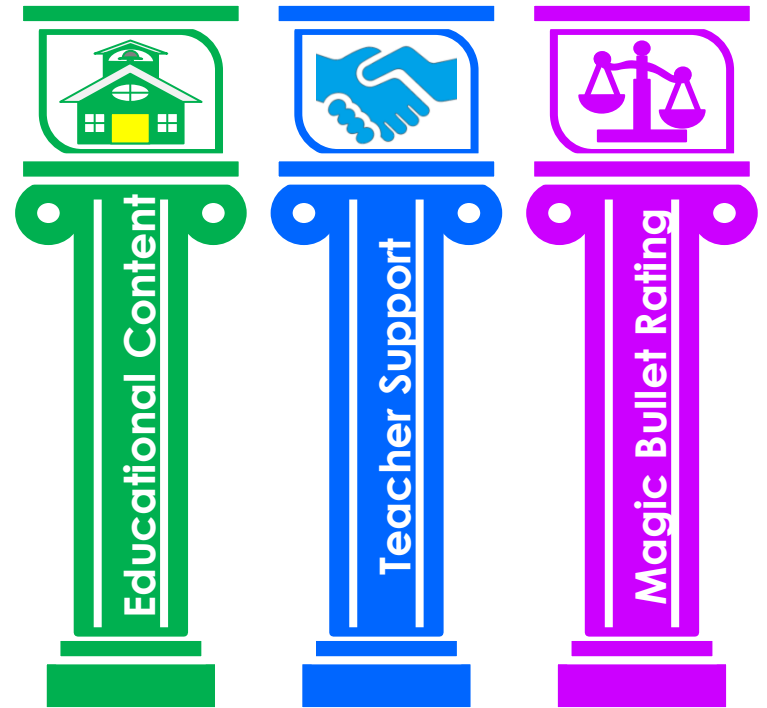
# Game Overview 30%

- Content & Originality
- Game Mechanics
- Game Progression
- Artistic Design
- Setting & Characters
- Audio



# Educational Overview 70%

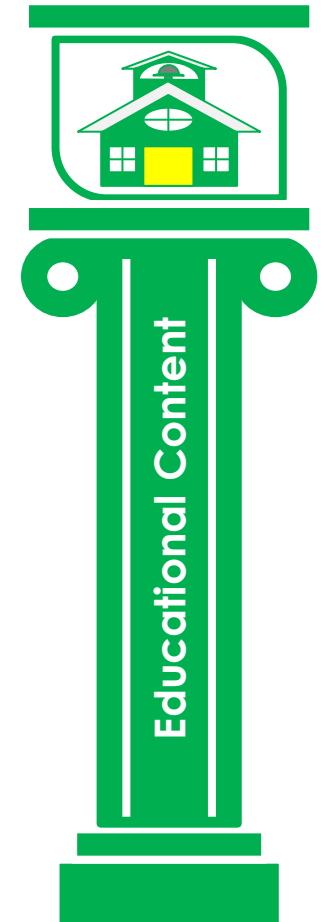
- 3 of 4 Pillars
  - Educational Content
    - 30%
  - Teacher Support
    - 20%
  - Magic Bullet Rating
    - 20%





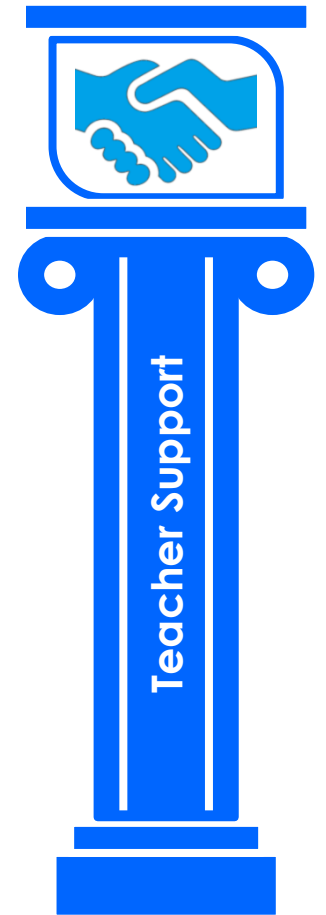
# Educational Content

- Instructional Strategies
- Instructional Design
- Integration
- Objectives
- Accuracy
- Assessment



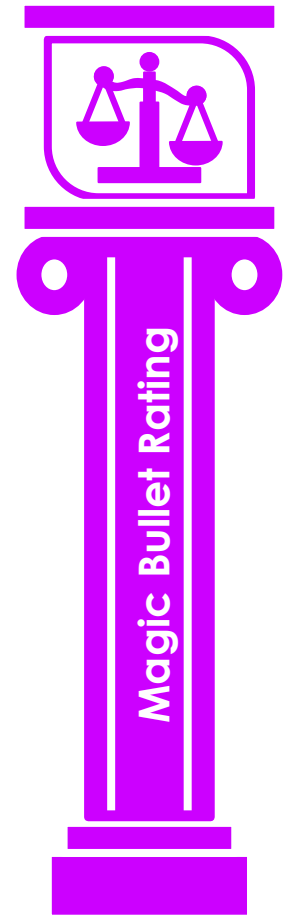
# Teacher Support

- Guides
- Plug N' Play
- Resources
- Community



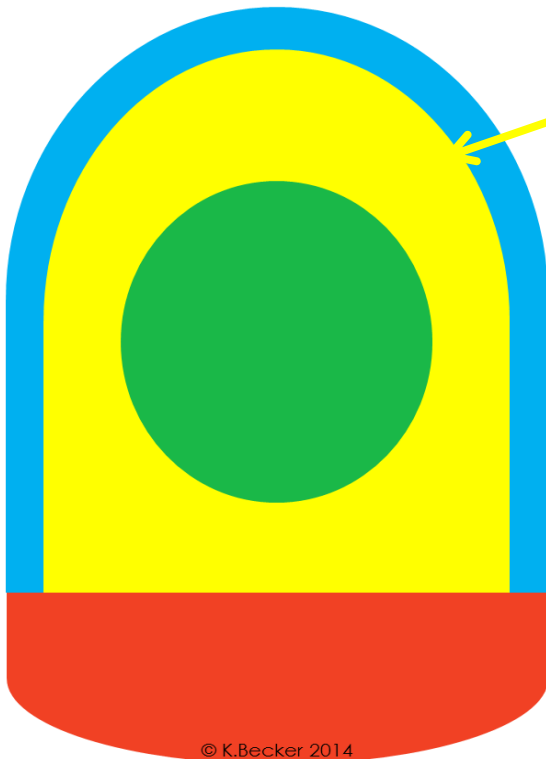
# Magic Bullet Rating

- Overall Balance
- Can Learn vs *Must* Learn
- Operational vs Educational Learning
- Educational vs Discretionary Learning



# Magic Bullet

## Magic Bullet



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## Things I CAN Learn

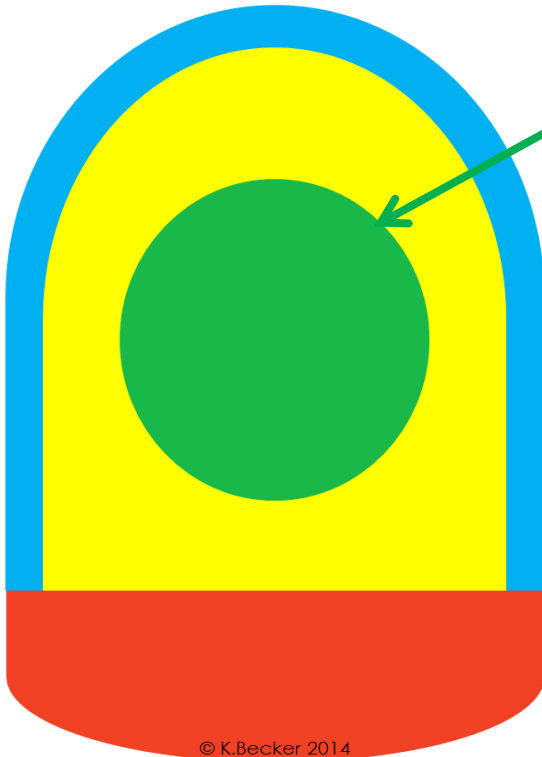


- Anything we CAN learn through the gameplay.
- Deliberately designed by those who created the game.
- May impact success in the game
- Includes things designers \*hope\* people will take up.
- Includes game-specific objectives as well as general ones.



# Magic Bullet

## Magic Bullet



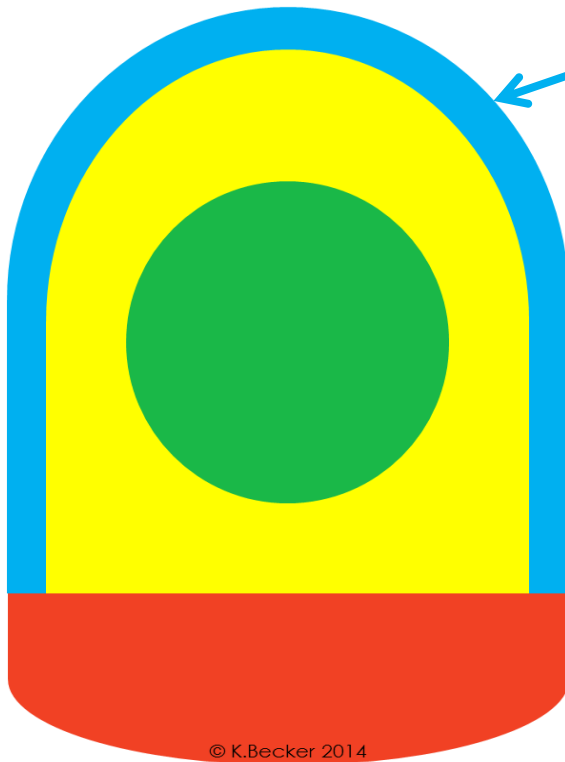
### Things I MUST Learn



- Things we **MUST** learn to achieve our goals.
- Deliberately designed by those who created the game.
- Definitely impacts success in the game.
- Needed in order to win or get to the end.
- Should be a subset of the first category.
- Required to achieve a specific game goal or in order to win.

# Magic Bullet

## Magic Bullet



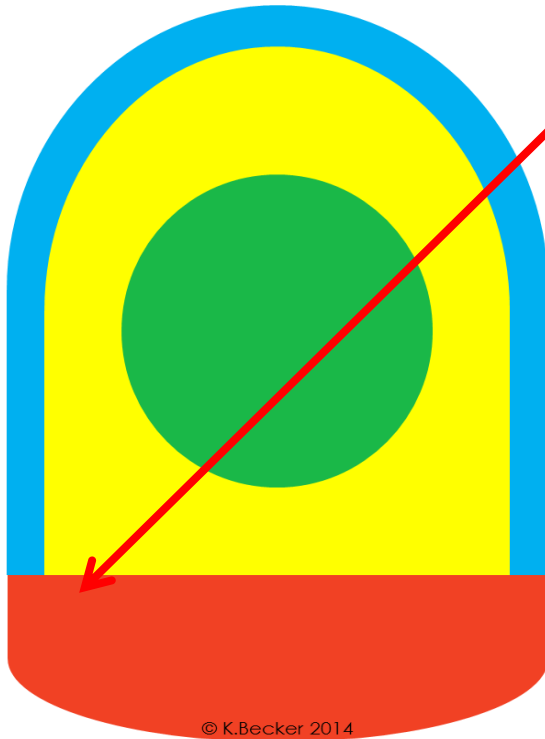
## External Learning



- Things we learn outside the bounds of normal gameplay.
- Deliberately designed by those who created the game.
- Not technically considered part of the normal gameplay.
  - May impact success in the game
  - Includes social learning and outside communities.
  - Also includes Cheats.
- Typically designed into the game for testing purposes.
  - Often left in the game once it ships
- Deliberate design elements on the part of the designers.

# Magic Bullet

Magic Bullet



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Collateral Learning



- Things we learn as a result of the game, but not as part of normal gameplay.
- Not designed into the game (at least, not on purpose).
- No impact on success in the game.
- Other things we can learn.
- These are not necessarily designed into the game, although sometimes designers may hope that players choose to take these up.

# Game Review V5

<GAME>

Fair [2]

OK [3]

Overall Rating 2.5 49 /100

## Summaries

<b>Game Overview</b>	2.8	14	/30
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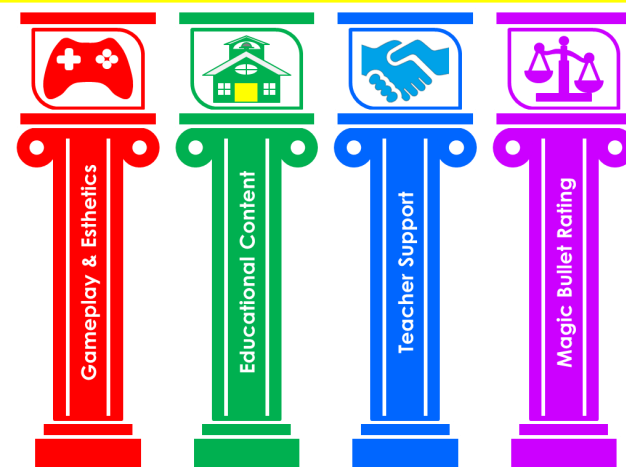
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Overall Balance	1	/5	
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Operational vs Educational Learning	3	/5	
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NOTE: Items marked -1 (na) are not counted

## 4PEG

The Four Pillars of Educational Games





# Abstract

## 4 Pillars of DGBL: A Structured Rating System for Games for Learning

Videogames are interactive by nature - people proceed in games by doing things, and this experiential quality lies at the very core of game design. Without interaction, it isn't a game. Videogames are popular precisely because of the experience - games designed for learning can do no less. However, to be feasible for use in formal educational settings, they must do more, and while we are making progress studying games in classrooms, there remain few structured approaches to analysing games that do not include classroom testing.

This presentation will outline the author's Four Pillars of Game-Based Learning and show using examples how they can be used to perform a structured analysis of both COTS and serious games to assess whether or not a game has potential for use in the classroom.

These four pillars are:

1. Gameplay - How is it as a game? Is it fun? Is it Interesting? How does it measure up esthetically?
2. Educational Content - Are there one or more recognizable educational objectives, discernible either from the game itself or from the accompanying support materials.
3. Teacher Support - Is there adequate teacher support to make viable for use in a formal setting?
4. Balance - This section examines the game through the lens of the Magic Bullet model to see how well the various learning elements are balanced.

Together these four pillars highlight the key issues associated with the use of games in the classroom.