STEM Gaming in Museums
Making the Right Moves

Darrell Porcello, Ph.D. (porcello@gmail.com)
Max Cawley
Tomas Durkin, MFA

www.nisenet.org
Session Introduction

• Quick advice on game development & facilitation. (15 min)

• Let’s play some STEM games! Dive into to our favorite examples. (10 min)

• Rapid reflections on the four game examples. (5 min)

• Now its your turn to adapt your groups game example or come up with a new game based on today’s session. (20 min)
WHY GAMES?
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- motivation
- social
- critical thinking
- imagination
- fun
- goals & feedback
- control
- engaging
- creative
- absorbing

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WHY GAMES?
NISE Network and Gaming

- 2017 NISE Net guide looked at when games were most effective in 12 years of hands-on activity development.

We favor game designs that **foster positive social interactions** between visitors.

We use **familiar games with simple rules** to quickly and easily engage visitors.

We design **experiences that are fun for all ages** by creating gaming challenges that are appropriate for young children, as well as older children and adults.

bit.ly/acm2018game for our SLIDES & RESOURCES
We favor game designs that foster positive social interactions between visitors.

- Learning can emerge from competition.
- Everyone gets a turn.
- Present important information in a variety of ways, to work for different age levels.

- Role playing works for all ages.
- Experimenting with no rules in gameplay may surprise some visitors, but the freedom can also open new doors.
We use **familiar games with simple rules** to quickly and easily engage visitors.

- Facilitator energy level is sometimes critical for a fun learning experience.
- Don’t discount the power of popular culture.
- Museum games modeled on popular games may be so familiar that they don’t need facilitation.
- Simple games are more likely to be remixed and customized by visitors.
- Don’t be afraid of fun.

- Facilitator energy level is sometimes critical for a fun learning experience.
- Don’t discount the power of popular culture.
We design experiences that are fun for all ages by creating gaming challenges that are appropriate for young children, as well as older children and adults.

- Storytelling and games are a natural fit.
- Guessing games build and reinforce skills.
GAMEFULLY EMPLOYED

EFFECTIVELY INCORPORATING STEM GAMING INTO YOUR CURRICULA

Max Cawley (Max.Cawley@lifeandscience.org)

Museum of Life + Science
So You Want to Design A STEM Game?


PROCESS

((What about this process is already game-like?))

- Exploration
- Limited Resources
- Problem-Solving
- Risk and Challenge
- Iterative
- Dramatic
- Imaginative
- Locomotive
GAMES ARE:

- Opportunities for deep learning
- Highly engaging
- Challenging

GAMES ARE NOT:

- “Chocolate-Covered Broccoli”
- Time-wasting
- Stressful
What Should My Game Do?

• Enable and empower learner to make decisions
• Allow learners to get better at your game with practice
• Show immediate (or near immediate) rewards and consequences to actions
• Balance agency of decision-making with randomness
What Should My Learner(s) Do?

- Embrace their failures, and turn them into iterations
- Build a sense of agency, confidence, and decisiveness
- Take on new roles, identities, and responsibilities
- Use their existing knowledge and values to inform
- Build relationships with others and the game content
- Feel like they’re playing!!
Design Your Own Video Games

Workshops from Children’s Creativity Museum, San Francisco, CA
DESIGN YOUR OWN VIDEO GAME WORKSHOPS

- Partnered with Pixel Press to create drop-in workshops
- Used small, colorful plastic blocks for content creation
- Leveraged visitors familiarity and passion for platform video games
- Empowered visitors to create their own content and narratives without having to focus on game mechanics
Characteristics of Platform Video Games

- Player-controlled main character
- Run and jump to avoid obstacles and defeat enemies
- Collect points or coins
- Power-ups can affect player abilities
- Character has limits on how far it can jump and how high
Visitor-made Video Games

- Visitors were able to create endless variations of platform games
- Some focused on level design
- Others created characters and game artwork
- Wide range of ages were able to participate individually and collaboratively
WHAT WORKED?

Successful because it leveraged an existing, familiar game mechanic
WHAT WORKED?

Collaboration between family members and strangers
Contact Info:

Tomas Durkin
Exhibits Development Manager
tom@creativity.org
STEM GAME EXAMPLES (10 min)
What did we observe?

Social?

Fun?

Learning?
Pick a STEM topic you love and modify a game...
STEM GAME CHALLENGE (20 min)
SHARE OUT AND???
NEW: Explore Science: Let’s Do Chemistry Kit

Kit Overview document and how to apply: http://www.nisenet.org/chemistry-apply
Applications due June 1, 2018

In collaboration with the American Chemical Society, the NISE Network has assembled a set of engaging, hands-on experiences designed to stimulate interest, sense of relevance, and feelings of self-efficacy about chemistry among public audiences.

Includes Atoms to Atoms!
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