Public Engagement with Scientific Methods
FLASH SESSION

Sunday, October 22, 2017
10:15 AM - 11:30 AM
“How to Organize a Serious Game Jam in 87 Easy-to-Follow Steps”

Rik Panganiban

ASTC 2017, San Jose, California
About Me

Rik Panganiban, California Academy of Sciences

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What Is a Serious Game Jam?
Examples of Serious Game Jams

1. Climate Game Jam
2. Global Game Jam
3. #WHGameJam
4. National STEM Video Game Challenge
5. Dark Side of the Jam: A NASA Hosted Game Jam
   March 8-10th, 2013
Our Serious Game Jams

Science Game Jam
April 2015

Climate Game Jam
October 2015

Science Game Jam
April 2016
Invitation to Science Game Jam 2016
7 (out of 87) Tips for Organizing a Science Game Jam
Tip #1: PIZZA
Tip #2: Know Your Motivation
Tip #3: Choose a Great
Tip #4: Recruit Experts
Tip #5: Provide Structure
Tip #6: Allow for Freedom
Tip #7: Know Your Goal

For Participants

For the Public

For Your Institution
Cornucopia Demo

• http://www.calacademy.org/cornucopia
1. Pizza - it's the perfect jam food. Accommodates all diets, scales well for small or large groups.

2. Come up with main goals of the jam, why do you want to hold a jam, what happens after the jam?

3. Set up a website

4. Do you need a working product at the end? Or just a demo?

5. Security - people will have some valuable stuff with them.

6. Think about how to keep their stuff safe.

7. Safe Space - consider having a code of conduct so participants know what is expected of them and how they should conduct themselves during the event.

8. Public visibility - do you want visitors to be able to see the jam in progress? Has both good and bad aspects.

9. Winners - do you want to have winners? That can promote healthy competition, but also discourage some.

10. Diversity - would you like the participants to reflect the diversity of your local community, or do particular outreach to certain groups

11. Requirements - how hard do you want it to be to participate?

12. Breaks - do you want to schedule breaks, fun alternative activities

13. Partners - find local groups and organizations that can help make your event successful - education, corporate, government, local business, arts, youth

14. Media - do you want media coverage of your event

15. Figure out where you want your jam to be - 1 full day, 24 hours, a weekend?

16. Decide on the topic of the jam

17. Come up with a working budget

18. Meet with all stakeholders to start planning process

19. Come up with marketing plan

20. Decide on your jam team - 4-10 people

21. Decide on rules of the jam - platforms, tools, judging, prizes, IP

22. Assemble assets you need for jam - physical, digital, personnel

23. Find a space to hold your jam - not too large, not too small

24. Figure out your catering plan - critical to success!

25. Coffee - keep it coming

26. Water - it's the staff of life, have it readily available. Tell people to bring reusable water bottles.

27. Map - make a map so people know how to get to jam and what's nearby

28. Parking - where will people put their vehicles (cars, bikes, hoverboards)

29. Public transportation options

30. Internet - make sure your internet is up to snuff to handle lots of geeks hitting the network at the same time

31. Custodial - make sure the custodial team is prepared to deal with whatever refuse, recyclables and compostables get created

32. Signage - have clear signage created so people know what's up

33. Safety first! Make sure camera work is done, beware of getting hit by other, lack of sleep can lead to falls.

34. Restrooms - nearby and available. Consider non-gendered signage.

35. Kids policy - can you accommodate adults who have small children with them?

36. Aural space - jams can be noisy! Remind people to bring headphones or have quiet spaces available for those that need it.

37. "I'm Done!" Have a plan for teams that finish early (or think that they finished early). They can help other teams, amuse themselves quietly, go home, etc.

38. "We're not done!" Have a plan for teams that don't finish.

39. Allow them to continue working, call it a day, have them present their "prototype" anyway, etc.

40. Time checks - have a visible countdown clock. Creates excitement and buzz in the room.

41. Prior work - decide on your policy regarding use of prior code / work / projects in the current jam.

42. IP - decide on a policy regarding use of media assets that aren't created by the jammers.

43. IP - decide on if jammers can take their games and continue to develop and potential sell them later.

44. Arcade - create an arcade to feature the games that people can play afterwards.

45. Virtual arcade - if the games are online, create a virtual arcade where people can play games.

46. Inspiring examples - consider having inspiring examples to get people started. But be careful about constraining their creativity if you do so. If you show a puzzle game, jammers might all decide to make puzzle games.

47. Platform: think about what platform makes sense for your jam. Should it be something readily available and known to many people? Something that can be picked up in a weekend? Or something more complex but will result in a higher quality product?

48. Your media assets: consider making media assets available that you would like incorporated into the game. These can be on flash drives or a common Dropbox for all.

49. Prepping jammers ahead of time: consider having "homework" that jammers are required to do on their own beforehand so they know your content well coming into the jam. These can be lectures, videos, documents, slideshows.

50. Alcohol: some jams allow or provide alcohol, others don't. Have a policy and stick to it.

51. Prizes - it's always good to have prizes for winners, and swag for everyone. It doesn't have to be a lot. They should be coming because they are interested in the topic or supporting your cause, not because of a huge cash prize.

52. Technology tools: are you providing computers or other tech for jammers? Or are they expected to bring their own?

53. Evaluation - have a process for jammers to be able to give you feedback on the jam, a form, suggestion box, email address, etc.

54. Call to Action - should all the games inspire some kind of action in the player?

55. Audience - who is the audience for the games jammers are creating?

56. Team size - decide on a team size requirement. Two is too small, 10 is too many.

57. On the Spot Teams - decide on if you will support people creating teams on the spot, or if they have to have pre-set teams beforehand. Our experience is that pre-set teams are always easier to manage and work together the best. On the spot teams require more support and have more potential pitfalls.

58. Duration of games - how long of game play do you want? One minute? One hour?

59. Location of games - where will the games be played? In a physical location, on a website, an app, in a classroom

60. Packets for Jammers - have a packet of materials that jammers get when they arrive

61. Take care of yourself - make sure that you take breaks, drink water, get sleep

62. Print out detailed schedule for all team and volunteers to have on them

63. Be reachable - cell phone, walkie-talkie

64. Supplies on the table - pens, pencils, scrap paper, art supplies

65. Electricity - have outlets and power strips available

66. Lighting - proper lighting can help keep the mood energetic, or calm, depending on what you want. Natural light is best, if you can provide it.

67. Check-in - how will you handle check-in and check-out

68. Name badges: print clear name badges for all jammers

69. Your team visibility - have them easily visible, colors, tee-shirts, vests

70. Sleep - is this required? (I say yes, others disagree)

71. Recruit and prepare your experts and volunteers

72. Plan for how to document your event - photos, video

73. Prepare materials for jam - content, game building supplies, technology

74. Logistics before event: Do as much as possible the night before

75. Begin the jam - have a kick-off - inspiring speakers, clear directions, ice-breaker

76. Schedule check-ins with teams & experts

77. Have teams create working prototypes and test them

78. Create rubric for judges panel to use to decide on winners

79. Hold a final presentation of games

80. Award prizes / swag

81. Have a clean-up plan

82. Plan a celebration for your planning team

83. Post the results, share it out

84. Thank your participants, experts, volunteers and partners

85. Prepare final budget with actual costs

86. Plan your next jam....

87. Seriously, pizza is the best
Thank you.

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Design Stories: Bringing Field Trip Engineering Design Experiences Back to the Classroom

Rose K. Pozos
New York Hall of Science // Stanford University
ASTC 2017
Design Stories

- Intro: What is Design Stories?
- Study Overview: What did we do with it?
- Implications for Design Stories
- Potential Areas for Further Research
Design, Make, Play experiences invite everyone to ask questions, take risks and experience success
Intro: What is Design Stories?
Study Overview: What did we do?

- Purpose
- Methods
- Setting
- Findings
Key Takeaways

- Approaches to Documenting STEM Learning
- Challenges of Balancing Documentation and Interaction During the Field Trip
- Teachers’ Observation and Reflection Processes
- Strategies to Support Students’ Discussions and Reflections
Implications for Design Stories

“Overall, I am surprise by how [student] has shown me his higher level of engagement which made me realize that he in fact not really shy but just cautious. His seemingly distracted demeanor was not because of his lack of engagement but rather, because of his lack of English proficiency, he needed to constantly validate his work with his seat mates. [The observation framework] made me realize that ELL students like [student] needed a more visually engaging activities that can help neutralize the challenges and problems of English learners in a regular class room settings.” - Teacher
Areas for Further Research

- Understand the impact of the observation framework in the classroom
- Process of documenting from student perspective
Thank you!

- Questions, comments, etc.?

Rose K. Pozos
rkpozos@stanford.edu
Katherine Nielsen
Bay Area Science Festival
Science & Health Education Partnership
UC San Francisco
Science Festivals in the US

60+ Festivals

3 million+ attendees

20,000 STEM practitioners
Core Questions

2015
• In the past year, I interacted with a STEM professional.
  ☐ Yes ☐ No
• At today's event, I interacted with a STEM professional.
  ☐ Yes ☐ No

2016 to present
• In the past year, I interacted with someone who works with science or engineering.
  ☐ Yes ☐ No ☐ Not Sure
• At today's event, I interacted with someone who works with science or engineering.
  ☐ Yes ☐ No ☐ Not Sure
Scientist or Engineer Interactions

Year 1
- Past Year 58%
- At Festival 80%

Year 2
- 83%
- 86%
Hi, I’m Hope Jahren and I’m a Geobiologist.
Interacting with a science profession results in higher STEM outcomes and ratings.
Digging Deeper

• Attendees from racial/ethnic groups under-represented in STEM are:
  • Significantly less likely to report having had an encounter with someone who works with science and engineering in the last year, AND
  • Significantly more likely to have their first encounter with someone who works in science and engineering at the festival

• Women are:
  • Significantly less likely to report having had an encounter in the past year, AND
  • Marginally more likely to have their first encounter with someone who works in science and engineering at the festival
“Watching the scientists interact with my kids”

“Seeing all the scientists and getting to talk to them”
Q Is it important to you that a lot of the facilitators are practicing scientists? Why or why not?
No

It doesn’t matter at all if they are real scientists as long as they are knowledgeable. (mom)

I prefer that my kids are interacting with knowledgeable people, but scientists, university students or researchers, that’s all appropriate. (mom)
Yes

Yes, it matters that they are scientists because I want to follow in their footsteps (12-year-old boy)

If my kids are talking to real scientists, it can help them imagine themselves as scientists. I’m happy to have my kids talk to students too. (mom)
Igniting Inquiry: Kids’ Citizen-Science Observations
Spark Authentic Science Investigations

Insights from Cornell Lab’s BirdSleuth Program

Jennifer Fee
Manager of K-12 Programs
Mission: To help educators bring the power and engagement of citizen science and inquiry to students
“Citizen science gives the students the ability to participate in science. To feel like their observations count for something.”

– Phil Kahler, BirdSleuth teacher
“I learned that taking them outside and letting them do bird observation was a great way to motivate them to ask questions in science.”
I wonder...?
The SCIENCE PROCESS:
What will YOU Discover?

- Make observations
- Pose questions
- Look at references
- Form a hypothesis
- Design an experiment
- Collect and analyze data
- Draw conclusions
- Share results

I WONDER

Investigating Evidence
RESOURCE PAGES
Kinds of Questions

If you have already come up with some questions about your observations, different types of questions lead to different types of research projects. You can clarify questions by asking for help. This image shows four ways to answer scientific questions:

1. **Observational Study**
2. **Experiential Study**
3. **Experimental Study**
4. **Observational Study**

**What Do You Think?**

Look at the graphic and read the paragraph in the box below. What are the four ways to answer scientific questions?

**Variables in Science Experiments**

What makes an experiment "fair"?

Unit Timeline: 1 week, a semester, or a year-long project... it's up to you and your students!
KEEP CALM & PRETEND
THIS IS ON THE
LESSON PLAN
Why are no birds visiting our feeders?
By Hilltop Elementary 3rd graders
3rd Grade’s Finished Bird Habitat

SUBMITTED BY
janet vigeland
Sparta Township, NJ, United States

DESCRIPTION
Hilltop’s third grade class finished the bird habitat they designed together. Students used funding from the Habitat Heroes grant to purchase supplies to build a better habitat for the birds outside their windows. It was a team effort and everyone had a good time working for a great cause!

CATEGORY
Habitat Helpers

TAGS
Hilltop
Will a Fake Cat Scare Away Birds?

by Amy, 4th grade
Will a Fake Cat Scare Away Birds?

by Amy, 4th grade

Seed Eaten With and Without a Fake Cat

Cups of Seed Eaten

<table>
<thead>
<tr>
<th>Cups of Seed Eaten</th>
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<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<td>3</td>
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Without Cat | With Cat
Will a Fake Cat Scare Away Birds?

by Amy, 4th grade

Seed Eaten With and Without a Fake Cat

<table>
<thead>
<tr>
<th>Cups of Seed Eaten</th>
<th>Without Cat</th>
<th>With Cat</th>
</tr>
</thead>
<tbody>
<tr>
<td>sunflower seeds</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>mixed seed</td>
<td>2</td>
<td>0</td>
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</tbody>
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The cat is a good guard
The cat is a good guard, but I thought the birds would learn the cat was fake!
INTEGRATING INQUIRY THROUGH CITIZEN SCIENCE COLLABORATIVE

Citizen science is a wonderful "question generator," and a great way to inspire students to ask and answer their own scientific questions! We're launching a new effort with the National Girls Collaborative Project to support a cohort of 20 educators in doing citizen science and inquiry investigations with youth this summer and fall. Along with a cohort of talented educators, you'll take our popular online course, receive curriculum and ongoing support, and enjoy doing outdoor activities with students. Participation in this project is free for educators. We invite you to apply!

Benefits of the Program

- Free access to the Cornell Lab of Ornithology online training and ongoing support (Integrating Inquiry course)
- Free access to curricula and materials valued at over $100 per educator
- Access to experts in the fields of citizen science and ornithology
- 2 CEU credits from Cornell University
- High quality, equitable experiences to deliver to youth
BirdSleuth K-12

Merlin Bird ID

eBird Mobile