Tools for Collaboration: increasing your museum's local impact through partnerships:

- Rae Ostman, Arizona State University
- Brad Herring, Museum of Life and Science
- Catherine McCarthy, Science Museum of Minnesota
- Ali Jackson, Sciencenter, Ithaca, NY
- **Discussion**
  - Melissa Ballard, Afterschool Alliance
  - Karen Peterson, National Girls Collaborative Project
  - Keith Ostfeld, Children's Museum of Houston

Tools for Collaboration: increasing your museum's local impact through partnerships

Museum & Community Partnerships Project Overview

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Interactivity
Association of Children's Museums Conference

May 2016
Stamford, Connecticut

MUSEUMS AND COMMUNITY PARTNERSHIPS:
Leveraging Resources and Increasing Impact

MUSEUMS & COMMUNITY PARTNERSHIPS

Rae Ostman + Catherine McCarthy

National Informal STEM Education Network

NISE Network

National Network
- Originally dedicated to nanoscale science, engineering, and technology
- Now have projects on a range of STEM topics

Activities
- Public engagement
- Professional development
- Knowledge and practices related to informal learning

Partnerships
- National
- Local

NISE Network

Currently, NISE Net programs, events, and exhibitions reach

10 MILLION PEOPLE

each year!

NanoDays kits reach
1 MILLION PEOPLE
annually

Nano *exhibitions reach*
9 MILLION PEOPLE
annually

Museums & Community Partnerships

Project goals:

1. **Engage local communities more broadly** in STEM learning, focusing on nanoscale science, engineering, and technology
2. **Develop local partnerships between museums and community organizations**, helping museums reach new audiences and helping community organizations provide high-quality STEM learning experiences for their audiences
3. **Identify, develop, and share successful practices and models** for reaching new audiences and developing successful collaborations among local organizations

National Partners

Core partners

- Afterschool Alliance
- Boys & Girls Clubs of America
- Girls Inc.
- National Girls Collaborative Project
- 4-H

Additional participation

- American Library Association
- Arizona State Library
- Boy Scouts of America
- Girl Scouts
- Parent Teacher Association (PTA)
- Y (YMCA)
- YWCA

Project overview

Target audience

- Elementary
- Traditionally underserved and underrepresented

Process

- Existing and new partnerships
- NISE Net partners apply, receive kits, and report
- Partnership is defined and managed locally

Resources

- 100 kits

Timeline

- Kits delivered winter 2016
- Program delivery spring-summer
- Report on activities summer 2016
- Evaluation results winter 2017

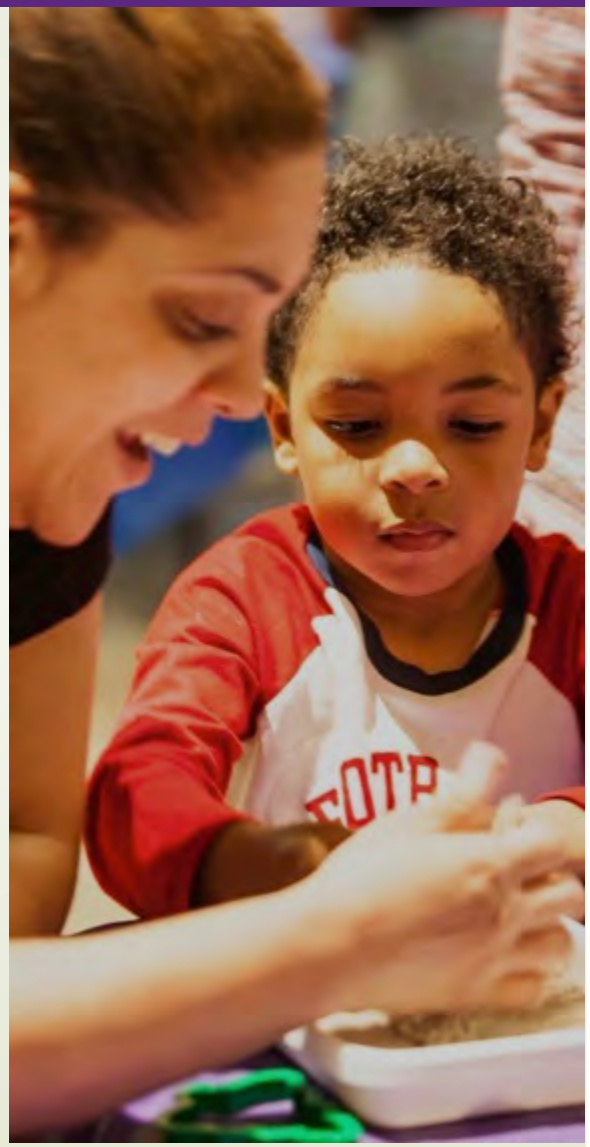
Materials

Public engagement

- Hands-on activities
- Videos and supporting materials

Professional resources

- Planning and promotional materials
- Training videos, slides, and guides
- Collaboration guide, video, and tools



Thank you

This presentation is based on work supported by the National Science Foundation under Grant No. 0940143. Any opinions, findings, and conclusions or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Foundation.

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

Tools for Collaboration: increasing your museum's local impact through partnerships

Creating a Video: Advice for successful collaborations

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Interactivity
Association of Children's Museums Conference

May 2016
Stamford, Connecticut

Video: Creating Successful Collaborations: Museum and Community Partnerships

Available at www.nisenet.org/collaboration-guide

and

https://vimeo.com/139256428

Tools for Collaboration: increasing your museum's local impact through partnerships

Collaboration Guide and Tools

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Interactivity
Association of Children's Museums Conference

May 2016
Stamford, Connecticut

Science Museum of Minnesota

Why Collaborate?

To achieve something you can't do on your own!

Collaboration occurs when organizations and individuals make a commitment to work together and contribute resources and expertise to achieve a common, long-term goal.

1. To share resources, expertise, and connections
2. To build upon existing strengths
3. To reach new audiences

Science Museum of Minnesota

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

MUSEUM & COMMUNITY PARTNERSHIPS:

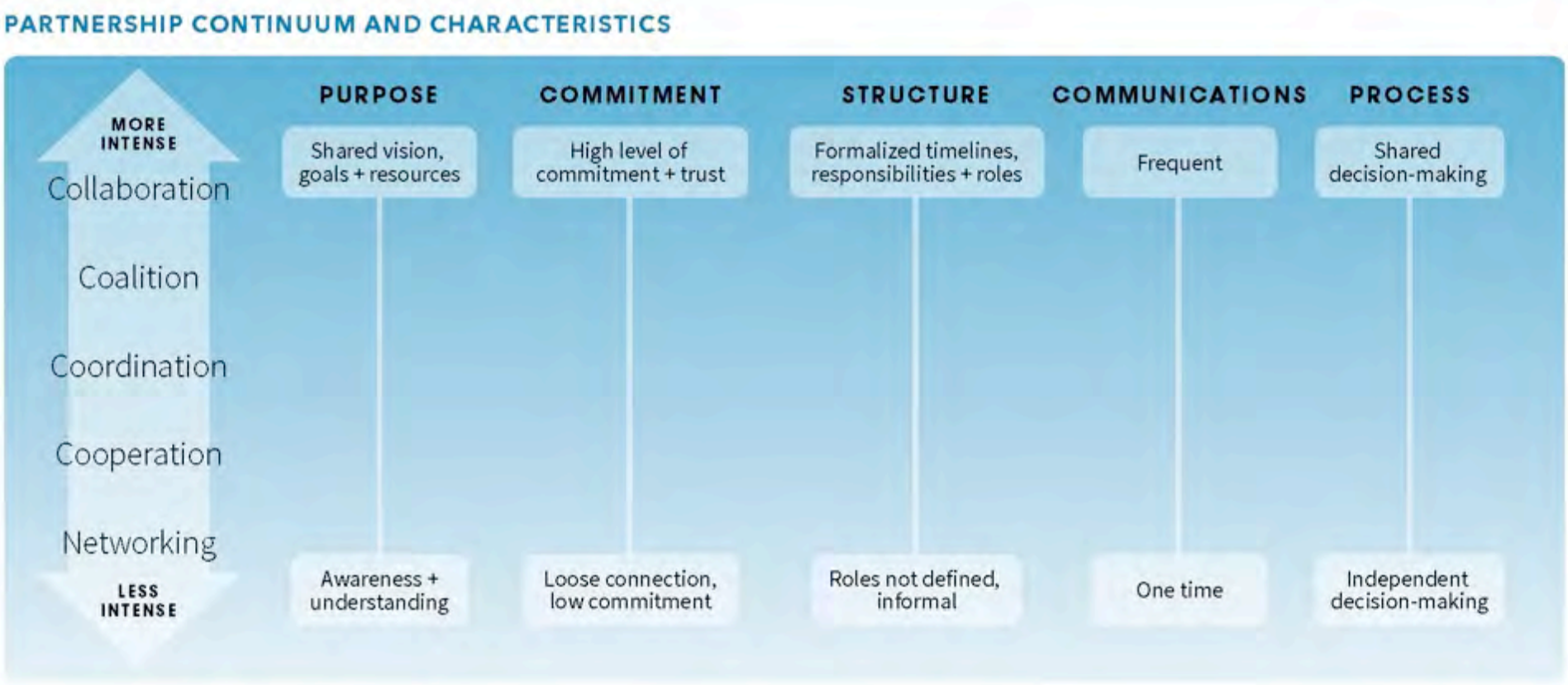
Collaboration Guide

For museums working with community youth-serving organizations

By Catherine McCarthy and Brad Herring

Available at www.nisenet.org/collaboration-guide

Levels of Partnerships - Continuum



Science Museum of Minnesota

Tips for Successful Partnerships

Be patient! Collaboration takes time

- Start small; developing a relationship and building trust takes time
- Communicating takes time: your organizations have different cultures and terminology
- Always keep the long-term relationship in mind while working on shorter-term projects
- Start early; your partner's schedule will vary from your own, so be sure to include enough lead time so that you both can be prepared for the work of the collaboration

Science Museum of Minnesota

Tips for Successful Partnerships

Be clear about your goals and expectations

- **What:** Decide on your common goals; be sure your partnership is mutually beneficial
- **How:** Agree upon activities to meet your shared goals and missions
- **Who:** Clarify your roles and responsibilities for all project activities
- **Where:** Decide upon the locations of activities
- **When:** Agree upon a timeline and key dates, and check in regularly

Science Museum of Minnesota

Tips for Successful Partnerships

Get to know each other
Each partner has a lot to learn and a lot to offer

- Familiarize yourself with your partner organization through websites, newsletters, events, and other opportunities
- The more you understand about each other's purpose, activities, audiences, and culture, the easier your partnership will be
- Individuals come to a partnership with different strengths and experiences; every group needs dreamers, developers, and doers

Science Museum of Minnesota

Tips for Successful Partnerships

Communication is critical

- Strive to achieve a flexible, trusting atmosphere; be open and honest while still being tactful and supportive
- Things may not always go smoothly, so don't hesitate to pick up the phone and have an honest conversation to work things out
- Involve more than one contact person at each organization at different levels to ensure a deeper relationship that can survive changing circumstances and turnover

Science Museum of Minnesota

Tips for Successful Partnerships

Stay focused on your goals
And don't forget to celebrate your successes

- Reflect on the original goals of your partnership and project, and consider how you want to improve, change course, or evolve the relationship
- As you work together, keep your long-term relationship in mind; by leveraging your combined resources and strengths, you can each do much more for your community

Science Museum of Minnesota

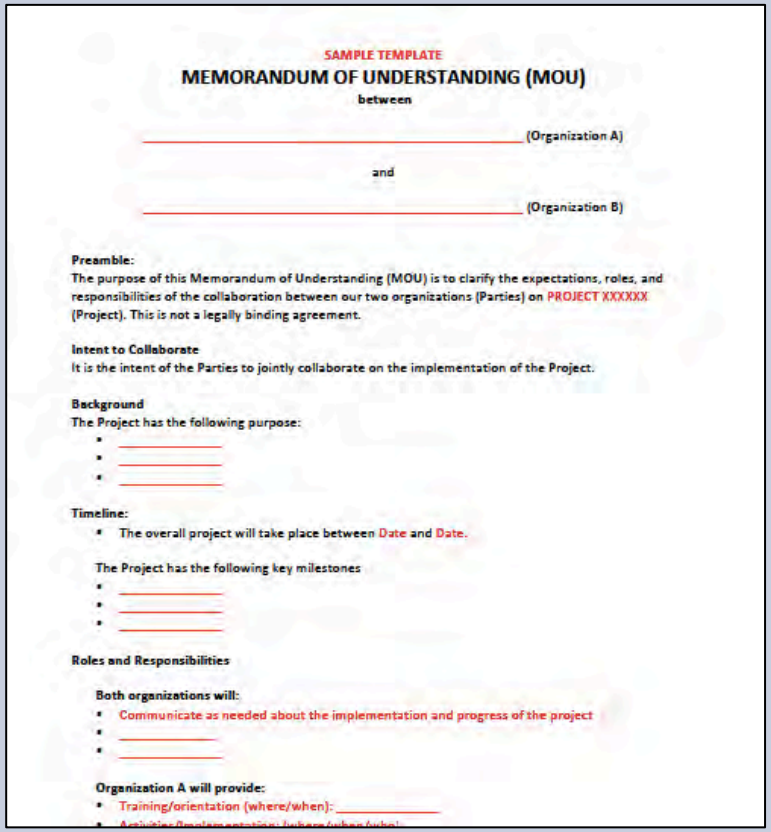
Collaborating with National Youth Serving Organizations

1. 4-H
2. Afterschool Alliance
3. Boys & Girls Clubs of America
4. Boy Scouts of America
5. Girls Inc.
6. Girl Scouts
7. Libraries
8. National Girls Collaborative Project
9. Parent Teacher Association (PTA)
10. Y (YMCA)
11. YWCA

Science Museum of Minnesota

Tools and Templates

Template MOUs & emails



SAMPLE TEMPLATE

MEMORANDUM OF UNDERSTANDING (MOU)

between

_____(Organization A)

and

_____(Organization B)

Preamble:
The purpose of this Memorandum of Understanding (MOU) is to clarify the expectations, roles, and responsibilities of the collaboration between our two organizations (Parties) on PROJECT XXXXXX (Project). This is not a legally binding agreement.

Intent to Collaborate
It is the intent of the Parties to jointly collaborate on the implementation of the Project.

Background
The Project has the following purpose:

- _____
- _____
- _____

Timeline:

- The overall project will take place between Date and Date.

The Project has the following key milestones

- _____
- _____
- _____

Roles and Responsibilities

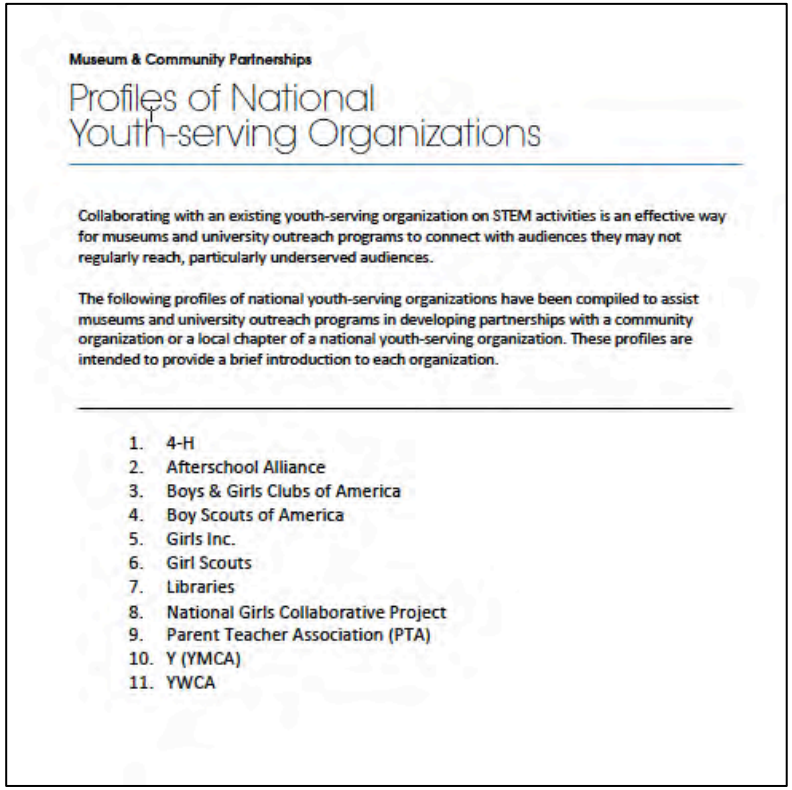
Both organizations will:

- Communicate as needed about the implementation and progress of the project
- _____
- _____

Organization A will provide:

- Training/orientation (where/when): _____

Profiles of National Youth-Service Organizations



Museum & Community Partnerships

Profiles of National Youth-serving Organizations

Collaborating with an existing youth-serving organization on STEM activities is an effective way for museums and university outreach programs to connect with audiences they may not regularly reach, particularly underserved audiences.

The following profiles of national youth-serving organizations have been compiled to assist museums and university outreach programs in developing partnerships with a community organization or a local chapter of a national youth-serving organization. These profiles are intended to provide a brief introduction to each organization.

1. 4-H
2. Afterschool Alliance
3. Boys & Girls Clubs of America
4. Boy Scouts of America
5. Girls Inc.
6. Girl Scouts
7. Libraries
8. National Girls Collaborative Project
9. Parent Teacher Association (PTA)
10. Y (YMCA)
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Science Museum of Minnesota

Illustrative Stories and Advice

"Community organizations and museums have a common interest, they both want to make their cities a better place. Science is an essential part of that."

- Jayatri Das, Chief Bioscientist, The Franklin Institute, Philadelphia, PA

"You always have to be open about what is working, what is not working, why it didn't work, and why is it successful. Communication is the key to making a good partnership work."

- Dorothy McCargo Freeman, Associate Dean and State 4-H Director, University of Minnesota Extension Center for Youth Development, Saint Paul, MN

Science Museum of Minnesota

Barriers to Success

- Lack of time and capacity to sustain the relationship
- Lack of clear purpose or common vision
- Lack of understanding roles or responsibilities
- Lack of commitment or buy-in by key individuals
- Major differences in philosophies and styles of working
- Unacceptable balance of power and control
- Staff turnover
- Failure to communicate
- Lack of feedback
- Failure to respond to feedback and evaluation
- Financial input and time commitments outweigh potential benefits

Science Museum of Minnesota

Tools for Collaboration: increasing your museum's local impact through partnerships

Museum & Community Partnerships Project kit contents

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Interactivity
Association of Children's Museums Conference

May 2016
Stamford, Connecticut

EXPLORE SCIENCE

Zoom into Nano

Activity Kit Overview

Explore Science kits

- Designed for hands-on learning
- Adaptable to different settings and learners
- Five units, each with several activities
- Everything you need is in the kit!

Themes

- Intro to Nano
- Small and Surprising
- Labs and Tools
- Tech and Nature
- Nano and Our Lives

Zoom into Nano

A nanometer is a billionth of a meter.
That's very, very small!

Get in Order

Powers of Ten

Measure Yourself

Small and Surprising

Nano-sized things can behave in surprising ways.

Gravity Fail

Smelly Balloons

Ready, Set, Fizz

UV Bracelets

Labs and Tools

Nano scientists use special tools and equipment.

Draw a Circuit

Mystery Shapes

Gummy Shapes

Tech and Nature

Nano research lets us create new technologies and understand nature.

I Spy Game

Morphing Butterfly

Invisible Sunblock

Rainbow Film

Nano and Our Lives

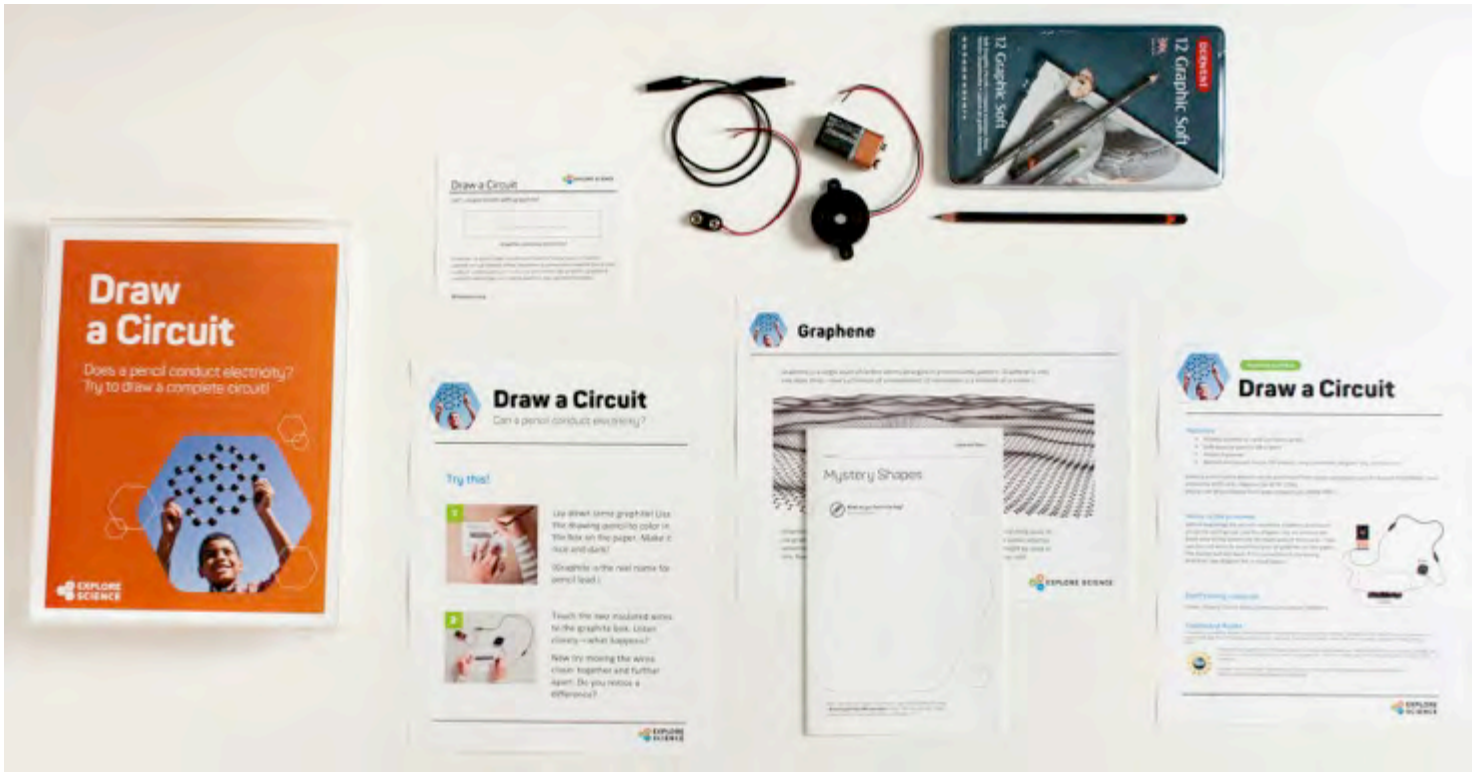
Nanotechnologies will be part of our lives—now and in the future.

Mystery Sand

You Decide!

Stained Glass Art

Activity materials



Activity instructions

Draw a Circuit

Can a pencil conduct electricity?

Try this!

Lay down some graphite! Use the drawing pencil to color in the box on the paper. Make it nice and dark!

(Graphite is the real name for pencil lead.)

Touch the two insulated wires to the graphite box. Listen closely—what happens?

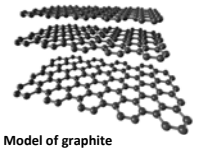
Now try moving the wires closer together and further apart. Do you notice a difference?

EXPLORE SCIENCE

The buzzer sounds because the graphite conducts electricity. Graphite is made of many layers of carbon stacked on top of each other.

What's going on?

The graphite on the paper conducts electricity. It completes an electrical circuit, making the buzzer sound. Graphite is a mineral made of many layers of carbon stacked on top of each other.



Model of graphite

Graphene, a relatively new nano material, is also made up of carbon atoms. It's only one atom thick—that's a fraction of a nanometer! (A nanometer is a billionth of a meter.) In 2010, scientists won a Nobel Prize in Physics for creating graphene out of graphite. Their celebrated method was surprisingly simple. They used ordinary transparent tape to peel apart layers of graphite until it was very thin. Then they measured their results and found out that they'd made graphene!

How is this nano?

In the field of nanotechnology, scientists and engineers make new, nano-sized materials and devices. Graphene has a lot of useful properties. It's flexible, super strong, and nearly transparent—and it conducts electricity.

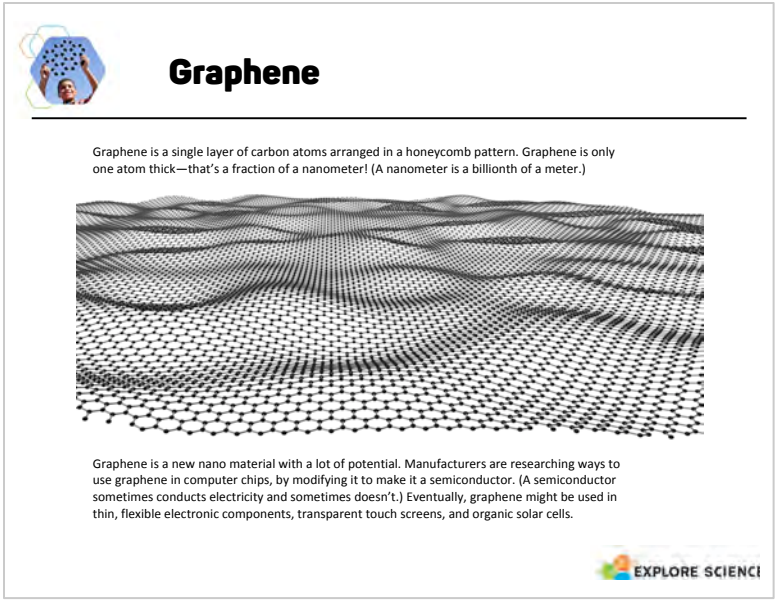
Flexible graphene circuit

Computer chip manufacturers are developing circuits from graphene, by modifying it to make it a semiconductor. One day, graphene could be used to make see-through, bendable electronic displays, and tiny, fast computer chips.

Photo of flexible graphene circuit, Ji Hye Hong.

EXPLORE SCIENCE

Info sheets and worksheets

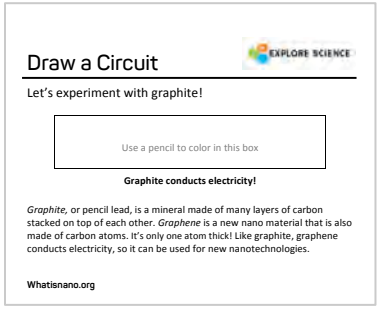


Graphene

Graphene is a single layer of carbon atoms arranged in a honeycomb pattern. Graphene is only one atom thick—that's a fraction of a nanometer! (A nanometer is a billionth of a meter.)

Graphene is a new nano material with a lot of potential. Manufacturers are researching ways to use graphene in computer chips, by modifying it to make it a semiconductor. (A semiconductor sometimes conducts electricity and sometimes doesn't.) Eventually, graphene might be used in thin, flexible electronic components, transparent touch screens, and organic solar cells.

EXPLORE SCIENCE



Draw a Circuit

EXPLORE SCIENCE

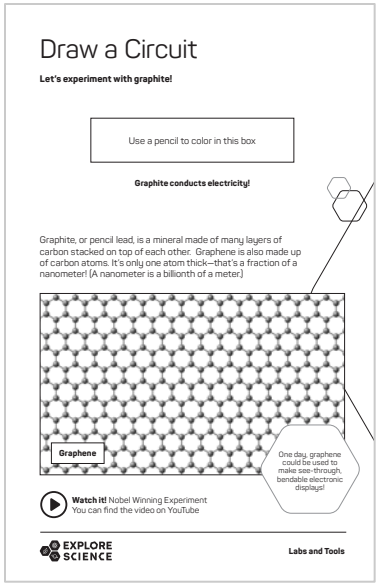
Let's experiment with graphite!

Use a pencil to color in this box

Graphite conducts electricity!

Graphite, or pencil lead, is a mineral made of many layers of carbon stacked on top of each other. *Graphene* is a new nano material that is also made of carbon atoms. It's only one atom thick! Like graphite, graphene conducts electricity, so it can be used for new nanotechnologies.

Whatisnano.org



Draw a Circuit

Let's experiment with graphite!

Use a pencil to color in this box

Graphite conducts electricity!

Graphite, or pencil lead, is a mineral made of many layers of carbon stacked on top of each other. Graphene is also made up of carbon atoms. It's only one atom thick—that's a fraction of a nanometer! (A nanometer is a billionth of a meter.)

Graphene

One day, graphene could be used to make see-through, bendable electronic displays!

Watch it! Nobel Winning Experiment
You can find the video on YouTube

EXPLORE SCIENCE

Labs and Tools

Notes and tips

TRAINING MATERIAL

Draw a Circuit

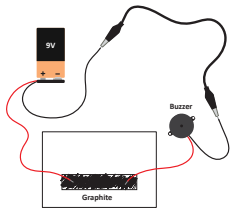
Materials

- Activity booklet or cards (or index cards)
- Soft drawing pencils (6B is best)
- Pencil sharpener
- Battery and buzzer circuit (9V battery, snap connector, alligator clip, and buzzer)

Battery and circuit materials can be purchased from www.radioshack.com (9v battery #55039849, snap connector #270-324, alligator clip #278-1156).
Buzzer can be purchased from www.newark.com (#89K7985).

Notes to the presenter

Before beginning the activity assemble a battery and buzzer circuit for each group. Use the alligator clip to connect the black wire of the battery to the black wire of the buzzer. Then use the red wires to touch the layer of graphite on the paper. The buzzer will not work if it is connected in the wrong direction. See diagram for a visual layout.



Staff training resources

Video: *Draw a Circuit,* https://vimeo.com/album/3636993

Credits and Rights

This activity is a modified version of the NISE Network's educational products *Exploring Materials—Graphene* and *DIY Nano Draw a Circuit* available on www.nisenet.org. Photo of flexible graphene circuit, Ji Hye Hong. Illustraion of graphite, Martin McCarthy. Illustration of graphene sheet, Jannick C. Meyer.

This project was supported by the National Science Foundation under Awards Nos. 0940143 and 0937591. Any opinions, findings, and conclusions or recommendations expressed in this program are those of the author and do not necessarily reflect the views of the Foundation.

EXPLORE SCIENCE

Tips for leading hands-on science activities

Greet your guests. Say "hello," make eye contact, and smile. People will come over if you look welcoming, available, and friendly.

Let them do the activity. As much as possible, let your guests do the hands-on parts of the activity, and let them discover what happens. (If your activity has a surprise, don't give it away!)

Encourage exploration. Provide positive feedback and assistance when people need it, but let them experiment and learn for themselves. Don't insist people do things the "right" way—sometimes learning how something doesn't work is just as valuable as learning how it does work.

Ask questions. Help people observe and think about the activity. Try to use questions that have more than one answer, such as: "What do you see happening?" "Why do you think that happened?" "What surprised you about what you saw?" "Does this remind you of anything you've seen before?"

Be a good listener. Be interested in what your guests tell you, and let their curiosity and responses drive your conversation forward.

Share what you know. Use clear, simple language. Focus on one main idea—you don't need to explain everything at once! Keep the information basic for starters, and share more with interested learners.

Use examples from everyday life. Familiar examples can help explain abstract concepts. Be aware of different abilities, keeping in mind that children do not have the same skills or vocabulary as adults.

Offer positive responses. If people haven't quite grasped a concept, you might say, "That's a good guess," or "Very close, any other ideas?" Never say, "No" or "Wrong." You can offer hints or suggestions for things to think about or watch carefully.

Share accurate information. If you aren't sure about something, it's ok to say, "I don't know. That's a great question!" Suggest ways that people can learn more, by trying another activity or looking up information at the library or online.

Remain positive. Maintain an inviting facial expression, positive tone, and open body language throughout the interaction.

Thank your guests. As your interaction ends, suggest other activities that you think your guests might enjoy.

Have fun! A positive experience will encourage learning.

EXPLORE SCIENCE

Planning materials

EXPLORE SCIENCE

PLANNING MATERIAL

Zoom into Nano

Events Guide

EXPLORE SCIENCE

PLANNING MATERIAL

Zoom into Nano

Out of School Programs Guide

NISE NETWORK
NATIONAL INFORMAL STEM EDUCATION

Project Opportunities

NanoDays
The Biggest Event for the Smallest Science!

- NanoDays

EXPLORE SCIENCE
Hands-on fun for everyone

- Museum & Community Partnerships Explore Science – Zoom into Nano kits

Building with Biology

- Building with Biology kit

sustainABLE

- Sustainability in Science Museums kit

- Space and Earth Informal STEM Education

- Transmedia Museum (Frankenstein anniversary)

Thank you NSF and partners!

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NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

Discussion

Discussion

Tell us about challenges
you have experienced in your collaborations
we can discuss strategies for working through them

1. changes in personnel
2. changing organizational priorities (on either side)
3. how do you foster organizational buy-in?
4. characteristics to identify
   the right partnership right now

Science Museum of Minnesota