NISE Net Online Workshop

Changing Brains - New Tools for Brain Awareness Week & Beyond

Tuesday, March 14, 2023

NISE NATIONAL INFORMAL STEM EDUCATION NETWORK

Today's Presenters:

Darrell Porcello, Ph.D., Children's Creativity Museum & Lawrence Hall of Science, University of California, Berkeley

Claire Weichselbaum, Ph.D., Barbara Gill Civic Science Fellow, Visiting Scholar, Arizona State University

Susan Heilman, Ph.D., Current Science Communication Team, Museum of Science, Boston

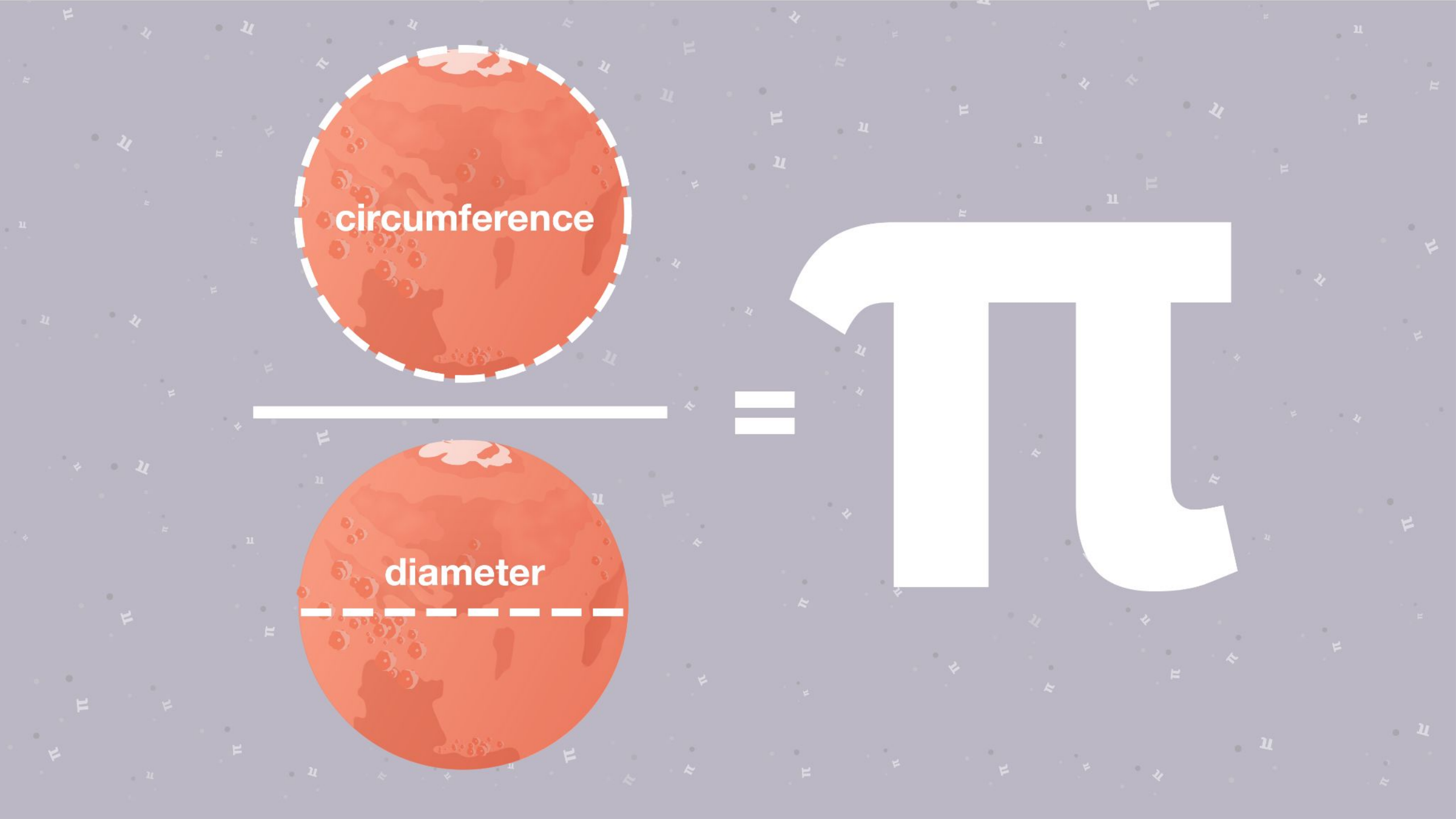
Abby Gwinn-Arakas, Director of Community Engagement, McWane Science Center

Welcome!

As we wait to get started with today's discussion, please:
Introduce yourself! Type your name, institution, and location into the Chat Box

Questions? Feel free to type your questions into the Chat Box at any time throughout the webinar or use the raise your hand function in the participants list and we'll unmute your microphone.

Today's discussion will be recorded and shared on nisenet.org at: nisenet.org/events/online-workshop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Resources & Opportunities

Learn more and access the NISE Network's online digital resources:
nisenet.org/browse-topic

NISE NETWORK
NEWSLETTER

Read our monthly newsletter
nisenet.org/newsletter

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2023 Online Workshops

Bubbling Up later this Year… 😹

Making Waves with Radio

Tuesday, April 4, 2023
2pm-3pm Eastern / 11am-12pm Pacific

Series of Sustainable Futures Workshops - Coming Soon!

NISE NETWORK
ONLINE WORKSHOPS

Learn more at nisenet.org/events

Brain and Neuroscience Public Engagement Resources

Project Info & New Resources: nisenet.org/brain

CHANGING BRAINS

More Resources: nisenet.org/neuro

- Public engagement and professional development resources about the brain, neuroscience, and neuroethics
- Resources for annual events including **Brain Awareness Week,** World Brain Day, Mental Wellness Month, and more

We have been hard at work...on the brain.

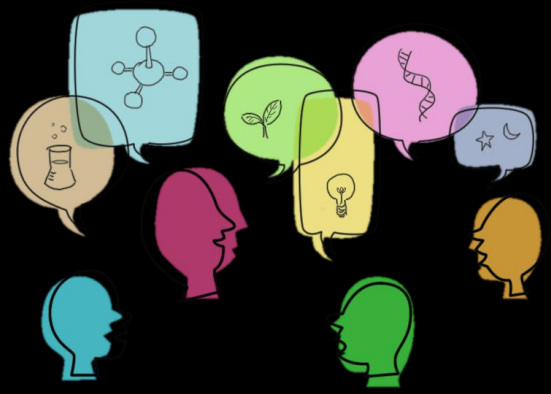
2018 Public Engagement with Neuroscience and Society Conference organized at the Franklin.

2019 *A Global Landscape of Neuroscience Public Engagement Efforts and the Potential Nexus of Neuroethics* published.

2020 Professional tools added to nisenet.org.

2020-22 Generative discussion leading to the publication of *Neuroscience is ready for neuroethics engagement.*

2022-23 Neuroethics engagement prototypes developed and evaluated.



Neuroethics

exploring the ethical and societal implications of neuroscience research and neurotechnology

Public Engagement

best practices to engage diverse audiences with scientific issues for mutual learning and dialogue

Attributes & Skills

Neuroethics Engagement

Project Framework

1. Stakeholder interviews led us to **Neurotechnology** and **Modeling Human Attributes.**

2. Leaned on NISE Net ideas:

People's values determine which technologies are developed and used.

New technologies **change society**, sometimes in **unexpected ways.**

Activities & Outputs

Identify neuroscience topics with ethical implications for society

Design and prototype new neuroethics engagement experiences

Learning Goals

Practice personal attributes:
- Curiosity
- Creativity and imagination
- Reflexivity

Practice interpersonal skills:
- Communication
- Collaboration
- Empathy

Activities & Outputs

Identify neuroscience topics with ethical implications for society

Design and prototype new neuroethics engagement experiences

Learning Goals

Practice personal attributes:

- Curiosity
- Creativity and imagination
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Practice interpersonal skills:

- Communication
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- Empathy

Broader Impacts

Strengthen self-efficacy in discussing neuroscience topics and sharing values

Increase awareness of neuroethical issues and questions

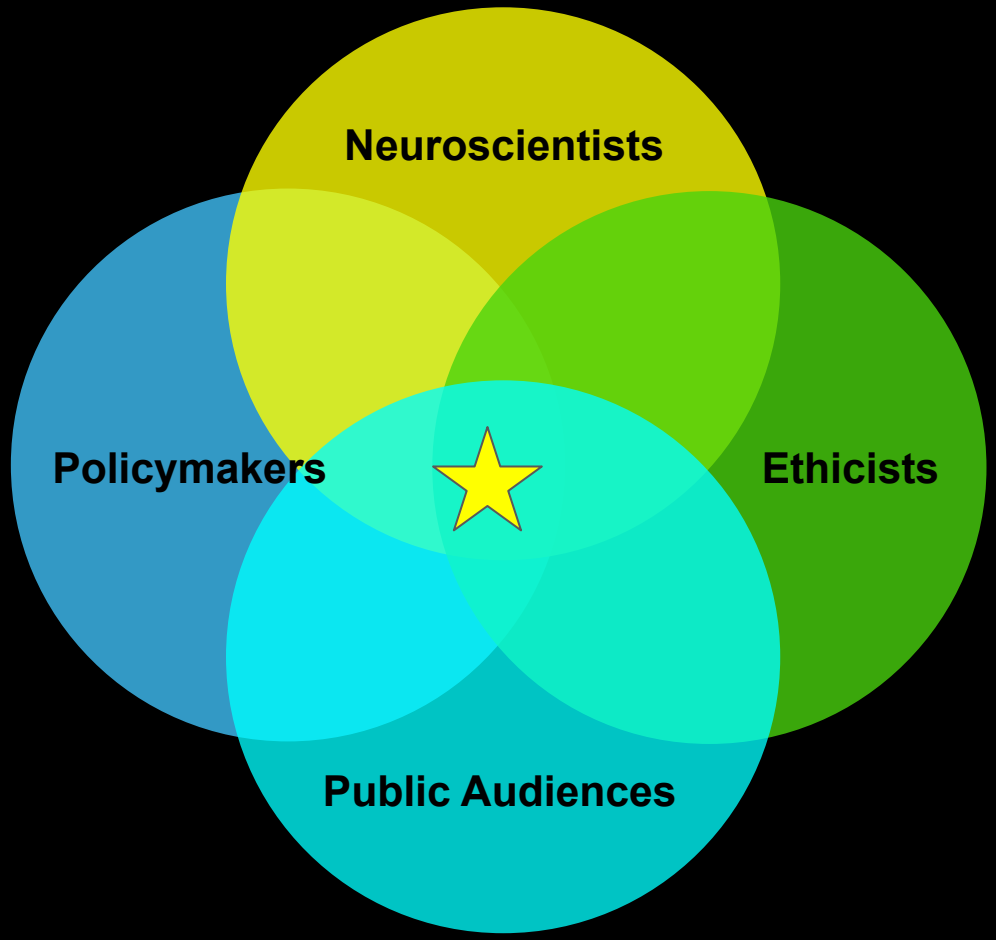
Develop potential for stakeholder input into neuroscience research and policy making

Guiding Ideas for Engagement

- People's values determine which technologies are developed and used.
- New technologies change society, sometimes in unexpected ways.
- Scientists, engineers, and designers use their creativity to invent things and imagine the future - just like you.
- Brain research benefits from many perspectives - including yours.

Identifying Topics for Engagement

- Interviewed 30+ neuroscientists, ethicists, policy and law experts, and museum educators
- Identified two topics ripe for pilot neuroethics engagement
  - Neurotechnology
  - Modeling Human Attributes



“Neuro Futures” Card Game

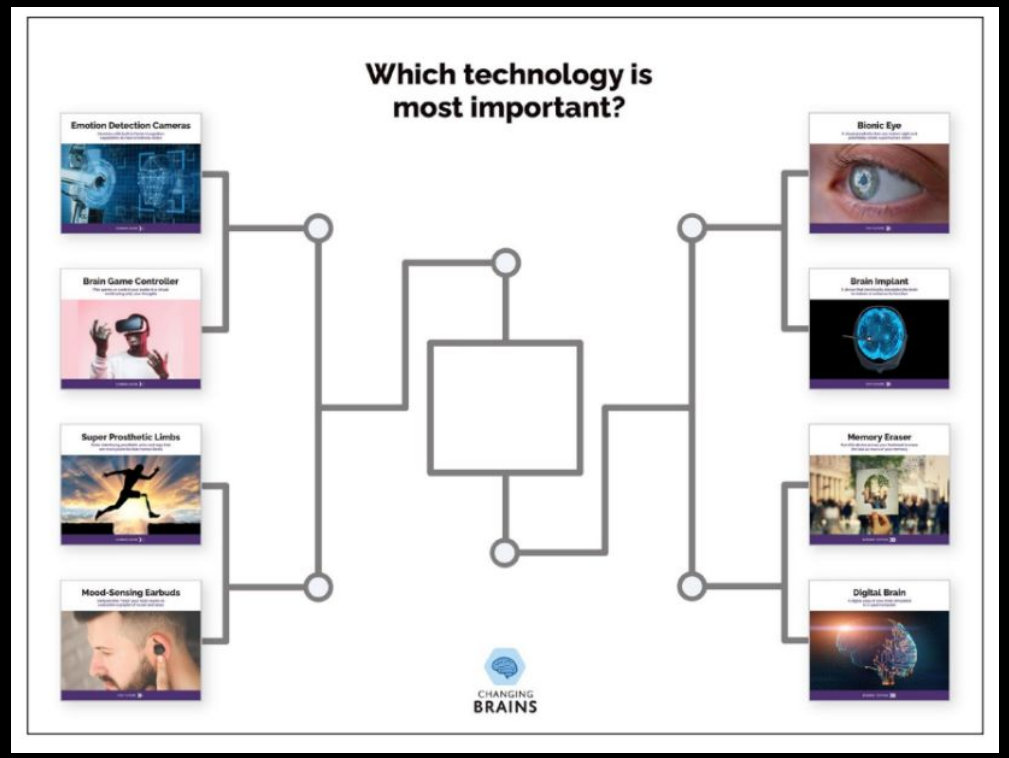
- How might future brain technologies change our society?
- How can we include many diverse perspectives and priorities in the development of brain technologies?

- Tabletop activity designed for small groups of adults, teens, and families
- Invites participants to prioritize emerging neurotechnologies from their own perspective, then from a character’s perspective

“Neuro Futures Championship” Game

- How might future brain technologies change our society?
- How can we include many diverse perspectives and priorities in the development of brain technologies?

- Tabletop activity designed for small groups of adults, teens, and families
- Invites consideration and conversation about the implications of neurotechnologies through a sports-style tournament bracket



“What Makes Us Human” Card Game

- What does it mean to be human? What is unique about the human brain?
- How human-like could machines become? What would be the risks/benefits?

- Tabletop activity designed for small groups of adults, teens, and families
- Invites participants to consider which abilities are most uniquely human, then design a robot incorporating some of those abilities

Formative Evaluation

- Engagement activities tested with **public audiences** at the Arizona Science Center (n=47 groups)
- Observation & interview data collected, analysis by Allison Anderson at MOS
- **96% of participants** interviewed found the game interesting, majority said they would play again
- Children as young as **7-8 years old** could participate successfully with their families as well as teens, adults

Learning Goals

Practice personal attributes

- Curiosity
- Creativity & imagination
- Reflexivity

Practice interpersonal skills

- Communication
- Collaboration
- Empathy

Personal Attributes

Curiosity Visitors ask or wonder about the topic beyond what is introduced in the activity.

"Would the smart pills be permanent or temporary?"

Creativity & Imagination Visitors express ideas that build on the topic, beyond the information shared during the activity.

"Using Emotion Detection Cameras in schools could help teachers help their students if they are in a bad mood or emotional distress."

Reflexivity Visitors recognize how biases and values (personal or communal) impact decisions about research and technology.

"We're a little more similar than I thought! But for different reasons."

Interpersonal Skills

Communication Visitors share their opinions and perspectives relevant to the activity's topic and listen or respond to others' opinions and perspectives.

Debate about whether to prioritize tech that will help people vs. letting the free market decide

Collaboration Visitors work together to make a decision or solve a problem relevant to the activity.

"Do we care if [the robot] can feel pain?"

Empathy Visitors share their understanding of another person's perspective or experience, considering how that person might be impacted by an action.

"I was thinking as Kim, thinking about my son"

Activities Supported Skills & Attributes to Varying Degrees

	Neuro Futures Championship	Neuro Futures	What Makes Us Human?
Curiosity			
Creativity & Imagination			
Reflexivity			
Communication			
Collaboration			
Empathy			

0-24%
25-49%
50-74%
75-100%

NISE NETWORK CHANGING BRAINS

Design Strategies to Support Skills & Attributes

Forced choice / requiring decisions

Character cards with different perspectives

Setting up simple hypothetical scenarios

Providing clear but limited information

This activity is about…

"Where we're going as a society, where our values are" - 52yo

"More ethical [issues] than straight facts" - 31yo

"Reflecting on what we want to see . . . thinking about ourselves and others" - 24yo

"About ourselves, how we feel and think" - 41yo

"Letting people know there's hope for them, like if someone is blind" - 10yo

"Very philosophical . . . So often we think science is objective, but all exhibits have a perspective . . . this brings it more to the surface" - 36yo

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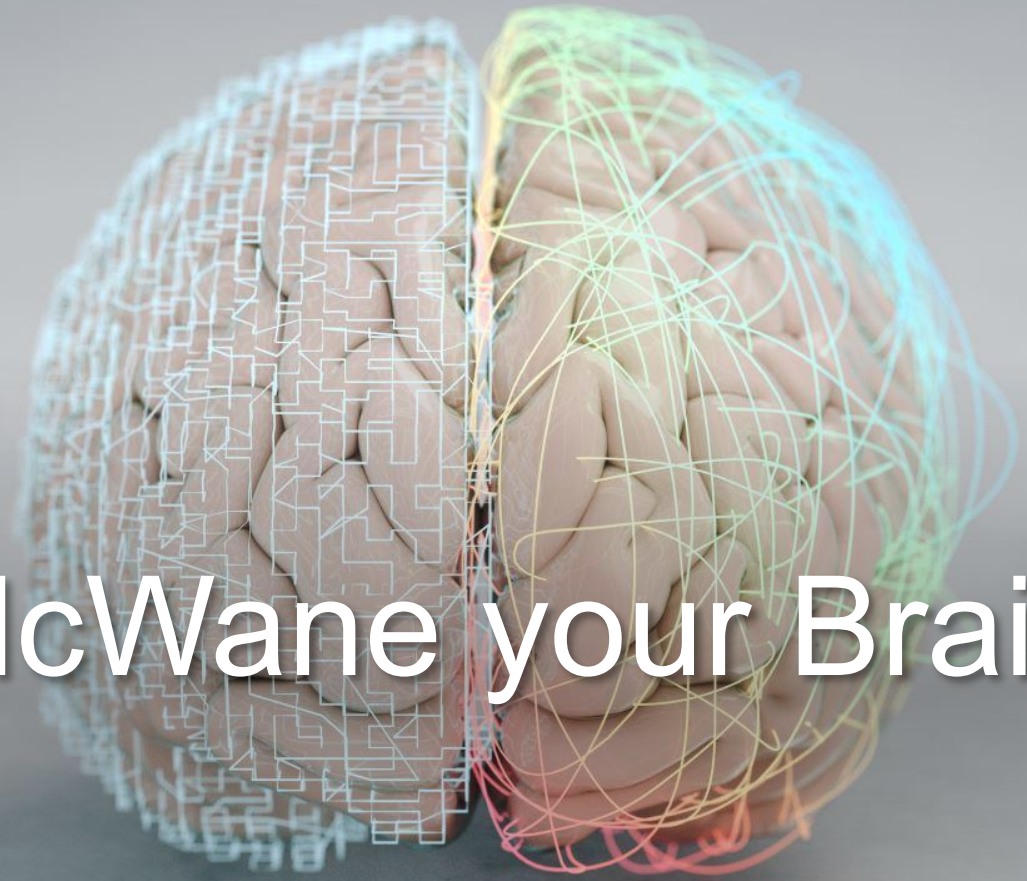
building balance

A Mental Wellness Event

Museum of Science.

Susan Heilman, PhD
Current Science Communication Team

NISE NETWORK



McWane your Brain

Abby Gwinn
Director of Community Engagement
McWane Science Center

Changing Brains at McWane

- How we've used the kit
  - Alignment with Theory of Change
  - Program training
  - Regularly scheduled floor programming
  - Special event programming
  - Group volunteer opportunities
- Showcasing scientists
- Future plans
  - Brain Awareness Week
  - Robotics Week

McWane Theory of Change

McWane Science Center

Science education that is:

Social
Connected
Inclusive
Engaging
Needed
Conversational
Evidence-based

Leads to:

Knowledge (Science Literacy)
Trust
Interest
Confidence

Which builds:

Science capital
Who you know + What you know

Science identity
Who you are

Fostering:
Science participation
So everyone can use science to improve and enrich their lives & community

McWane Theory of Change

McWane Science Center

Science education that is:

- **S**ocial
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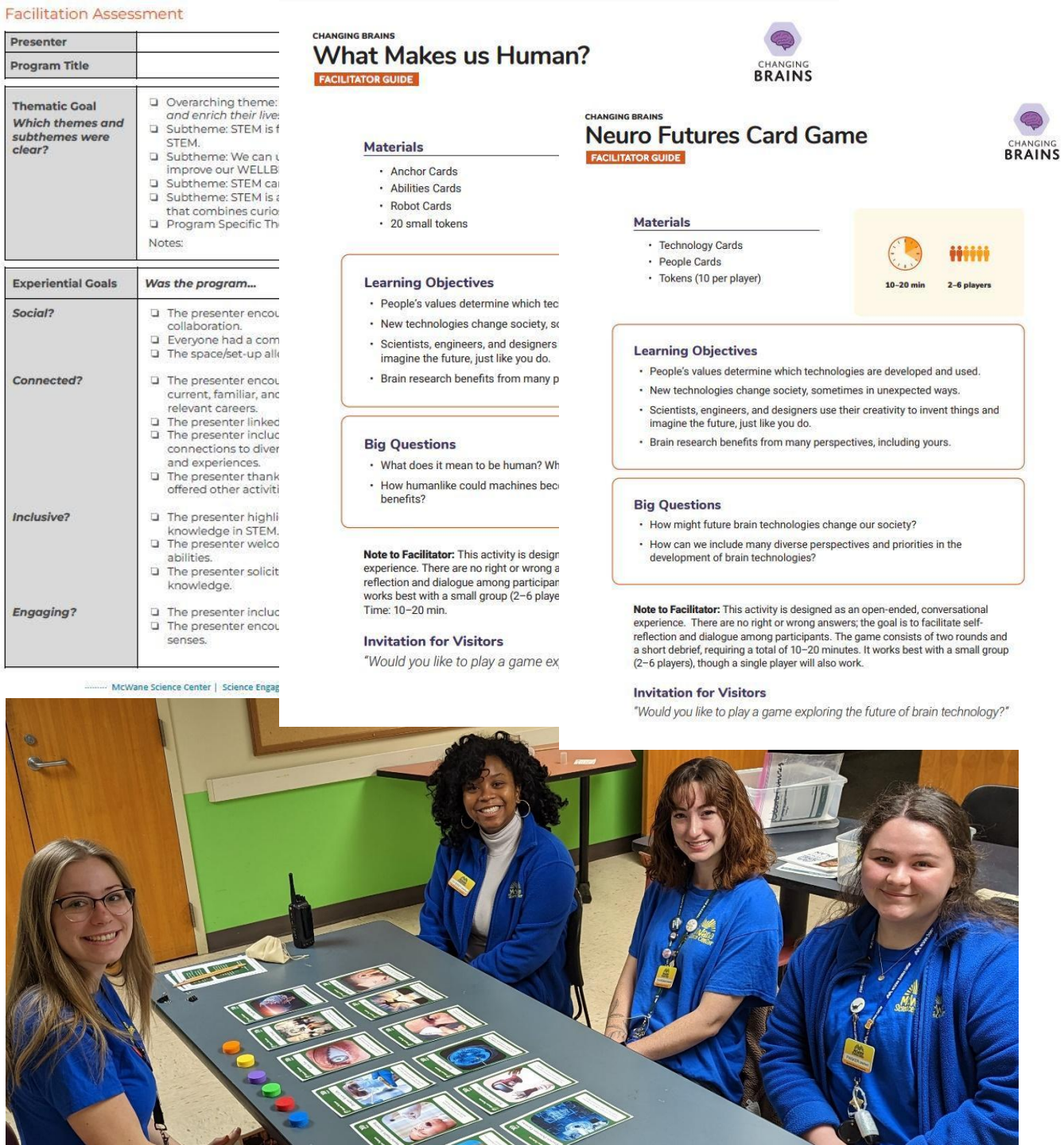

Facilitation Assessment

Presenter	
Program Title	

Thematic Goal *Which themes and subthemes were clear?*	❑ Overarching theme: *and enrich their lives* ❑ Subtheme: STEM is f STEM. ❑ Subtheme: We can u improve our WELLB ❑ Subtheme: STEM ca ❑ Subtheme: STEM is a that combines curio ❑ Program Specific Th Notes:

Experiential Goals	*Was the program...*
Social?	❑ The presenter encou collaboration. ❑ Everyone had a com ❑ The space/set-up all
Connected?	❑ The presenter encou current, familiar, and relevant careers. ❑ The presenter linked ❑ The presenter incluc connections to diver and experiences. ❑ The presenter thank offered other activiti
Inclusive?	❑ The presenter highli knowledge in STEM. ❑ The presenter welco abilities. ❑ The presenter solicit knowledge.
Engaging?	❑ The presenter incluc ❑ The presenter encou senses.

McWane Science Center | Science Engag

CHANGING BRAINS

What Makes us Human?

FACILITATOR GUIDE

CHANGING BRAINS

Materials

- Anchor Cards
- Abilities Cards
- Robot Cards
- 20 small tokens

Learning Objectives

- People's values determine which tec
- New technologies change society, s
- Scientists, engineers, and designers imagine the future, just like you do.
- Brain research benefits from many p

Big Questions

- What does it mean to be human? Wh
- How humanlike could machines bec benefits?

Note to Facilitator: This activity is design experience. There are no right or wrong a reflection and dialogue among participan works best with a small group (2–6 playe Time: 10–20 min.

Invitation for Visitors

"Would you like to play a game ex

CHANGING BRAINS

Neuro Futures Card Game

FACILITATOR GUIDE

CHANGING BRAINS

Materials

- Technology Cards
- People Cards
- Tokens (10 per player)

10–20 min 2–6 players

Learning Objectives

- People's values determine which technologies are developed and used.
- New technologies change society, sometimes in unexpected ways.
- Scientists, engineers, and designers use their creativity to invent things and imagine the future, just like you do.
- Brain research benefits from many perspectives, including yours.

Big Questions

- How might future brain technologies change our society?
- How can we include many diverse perspectives and priorities in the development of brain technologies?

Note to Facilitator: This activity is designed as an open-ended, conversational experience. There are no right or wrong answers; the goal is to facilitate self-reflection and dialogue among participants. The game consists of two rounds and a short debrief, requiring a total of 10–20 minutes. It works best with a small group (2–6 players), though a single player will also work.

Invitation for Visitors

"Would you like to play a game exploring the future of brain technology?"

Program Training

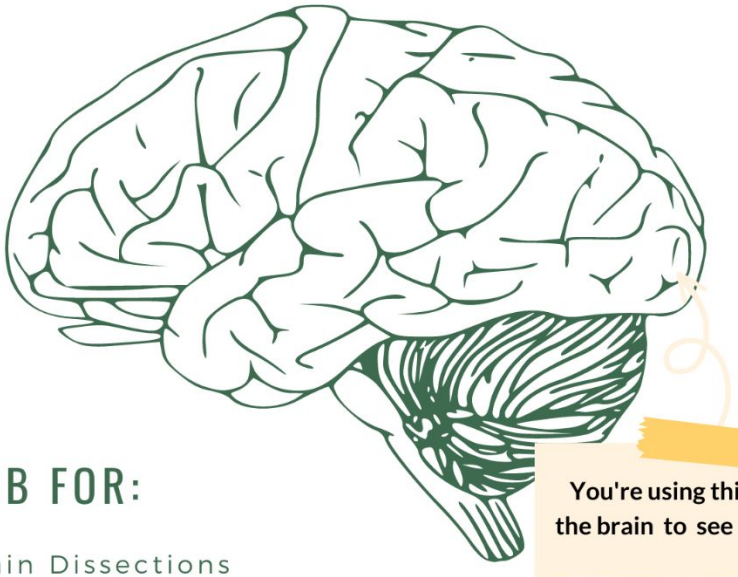
- Resources: NISE Net Facilitation Guides, program materials
- Alignment with the Theory of Change and Interpretive Plan
- Flow of Training
  - Observation
  - Review – facilitation guides, research
  - Practice
  - Practice
  - Evaluation – Facilitation Assessment

Special Events and Volunteer Opportunities

- Beaker Bash
  - Theme: I am a scientist
  - UAB Neuroscience students and McWane staff co-facilitated Changing Brains programs
- Group Volunteer Opportunities
  - UAB Undergraduate Neuroscience Society
  - Samford Gives Back: Pediatric Pharmacy Association

Showcasing Scientists

BRAIN AWARENESS WEEK



You're using this part of the brain to see this flyer!

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Sheep Brain Dissections
Visual Demonstrations
Taste test your Genes
Visual Illusions
Movement Science
Backyard Brains
Online Content:
www.brainawarenessuab.com

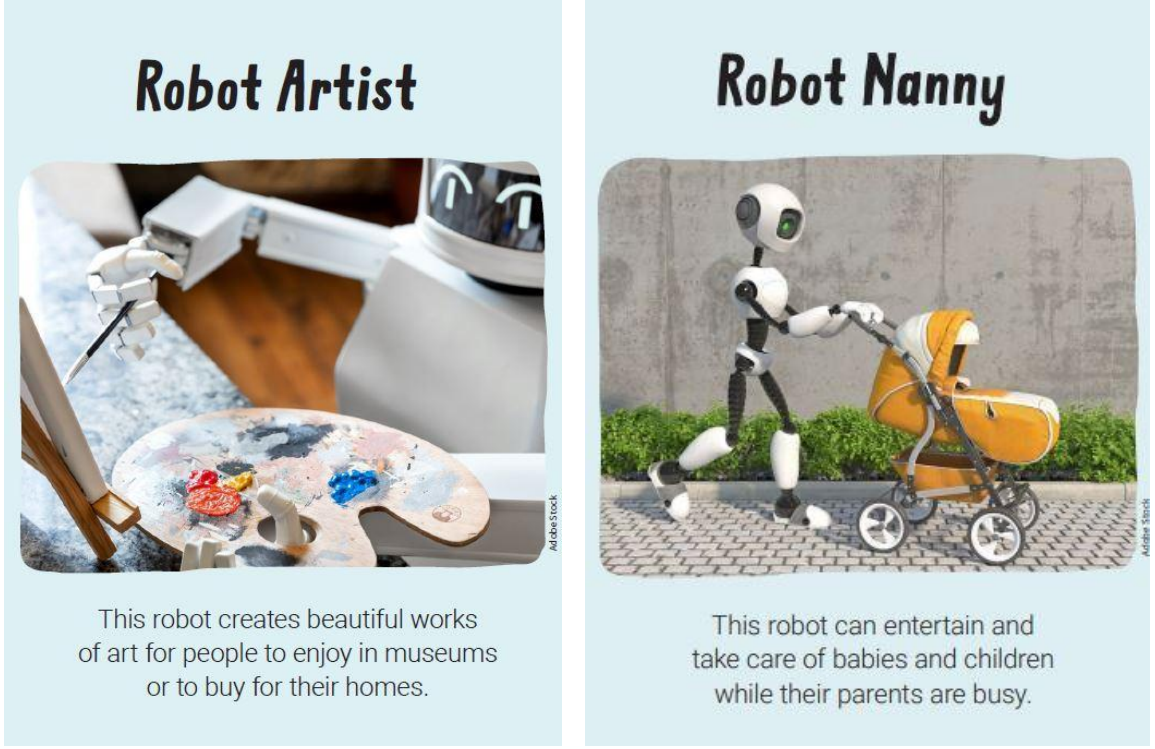
March 30 - April 2

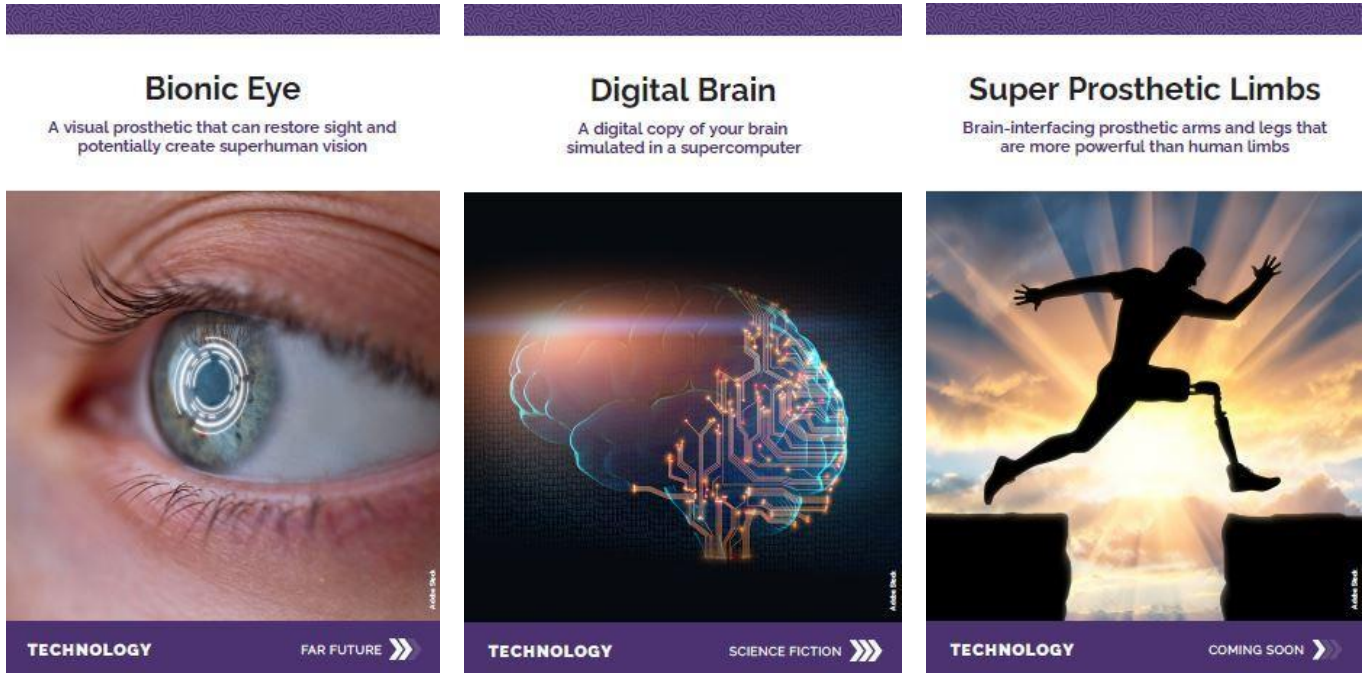
Scan Here to Learn More

The Birmingham News

Robotics Week

- April 8-16
- World Art Day – April 15
- Incorporating What Makes Us Human and Neuro Futures
- LEGO WeDo and Ozobots
- Other NISE Network programs: Scribble Bots, Automata, Mars Rover, Filtered Light, Nebula Spin Art





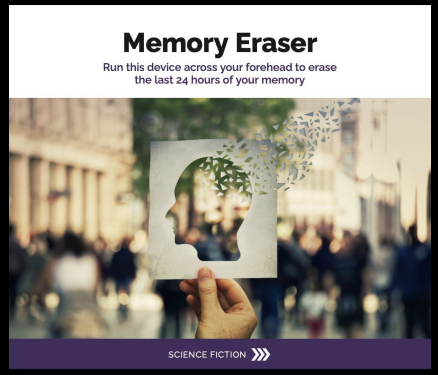
CHANGING BRAINS

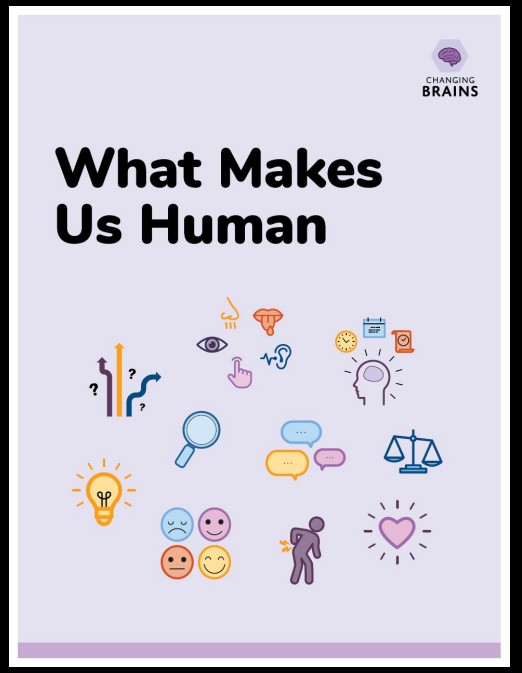
nisenet.org/brain

Download all the guides, cards, & signs now!

Watch the training videos!

Send us any feedback you have on these resources!
christinamleavell@gmail.com





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Civic Science Fellows

Dana Foundation

Thank You

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