Committee make-up: CEO Lockheed Martin, Exxon, DuPont, chairman of the Board Intel, Presidents Yale, MIT, Rensselaer Polytechnic Institute, Texas A&M (former director CIA), University of MD, Nancy Grasmick, plus

- More S&P 500 CEOs obtained their undergraduate degrees in engineering than in any other field.26

- In one recent period, low-wage employers, such as Wal-Mart (now the nation’s largest employer) and McDonald’s, created 44% of the new jobs while high-wage employers created only 29% of the new jobs.27

- The United States is one of the few countries in which industry plays a major role in providing health care for its employees and their families. Starbucks spends more on healthcare than on coffee. General Motors spends more on health care than on steel.28

- In South Korea, 38% of all undergraduates receive their degrees in natural science or engineering. In France, the figure is 47%, in China, 50%, and in Singapore 67%. In the United States, the corresponding figure is 15%.29

Energizing and Employing America for a Brighter Economic Future

Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position. For the first time in generations, the nation’s children could face poorer prospects than their parents and grandparents did. We owe our current prosperity, security, and good health to the investments of past generations, and we are obliged to renew those commitments in education, research, and innovation policies to ensure that the American people continue to benefit from the remarkable opportunities provided by the rapid development of the global economy and its not inconsiderable underpinning in science and technology.
ABOUT ME

Computer Science Degree, then Systems Engineering
I am a manufacturing engineer
  ▪ Northrop Grumman: Varied Experiences, travel, growth opportunities
I am a father (3 kids all done undergrad, 2 graduate degrees)
I work with a lot of schools and STEM programs
  ▪ As a parent/engineer/citizen
  ▪ As Northrop Grumman Education Outreach
I sit on a variety of STEM and education committees
I try to pay attention to what kids are doing, what MSDE is doing, what works, what's happening in the world, and where there are opportunities.
PRACTICE INDEX CARD QUIZ:

WHAT GRADES ARE OF INTEREST TO YOU?

A. Pre-K
B. K
C. 1-3
D. All students

Answer: It’s never too early, or late

INDEX CARD QUIZ:

ARE YOU?

A. Teacher
B. Administrator
C. Parent
D. Other

Answer: Today we’ll look at tools you can use as Teacher, Parent, Grandparent, Volunteer or Friend
INDEX CARD QUIZ:
WHAT DOES STEM STAND FOR?

A. Scientific Teaching of Engineering Methodology
B. Statewide Technology Encouraging Math
C. Science, Technology, Engineering & Math
D. Science Taught with English & Math

Answer: Science, Technology, Engineering & Math

INDEX CARD QUIZ:
HOW MANY OF YOU HAVE BEEN TO THE PEEP AND THE BIG WIDE WORLD WEB SITE?

A. Have seen it, didn’t spend much time there
B. My kids like it home
C. I use it in the classroom
D. Never heard of PEEP.

Answer: We want to build off past experiences
WHAT’S IN A LANDFILL?

- Steel, Aluminum
- Paper
- Oil
- Bio-mass, Nitrogen

Why don’t we use this Stuff?

We don’t know how.

WHY STEM

That’s where the jobs are
That’s the thinking we need to save ourselves from the problems we’ve created
That’s where our future economy is coming from
It just may be a better way to teach
Global competitiveness
Quality of life
THEMES FOR STEM IN ELEMENTARY SCHOOL

Math and Science let us do fun stuff
- Rockets
- Video games
- Amusement parks
- Cell phones
- Movie special effects

Math and Science allow us to do important things
- Safe air travel
- Roads and Bridges
- Fresh water
- Fuel economy
- Microfibers
- CAT-Scan, MRI, SonoScan, etc.

BUILD A BETTER BUNNYCOPTER

Kids discover the value of refining inventions as they work to optimize Deeler's Bunny Copter to make it twist faster.

How Am I Inventing?
This part of the inventing process is called refining and optimizing. Working with existing inventions, inventors make changes and then test them to see whether the changes have improved overall performance. In this activity, kids work with Deeler's invention and experiment with changes to help it twist faster.

How Am I Inventing?
Inventors are always looking for ways to make something work better. So, they test and make changes to an invention to improve it. When you make changes to Deeler's Bunny Copter to make it twist faster, you're doing the same thing. Inventors call this process refining and optimizing. You can call it fun!

www.pbskids.org/cyberchase
WHAT IS A SHADOW

What do we need to see our shadow?

Can we make shadows with other things?


WHAT DO WE WANT TO TEACH KIDS ABOUT THE SCIENCE OF SHADOWS?

We need a light (Sun, Lamp, Flashlight)

We need a place for the light to reflect (Wall, floor, ground)

We need something to block the light (Our body, a tree, a toy, etc.)
WHAT ABOUT THE MATH?

Have Fun!

OUTSIDE SHADOW ACTIVITIES

OUTSIDE SHADOWS

Chalk outlines:

1. Go outside to a flat, open, and sunny area with children and take a look at your shadows. Have children describe what they see. Ask:
   - Can you tell which shadow is yours? How do you know?
   - Wave your shadow. Does your shadow wave back?
   - What else can your shadow do that you can do? (Jump, dance, raise hands, etc.)
   - Do you see anything else outside that has a shadow? What?

2. Record children’s observations. You’ll use these notes later in creating a chart called “Our Ideas About Shadows.”

WE DON’T KNOW EVERYTHING ABOUT SHADOWS – BUT IT’S EASY TO EXPLORE

Vocabulary
Encourage children to use words related to shadows like sun, light, outline, and shape. Emphasize science process words like notice, observe, describe, and compare.

Materials
- Shadow tracing on paper of four everyday objects you’ve prepared beforehand (examples: cap, scissors, hat, toy truck, pencil, doll, etc.)
- The four objects you used to make shadow tracings plus four more objects about the same size
- Desk lamp
- Wall to project shadows onto

Key Science Concepts
- A shadow is created by an object blocking the light.
- A shadow shows the shape of an object, but it doesn’t show colors or many other details.

Directions
Tell children they will play a guessing game with shadows, similar to what they did in the look box just now:
1. Lie each of your four shadow tracings on the ground. Place the group of eight objects in front of the tracings.
2. Ask children to try to match the shadow to the object that made it. Ask, “Which object made this shadow? Why do you think that is?”
3. Then have a child recreate the shadow shape using the object and a lamp. How does this help them test whether they were right?
4. Repeat with the three other tracings.

5. Tell them the rules of the game. I will be Simon. I am going to tell you to make a certain kind of shadow on the wall. Then you’ll make the shadow.
6. Have children stand between the lamp and the wall. Dim their lights and turn on the lamp.
7. Then begin offering children a dozen or so different commands. These will provide a review of the different shadow shapes you experimented with in this week’s activities.
   - Simon says make your shadow...
     - wide
     - shallow
     - wide
     - horizontal
     - narrow
     - pointy
     - cross
     - taller
   - Si”mon says make your shadow...
   - Make it tall and narrow.
   - Make it wide and fuzzy.
   - Make it long and pointy.
   - Make it short and fat.

Pause between each command until everyone has done the pose.
8. Then have children to be Simon, each commanding the group to make a shadow...
MORE ABOUT PEEP

PEEP is on-line
FREE
Created by Educators
Easy to Use
Available in Spanish and Cambodian

THERE IS A LOT TO DO AT THE WEBSITE

You can use PEEP as formal curriculum, a fun reward, a structure for adult visitors, as homework, for family engagement, or as an individual activity.
# BOOKS ABOUT SHADOWS

**Materials**  
Here are the read aloud books for the three week shadow curriculum. Add these books in the library center:

- Tompert, Ann. Sticking Sticks Like a Shadow  
- Stevenson, Robert Lewis. My Shadow  
- Sendak, Brian. Where Is My Shadow?  
- Ring, Susan. Light and Shadow  
- Bulla, Clyde. Robert. What Makes a Shadow?  
- Silverman, Buffy. Me and My Shadow: A Book about Light  
- Gore, Sheila. My Shadow

**Additional Books (Optional)**

- Lee, Sue. Shadow  

---

**Questions?**
THE BOOK WE HAVE PRINTED OUT IS FOCUSED ON THE EXPLORER’S GUIDE

Various support resources are available

The book focuses on 6 units from the Explorer’s guide:
- Explore Shadows
- Explore Water
- Explore Plants
- Explore Color
- Explore Sound
- Explore Ramps

It also includes:
- PEEP Approach
- An Event Sample
- Outcomes matrix
- Family letters

Resources

A Blog, In the Classroom with PEEP
Lisa Durant, teacher Denise Nelson blogs about using the PEEP Explorer’s Guide with her students in Worcester, Massachusetts. Denise reflects on the discoveries both she and the children make with their hands-on, in-depth investigations of shadows, water, plants, sound, color, and ramps.

PEEP Explorer’s Guide (Español)
Explore Shadows, Water, Plants, Color, Sound, and Ramps with your preschoolers. Teacher tips, Classroom Close-Ups (glimpses into what our activities look like in action), and photos make this Guide easy and fun to use. Family Science Letters extend the learning into the children’s homes. An animated PEEP sample highlights each science concept and several five-act video shows real kids playing and experimenting with these concepts.

PEEP Event Kit
Our PEEP Event Kit offers resources to organize three different science events for preschoolers: Exploring Shadows, Exploring Structures, and Exploring Ramps, Each event has an Event Leader’s Guide detailing the setup of hands-on activities, a flyer to promote the event, and take-home materials for families in English and Spanish.

Recommended Books
For every story, we’ve found two wonderful kids’ books that extend the stories, the science, the math, or all three. You’ll find fiction and non-fiction titles on our easy-to-print book list. Reading together is yet another way that you and your kids can connect to the ideas that make the TV series so special.

PEEP, Cambodian version
Peep and the Big Wide World is localized for a Cambodian audience through a partnership between WGBH and World Vision.
INTRODUCTION TO PEEP

On-line orientation:
One hour teacher orientation available on-line

LINK
Joan Cusack interview
5:40 – 7:25

What is Peep?

• Targets 3 to 5-year olds, models science inquiry skills and stimulates curiosity
• Independent evaluation found children exposed to Peep demonstrated more science inquiry skills

Getting the “right” answer isn’t the goal, what’s important is for kids to have the time and space to wonder and explore to learn the joys of discovery.

EXPLORER’S GUIDE

Designed to be used by educators
Each Unit covers several different activities
  • Most can be done indoors
  • Includes ideas for outside activities
  • And activities the kids can do at home
Activities tie together Art, Science and Language

Experience isn’t everything - Reflection on experience is key.
PEEP IS DESIGNED FOR EDUCATORS

Recommended Uses
Use Animation to introduce activities
Use the guide for ideas on how to create in class activities
Use the live action video after the kids have done an activity to compare your classes experience to the kids in the video.

Repeated exposure and self directed exploration allows the kids take away the big concepts, and have fun doing it.

WHEN YOU WANT TO USE PEEP

Share the book, everything is available on-line
Read through one unit and see what activities your kids will enjoy
Use the animated video, introduce the idea, leave time for exploration and discovery
To follow-up there is an online teacher introduction at:

http://wgbh1.na4.acrobat.com/p26758642
EXPLORER’S GUIDE UNITS

Find one that looks fun
Work within your comfort zone, but know there is lots of help available
Try one, see how it goes, then decide when to implement more

http://www.peepandthebigwideworld.com/guide/

EVENTS

Designed to be used by adult volunteers
No Teaching experience required
Different topics to chose from
Great way to involve parents, or school partners

http://www.peepandthebigwideworld.com/resources/event-kit.html
EVENTS

PEEP short.wmv

WHY NOW?

Productivity in America is at an all time high
- We do more with less time than ever before
- More families work more hours to maintain standard of living
- Working harder will not maintain our growth

The global economy has “flattened” the world in terms of skills and technology. A new workforce of problem-solvers, innovators, and inventors who are self-reliant and able to think logically is one of the critical foundations that drive innovative capacity in a state. The K-12 (kindergarten through grade 12) education system, with the support of postsecondary education, the business sector, foundations, and government, must ensure that 1) all students graduate from high school with STEM competencies to become this workforce; and 2) a greater number of students graduate from high school as potential professionals in STEM fields.

The generation coming out of college right now, is the first American generation NOT expected to have a significantly higher Standard of Living than their parents. And many of them will live healthfully into their 100s.
INDEX CARD QUIZ:

SWITCHING TO FLUORESCENT LIGHTING CAN SAVE CONSUMERS A LOT OF MONEY. HOW MUCH MONEY COULD AMERICANS SAVE COLLECTIVELY EACH YEAR IF WE ALL MADE THE SWITCH TO EFFICIENT LIGHTING?

A. $ 1 million  
B. $ 10 million  
C. $ 50 million  
D. $ 750 million

Answer:  D. $ 750 million

INDEX CARD QUIZ:

WHAT’S THE BEST PART ABOUT PEEP?

A.  Everything is free from the internet.  
B.  The lesson plans are very straight forward with easy to apply concepts.  
C.  PEEP characters are fun and will engage my kids.  
D.  PEEP allows me to prepare my kids to be better students, more interesting people, and good STEM learners.

Answer:  However you use PEEP, it will be good for your kids.
STEM TEACHING IDEAS COME FROM MANY PLACES

http://pbskids.org/cyberchase/