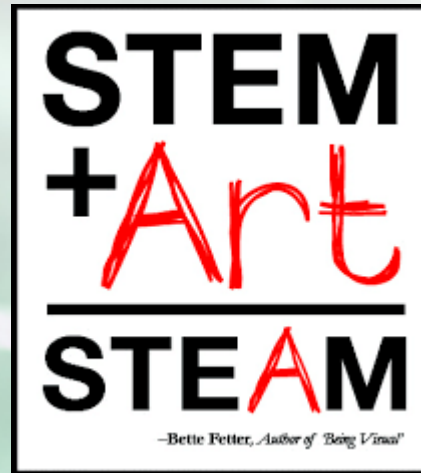


STEAM in Plain Language



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Outline

- Introductions
- What is STEAM? (STEM + Art)
 - *Science*
 - *Technology*
 - *Engineering*
 - *Arts*
 - *Mathematics*
- Why STEAM?
- STEAM Jobs and Careers
- STEAM Activities for Young Children
- Critical Thinking and Problem Solving
- STEAM Resources

What is STEAM?

- STEAM is an educational approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics for guiding exploration, innovative problem solving, and critical thinking. The end results are children who take thoughtful risks, engage in experiential learning, persist in problem-solving, embrace collaboration, and work through the creative process. These are the innovators, educators, leaders, and learners of the 21st century!
- The Arts component adds creativity, design, thinking outside the box and innovative problem solving.



Why STEAM?

- 21st Century Skills for 21st Century Jobs
- Greatest number of new jobs
- Most financially rewarding opportunities
- Critical Thinking
- Problem Solving
- Innovation
- Thinking Outside the Box
- Entrepreneurship
- Creativity
- Communication



STEM vs Non-STEM Careers

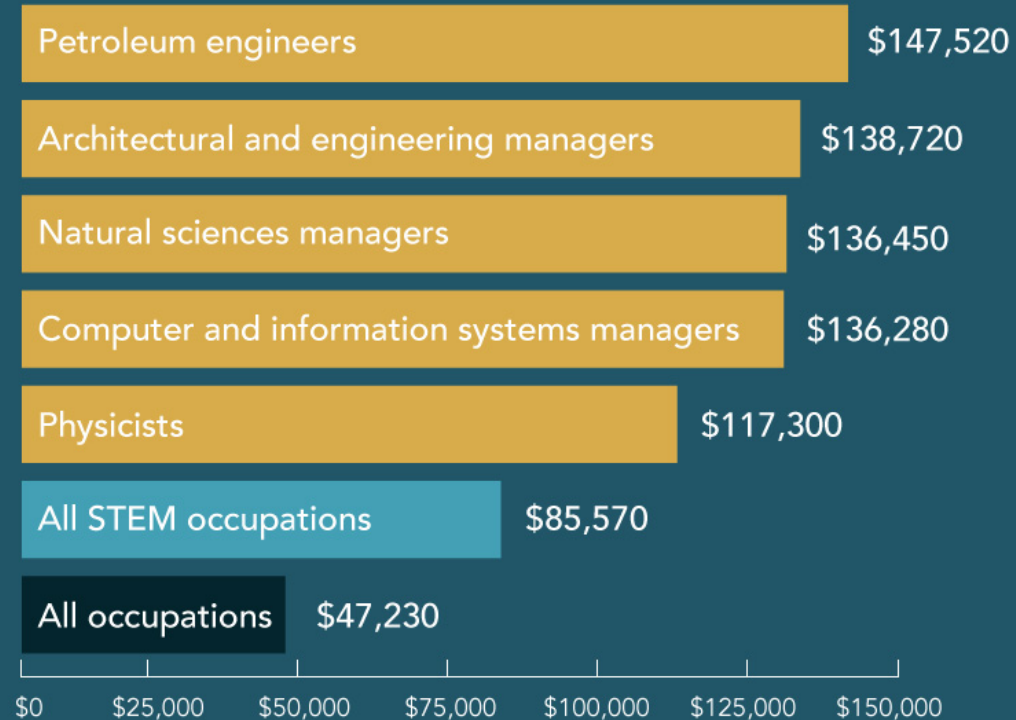
Examples of Annual Salaries for STEM Careers vs. Non-STEM Careers

Non-STEM Career	Average Starting Salary	STEM Career	Average Starting Salary
Animal Control Worker	\$31,990	Veterinarian	\$89,450
Grounds Maintenance	\$27,180	Civil Engineer	\$78,560
Chef / Head Cook	\$42,410	Dietitian / Nutritionist	\$51,470
Middle School Teacher	\$52,570	Mathematics Teacher, Postsecondary	\$68,130

Source: Bureau of Labor Statistics, May 2008

Highest Paying STEAM Careers

Highest-paying STEM occupations



Annual mean wage, May 2014

Source: U.S. Bureau of Labor Statistics

Science

- Science is the study of the physical and natural world through observation, exploration and experimentation.
- The work of scientists often involves research, writing proposals and academic papers, and presenting findings. Science technicians collect samples, conduct experiments, and do other tasks to assist scientists in those efforts.



Science

Careers

- Biology
- Chemistry
- Physical
- Environmental

Classroom

Science activities include exploring water and sand, comparing and contrasting natural materials like rocks and soil, rolling balls across the room, and looking through a magnifying glass to count how many legs are on the bug that was caught during outdoor play.



Technology

- Technology workers use science and engineering to create and troubleshoot computer and information systems. For example, some tech workers develop software applications and build and maintain computer networks and databases.
- The work often involves designing, testing, maintaining, and improving computer software, hardware, systems, and networks



Technology

Careers

- Computers
- Programmer
- Networking
- System Admin
- PC Technician

Classroom

Technology activities include computers, but also identifying simple machines like gears and wheels and pulleys. Using batteries and magnets are also useful tools for learning about technology

Engineering

- Engineers and engineering technicians use math, science, and technology to solve real-world problems. The work often involves developing systems, structures, products, or materials.
- Disciplines in engineering are often categorized by industry, such as aerospace, petroleum, or textiles. Major disciplines include civil, mechanical, industrial, electrical, and materials engineering.



Engineering

- Aerospace
- Electrical
- Petroleum
- Mechanical
- Electrical

Engineering in preschool happens in the block area. There children are planning and designing structures every day with little teacher direction.



Arts

- Arts education is a key to creativity, and
- Creativity is an essential component of, and spurs innovation, and
- Innovation is, agreed to be necessary to create new industries in the future, and
- New industries, with their jobs, are the basis of our future economic wellbeing.





Arts

- Fashion Design
- Choreography
- Musician
- Artist
- Painting

By teaching in and through the arts, children carry the creative spark across the curriculum for all content areas.

Arts integration is an innovative teaching strategy that fuses the arts curriculum—dance, music, visual arts—with standard curricula.

Mathematics

- Math workers use numerical, spatial, and logical relationships to study and solve problems. Mathematics is the technical foundation for science, engineering, and technology.
- The work often involves finding patterns in data or abstract logic. These patterns can be used to draw general conclusions about data, to test mathematical relationships, and to model the real world.
- Disciplines in math include algebra, statistics, calculus, game theory, and geometry.



Mathematics

- Mathematics
- Statistical Analysis
- Survey Design
- Economist

Math activities include counting and matching shapes and making patterns. Measuring is easy too, especially with unit blocks where two of one size equal one of the next size up.



Activities for Young Children

- Science Activities
- Technology Activities
- Engineering Activities
- Arts Activities
- Mathematics Activities



Science Activities

- **Air can move things** (Blow air on their hands and ask them, “What do you feel?”)
- **Bubbles have one shape** (Make a bubble solution and use different objects to create bubbles. The shape will always be round due to liquid surface tension.)
- **Shadows have changing shapes** (Outside in the sun or inside with a flash light, create shadows. Ask, “What do you need to create a shadow?”)



Technology Activities

- **Scissor skills** (Show children how to use scissors.)
 - *Cut along the line*
 - *Basic shape cutouts*
- **Practice pouring** (Use a picture and plastic cups. Experiment with different cup sizes.)
- **Scooping** (Use scoops to move sand or dirt from one container to another.)
- **Observe closely** (Use a magnifying glass to look at something up close.)



Engineering Activities

- Mix it up (Use different types of building materials. Some work better than others.)
- Recycle it (Use card board boxes, plastic bottles, cups and other containers for different uses.)
- Challenge it (Create sets of challenges for children using materials.)
 - *How tall can you make it?*
 - *Build a tunnel you can crawl through,*
 - *Build something as a team.*
 - *Build something in 5 minutes.*



Art Activities

- Designs
- Dancing
- Singing
- Musical instruments
- Drawing
- Painting



Mathematics Activities

- **Likes go together** (Assemble sets of toys and have the children match them – cars with cars, blocks with blocks, etc.)
- **Design a quilt** (You can use fabric squares or construction paper to create a variety of patterns.)
- **Body measurements** (Children can use their body as a unit of measurement.)
- **Da Vinci dimension** (Compare height from head to toe and arm span by marking the length of the children on the floor with tape.)



Teaching Critical Thinking and Problem Solving to Preschoolers

- Provide opportunities to play
- Help children view themselves as problem solvers and thinkers
- Don't solve all problems immediately for children
- Help children develop hypotheses
- Encourage thinking in new and different ways
- Support your children to research further information
- Ask open ended questions “What”



STEAM Resources

- **Sprouts STEM Teaching Guide**
<http://www.bostonchildrensmuseum.org/sites/default/files/pdfs/STEMGuide.pdf>
- **Best Apps for Teaching and Learning**
<http://www.ala.org/aasl/standards-guidelines/best-apps/2015>
- **Using Blocks to Develop 21st Century Skills**
http://www.naeyc.org/yc/article/using_blocks_develop_21st_century_skills_Lindeman
- **The Show Me Librarian – All Things STEAM**
<http://showmelibrarian.blogspot.com/p/all-things-steam.html>



Childcare Management Solutions

- Approved training organization with Maryland, Virginia and the District of Columbia
- Instructor-facilitated online training on CMS website www.EarlyCareInstitute.com
- Classroom training on-site and at our Fort Washington, MD location
- Download our free app CMS4Training at <http://fanapp.mobi/cms4training>
- Download our free career app URSuccess at <http://fanapp.mobi/ursuccess>
- Visit our web site at www.CMS4Training.com