
STrEAMing
An Interactive online training for
the next generation STEAM educators

Part 1. Lecture 1.

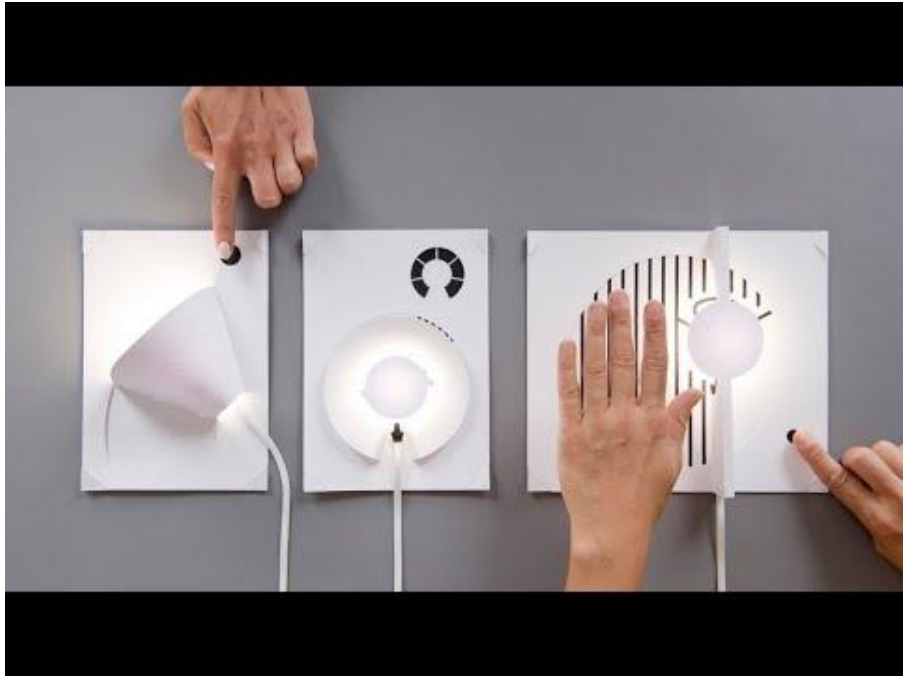
STEAM Education: best practices and general principles

What is STEAM?

Teaching STEAM is not just about adding the subjects into the learning. To effectively teaching STEAM it's important to incorporate hands-on learning; projects allow open-ended exploring and investigating, problems to solve and solutions to create. The more senses involved in education, the more it will help kids remember what they are learning. When kids are building, creating and exploring the learning matters to them. The experience that comes from hands-on projects makes learning more meaningful and engaging.

What is STEM?

What is STE(A)M?



STEAM takes STEM to the next level: it allows students to connect their learning in these critical areas together with arts practices, elements, design principles, and standards to provide the whole pallet of learning at their disposal. STEAM removes limitations and replaces them with wonder, critique, inquiry, and innovation.

www.educationcloset.com/what-is-steam-education-in-k-12-schools/#whysteam

What is STE(A)M?

https://www.maind.supsi.ch/portfolio/2015-16/thesis/o-kao

STEAM programs aim to teach students to think critically and use engineering or technology in imaginative designs or creative approaches to real-world problems framed in social studies. STEAM programs add art to STEM curriculum by drawing on reasoning, ethics and design principles and encouraging creative solutions.

Tech education

The fastest-growing job categories
+9 millions job openings (just in USA)

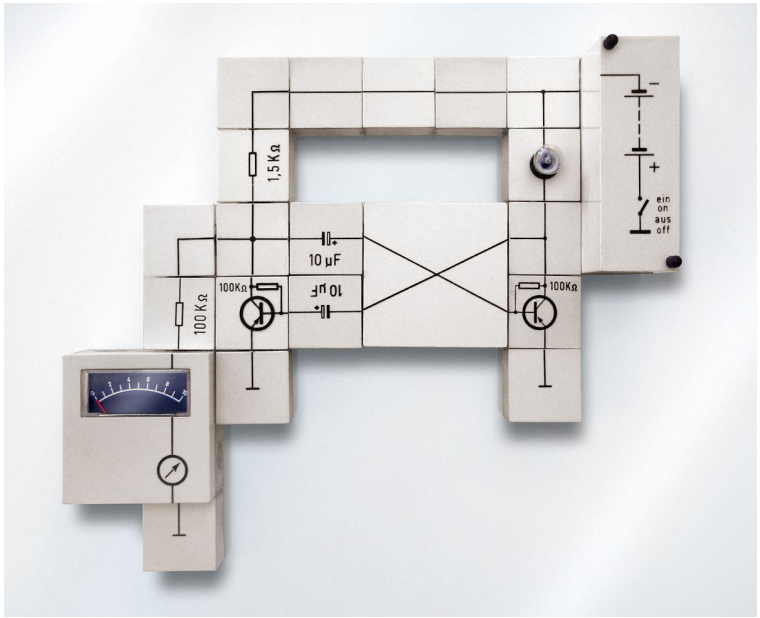
What is STEAM?

LOGO Turtle
Seymour Papert

The idea of programming is introduced through the metaphor of teaching the Turtle a new word. This is simply done, and children often begin their programming experience by programming the Turtle to respond to new commands invented by the child such as SQUARE or TRIANGLE or SQ or TRI or whatever the child wishes, by drawing the appropriate shapes.

S. Papert (1980), Mindstorms, Basic Books, New York, p.12

What is STEAM?



Raytheon Lectron

The Lectron kit consisted of electronic components installed within individual "building blocks" with a clear plastic base, an opaque white top with the component's schematic symbol and permanent magnets attached to the leads of the enclosed components.

https://en.wikipedia.org/wiki/Raytheon_Lectron

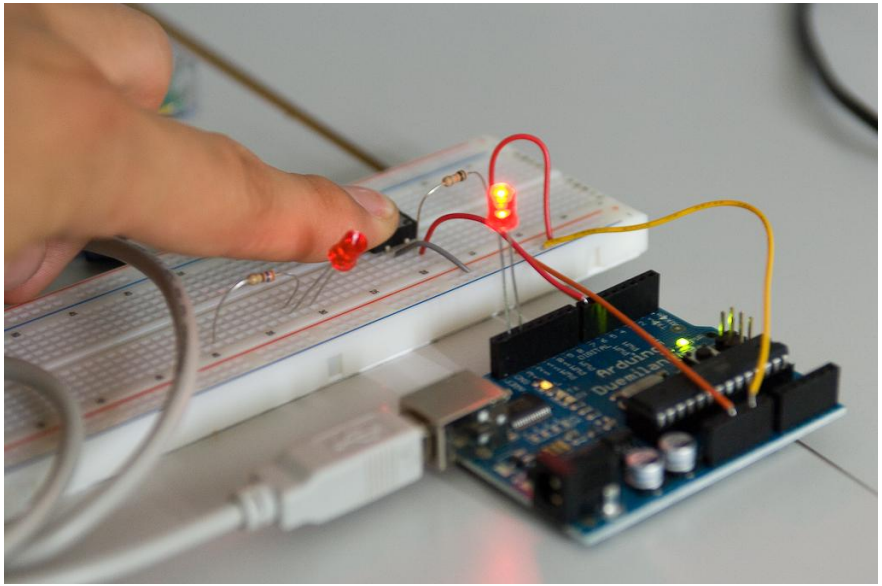
SCRATCH

Some key principles

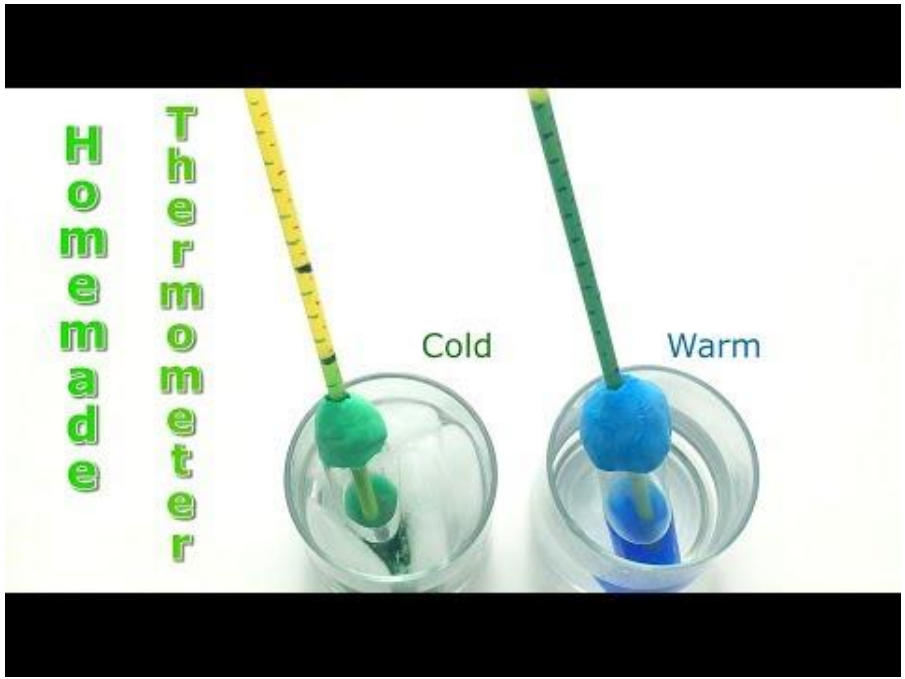
What STEAM brings into the classroom

1. Add More Hands-On Projects.
2. Include REAL World Problem Solving Activities.
3. Integrate and Apply the Learning.
4. Encourage Questioning and Wondering.
5. Give the Kids More Control of Their Learning.

www.teachbesideme.com



Many online resources

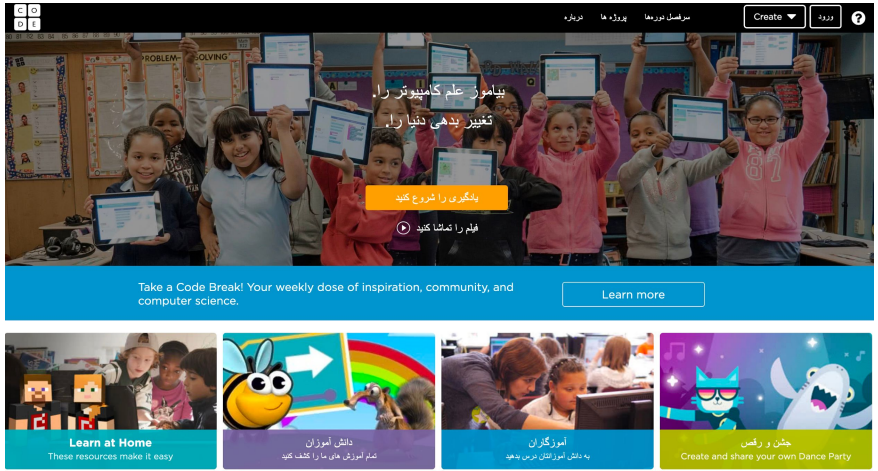


Science buddies

A series of tutorials and resources to make hands-on science related activities

https://www.sciencebuddies.org/

Many online resources



Code.org

A repository of resources to teach computer sciences in all grades.

www.code.org

21st Century Skills

Top 10 skills*

In 2015

1. Complex problem solving
2. Coordinating with others
3. People management
4. Critical thinking
5. Negotiation
6. Quality control
7. Service orientation
8. Decision making
9. Active listening
10. Creativity

In 2020

1. Complex problem solving
2. Critical thinking
3. Creativity
4. People Management
5. Coordinating with others
6. Emotional intelligence
7. Decision making
8. Service orientation
9. Negotiation
10. Cognitive flexibility

*Future of jobs report, World Economic Forum