

Robotics, Computational Thinking & Coding

by Edith, Carol & Emily

defining the field



history



by the numbers

Robots +
Computational
Thinking +
Coding
Equals....



Robots R
Cool

into the future

benefits &
limitations



to code or not to code?



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did you
know?

Classroom
Engagement
Robots,
Conceptur...

Please take the
poll by joining
at
slido.c...



Computational Thinking: Empower our kid's future



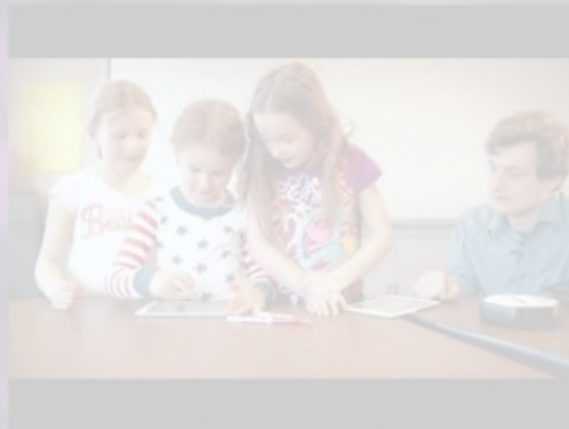
 createlab

Computational Thinking: Empower our kid's future



 create lab

**Classroom Engagement
Robots, Conceptual Thinking
& Coding**







**Please take
the poll by
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#2983**

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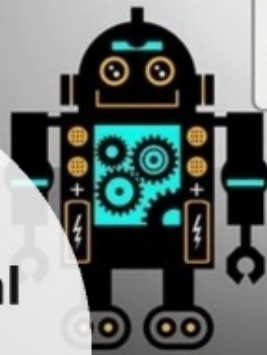
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**Computational
Thinking &
Coding**



"Robot,
get me a glass
of water."

**Robots &
Robotics**

Computational Thinking & Coding

Computational thinking is a **problem-solving process** that includes (but is not limited to) the following characteristics:

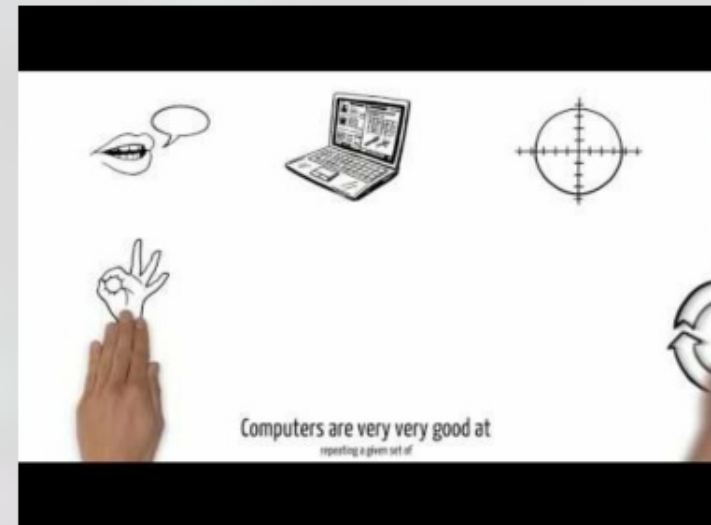
- Formulating problems in a way that enables us to use a computer and other tools to help solve them
- Logically organizing and analyzing data
- Representing data through abstractions such as models and simulations
- Automating solutions through algorithmic thinking (a series of ordered steps)
- Identifying, analyzing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources
- Generalizing and transferring this problem solving process to a wide variety of problems

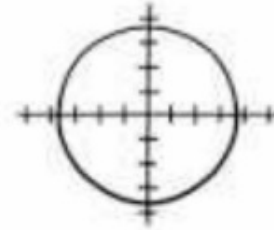
Source: International Society for Technology in Education (ISTE) and the Computer Science Teachers Association (CSTA). 2011. Retrieved from <https://c.ymcdn.com/sites/www.csteachers.org/resource/resmgr/CompThinkingFlyer.pdf>

Code is instructions for a computer (as within a piece of software)

Source: Merriam-Webster dictionary

Resources





Computers are very very good at
repeating a given set of

'ANGRY BIRDS' DESIGN OF SIMPLICITY...



oScribe

Robots & Robotics

According to Merriam-Webster dictionary,

a robot is

1a : a machine that looks like a human being and performs various complex acts (such as walking or talking) of a human being; also : a similar but fictional machine whose lack of capacity for human emotions is often emphasised

b : an efficient insensitive person who functions automatically

2: a device that automatically performs complicated often repetitive tasks

3: a mechanism guided by automatic controls

robotics is

: technology dealing with the design, construction, and operation of robots in automation



Robot



various

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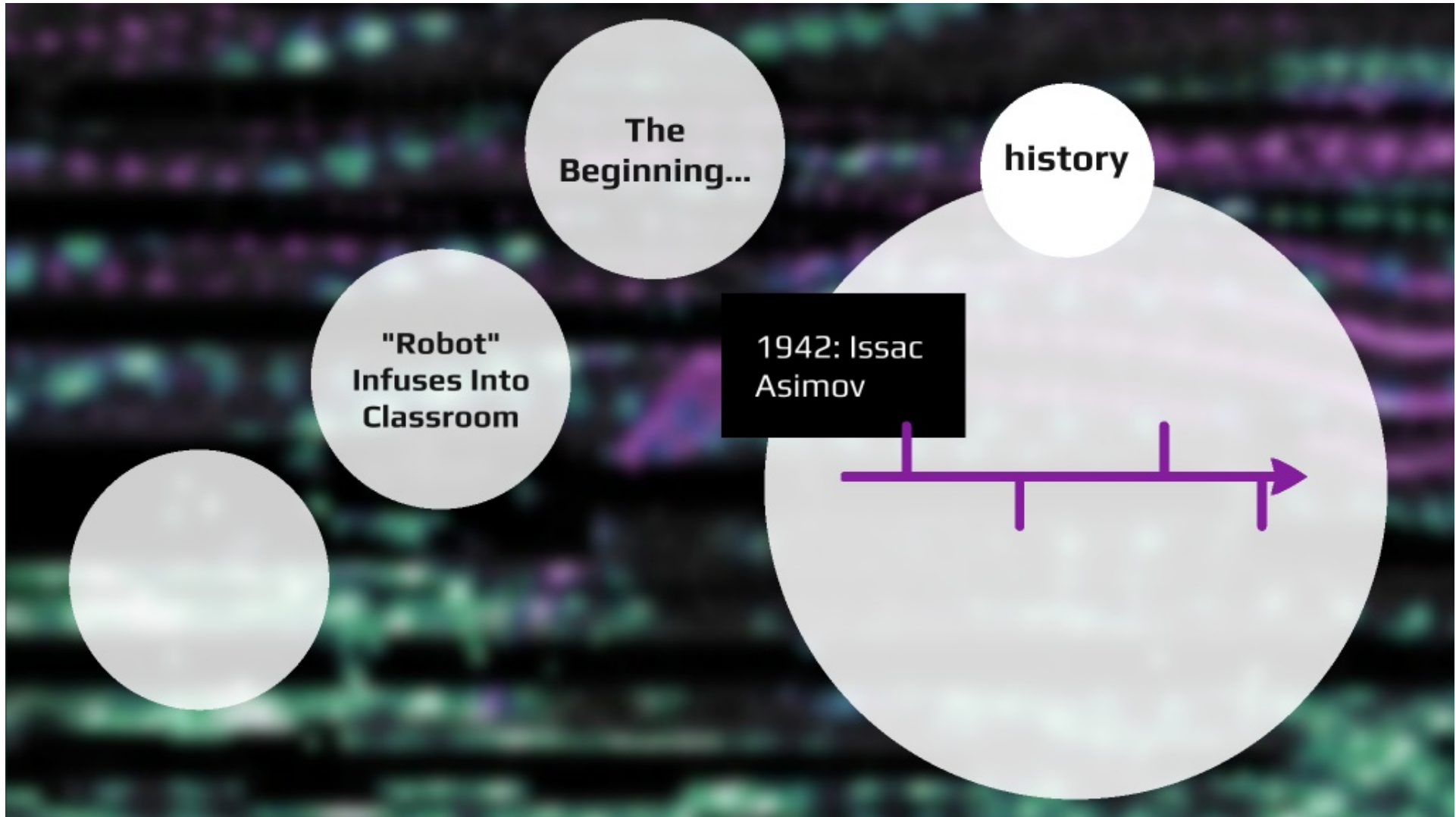


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The Beginning...





"Robot" Infuses Into Classroom





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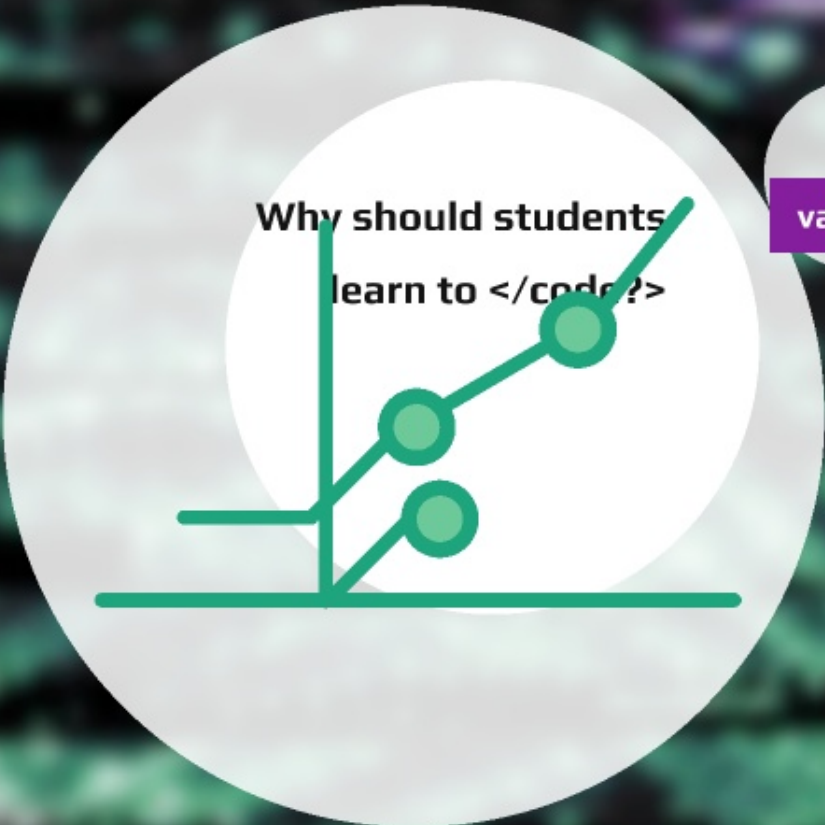


benefits &
limitations



to code or not to code?





Why should students
learn to `</code?>`

value of computer science education

reality check

coding jobs
are growing

**global
sales**



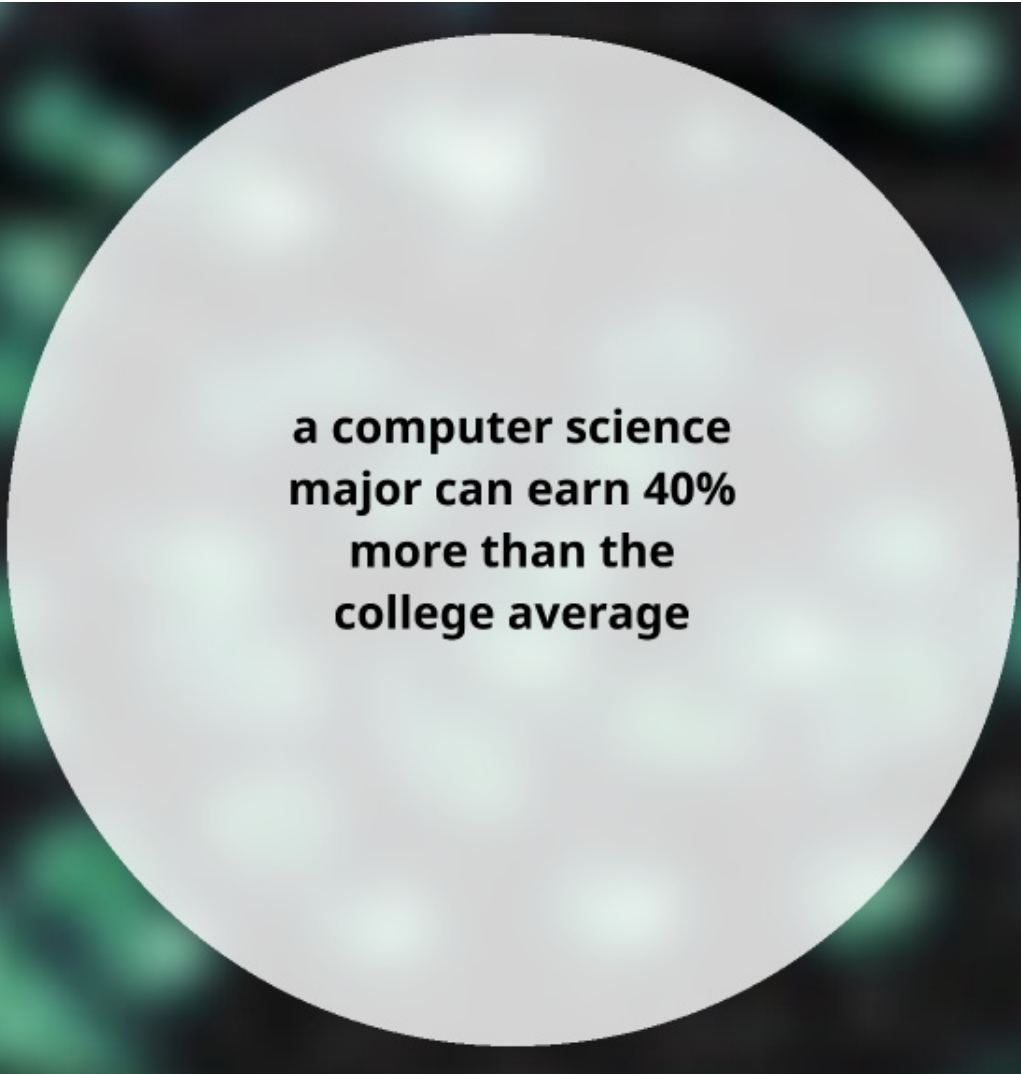
reality check

90% of parents
want their child
to study
computer science

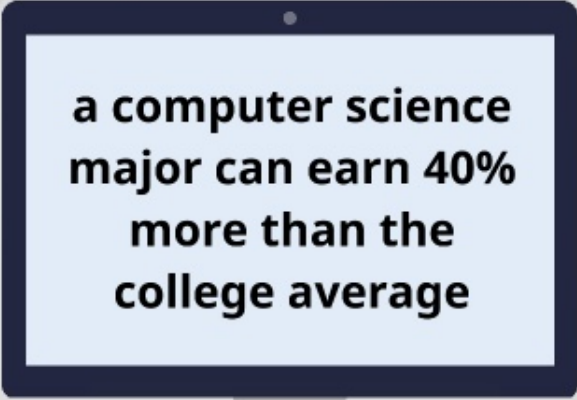
40% of schools
teach computer
programming

71% of all new
jobs in STEM are in
computing

8% of STEM
graduates are
in Computer
Science



**a computer science
major can earn 40%
more than the
college average**

A stylized illustration of a laptop screen with a dark blue border and a light blue background. The screen displays the text "a computer science major can earn 40% more than the college average" in a bold, black, sans-serif font. The laptop is centered within a large, light gray circle. The background of the entire slide is a dark, blurred green and black pattern.

**a computer science
major can earn 40%
more than the
college average**



**Computing jobs are #1
source of new wages in US**

500,000 current openings in
every industry and *every* state;
projected to grow at twice
the rate of other jobs

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**K-12 CS
Standards**

**Graduation
Requirements**

product 3

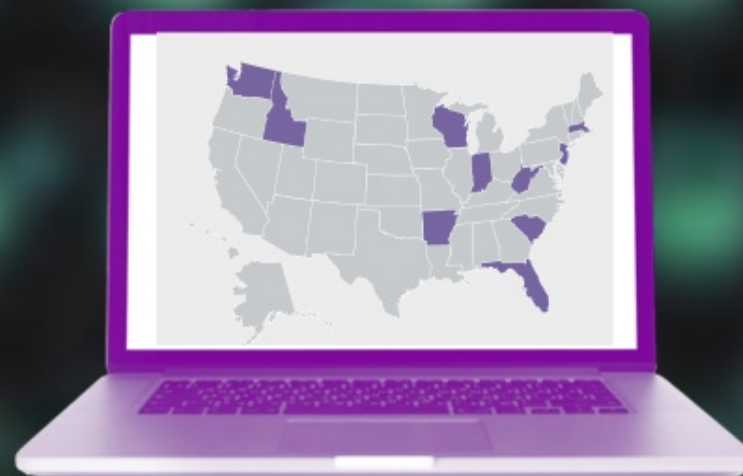
to code or not to code?

Every 21st century child should have a chance to learn to code, the same way they learn to read, write and use math



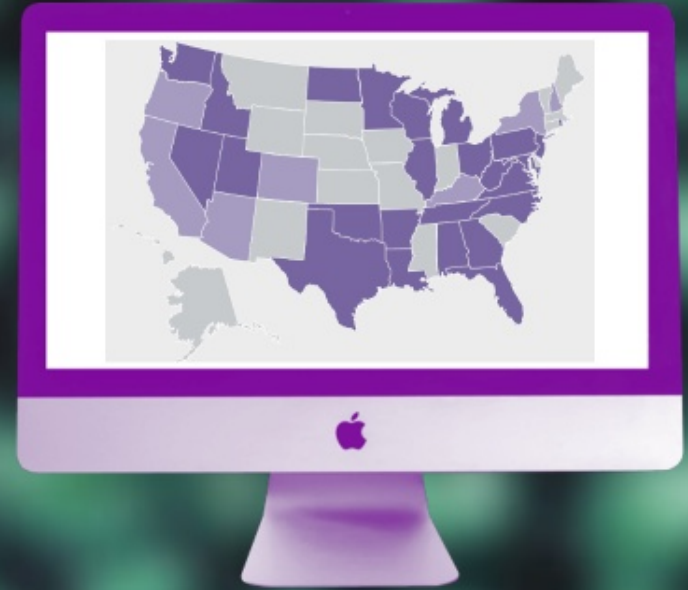
K-12 computer science standards

Only **10 states** have created K-12 computer science standards



Graduation Requirement

- In 32 states + DC, Computer Science counts as Math or Science graduation requirement
- It is in only 12 states more than in 2013



product 3



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NAO Robot in School - for STEM,
Autism and engaging students

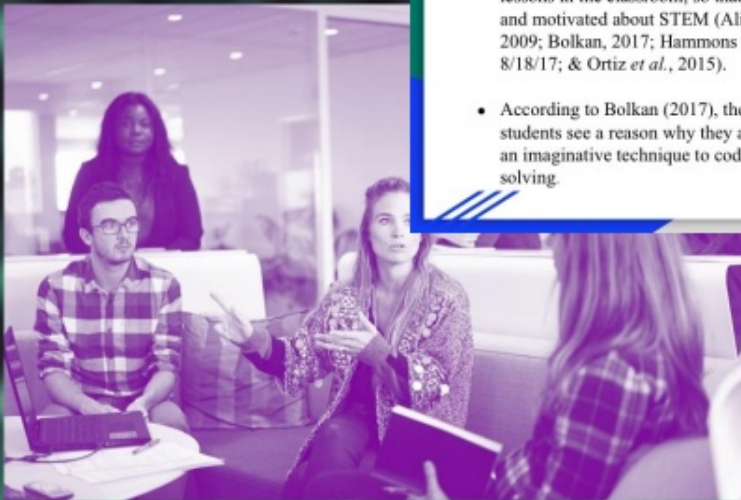
story 2

story 3

Benefits

BENEFITS OF ROBOTS

- The use of educational robotics help instructors to reinforce lessons in the classroom, so that students can be more excited and motivated about STEM (Alimisis, 2013; Barak & Zadok, 2009; Bolkan, 2017; Hammons *et al.*, 2013; NJ State Library, 8/18/17; & Ortiz *et al.*, 2015).
- According to Bolkan (2017), the computer programming helps students see a reason why they are learning the lessons, have an imaginative technique to coding, technology, and problem solving.





The students are able to interact with the robots more
at a level that they're feeling comfortable with.

NAO



The students are able to interact with the robots more
at a level that they're feeling comfortable with.

story 2



story 3



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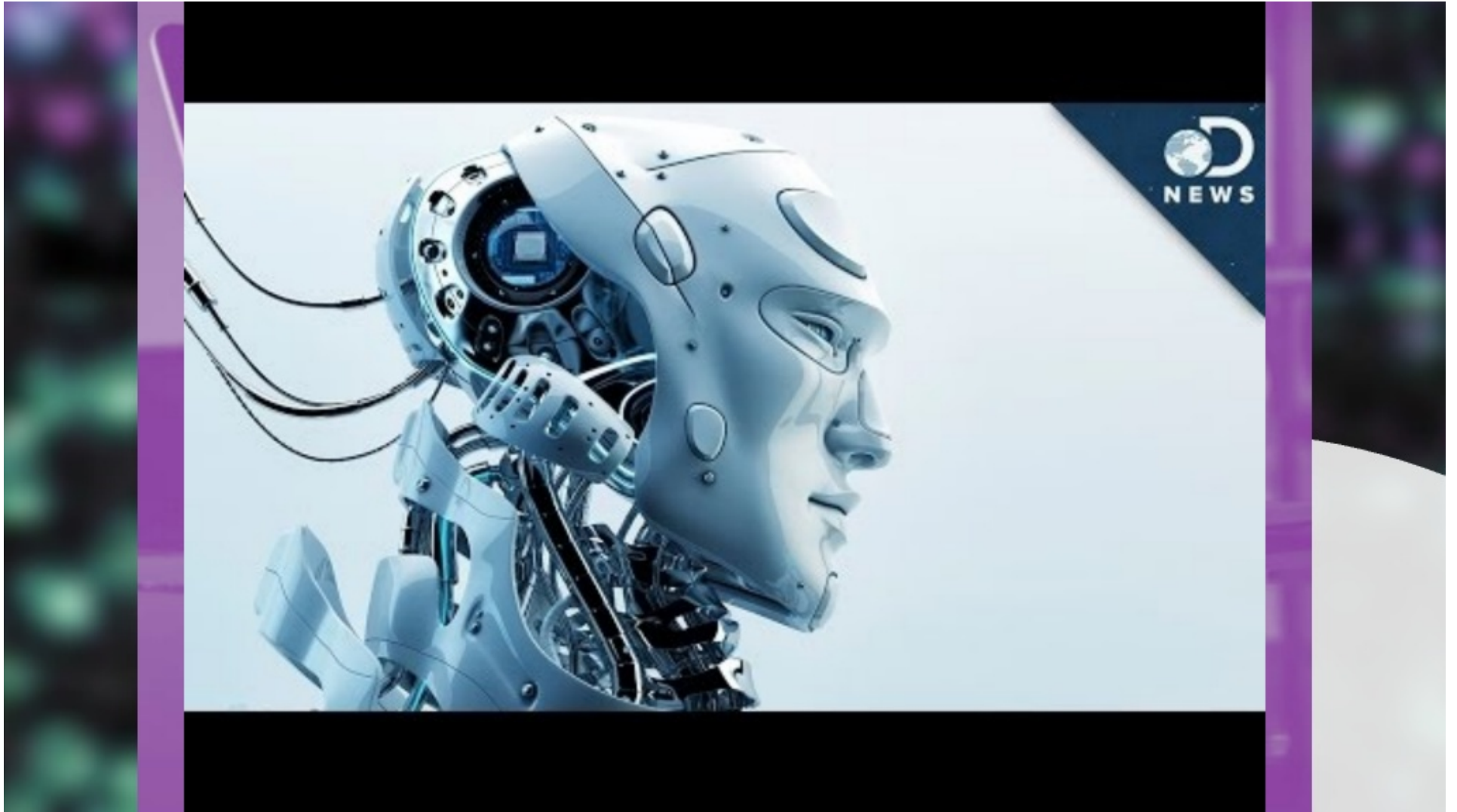


<Teacher
Robot?>

product 2

product 3

**what's it like inside
a robot's mind?**

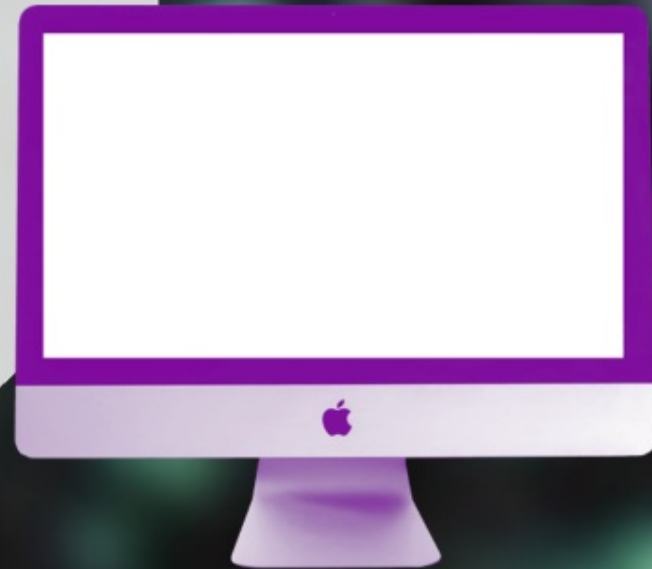


Robot Takes on the Role of Teacher





product 2



product 3

-
-
-

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testimonials

story 1

story 2

story 3





story 1

story 2



story 3



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