



The Science Behind **PIXAR** Educator Overview

The Science Behind Pixar

Exhibit Opens Sunday, June 28 | *Recommended for Grades 3 – 12*

Learn about the filmmaking process through hands-on activities inspired by some of Pixar's most treasured films, from *Toy Story* to Pixar's newest film *Inside Out*. This world premiere exhibition offers an unparalleled view of the production pipeline and concepts used at Pixar every day. Participate in fun hands-on activities, listen to firsthand accounts from members of the studios' production teams, and even come face-to-face with re-creations of your favorite Pixar film characters, including Buzz Lightyear, Dory, Mike and Sulley, Edna Mode, and WALL•E!

Give your students a chance to discover how science, technology, engineering, and math (STEM) are applied to create Pixar's award-winning films. Screen-based activities and physical interactive exhibits will allow your students to experience a variety of roles—such as lighting designer, animator, or modeler—that all contribute toward the making of iconic animated films. Videos featuring members of Pixar's production teams will give your students firsthand accounts of the technological challenges that were overcome during film development. Through this highly immersive and visually stimulating experience, your students will gain insight into a world of STEM applications they may never have known existed!

This exhibition features eight distinct sections, each focusing on a step of the filmmaking process. In these areas, your students will:

MODELING

Use mathematics to create virtual 3D models.

SETS & CAMERAS

Create a 3D scene through virtual cameras.

RIGGING

Explore how movement is made possible through rigging.

SURFACES

Control the appearance of surfaces by applying properties of light.

LIGHTING

Manipulate light to enhance a scene's mood or believability.

ANIMATION

Animate virtual 3D characters and sets.

SIMULATION

Apply mathematical equations to create complex scene simulations.

RENDERING

Render a virtual 3D scene into a 2D image for the theater.



This exhibition was developed by the Museum of Science, Boston in collaboration with Pixar Animation Studios.

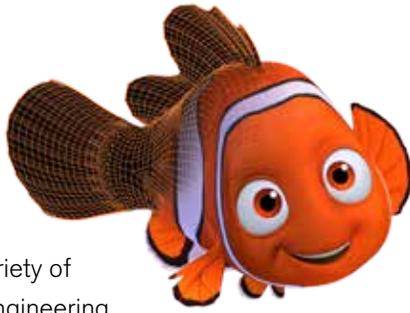
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Curriculum Connections

Teachers can use their students' experiences in *The Science Behind Pixar* to support learning in a variety of academic disciplines: engineering, technology, computer science, geometry, algebra, physical science, trigonometry, calculus, physics, art, and more.



Below you will find examples of themes that link to and reinforce classroom work in the National and Massachusetts Curriculum Framework Connections. Additional standards connections can be found in the full *The Science Behind Pixar* educator guide (available Summer 2015), at mos.org/educators, or by contacting the Educator Resource Center at 617-589-0172.

Computer Science

- **CT.L2-9** Interact with content-specific models and simulations to support learning.
- **CT.L3A-8** Use modeling and simulation to represent and understand natural phenomena.
- **CP.P.L3A-10** Explore a variety of careers to which computing is central.

Mathematics

- **CCSS, K.G.A.2/MA, K.G.2** Correctly name shapes regardless of their orientations or overall size.
- **CCSS, 5.G.A.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system.
- **CCSS, 6.G.A.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
- **CCSS, HSG.MG.A.3/MA, G-MG-3** Apply geometric methods to solve design problems.
- **CCSS, HSG.GMD.B.4/MA, G-GMD.4** Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
- **CCSS, HSF-IF.C.9/MA, 8.F.2** Compare properties of two functions each represented in a different way.

Science, Technology, and Engineering

Physical Science

- **MA STE Pre K – 2, 1** Position and Motion of Objects
- **MA STE 3 – 5, 1** Properties of Objects and Materials
- **MA STE 3 – 5, 12** Light Energy
- **MA STE 6 – 8, 11** Motion of Objects

Technology/Engineering

- **MA STE 3 – 5, 2.2-2.3 and 6 – 8, 2.2, 2.3, 3.2, 4.2** Engineering Design

STANDARDS SOURCES

CSTA Standards Task Force. (2011). CSTA K – 12 Computer Science Standards. Computer Science Teachers Association: New York, NY.

Common Core State Standards Initiative. (2012). Math Standards. Retrieved from corestandards.org/math on December 11, 2013.

Massachusetts Department of Education. (2011). Massachusetts Curriculum Framework for Mathematics. Malden, MA.

Massachusetts Department of Education. (2006). Massachusetts Science and Technology/Engineering Curriculum Framework. Malden, MA.

PLAN YOUR FIELD TRIP TODAY

To book your field trip, contact Science Central: 617-723-2500. The school add-on price for *The Science Behind Pixar* is \$4 per person. Exhibit Halls admission is required.

During September, October, and January, a discounted Exhibit Halls admission fee is available to schools with 35% or higher free and reduced lunch program participation.

Need assistance connecting *The Science Behind Pixar* to your curriculum? Our Museum educators are happy to help you design your visit with a field trip planning session: 617-589-0172.

For more educational resources, workshops, and professional development offerings: mos.org/educators.

Visit mos.org for the latest updates on live presentations and other Museum programming related to this exhibition!

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1 Science Park
Boston, MA 02114-1099

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