Museum of Science®

The Science Behind PIXAR

Activity Sheets

Activity Sheets

The Science Behind PIXAR

These activity sheets have been designed to reinforce the general themes of *The Science Behind Pixar* and help guide your students' experiences within the exhibition. The themes of this exhibition are:

- Art, technology, science, and creativity are inseparable in animation.
- At Pixar, art drives digital technology, and digital technology inspires the art.
- People at Pixar imagine and create compelling movies, using computers as another filmmaking tool.
- Understanding science, math, and computer science are necessary to create believable animated films.
- Filmmaking is a team sport.

Additional pre- and post-activities and exhibition-related questions to create your own activity sheets can be found at **sciencebehindpixar.org/educators.**

ELEMENTARY SCHOOL ACTIVITY SHEETS

- **Pixar 3-2-1:** This activity sheet is designed for students to make observations and ask questions about their experience in *The Science Behind Pixar.*
- **Working Together in Pixar:** This worksheet highlights the collaborative nature of the animation process. Students are asked to identify different examples of when Pixar team members used math, art, science, and creativity to make an animated film.
- **Searching for Shapes!:** Designed for younger students in grades K – 1, this worksheet guides students to identify and draw different shapes within the exhibition. They are then asked to combine different shapes they have found to create an imaginary robot.
- **Vocabulary:** These eight activity sheets highlight the vocabulary words related to the eight steps of Pixar's production pipeline (one step per sheet). Students can write or draw a description of each word.

MIDDLE & HIGH SCHOOL ACTIVITY SHEETS

- **Pixar Production Pipeline I:** This worksheet asks students to identify two different steps of the Pixar production process and answer questions related to each step.
- **Pixar Production Pipeline II:** This activity sheet encourages students to identify how different steps of the production process contribute to various elements of a Pixar film, such as the development of characters, scenes, and movement.
- **Collaboration in Pixar:** Designed to highlight the importance of collaboration within digital animation, this worksheet asks students to identify ways that Pixar team members have used math, art, science, computer science, technology, and creativity to solve problems.
- **Careers at Pixar:** This activity sheet encourages students to explore different types of STEM careers within the field of digital animation. Students are asked to identify two different careers at Pixar and answer questions related to those careers.

Name: _____

Choose a character from any of the Pixar films you see in the exhibition. Draw or describe your character in the box below:

Describe 3 physical characteristics of your character. What does he/she look like?

1. _____

2. _____

3. _____

Describe 2 personality traits. How does your character act?

1. _____

2. _____

What is one question you have about how the animators created this character?

_____

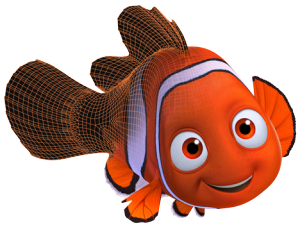
_____

Activity Sheet:

Working Together in Pixar

The Science Behind PIXAR

Name:_____



Art, science, math, and creativity are very important in animation.

Math, art, science, and creativity are all used to make a Pixar film. Explore *The Science Behind Pixar* and write or draw an example of how each of these areas are used by Pixar.

ART	SCIENCE
MATH	**CREATIVITY**

Which of these areas could you help out with on a Pixar film? Why?

_____

_____

_____

Activity Sheet:

Searching for Shapes!

The Science Behind PIXAR

Name:_____

Find examples of different shapes in the exhibition. Name and draw the shape.

_____ **SHAPE:** _____	_____ **SHAPE:** _____
_____ **SHAPE:** _____	_____ **SHAPE:** _____

Draw a character that uses the shapes you found:

Activity Sheet:

Pixar Vocabulary: Modeling

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

Digital

Model

Sculpting

Modeling: digital sculpting creates virtual 3D Models

3D

Virtual

Activity Sheet:

Pixar Vocabulary: Rigging

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

© Disney / Pixar

Digital

Rig

Movement

Rigging: digital rigs make movement possible

Model

Pose

Activity Sheet:

Pixar Vocabulary: Surfaces

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

© Disney / Pixar

Virtual

Surface

Shape

Surfaces: Appearance is contolled separately from shape

Light

Appearance

Activity Sheet:

Pixar Vocabulary: Sets and Cameras

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

Virtual

Set

Camera

Sets & Cameras: Virtual cameras view virtual 3D worlds

View

3D

Activity Sheet:

Pixar Vocabulary: Animation

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

Frame

Animation

Movement

Animation: Animation is acting

Acting

Pose

Activity Sheet:

Pixar Vocabulary: Simulation

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

Motion

Simulate

Automated

Simulation: computer programs create automated motion

Computer

Program

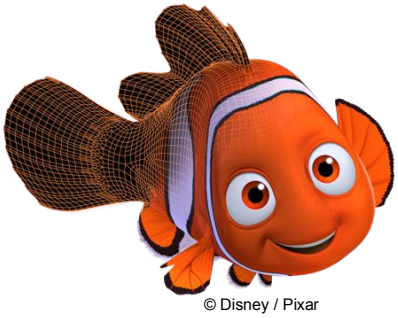
Activity Sheet:

Pixar Vocabulary: Lighting

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.



Virtual

Light

Emotion

Lighting: Virtual lights enhance mood and believability

Mood

Believability

Activity Sheet:

Pixar Vocabulary: Rendering

The Science Behind PIXAR

Name: _____

Sketch and Stretch: Complete each box with a phrase and/or drawing that describes each word.

Virtual

Scene

Frame

Rendering: Rendering turns a virtual 3D scene into a 2D image

3D

2D

Activity Sheet:

Pixar Production Pipeline I

The Science Behind PIXAR

Name:_____

There are eight technical steps in the film production process that contribute to the development of a Pixar film.

MODELING | RIGGING | SURFACES | SETS & CAMERAS

ANIMATION | SIMULATION | LIGHTING | RENDERING

Choose 2 steps of the Pixar Production Pipeline and answer the following questions:

	Step 1	Step 2
Technical Step:		
How does this step contribute to the development of a Pixar film?		
What is one challenge that Pixar members face during this step?		
What skills are necessary to contribute toward this production step?		

Did any of the production steps interest or surprise you? Why?

_____

_____

Pixar Production Pipeline II

Name:_____

There are eight technical steps in the film production process that contribute to the development of a Pixar film.

MODELING | RIGGING | SURFACES | SETS & CAMERAS

ANIMATION | SIMULATION | LIGHTING | RENDERING

Explore the exhibition and identify how different steps of the production process contribute to various elements of a Pixar film.

Identify **two steps** that contribute to the development of a **character's features or persona**. How do these steps affect how the character is perceived?

1. _____: _____

_____

2. _____: _____

_____

Identify **two steps** that contribute to the development of a **scene**. How do these steps make the scene look believable? How do these steps affect the mood or feeling of a scene?

1. _____: _____

_____

2. _____: _____

_____

Identify **two steps** that contribute to the development of **action or movement.** How do these steps affect how characters or objects move in a film?

1. _____: _____

_____

2. _____: _____

_____

Activity Sheet:

Collaboration in Pixar

The Science Behind PIXAR

Name:_____

Art, technology, science, math, computer science, and creativity are inseparable in animation.

Look for examples of how each of the following areas are used in the production of a Pixar film. In the spaces below, explain how each area has been used to simplify or solve a problem faced by the Pixar team.

ART

_____

_____

_____

_____

MATH

_____

_____

_____

_____

TECHNOLOGY

_____

_____

_____

_____

COMPUTER SCIENCE

_____

_____

_____

_____

SCIENCE

_____

_____

_____

_____

CREATIVITY

_____

_____

_____

_____

Which of these areas could you contribute to on a Pixar film? How?

_____

_____

_____

Activity Sheet:

Careers in Pixar

The Science Behind PIXAR

Name:_____

The making of Pixar films involves the collaboration of many different people with unique roles. Check out each exhibition area and look for a video describing someone's job at Pixar.

Research Scientist	Technical Director	Director of Photography	Character Modeler	Character Animator	Software Developer	Rendering Supervisor

Choose 2 careers represented in the Pixar exhibition and answer the following questions:

	Career 1	Career 2
Job Title:	_____	_____
What does this person do in his or her job making Pixar films?	_____	_____
	_____	_____
	_____	_____
What skills are required for this person to do his or her job at Pixar?	_____	_____
	_____	_____
	_____	_____
Do you think you would like this job? Why or why not?	_____	_____
	_____	_____
	_____	_____

Which jobs interest or surprise you? Why?

_____

_____