

THE ART AND SCIENCE OF LUCASFILM: STAR WARS: THE LAST JEDI

GRADES 6 - 12
CLASSROOM GUIDE

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PRESENTATION OVERVIEW:

This special Schools at the Festival edition of our long running collaborative educational series will highlight the work of the Academy Award nominated film Rogue One. Experienced professionals from Lucasfilm will share their knowledge in a behind-the-scenes, interactive multimedia presentation that demonstrates the intersection of art and science in the entertainment industry, all while making connections to current STEAM curriculum topics. Presentation doesn't include screening of the film. The Art & Science of Lucasfilm program features experienced professionals from the various Lucasfilm divisions sharing their knowledge with Bay Area middle and high school students in a series of behind-the-scenes, interactive multimedia presentations that demonstrate the intersection of art and science in the entertainment industry. Each event includes time for discussion, where students have the opportunity to ask questions of Lucasfilm, supervisors, artists and engineers.

All SFFILM Education materials are developed in alignment with California educational standards for media literacy. SFFILM Education welcomes feedback and questions on all printed study materials.

Grades 6-12

Suggested Subject Areas:
Arts/Media, Career Path Training,
Math, Peer/Youth Issues, Science





PRESENTER BIOS

JANET LEWIN, Executive Producer of Lucasfilm

A 24-year veteran of Lucasfilm and Industrial Light & Magic, Janet Lewin is currently serving as Lucasfilm's VP of Visual Effects.

In her current role, Janet oversees all visual effects work across the Lucasfilm franchise, encompassing feature films, theme park rides, marketing projects and commercials. In addition, she functions as VFX Producer on the films, closely collaborating with filmmakers on VFX strategy, schedule and budget throughout the productions of *Star Wars: The Force Awakens*, *Rogue One: A Star Wars Story*, *Star Wars: The Last Jedi* and *Solo: A Star Wars Story*.

Before joining Lucasfilm, Janet was Head of Production and Executive Producer at ILM. Some of her ILM Producing credits include *Star Wars: Revenge of the Sith*, *The Hulk* and *Spiderwick Chronicles*, among many others.

Eddie Pasquarello, ILM Supervisor

Eddie Pasquarello joined Industrial Light & Magic in November of 1993 as a compositor working on *Forrest Gump*. In 1999, he became Lead Compositor on *Sleepy Hollow*. Pasquarello just wrapped production on *Star Wars: The Last Jedi* directed by Rian Johnson on which he served as ILM San Francisco's Visual Effects Supervisor. Previously he served as Visual Effects Supervisor on Brad Bird's *Tomorrowland*, Co-Visual Effects Supervisor on Guillermo del Toro's sci-fi epic, *Pacific Rim*, Associate Visual Effects Supervisor and Compositing Supervisor on J.J. Abram's *Star Trek* and Compositing Supervisor on James Cameron's blockbuster science fiction epic, *Avatar*.

Originally from Woburn, Massachusetts, Pasquarello graduated from Suffolk University in Boston with a B.S. degree in Mass Communications/Advertising with a

minor in Journalism.

Prior to ILM, Pasquarello worked for Disney, starting in 1989, as a digital compositor for various projects for Walt Disney Animation and The Disney Channel, including *The New Mickey Mouse Club*.

PABLO HIDALGO, Lucasfilm Story

A lifelong *Star Wars* fan and recognized expert on the depth and history of the saga, Pablo Hidalgo started writing professionally on the subject in 1995, penning articles for the original *Star Wars* role-playing game. He was one of the first online fans to attempt to tackle cataloging and inventorying the *Star Wars* universe in 1997 with a fan encyclopedia he eventually moved offline.

In 2000, he switched careers from being a visual-effects concept artist and digital compositor to a full-time *Star Wars* authority at Lucasfilm, joining as a content developer for the official *Star Wars* website. In 2003, he accompanied the Episode III crew as the on-set diarist, reporting daily from Sydney, London and San Rafael during the film's production and postproduction periods. His close involvement with the making of Episode III netted him a walk-on cameo role in *Revenge of the Sith*. He would later serve as managing editor of *StarWars.com*, and then became brand communication manager for Lucasfilm, where he applied his deep knowledge of the company's brands to advise on creative and business decisions.

Now, as part of the Lucasfilm Story Group, Hidalgo works with filmmakers, authors, artists and other creatives to hone their stories and connect to the larger mythos of the *Star Wars* galaxy. Hidalgo has also written or co-written several authoritative *Star Wars* reference books, and frequently serves as stage host at fan conventions.

Pablo lives in San Francisco.



CHARMAINE CHAN, ILM Composer

Charmaine Chan joined Industrial Light & Magic in 2007. She started off as a Digital Resource Assistant, then became an Assistant Technical Director, and currently holds the role of a Composer and Area Tech Lead for the Compositing Department.

Born and raised on the islands of Hawaii, Charmaine moved to California to study at UC Irvine where she received a BA in Studio Art. During college, Charmaine worked part time for Deluxe Digital Studios where she created motion graphics for DVD/Blu-ray menus.

While working as an Assistant Technical Director, Charmaine helped create the outsourcing pipeline and process for collaborating with third party vendors and ingesting their material for artists to use.

As a Composer, Charmaine has done shot work for films like Black Panther and Star Wars: The Last Jedi. She has also designed and created the current Compositing Nuke pipeline. As an Area Tech Lead she continues to facilitate new developments and processes for the department.

On the side Charmaine has created the project Women in Visual Effects which is a video series that helps advocate the stories and experiences of women in the industry. She is also an active member of Women in Animation and the Visual Effects Society.

MATT SHUMWAY, ILM Animator

Matt Shumway joined Industrial Light & Magic in 2013 as an Animation Supervisor.

Matt received an Academy Award nomination for his contribution to Alejandro Gonzalez Iñárritu's *The Revenant*. That work included the development of several photo real animals including wolves, buffalo, cubs, and a large grizzly bear. The terrifying bear sequence led to honors from both the Visual Effects Society and ASIFA Hollywood for outstanding character animation.

Prior to joining ILM, Matt spent 10 years working as an Animation Supervisor for Rhythm and Hues Studios in Los Angeles. There he was part of the supervisory team for several films including two Academy Award-winning films, *The Golden Compass* and *Life of Pi*. For *Life of Pi*, Matt's team led the development of the film's central character Richard Parker, the Bengal tiger. Matt's work also included the creation of several other animals in the film including the orangutan, zebra, hyena, and meerkats. His work on the tiger earned him a 2013 Annie Award. The *Life of Pi* visual effects were honored worldwide.

In 2016, Matt headed off to a galaxy far, far away, Supervising Animation on *Star Wars: The Last Jedi*. His team was responsible for the epic end battle which included the development of the Crystal Foxes and the Porgs. Following *Jedi*, Matt continued with the Force by joining *Solo: A Star Wars Story* as the overall Animation Supervisor.

Matt graduated with distinction from Art Center College of Design in Pasadena, California.



DISCUSSION AND EXERCISES

POST PRESENTATION DISCUSSION

1. Did you enjoy this presentation? What were your favorite moments? What was most thrilling about STAR WARS: The Last Jedi?
2. Describe some of the settings of the film: where does the action take place? Are the worlds created for The Last Jedi believable? Why or Why not (what makes them believable or not believable)?
3. Can you explain how a Green Screen works? How does this technique help the film makers connect the Real World to the Virtual World they have created with computers? What other techniques help build the STAR WARS Universe?
4. What are some of the more interesting creatures in the film? How do the main characters interact with them and how do they help to tell the story? What CGI techniques might be used to help the actors interact with the creatures? How do the actors in The Last Jedi interact with other computer generated elements?
5. Who are the main characters and what are their main strengths and weaknesses? How are they connected to each other? How does the plot (storyline) help develop and build the character's traits and personality, or the character's relationships?
6. Why is it important to have women working on and starring in action films like STAR WARS: The Last Jedi? What happens when women create female characters in a popular film? Describe the character of Rey and her role in the story?
7. What did you think about the personal histories of the presentation team? How did the presenters find a place behind the scenes of STAR WARS?
8. What is different about the main characters in The Last Jedi compared to other movies you have seen? Why is it important to have a diverse crew and cast working on films today?
9. Were you surprised by the scope of teamwork and collaboration that went into the making of The Last Jedi? Would you enjoy working on a large production like The Last Jedi?
10. What did you know about the STAR WARS series as a whole before seeing this film, and how does STAR WARS: The Last Jedi fit into the series? Does it have a simple plot (storyline) or complicated plot? Why?
11. What is the main conflict in the plot? What are some of the smaller conflicts in the plot, and why are they conflicts? Do the characters make the conflicts in the film worse or help resolve it? How?
12. Which combination of settings, creatures, actors, props and CG elements seemed the most interesting, or complicated? How do the details of the STAR WARS universe allow us to experience the story as familiar and strange at the same time?
13. What happens at the end of the movie to resolve some or all of the conflicts or action?
14. What advice did the presenters give to people who want to work in films or other creative jobs? What is your take away from this presentation today?



WRITING EXERCISES

CONNECTING TO SOCIAL STUDIES

Considering the beautiful city of Canto Bight on the planet Cantonica in the Corporate Sector, make a poster showing the economic ramifications of the war with the rebels.

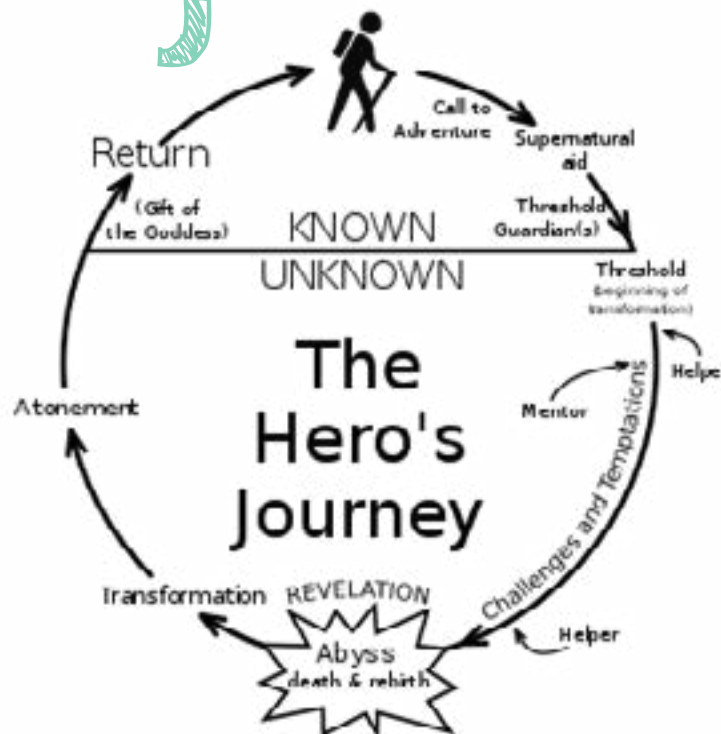
- How does the character of the slicer DJ exemplify this?
- How would the ramifications change if the Empire won and wiped out the rebels?
- How would it change if the rebels won?

ESSAY PROMPTS

In creating the original STAR WARS series, George Lucas took inspiration from the “Hero’s Journey”, a narrative structure identified by the American scholar Joseph Campbell. The story arc of the Hero’s Journey appears throughout classic mythology, literature and modern popular culture. Write a five-paragraph essay supporting your opinion on one of these topics:

- Based on the classic narrative cycle of a Hero’s Journey illustrated below, how is Rey a hero? Why is it important to see women as heroes? Are there other women heroes in The Last Jedi? Who are some real life women heroes?
- Based on the classic narrative cycle of a Hero’s Journey illustrated below, can you name another, unlikely hero in The Last Jedi? Why is this character unlikely as a hero? Describe each step along the HERO’S PATH in the film to support your opinion.

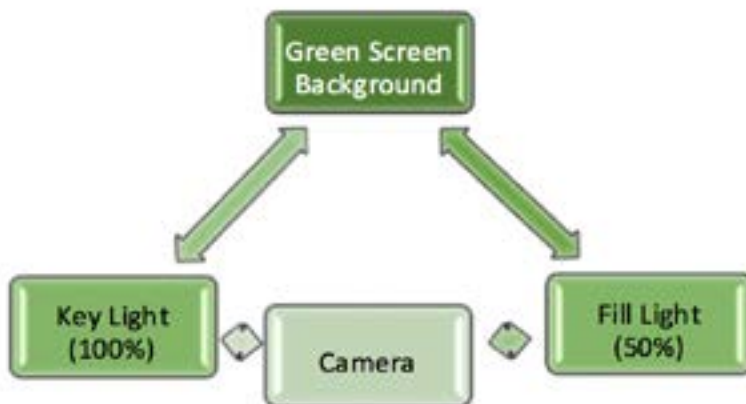
MAPPING THE HERO’S JOURNEY



PROJECT: GREEN SCREEN VIDEO

You can change the background in a video you shoot by using the Chroma Key, or Green Screen technique. You just have to plan ahead. Chroma keying allows editors to separate green screens from the people standing in front of them, replacing the green background with just about anything else. The process works by removing a single color (green), because this hue offers the most contrast from the actors standing in front of the background. The green color in the foreground footage is made transparent through chroma keying, allowing separately filmed background footage to be inserted into the scene.

Whether you are filming with a professional camera or a phone camera, the technique is the same. All you need is a green backdrop, your camera and a tripod – and lights if you have them. Then you will need simple editing software that allows you to Chroma Key. Adobe Premiere is professional-grade editing software, and iMovie is a free option for Mac users and [Wondershare Filmora](#) works on PCs and has a long free trial. Please read all the instructions before you begin.



HOW TO FILM AND EDIT GREEN SCREEN

STEP ONE Get Creative: Do you want to shoot a period piece for History class? Show your friends traveling to cities they have never seen? Make a short science fiction film about the International Space Station? Pick a topic for your video.

STEP TWO Collect video clips and footage: this will be for the finished video - it will replace your Green Screen. It can be footage you shoot, collected from free video sites, or a still image. Remember to give credit to the creator!

STEP THREE Chose costumes and props: make sure nothing is green!

STEP FOUR Set up backdrop: hang a green cloth or flat green butcher paper on a large wall. Make sure to eliminate any wrinkles and hide any tape, the background should be uniform.

STEP FIVE Set up camera and lights: use a tripod to ensure framing remains steady. Use a key and fill light (see diagram) to keep the background solid and bright.

STEP SIX Rehearse and film! Shoot a few takes so you can choose the best when editing your final project.

STEP SEVEN Begin editing in an editing software: Wondershare Filmora, iMovie, Adobe, or any video editing software that is available to you.

STEP EIGHT Import your footage: load the footage you just shot, as well as any background videos or images to use in the final project. Drag and drop your green screen clip onto your timeline.

STEP NINE Adjust your green screen settings: using chroma key or green screen effects, select the color (green) you would like to make transparent. Adjust the shadows and borders to ensure a crisp and clear image.

STEP TEN Drag and drop your background clip (the clip that is replacing the green screen). Resize and edit as necessary.

STEP ELEVEN Once you have finished all the previous steps, you are ready to export the footage. Click export, select a supported format, and save it to your computer!



VFX TERMS

CHARACTER ANIMATION: A specialized area of the animation process, which involves bringing animated characters to life. Character Animators must create the illusion of thoughtfulness, emotion and personality by developing every character's appearance, body language and facial expressions from scratch. While an actor generally provides the vocals in an animated film performance, the character animator provides all else.

COMPOSITING: The combining of visual elements from separate sources into single images, often to create the illusion that all those elements are parts of the same scene or space.

CREATURE ANIMATION: Not unlike character animation, creature animation is the process of bringing animated beasts, aliens and animals to life.

FACIAL ANIMATION: The detailed process of animating characters' facial features to convey particular appearances, emotions, reactions, etc.

GREEN SCREEN: A special effects film technique involving filming actors against a green screen on which effects such as computerized graphics can be added later and integrated into a single sequence.

MOTION CAPTURE: A process by which patterns of movement are captured via a series of sensory nodes applied to various body/face parts of a live actor; these nodes record data about the spatial configuration of these nodes over time; simulation software then processes these data and applies them to a virtual actor on a computer.

MOTION CONTROL: A process that generally utilizes robotic camera mounts, enabling identically configured and timed camera movement on every take. This process facilitates digital compositing on shots that involve camera movement, as it eliminates the many variables of human camera operation.

PHOTOGRAMMETRY: The age-old practice of determining the geometric properties of objects based on photographic images.

ROTOSCOPING: An animation technique in which live-action video is traced and "painted" to create 2-D animation that mimics the live-action

TELECINE: The process of transferring celluloid film footage into electronic formats.

VIRTUAL CINEMATOGRAPHY: The process of creating the illusion of camera movement by digitally compositing and sequencing background images that change position relative to live action footage.

VIRTUAL SET: A 3-D software module that collates and arranges a massive series of (background) images according to the spatial organization and geometry of a given scene setting such that live action green screen footage of actors can be dynamically combined with the virtual space.



SUPPLEMENTAL RESOURCES

Lucasfilm home page <http://lucasfilm.com/>

Industrial Light and Magic home page <https://www.ilm.com/>

The Official STAR WARS website <http://www.starwars.com/the-last-jedi>

Wookipedia, the STAR WARS wiki http://starwars.wikia.com/wiki/Star_Wars

Free animation software downloads from Autodesk <https://www.autodesk.com/education/free-software/featured>

SAM animation software for kids <https://www.kaplanco.com/SAM>

iCreate animation software for kids <https://huehd.com/>

Teaching the Hero's Journey for educators <https://www.varsitytutors.com/englishteacher/hero.html>



LUCASFILM OVERVIEW

LUCASFILM

Founded by George Lucas in 1971, Lucasfilm is a privately held, fully integrated entertainment company. While best known for its association with the *STAR WARS* and Indiana Jones film franchises, Lucasfilm is actively involved in many facets of the entertainment industry, operating seven different divisions that lead in their respective fields. Lucasfilm is responsible for the production, promotion and strategic management of the company's various theatrical, television and entertainment companies. These include *STAR WARS*, the *INDIANA JONES* trilogy, *THE ADVENTURES OF YOUNG INDIANA JONES*, *THX1138*, *WILLOW*, *LABYRINTH* and more.

INDUSTRIAL LIGHT AND MAGIC

The Death Star trench run. Velociraptors versus T-Rex. *THE AVENGERS* defend New York. Industrial Light & Magic, founded in 1975 by George Lucas, has created some of the most memorable visual effects in film history. From its astounding innovations in the original *STAR WARS* trilogy to its groundbreaking CGI work in blockbusters like *JURASSIC PARK*, *STAR TREK*, and *THE AVENGERS*, ILM has changed and expanded the possibilities of what a film can be. ILM has won 15 Academy Awards® and 15 BAFTAs®, and has been nominated 29 and 17 times, respectively.

SKYWALKER SOUND

From Darth Vader's ominous breathing to the simple yet iconic voice of WALL-E, Skywalker Sound has moved audiences with inventive uses of audio for more than 35 years. Skywalker Sound specializes in sound design and audio postproduction on everything from motion pictures to video games. The celebrated facility has created the soundscapes and mixes for hundreds of movies, including the *STAR WARS* films, *IRON MAN*, the *JURASSIC PARK* series, a variety of independent works, and many animated features. Skywalker Sound has won 19 Academy Awards® and has received 45 nominations.

LUCASFILM ANIMATION

Formed in 2003 to produce *STAR WARS: THE CLONE WARS*, an Emmy®-winning series that ran for five broadcast seasons. Bringing an unprecedented production quality to television animation, the show broke new ground in facial expression, character movement, and detail, while maintaining the level of storytelling introduced by the live-action films. Lucasfilm has won two Emmy Awards®, and has received seven nominations, for *STAR WARS: THE CLONE WARS*. The studio is currently hard at work creating *STAR WARS REBELS*, which explores the rise of the Rebellion between *STAR WARS: EPISODE III* and *IV*.

LUCASFILM PRODUCTION

Lucasfilm shepherds projects through all evolutionary phases: creative development, physical production, and postproduction technological enhancements. In film and television, this process begins with script development and conceptualization; securing stages, actors, and completing live-action shoots follows, and the process ends with the use and creation of groundbreaking technologies to add breathtaking effects and immersive sound.

LUCASFILM GAMES

Lucasfilm delivers interactive entertainment across multiple platforms and genres, ranging from the classic *MONKEY ISLAND* series to the recent launch of *STAR WARS: BATTLEFRONT*. Continually pushing the art form forward, Lucasfilm leverages the global skills, technology, and resources of its family of companies, in addition to strategic partnerships, to further the boundaries of gaming.

LUCASFILM PRODUCTS

Through licensees and partnerships, Lucasfilm works to create consumer products that bring the experience of its films home in rewarding ways. From the original *STAR WARS* action figures of 1977 to today's bestselling LEGO® *STAR WARS* line, high-quality and engaging product has been essential to Lucasfilm's relationship with fans and enthusiasts.