VFX industry career map

Follow the dotted lines to see how visual effects in the film and TV industries are made.

Multiple entry routes

Production management

- **VFX Producer**
- **Production manager**
- **Production coordinator**
- **VFX editor**
- **Data input/output (I/O) technician**
- **Runner** *(Entry level)*

Pre-production

- **Concept artist**
- **Previsualisation (previs) artist**

Art, graphic design, creative digital media routes

Computer science, maths, physics routes

On set

- **VFX supervisor**
- **Data capture technician** *(Entry level)*

Art, creative digital media, computer science routes

Computer-generated (CG) department

- **Computer graphics (CG) supervisor**
- **Look development artist**
- **Modelling artist** *(Entry level)*
- **Animator**
- **Texture artist** *(Entry level)*
- **Environment artist** *(Entry level)*
- **Layout artist** *(Entry level)*
- **Lighting artist**
- **Matchmove artist** *(Entry level)*

Art, animation, creative digital media routes

Technical

- **Pipeline technical director (TD)**
- **Rigging technical director (TD)**
- **Creature technical director (TD)**
- **Effects technical director (FX TD)**
- **Assistant technical director (TD)** *(Entry level)*
- **Software developer**

Entry level

Entry level roles are ones that you can do straight after education, whether that be school, college or university. Most entry level roles are in production. Some companies look for new entrants in all the production roles listed.

Compositing

- **Prep artist** *(Entry level)*
- **Roto artist** *(Entry level)*
- **Compositor**
- **Compositing supervisor**

The stamps show the routes in. Remember, you can move from one department to another.

Art, photography, creative digital media routes

VFX industry career map

Go to ScreenSkills for more details:
www.screenskills.com/careers-in-vfx
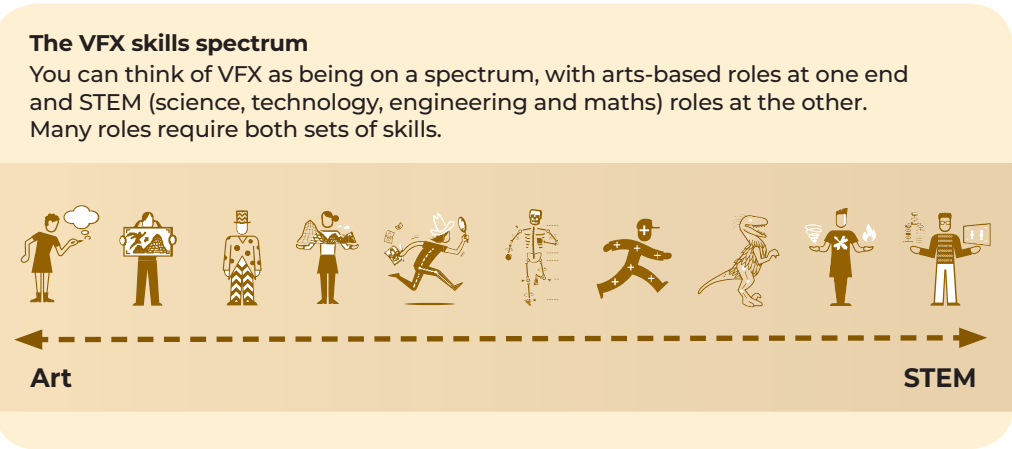
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What is visual effects?

Visual effects (VFX) is the art of combining computer-generated imagery (CG) with live-action pictures. Think of the dinosaurs in Jurassic World: Fallen Kingdom or the final battle in Avengers: Infinity War. If a scene in a film can't be captured on camera, it's made through the ingenuity of VFX.

The picture in the UK

The UK is an international leader in the VFX industry. DNEG won the VFX Oscar for First Man in 2019. The year before, DNEG and Framestore received the award for Blade Runner 2049. These companies, based in the UK, with other studios around the world, are internationally renowned for their quality and innovation.

Almost all the UK companies that create VFX for the feature film industry (98%) are based in London. However, VFX is also used in television, advertising and games, so there are opportunities for VFX careers wherever those are made. VFX is increasingly being used in virtual reality for architecture, training and healthcare too. Cardiff, Glasgow, Belfast, Manchester, Brighton, Bournemouth and Bristol are all places where VFX is made.

The VFX skills spectrum

You can think of VFX as being on a spectrum, with arts-based roles at one end and STEM (science, technology, engineering and maths) roles at the other. Many roles require both sets of skills.

Art — — — **STEM**

Roles in the VFX industry

There are many different roles in VFX. Some suit those who are more artistic side. Others suit those who prefer maths and programming. There are plenty for those who like both and there is a need for those with business and marketing skills too.

Artists

More than half the VFX workforce is employed as artists or technical directors (TDs). Artists work on the look of the effect they are creating, whether that be a car bursting into flames or an animated figure. TDs write the rules, in code, for the way water moves when a dam bursts or how light reflects on glass. Both require a blend of art and science, technology, engineering and maths (STEM) skills, but more art is needed for artist roles and more STEM is needed for the TD roles.

Programmers

Programmers are needed to create new software tools to produce better VFX, such as more convincing explosions, fur or water. You can think of VFX skills as being on a spectrum, with artists at one end, TDs in the middle and programmers at the other end. People are often surprised to learn that a good degree in computer science or maths can lead to a career in VFX.

Producers

Like any business, the industry needs people to manage the projects, sell the VFX services and seal the deals. There is a shortage within the VFX industry of people with project management, accountancy, legal, marketing and sales skills. To be equipped for roles like producer, accountant or marketing executive, you need to have core business skills, an in-depth understanding of the VFX pipeline and knowledge of the industry as a whole.

Generalists and specialists

It's worth being aware that your role will be different depending on whether you are employed in a small or a large VFX company. Small VFX companies need people who can do a wide range of things, so they employ generalists. In large companies, employees will be working on one specific part of the VFX pipeline, picking up the work from one artist and handing it on to the next, so they are looking for specialists. You might be someone who likes to excel in doing one thing very well, or someone who enjoys getting to grips with a breadth of skills.

Develop yourself

Developing your skills is as important as gaining qualifications. Watch lots of movies. Take note of contemporary culture and the way ideas are visualised. For instance, we all have notions of what vampires and robots look like that we have referenced from popular culture. Films, graphic novels and computer games can provide a good background for anyone interested in pursuing a career in VFX.

Build a portfolio

If you're interested in the art or TD roles, get experience learning to use free industry-standard software and tutorials, including:

- Maya, the ubiquitous industry 3D package
- Nuke, the software used for VFX compositing
- Mari, for painting the surface texture of models in 3D
- Substance designer, also used for designing surface textures
- Houdini, which is used for effects simulation

Use these tools to create a showreel to show off your talents.
Go to screenskills.com/portfolio to learn how to do this. You can also test your ideas and share renders through forums, blogs and video sharing sites like Vimeo or YouTube. Those pursuing computer science or code-based VFX routes won't usually have to develop a showreel but will need to evidence relevant coding skills.

What to study

What to study at school and college

For art and technical director roles, a trained eye and an appreciation of light and colour are vital to be able to make images appear real. A-levels or Highers in art, art history and photography can help with this. It's also useful to take A-levels or Highers in biology and physics as they can be helpful in interpreting anatomy, mass, mechanics and movement. For programming roles, A-levels or Highers in maths and computer programming are useful.

There are a wide range of Level 3 vocational qualifications that are useful too. Look out for the AIM Awards Level 3 Extended Diploma in Games, Animation and VFX Skills or NextGen Skills Academy courses. To find the recommended vocational qualifications for each of the roles listed on the inside of this map, go to screenskills.com/careers-in-VFX.

What to study at university

The VFX workforce is highly qualified, with 83% of workers being either graduates or post-graduates (29%). Some have creative or media related degrees and others have degrees in physics, maths and computer science.

If you want to take a degree, make sure you take one that will best equip you for a job. Have a look at ScreenSkills' Select list of recommended courses in VFX at screenskills.com/courses, and select one in VFX. We recognise courses where they offer training in the relevant software, dedicated time to building a portfolio and have strong links with the VFX industry.

Whichever path you are planning to follow, look into the destinations of other students who have taken that route. If recent entrants are employed in jobs that interest you, you are most likely on the right track.

Routes into jobs in VFX

The apprenticeship route

Apprenticeships are an alternative to university. They are jobs with training, so they're a great opportunity to earn as you learn. They are relatively new to the VFX industry, but NextGen Skills Academy (nextgenskillsacademy.com) has developed apprenticeships as junior 2D artists and Assistant technical directors, so check those out. These are Level 4 apprenticeships, which means they can be taken after A-levels, Highers or Level 3 diplomas. If you're interested in production roles, it's worth looking for apprenticeships in marketing or accounting in related industries, such as a marketing apprenticeship for a video production company. Even if you're not working in VFX, you can develop skills that you can transfer to the VFX industry later on. Go to gov.uk/apply-apprenticeship to find apprenticeships near you.

The internship route

Undergraduate students, towards the middle of their studies, should consider applying (with a student showreel) for summer internship programmes offered by larger VFX companies. Look at the websites to find ones with student accommodation for the duration of the programme.

The production route

If you enjoy planning and organising, a good starting point is a role as a production runner. Being a runner with a VFX company can take you into being a production coordinator, then a line producer or production manager and finally a producer. Runners don't need to have degrees, but they often do. Check out the websites of VFX companies for opportunities.

The graduate-training route

Some companies recruit staff directly from undergraduate and postgraduate courses. Go to the large VFX companies' websites and look for in-house graduate training schemes. These are usually for roles with a high degree of STEM as well as art skills, such as layout or technical animation (tech anim) and effects specialisms. Make sure you have a strong showreel if you want to go down this route.

The data wrangling route

Graduates who have gained experience in managing digital data within other sectors and can demonstrate an interest in film and VFX can get a start as part of the team looking after a VFX company's data, asset management and rendering. This involves supporting projects in production by backing up and moving data around or working in editorial as a data input/output technician. The work is usually shift-based, which means there's time to take internal online training and get feedback on practice assets from VFX professionals between their shifts.

The animation route

Consider junior roles in animation, such as a lighting artist or junior compositor. Roles that require both STEM and art skills are highly sought-after in both industries. If you can get into animation in this kind of role, you can transfer your skills to VFX at a later point.

Enjoy VFX

Whatever route you choose, a passion for VFX and an awareness of the industry is essential. Keep watching VFX. Think about how it's made. Look up the companies that made it. Immerse yourself in the VFX world.

Careers in
Visual effects (VFX)

Production management

VFX Producer
Manages the whole process of creating the VFX for film or TV. VFX producers write the bid, the document through which they persuade the film or TV series' producer to take on their VFX studio to do the work. They put together the team of artists and technical staff. They set the schedules and manage the budget. They also communicate between the crew working on the film set and the VFX editor in the studio.

Production manager
Acts on the decisions that have been made by the producer. Production managers create the detailed schedule for the project and budget. They liaise with the artists and technical directors to see that work is completed on time. They are also the link with the client shooting the live-action footage and producing the film or TV programme.

Production coordinator
Helps ensure VFX projects run smoothly. Production coordinators help to arrange the day-to-day running of the team and make sure everyone has the information they need to work effectively. They organise the movement of the assets through the VFX pipeline. They keep production databases updated with the current status of shots and take detailed notes in meetings. They also track costs against the budget.

VFX editor
Works as the link between the film or TV production team, which shoots the live-action footage, and the VFX studio that does the visual effects. The role of a VFX editor varies depending on whether they are in-house (employed by the studio) or client-side (employed by the film or TV production company).
Client-side VFX editors work on set, while the live-action footage is being shot. They check everything is being captured in a way that makes it possible for the VFX to be created and integrated effectively. In-house VFX editors work closely with client-side VFX editors and are also responsible for ensuring that the VFX artists at the VFX studio have everything that they need to create their work.

Data input/output (I/O) technician
Responsible for organising, transferring and storing the computer files and data for a VFX production company. Data I/O technicians manage the computer storage and retrieval systems, including company hard drives. They ensure that the transferring and storing of data is done securely and that files are encrypted wherever necessary.

Runner – entry level
Supports everyone in the VFX studio. Runners do a variety of jobs. They deliver materials and messages between departments. They organise meetings and schedules. They keep the office clean and tidy and might work on reception or be responsible for locking up. They also make a lot of tea and coffee. Runners are well placed to observe experienced professionals, ask questions and build their knowledge.

Pre-production

Concept artist
Creates artwork to inspire the look of the VFX in a film or TV production. Concept artists are the first to draw the characters or creatures and environments as well as vehicles, props and buildings. They begin with a brief, which might be a script, or the original concept of a film as told by its filmmaker. Their work is used help other members of a production, or in the VFX pipeline, to have a shared vision.

Previsualisation (previs) artist
Helps to plan what a film is going to look like. Previs is the process of visualising a scene before creating it. Previs artists usually start with a 2D storyboard or imagery from a concept artist. They create draft versions of the different moving image sequences and they put it all together using their compositing and editing skills. This is used to map out how the VFX will fit into a live-action scene.

On-set

VFX supervisor
In charge of the whole VFX project. They manage the VFX pipeline, including all the VFX artists who work in the process. They have ultimate responsibility for all the VFX elements produced for a project by their company or studio. They are therefore ultimately responsible for the relationship between a VFX studio and the director or producer of the film or TV programme. They continue to lead when a film is being put together in post-production.

Data capture technician – entry level
Goes onto the film or TV set to collect the information about the live-action footage that the teams in the VFX studio need to add the visual effects. Data capture technicians take photographs of the set and the way the cameras are positioned. They "capture data" about the type of lens being used, its focal length, filters, focus and colour temperature. They upload, log and back up all the data, before sending it on to the relevant members of the VFX company on a daily basis.

Computer-generated (CG) department

Computer graphics supervisor
Responsible for the delivery and quality of the 3D computer-generated (CG) elements of a VFX project. Before a film goes into production, Computer graphics (CG) supervisors identify areas of the VFX work that need to be researched by software developers. They design the VFX pipeline – which means they decide the order in which the work needs to be done. They supervise the creation of all CG imagery and manage the artists creating it.

Look development artist
Defines the look of computer-generated creatures or objects to ensure all the art in the film or TV programme is consistent. If a concept artist draws an alien, then look development artists (look devs) work out what the skin of the alien will look like in different conditions – when it's raining, when it's dark, when the creature's angry. They work with lighting technical directors (TDs), texture artists and creature TDs to establish the different looks, balancing the processes of texturing, lighting and rendering to match reference images and real footage.

Modelling artist – entry level
Creates characters, weapons, plants and animals on a computer in 3D. Modelling artists start with a brief, which might be 2D or 3D art produced by a concept artist. From this they create a 3D digital model that can then move on to be animated, given texture and lit.

Animator
Imbues figures with personality by making them move in ways that show their character and emotion. In VFX, animators use computer-generated "rigs" to help make the characters in a shot move in a believable way. They might animate vehicles or machinery too.

Texture artist – entry level
Makes surfaces look realistic on computer-generated 3D models. Texture artists rough up objects or they make them shine – scales on a crocodile's skin, reflections on car doors, skid marks on roads, creases in trousers. They start with a 3D model created by a modelling artist that is usually a plain grey shape. The texture artists paint the details onto the surface of the models until they look like a photograph.

Environment artist – entry level
Creates the computer-generated places in which actors move. They make galaxies, lunar landscapes and desecrated cities – any environment that it's too difficult to film in real life. Environment artists used modelling and sculpting software.

Layout artist - entry level
Determines the position of the virtual camera. Layout artists consider a shot's framing, composition, camera angle, camera path and movement, and the rough lighting of each key scene. They keep a consistent scale of the elements within the frame. The work that layout artists do enables other VFX artists to have a basis for shot construction later in the VFX production pipeline.

Lighting artist
Enables depth and realism to be added to a computer-generated (CG) scene through lighting, just as a director of photography (DoP) does in a live-action scene. Lighting artists adjust the colour, placement and intensity of CG lights to create atmosphere. Using reference photos taken on set or location, they match the illumination of virtual 3D objects to the look of the on-set production and cinematography.

Matchmove artist – entry level
Matches computer-generated scenes with shots from live-action footage so the two can be convincingly combined. Matchmove artists recreate live-action backgrounds (plates) on a computer in a way that mirrors the camera on the set in every way, including lens distortion.

Technical department

Pipeline technical director
Makes sure a VFX project runs smoothly by identifying and fixing problems as they arise. Pipeline technical directors make sure each department has the software tools that they need to complete their part of the project to the best standard possible. They have a very good understanding of how VFX production pipelines work and the roles within them.

Rigging technical director
Creates digital skeletons for 3D computer-generated models. Rigging technical directors (TDs) program these "rigs" so that they move in a realistic way. This underlying skeleton is then used by animators as the basis for their movements.

Creature technical director
Builds the software that enables artists to create believable fur, feathers and skin on their creatures. Creature technical directors (TDs) develop and program the digital tools for all the artists who work on digital dinosaurs, animals or magnificent beasts, helping them to be as efficient as possible. They then work with pipeline TDs to incorporate the tools into a VFX production pipeline.

Effects technical director
Makes it easier for VFX artists to use effects like explosions, billowing smoke and rushing water. Effects technical directors (FX TDs) create these effects for the VFX artists to use in their sequences; they write the computer language scripts that generate the effects. FX TDs build and test software tools for the VFX artists to use and then they incorporate them into a VFX studio's production pipeline.

Assistant technical director – entry level
Helps to identify and fix problems and make sure everyone in a VFX production pipeline has the tools they need. Assistant technical directors (TDs) gather information on the needs of each department. They design solutions for problems that arise and also use coding skills to create small-scale tools needed for the VFX artists.

Software developer
Produces the technology required for a VFX project. Software developers create the systems that technical directors use and modify to suit the specific needs of their VFX artists. They also design new digital tools and make sure they fit into existing software systems. This enables the efficient passing of assets from one VFX process to the next.

Compositing department

Prep artist – entry level
Cleans up the backgrounds of live-action footage ready for the effects to be layered onto it by the compositor. The shots they work on, known as plates, either moving or still, don't have foreground action or players included. Prep artists use specialist VFX software to clean plates. They remove any unwanted dust and scratches from the frame and any unwanted items such a boom microphones or electric pylons.

Roto artist – entry level
Manually draws around and cuts out objects from movie frames so that the required parts of the image can be used, a process known as rotoscoping. The parts of an image that are wanted after cutting out are known as mattes. Roto artists work on the areas of live-action frames where computer-generated images or other live-action images will overlap or interact with the live image.

Compositor
Creates the final image of a frame, shot or VFX sequence. Compositors take all the different digital materials used (assets), such as computer-generated images, live action footage and matte paintings, and combine them to appear as one cohesive image and shot.

Compositing supervisor
In charge of the department that puts together all the different elements of the VFX shots. They manage the compositors, who do this work, and check it for quality. They are also responsible for ensuring the continuity of colour between shots.