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The **CANON**

Cookbook

Recipes for learning and teaching

the

history of technical theatre

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the

history of technical theatre

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the
history of technical theatre

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www.canon-timeline.eu info@canon-timeline.eu



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Introduction

The aim of the Erasmus+ strategic partnership project CANON is to create awareness about the history and heritage of technical theatre. It has developed a 'cookbook' of methodologies for teaching technical theatre history, supported by a collection of teaching tools, a canon of 100 stories, and an interactive timeline and database. Through the process, it has developed a network of like-minded people that support the goals of the project.

What is our knowledge of the history of technical theatre, and how do we teach it? And are our teaching methodologies the same in all European countries, and for all aspects of the subject (architecture, stage mechanics, lighting, sound, scenography)? We explored these questions with 20 teachers and 76 students from 9 universities and institutions from 7 different countries (Belgium, Czech Republic, Germany, Italy, Spain, Sweden, UK). This international cooperation meant that we could draw on different – regional – points of view, and the different background of the participants (architects, scenographers, technicians, theatre practitioners, theatre historians), to expand and enrich our view.

Each 'recipe' in the cookbook describes a teaching and learning methodology for an aspect of the history of technical theatre. Some

methodologies are specific to a particular field, such as architecture, or lighting, while others can be used to learn about any aspect. Each methodology describes the process, the resources needed and the preparation required, as well as indicating the type of student it is intended for, the kind of learning process it is, and how long it will take. We also offer some tips and advice, based on our experience as 'chefs'.

As with any cookbook, we invite you to create your own preferred variations. If you are cooking for more or fewer guests, just for yourself or for a small army, if you just want a snack or need to prepare a banquet, please feel free to adapt the recipes we have included here. The tastes offered by the history of technical theatre can be aromatic, spicy, rich, sweet or delicate, homely or exotically unfamiliar. They can feed not only a technological understanding, but also our imagination about what theatre can be, how it can be made, and what effect it can have in the world. Above all, like any cuisine, the recipes here offer a means to get to know the people and cultures they come from, nourishing our sense of who we are today and how we want to shape our tomorrow. So, whether you cook for yourself, for others or only in your imagination, we hope our cookbook will enable you to relish a taste of technical theatre's nutritious past!

Anders Larsson and Nick Hunt
for the CANON team

If you have any feedback about the Canon Cookbook, or any other aspect of the project, please contact us at info@canon-timeline.eu. We would love to hear from you!

The 'Recipes'

Using the 'Recipes'

Each of the teaching methodologies, 'recipes', is written to be both an insight into the teaching practices at the Canon partner institutions, and as an inspiration and guide for your own teaching and learning. They assume some basic knowledge of both technical theatre and teaching practices, and different methodologies offer different levels of detail about how to carry them out. Based on your own needs, experience and available resources, adapt them as you wish.

Safety

Some methodologies have safety notices. Please pay attention to these, and even when there is not an explicit safety notice, always ensure you have appropriate safety measures in place, based on the practices and regulations in your locality.

References

Some teaching resources are referred to using the Q-numbers in the CANON database, *Canonbase*. When you see a reference such as (Q466), go online to canonbase.eu, and search for 'Q466'. This will lead you to the entry for - in this case - Vitruvius's treatise on architecture, *De Architectura*. You will also see references to the Canon Stories, in the format A.01. Find these on canonbase.eu site under Q29723.

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Formats

The methodologies are available as a PDF, formatted for print, and online as part of the Canonbase - go to <https://canonbase.eu/wiki/Q29997>. The online versions often have additional images or other resources.

Languages

The methodologies are written in English, the working language of the CANON project. If you need the stories in languages other than English, please use the web versions with online translation tools.

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Contributors

The Canon Cookbook: Recipes for learning and teaching the history of technical theatre has been researched, written and prepared for web publication by the staff of the project partners. Individual credits are shown in the list of methodologies.

Many of the examples shown are the work of students and staff of the partner institutions. For more details, see the online version of the methodologies, Q29997.

Editing of the methodologies and the design for the print version is by Nick Hunt.

We are grateful to everyone who has helped in any way the project to come to fruition.

Project Partners and Teachers

Accademia Belle Arti Frosinone, Italy

Umberto Di Nino
Emanuela Trixie Zicoschi

Berliner Hochschule für Technik, Germany (formerly Beuth Hochschule für Technik)

Bri Newesely
Franziska Ritter

Escola Superior de Tècniques de les Arts de l'Espectacle, Barcelona, Spain

Jordi Planas Vandrell
Aleix Soler Castañé

Escola Tècnica Superior d'Arquitectura de Barcelona - Universitat Politècnica de Catalunya, Spain

Antoni Ramon Graells
Guillem Aloy Bibiloni

Institut umění - Divadelní ústav, Praha, Czech Republic

Markéta Fantová
Michaela Buriánková
Ondřej Svoboda

Real Escuela Superior de Arte Dramático, Madrid, Spain

Felisa De Blas Gómez
Almudena López Villalba

Rose Bruford College of Theatre and Performance, London, United Kingdom

Nick Hunt

Royal Institute for Theatre, Cinema & Sound, Brussels, Belgium

Chris Van Goethem
Saskia Louwaard
Katrijn Baeten

Stockholms Konstnärliga Högskola, Sweden

Anders Larsson
Anders Aare
Fredrika Rembe

List of Methodologies

Suitable for All Subject Areas

M.01 'Getting to Know You' Postcard project

Franziska Ritter, Bri Newesely: Berliner Hochschule für Technik

M.02 Teaching Theatre History on location

Saskia Louwaard, Chris Van Goethem, Karel Vanhaesebrouck:
Royal Institute for Theatre, Cinema & Sound

M.03 Making a Dictionary of Key Terms

Antoni Ramon, Guillem Aloy: Universitat Politècnica de Catalunya

M.04 Learning Theatre Words in other languages

Bri Newesely, with Sarah Kamender: Berliner Hochschule für Technik

M.05 Technical Theatre Quiz

Franziska Ritter: Berliner Hochschule für Technik

M.06 Making Oral History Interviews

Chris Van Goethem: Royal Institute for Theatre, Cinema & Sound

M.07 From Text to Theatre: staging the dialogues of Leone de' Sommi

Rosa Fernández Cruz, Felisa de Blas and Almudena López Villalba:
Real Escuela Superior de Arte Dramático de Madrid

M.08 Building a Timeline of technical theatre history

Chris Van Goethem: Royal Institute for Theatre, Cinema & Sound

M.09 Anno Teatri: the history game of technical theatre

Franziska Ritter: Berliner Hochschule für Technik

Architecture

M.10 Design Your Own Theatre from a kit

Bri Newesely, with Sarah Kamender and Sophia Soehner: Berliner Hochschule für Technik

M.11 Comparing Theatre Architectures by drawing and writing

Antoni Ramon, Guillem Aloy: Universitat Politècnica de Catalunya

M.12 From Text to Drawing: modelling Sabbatini's theatre

Antoni Ramon, Guillem Aloy: Universitat Politècnica de Catalunya

M.13 Gingerbread Theatre

Bri Newesely, with Sarah Kamender: Berliner Hochschule für Technik

Lighting and Projection

M.14 Workshop to create a Candlelit Miniature Theatre Performance

Jim Laws and Nick Hunt: Rose Bruford College of Theatre and Performance

M.15 Making a Room-sized Camera Obscura

Nick Hunt: Rose Bruford College of Theatre and Performance

M.16 Making a Miniature Camera Obscura

Nick Hunt: Rose Bruford College of Theatre and Performance

M.17 Making a Salt Water Dimmer

Nick Hunt: Rose Bruford College of Theatre and Performance

M.18 Making a Linnebach Projector

Nick Hunt: Rose Bruford College of Theatre and Performance

M.19 Making a miniature demonstration of Pepper's Ghost

Nick Hunt: Rose Bruford College of Theatre and Performance

M.20 Discovering Lighting Control with Virtual Grand Master

Nick Hunt: Rose Bruford College of Theatre and Performance

Sound

M.21 Historical sound Mixing and Microphone Workshop

Anders Aare and Anders Larsson: Stockholms Konstnärliga Högskola

M.22 Foley Sound Workshop

Tom Espiner for *Sound and Fury* (soundandfury.co.uk): Rose Bruford College of Theatre & Performance

Scenography

M.23 Exploring Historic Scenographies through 3D modelling

Almudena López Villalba: Real Escuela Superior de Arte Dramático de Madrid

M.24 Investigating Accelerated Perspective using Serlio's scenes

Felisa de Blas and Almudena López Villalba: Real Escuela Superior de Arte Dramático de Madrid

M.25 Painted scenery using Rabbit Glue and Canvas

Umberto Di Nino: Accademia Belle Arti Frosinone

M.26 Workshop to Build a Scenography for de' Sommi's dialogues

Carmen Arias, Felisa de Blas and Almudena López Villalba:
Real Escuela Superior de Arte Dramático de Madrid

Stage Mechanics and Sets

M.27 Five laboratory exercises with Rope, Block and Tackle

Anders Larsson: Stockholms Konstnärliga Högskola

M.28 Baroque Elevator Workshop

Mercedes de Blas, Felisa de Blas and Almudena López Villalba:
Real Escuela Superior de Arte Dramático de Madrid

M.29 Discovering Scenotechnic Movements

Aleix Soler, Jordi Planas and Jordi Massó: Escola Superior de Tècniques de les Arts de l'Espectacle

M.30 Making one-to-four scale models of Baroque Stage Machinery

Chris Van Goethem: Royal Institute for Theatre, Cinema & Sound

Recipes for learning and teaching
in
All subject areas



Title

'Getting to Know You'

Postcard Project

Key Information

Number of learners 2-40

Number of staff The project can be led by a teacher, or it can be self-managed by a group.

ECTS Credits Not applicable.

Learning process

- Lecture/seminar**
Lecture, presentation, discussion (face-to-face or online)
- Making project**
Making a model, mock-up, plan or design (physical or digital)
- Performance project**
Making a performance or demonstration (live or mediated)
- Records and Archives**
Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)
- Independent study**
Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts

Professional

Researcher

General public

Participants learn about each other and a given topic by making and sharing a postcard that is about the topic, but also relates to where they live and their personal interests.

Aims

The postcards project requires students to research a topic they may not be familiar with, and present it through a single image and a short text, delivered in one minute. This develops research and communication skills.

The project is also a good 'ice breaker' activity, so group members can learn about each other when they first meet.

What You Will Need

Duration and schedule

- Preparation by the teacher: 2 hours
- Preparation by the students: 6 hours
- Presentation of the postcards: 0.5 – 2 hours, depending on the number of students.

Room or type of space

Any space large enough to accommodate the number of participants for the sharing of the postcards. Alternatively, the postcards can be shared online.

Equipment

- Computer or tablet for research, and to make the digital artwork for the postcards.
- If the postcards are to be shared in physical form, a printer.

Materials (consumables)

If the postcards are to be shared in physical form, suitable thin card that can be printed on.

Learning resources (books, websites)

Web and/or print resources related to the chosen topic.

Process

Preparation

Decide on a topic, which can be any aspect and period of technical theatre history. Make sure all students are able to respond to it from their own background and experience – they don't need to know the topic, but should feel it is accessible for them. Broad topics work best – for example, 'Roman theatre', or 'theatre lighting before electricity'.

Plan the briefing session, and a write brief for the task.

The learning activity

Brief the students on the project and give them the topic.

Give the students enough time to research the topic and each prepare a postcard (physical or digital), with:

- On the front, a picture of an object, person, building or place related to the topic.
- On the back, their name, home town and country written where the address would go on a postcard. Also, a short text describing the item they have chosen as a response to the brief.

When the group meets (in person or online) ask each person in turn to describe the item they have on their postcard, on one minute.

Assessment and feedback

This project is not intended to be assessed, but you could use the postcards as the basis for small group discussions, to give feedback on the research and presentation of the material, and to prompt reflection by students.

Our Experience

Tips

When presenting the postcards, it is a good idea for the teacher to go first, to show by example what is wanted.

Students can be concerned about 'getting it wrong' – encourage them to interpret the brief freely, according to their interests, and the research material available to them.

You can add a stage to the project if you have a suitable space. After students have presented their postcards, give them a map and ask them to draw it at large scale on the floor with chalk. Divide the students into groups and given them each a section of map. The map should be large enough to include all the places the students come from (city, country, continent, the world). Then have the students place their postcards where they come from.

This extra exercise gets the students working together, talking, looking at each other's postcards, and so on, which strengthens the group bonding aspect of the project.



Die Räuber, 1781,
by Friedrich Schiller, premiered at the Mannheim Theater

Friedrich Schiller (1759-1805) is considered one of the most important German poets and played a significant role in Western Classic. He first studied medicine under a civil military doctor. As a student, he became familiar with the works of Shakespeare and Goethe, after which he soon began writing his own theatrical plays. His play "Die Räuber" was premiered in 1781 – first under an anonymous name – at the Mannheim Theater. It was understood as a fight for freedom against tyranny and was considered beyond national borders. Many of his plays, such as "Don Carlos", "William Tell" or "Kabale und Liebe" are still part of the standard repertoire of German-language theatre.

Charlotte Schwane
Bellevue Hochschule für Technik (BHT)
Theater and Event Engineering (T.Eng.)
4th year of education, eighth semester

DANCE ON THE BANKS OF THE MANDANARIES
by Goya y Lucientes, Francisco de Goya, Spain 1776-1808

DANCE ON THE BANKS OF THE MANDANARIES
by Goya y Lucientes, Francisco de Goya, Spain 1776-1808

This painting depicts a group of people dancing on the banks of the Mandanar river. The scene is set in the early morning, and the dancers are dressed in traditional Spanish attire. The painting is a prime example of Goya's mastery of light and shadow, capturing a moment of joy and community.

Sara Patricia Lachar
Real Escuela Superior de Artes y Oficios (RESO)
Superiores de Artes y Oficios
Specialty in Stage Design
1st year of design, 1st year
Madrid, Spain



The Bristol Theatre Royal is the United Kingdom's oldest continuously operating theatre, dating from 1766. It opened as the Bristol Theatre, not possessing the royal patent required for the public performance of plays. Early productions were disguised as concerts and the audience entered through the garden of a next-door house. The theatre is a fine example of an 18th century neoclassical theatre, originally seating 1000 people in the main auditorium. The stage area was completely rebuilt in the 1870s, but much of the auditorium is original, with some modifications made over the years. The postcard shows the exterior of the theatre, a grand neoclassical building with a wooden trestle down which cannon balls are rolled to simulate the sound of thunder. As a student, I designed lighting for "The Doctor Barber" at The Bristol Theatre.

Nick Hunt
Rose Bruford College
Bidecup
DA16 9DF
United Kingdom

Teaching Theatre History

On Location

Key Information

Number of learners 12 – 18 (depending on the spaces visited)

Number of staff One teacher acquainted with technical and scenographic practice. Specialist guides/professionals from the visited spaces.

ECTS Credits 3 credits.

Learning process

- **Lecture/seminar**

Lecture, presentation, discussion (face-to-face or online)

- **Making project**

Making a model, mock-up, plan or design (physical or digital)

- **Performance project**

Making a performance or demonstration (live or mediated)

- **Records and Archives**

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

- **Independent study**

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- **Student of technical theatre**
- **Student of theatre design, architecture**
- **Student of theatre arts**
- **Professional**
- **Researcher**
- **General public**

A course designed to give students a greater understanding of the context of technical theatre history, through teaching on location in theatres and other venues.

Aims

The aim of the course is to give students an in-depth understanding of the relation between social history, architectural history, theatrical history, technical history and scenographic history, and places in the city.

The course is divided in different parts, taught by theorists in history as well as specialists from theatre practice. This ensures a strong theoretical background, that is applicable in daily practice.

What You Will Need

Duration and schedule

- Preparation (Teacher: 8 hours)
- Introductory lecture (4 hours)
- Visits to theatres or other venues (4 x 4 hours)
- Tutorials for the presentation assignment (Teacher: 4 hours)
- Developing the presentations (Students: 60 hours)
- Presentations (4 hours, depending on the number and type)

Room or type of space

- A classroom for the introductory lecture
- Different theatre spaces and related venues to visit
- A workshop or studio for the student presentations, depending on the format.

Equipment

Depends on presentation choices.

Materials (consumables)

Depends on presentation choices.



Learning resources (books, websites)

Websites, books, plans, photographs, videos, drawings and other material related to the chosen venues.

Process

Preparation

Prepare the introductory lecture: the history of space, theatre and scenography, giving the evolution and principles of different theatre concepts. This creates a framework to situate the concrete examples in the visited spaces.

Select spaces connected to the content of the course. For example, a black box (contemporary theatre), a traditional horseshoe proscenium theatre (illusion theatre), multifunctional contemporary large theatre, found space location. Plan with local specialised guides/professionals from the visited spaces what needs to be covered.

When planning the visits, think about -

Travel:

- Do the students know how to reach the venues – are they familiar with the area and transport systems?

- Will the visit involve late travel, or travelling in higher-risk areas?
- Will potentially vulnerable students be travelling alone?

Access:

- Do any students or staff have access requirements or support needs? If so, has the host venue been informed?
- On site:
- Does the venue have any safety rules or requirements you need to follow?
- Do you need personal protective equipment such as hard hats, high visibility jackets or steel toe-capped boots?
- What first aid arrangements are in place?

General:

- Do students have an emergency contact number for a member of staff?

The learning activity

The course is in several stages.

The first stage is an introductory lecture, giving an overview of:

- A chronological overview, giving the evolution and principles of different theatre concepts.
- Architectural evolutions: the history of space
- Dramaturgical evolutions: the history of theatre and the dramaturgical motivation of performance
- Scenographic evolutions: the history of scenic space and performance design
- Social evolutions: the history of the audience and the relation with evolving society

The aim is to show that the social history, architectural history, theatrical history and scenographic history and the places in the city interconnect. This creates a framework to situate the concrete examples of the visited spaces.

In the next stage, teachers and students visit different theatre buildings and stages, workshops/ateliers, rehearsal rooms, and other related spaces. Teaching on location to show and illustrate the content makes it more alive, more understandable, more vivid. It sticks more in students' memory and at the same time for teachers, it is more enjoyable and motivating to have real examples and with the enthusiasm that the spaces gives us.

Working in actual spaces shows the history is still present in different venues, but also shows concretely how and why it is adapted and used in different time periods.

In the next stage of the course, students work together in small groups. They choose a topic from the course, research it and make a personal work, performance or presentation, demonstrating their knowledge of the topic and their ability to translate this understanding of history into their own artistic work and interests. This makes history no longer an independent "box of facts" but rather it is a useful and essential base for the student's work as a theatre maker. This process should be co-tutored by teachers from a dramaturgical and scenographic as well as a technical background.

At the end of the course, the students present their work to each other and to the staff. The work is evaluated and discussed by the group, to ensure the insights from the different outcomes are shared.

Assessment and feedback

Assessment is based on the presentations, with the focus on:

- Understanding of historic information
- Quality of research
- Creativity and originality
- Ability to transfer ideas into contemporary theatre
- Feedback is given by peers and teachers after the presentation.

Our Experience

Tips

During the whole course, questioning is an important tool. "Why" is the keyword. This strengthens the active and critical thinking of the students, which is essential for an active attitude towards the use of the content of a theoretical course in daily practice.

During the visits, help the students make connections between the original or past use of the venue, and the current use. For example, how have lighting, sound and video systems been fitted into venues built for different technologies? What traces of different ways of working have survived, such as blocked up or newly added doors and openings, or old equipment no longer in use?

Invite students to imagine themselves as audience members, actors, technicians, designers, managers from a past era. What did they want, and how did they achieve it? How is that the same or different to now?

When they are planning their presentations, ask students to think carefully about how the format of their presentation relates to its content. Why chose to make a performance, an object or an installation, and what does the choice tell us about the topic?



**Acción:**

Debe comprometer la personalidad entera del actor, y permitir revelar todas sus facetas desde las biológicas e instintivas hasta la conciencia y el pensamiento, para alcanzar el punto en que todo se vuelve una unidad. (“Exploración Metódica”, 1967) la acción es la estructura preformativa objetivada en los detalles.

“Este trabajo no está destinado a los espectadores pero de vez en cuando la presencia de testigos puede ser necesaria; por un lado para que la objetividad del trabajo sea comprobada y, por otra parte, para que no sea un asunto puramente privado, inútil a los otros.” (“De la compañía teatral al arte como vehículo” 1992)

Acto total:

Acto de develación total del propio ser que se convierte en una ofrenda de uno mismo que alcanza a transgredir las barreras y el amor.

“Cuando el actor actúa de esta manera, crea una provocación para el espectador. La conjunción de opuestos, el problema total de la espontaneidad y de la disciplina,

Additional information and resources

Masters students at UPC studying architecture created a dictionary about the work of Jerzy Grotowski (Q30479). A sample page is shown above, and you can download the whole document from the Canonbase website:

canonbase.eu/wiki/File:IO4_35_Dictionary_of_Terms_Grotowski.pdf

Making a Dictionary of Key Terms

Key Information

Number of learners	Groups of two or three students. Multiple groups can do the project at the same time.
Number of staff	1 teacher
ECTS Credits	5 credits

Learning process**Lecture/seminar**

Lecture, presentation, discussion (face-to-face or online)

- Making project**

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

- Records and Archives**

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

- Independent study**

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop for learners to explore and understand the key terms associated with the work and ideas of a significant figure in theatre technology, design or architecture.

Aims

Students will develop their understanding of a selected aspect of theatre technology, design or theatre architecture, by creating a dictionary of key terms associated with a significant person. Students will also extend their specialist vocabulary.

What You Will Need**Duration and schedule**

Weekly sessions for one semester: two hours for the learners to prepare each week, plus a one hour review with the teacher.

Room or type of space

Classroom.

Equipment

Depending on the format of the dictionary students will create, they may need access to various software platforms.

Materials (consumables)

None.

Learning resources (books, websites)

Books, journals, websites and other sources of information about the selected person (both physical and/or online).

Process**Preparation**

Select the person for the case study, and gather information: texts, books, chapters, articles, drawings, and so on.

Prepare a presentation about the selected person.

The learning activity

Introduce students to the selected person, explaining their work and background circumstances: time, historical period, cultural context, and so on.

Each week the students research, read and start to collect the key words that will be in their dictionary. Also, weekly there are sessions with the teachers to supervise, adjust and refine the selection and the definitions made by the students.

At the end of the semester we might expect to have a dictionary with the most important concepts associated with the selected person. Through this process, the student group gets an in-depth knowledge of the historical importance of the selected person and their work, ideas and vision for the theatre.

Assessment and feedback

Students receive feedback throughout the process. The final dictionary can be formally marked if required, and written comments given.

Our Experience**Tips**

It is important students dedicate enough time to the research process before starting to write the definitions. They should read fully the resources provided by the teacher and expand their reading with other examples.

Make sure students cover all aspect of the work of the selected person: their technical and creative processes, key concepts and theories, and so on.

Choose the person carefully. You may want to use a particular person to fit into the students' wider learning, or you might want to use someone that students already have a connection with from previous study, or they have a particular local significance.

You can adapt the way the students develop and express their ideas, according to their skills and areas of interest. As well as written definitions of the terms, students should consider including drawings, diagrams, photographs and videos drawn from the resources they have, or which they make themselves.

You don't have to make a dictionary about a person. Consider making one about a building, an invention, a theatre company, an artistic movement...

Learning Theatre Words

In other languages

Key Information

Number of learners	Up to 44. Being in a group is beneficial as students compete with each other, but it can be done alone, or two people can set a crossword for each other.
Number of staff	1 teacher
ECTS Credits	0.125 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

This activity introduces students to the basics of theatre words in a different language to their own. Students complete a crossword with the clues in their own language, and the answers in a different language.

Aims

The activity is a first step towards learning and understanding specific theatre words in a language other than the student's own.

What You Will Need

Duration and schedule

The activity takes 1 hour:

If you are using our prepared crossword, aimed at German speakers learning English theatre words, preparation is 10 minutes by the teacher, copying the crossword for each student.

If you want the clues in your own language, you can use the same grid and solution, and create your own version by translating the clues. This will take 1-2 hours.

50 minutes with the learners:

- 5 minutes introduction
- 30 minutes working in groups
- 15 minutes presentation and discussion

Room or type of space

Classroom.

Equipment

It is helpful if there is a way to share the solution afterwards, such as a projector or screen in the classroom.

Learners should not use their mobile phones to search for translation.

Materials (consumables)

A copy of the crossword for each learner.

Learning resources (books, websites)

Physical dictionaries, such as OISTAT Theatre Words (<https://theatrewords.com>).

Process

Preparation

Create a suitable crossword with clues and the solution, or use our one for German speakers learning English theatre words.

The learning activity

The teacher starts by introducing the activity, showing the learners the crossword grid to fill in.

Each student then has half an hour to work on the crossword. At the end of this time there is a discussion of the results.

Assessment and feedback

Feedback can be immediate, as part of the discussion.

Our Experience

Tips

The session can be very quick, if students who have worked internationally are in the classroom, or those who know the language of the theatre words.

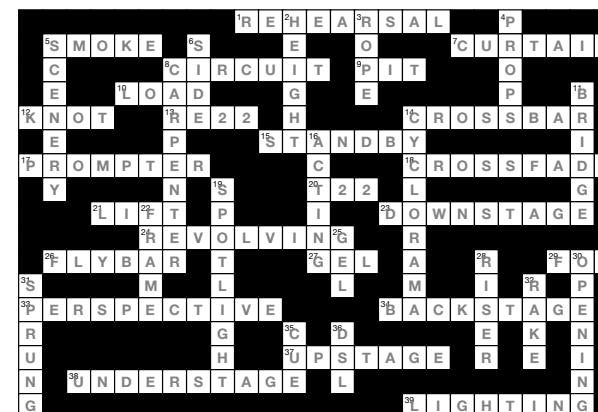
This is an easy, quick and fun activity!

Additional information and resources

The crossword and its solution are available on the Canonbase website:

canonbase.eu/wiki/File:Crossword.pdf

canonbase.eu/wiki/File:Crossword_Solution.pdf



Technical Theatre Quiz

Key Information

Number of learners 1-100. This activity is scalable to large numbers of students; the introductory lecture can be done with all students, and then the quiz sessions can be in sub-groups of up to 20.

Number of staff 1 teacher

ECTS Credits 1 credit

Learning process

● Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

● Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts

Professional

Researcher

General public

Using an online quiz to develop students' knowledge of technical theatre.

Aims

Students will learn about the chosen topic. They will also develop their research skills, and learn to present and share information in a playful manner.

What You Will Need

Duration and schedule

Teacher preparation: 4 hours

Session 1: 2 hours

Students: 6-10 hours homework / preparation

Session 2: 2-3 hours, depending on the group size.

Room or type of space

The activity can be done online, or in a classroom.

Equipment

In the classroom you will need a projector or screen where you can display the online quiz platform.

Students will need their mobile phones or a tablet or laptop.

Materials (consumables)

None.

Learning resources (books, websites)

An online quiz platform such as kahoot.com.

Process

Preparation

Prepare a topic (such as sound, lighting, theatre architecture) and give an introductory lecture.

Prepare a range of sub-topics (one for each student or pair of students).

Ensure you are familiar with the quiz platform you have chosen.

The learning activity

In the first session, give the introductory lecture on the chosen topic.

Set students the task to prepare in advance:

Using the chosen quiz platform, design a quiz with at least 20 questions about the topic. Think about the precise questions and 4 different answers for each question, one of which is correct and the other three wrong.

Take care the questions cover the whole topic, and think about the order of the questions – start with something easy and then get harder. Think about how long to give for each question, and collecting points (and a winner's prize?). Provide one or two fun facts, include some historic pictures, and at least one quote.

In the second session, play the quiz.

Assessment and feedback

The quiz format has feedback built in, because students know if they have scored well or not. Additionally, you could play the quiz again after a week and see if the students' scores rise.

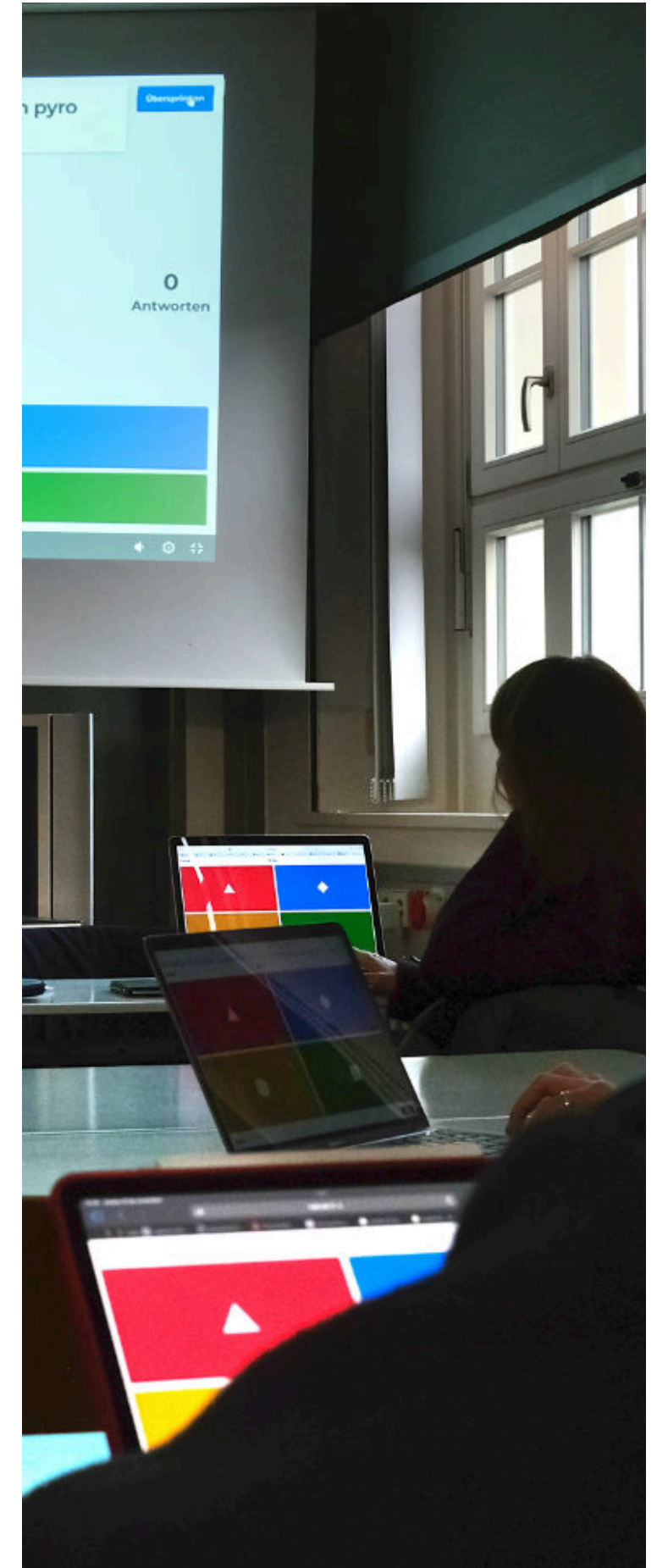
Our Experience

Tips

Play a quiz-game before starting to explain the task, so that students understand the format. This could be one you have created yourself, or one you find online.

If you have time, give each student or pair of students feedback on their quiz, before it is played by the group. This will help sharpen the "dramaturgy" of the questions, the question methods used, and the range of possible answers. You will also be able to suggest other sources of information they can base their questions on.

Right: students of the CANON project doing a quiz



Making Oral History Interviews

Key Information

Number of learners Interviews can be done by a single person working alone, or in groups of up to 4.

Number of staff One teacher / researcher to support the preparation of the questions and the structure of the interview.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

● Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A method for gathering information about past practices, techniques and ideas from still-living theatre professionals.

Aims

Interviewing theatre professionals can bring new knowledge about current and past working practices, techniques and technologies.

Students doing interviews will also learn:

- how to organise and structure an interview
- verbal communication skills
- research skills, while preparing for the interview
- planning skills
- technical skills using audio and/or video recording equipment
- teamwork

What You Will Need

Duration and schedule

Phase 1: instruction on how to perform interviews and how to develop structure and questions (4 hours)

Phase 2: research and development of interview (4-8 hours)

Phase 3: test interview and equipment (2 hours)

Phase 4: conduct interview (4-8 hours)

Phase 5: post-production (depending on the chosen medium and expected result)

Room or type of space

Chose the space to fit the professional interviewed. Ideally this is a space that is quiet, makes the interviewee at ease and that they are familiar with.

If video is recorded, it is nice to have a professional environment as the background.

Equipment

Depending on the type of interview you need:

- Only writing equipment, or
- A good microphone and audio recorder with enough batteries, or
- Video recorder, microphone, stand, basic light set

Materials (consumables)

Data storage, as required.

Learning resources (books, websites)

The Oral History Society offers very useful guidance on conducting oral history interviews:

www.ohs.org.uk/for-beginners/

Process

Preparation

There are many things that you need to consider when recording interviews with professionals, whether you are a solo researcher or are a teacher working with students. These considerations include:

- Planning how the interviews will be recorded and stored, including ethical and legal data protection requirements relevant to your country.
- Ethical working, to ensure interviewees are not harmed or disadvantaged in any way by the process, and have the opportunity to leave the process at any time.
- If you are a university researcher, or a teacher working with students, your university or school is likely to have regulations governing research ethics, which you will need to comply with.
- If you are an independent researcher, the UK-based Oral History Society has useful advice and guidance: www.ohs.org.uk/for-beginners/

The learning activity

The following process is designed for teachers working with students. If you are a researcher working on your own, the stages will be similar, but you will be able to work at your own pace.

- Briefing, with instructions on how to perform interviews and how to develop structure and questions, as well as discussion of the ethical, regulatory and legal considerations (4 hours)
- Research the background of the people to be interviewed, and develop the interview questions (4-8 hours)
- Test interviews and equipment (2 hours)
- Conduct the interviews (4-8 hours)
- Post-production (depending on the chosen medium and required form of the output)
- If needed, debrief, discussion and evaluation of the results and the process.

Assessment and feedback

This learning activity is not designed to be assessed, but if necessary, you could assess students by direct teacher observation, or by self- or peer-evaluation afterwards.

Our Experience

Tips

Interviewing people about their professional experience can raise important ethical issues, to do with data protection, privacy, consent, and so on. Make sure you have prepared fully for these before you start interviewing.

Make sure you have a clear purpose for the interview – what are you hoping to find out from the person you are interviewing? If you are researching the impact of a particular technology on working practices, you will need to ask different questions than if you want to know how the person developed their career.

Make sure you have researched the interviewees carefully – they will expect you to know who they are and their main professional achievements and experience.

Recording interviews (audio or video) can be very useful, even if you don't intend to publish the recording. You can then transcribe as much or as little as you want of the recording. Make sure the interviewee knows if the recording will be made public or not.



Photo by Jon Tyson on Unsplash

From Text to Theatre

Staging the dialogues of Leone de' Sommi

Key Information

Number of learners	Groups of 2-3. Several groups can work on parts of the Project. Other students can be involved in set and costume design and making.
Number of staff	1 teacher
ECTS Credits	3 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

Student of technical theatre

- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop to explore the role of the technicians in theatre and in the theatrical building, by staging the dialogues of the 16th century Italian playwright and author Leone de' Sommi. The dialogues discuss many aspects of theatre and how it is staged.

Aims

By doing this workshop, you will:

- learn about the 16th century theatre, and its relationship with present-day practices
- learn how staging techniques play a major role in a theatre play
- have an opportunity to reflect on theatre, dramaturgy and scenic space

What You Will Need

Duration and schedule

The schedule is flexible. The workshop can be done as an intensive activity over 1-2 weeks, or as 10-15 weekly sessions with two hours for the learners to prepare and one hour rehearsal and feedback with the teacher.

Depending on the complexity of the staging chosen, you will need 1-3 days in the theatre.

The workshop can be shortened by staging only a part of the de' Sommi dialogues.

Room or type of space

Preparation can take place in a classroom. Ideally, performance takes place in a theatre.

Equipment

Basic theatre equipment for the theatre play (lighting, sound, seats, stage).

Materials (consumables)

Some elements to build a simple scenography and costumes.



Learning resources (books, websites)

Canonbase articles:

- Leone de' Sommi (Q708)
- Quatro Dialoghi in materia di rappresentazioni sceniche (Q709)
- Dialogues on Staging – an example staging of the dialogues by students at RESAD. (Q15665)
- Workshop to build a scenography for de' Sommi's dialogues (Q31025)

Other resources:

- Pavesi, Giorgio. *Leone De' Sommi hebreo e il teatro della modernità*, Asola, Gilgamesh Edizioni 2015
- Leone de' Sommi. *Quattro dialoghi in materia di rappresentazioni sceniche*, Milano Il Polifilo 1968
- Leone de' Sommi. *Teatro*, nota introduttiva e cura di Daniele Lucchini, Mantova Finisterrae 2014

Process

Preparation

Gather some resources about the de' Sommi dialogues and Italian Renaissance theatre, and prepare a short presentation to introduce the topic to the students.

Make sure you the resources necessary for the staging at the end of the project.

The learning activity

Give a presentation to the students introducing Italian Renaissance theatre, de' Sommi and the dialogues.

Students then research, read and rehearse a performance of each dialogue. At regular points during the process, watch the rehearsals and give feedback.

At the same time as the rehearsal process, students develop their ideas for the staging of the dialogues, and prepare lighting, sound, scenery, costumes accordingly.

The final part of the workshop is to stage the dialogues in the theatre.

Assessment and feedback

The performance can be directly assessed in terms of students' understanding of the matters discussed in the dialogues, together with a discussion and Q&A session afterwards. Alternatively, students can be asked to write or present a reflection on their experience and learning.

If the dialogues are performed to an audience, their feedback can be an important part of the students' learning.

Our Experience

Tips

The workshop can be expanded or reduced in time, and in the scale of the production at the end, according to your needs and available resources.

The final performance can be given to other students and staff, as well as friends and family, if desired. It would also make a good centrepiece for a one-day symposium on Renaissance theatre or technical theatre history.

Additional information and resources

This methodology has been used in the Canon project to develop a Teaching Tool - see the project Dialogues on Staging by staff and students at RESAD. Rosa Fernández Cruz directed the RESAD performance, and offers the following notes:

A comprehensive reading of the text was carried out, as well as an analysis of it, establishing relations with the culture and art of its contemporaneity. The dramaturgical and staging proposal was based on the search for a simple and understandable language for the audience. To this end, the contemporary reading aimed to approach comedy. An actor and an actress play different characters, with an interpretation that is somewhere between gestural and textual. In each scene, one of the characters operated as the white-faced clown, and the other as Augusto. The rehearsals were based on the creation of a score of actions for each scene, and a very clear importance of the elements and themes to be dealt with. A third character, the light, appeared in one of the scenes as a reference to the scenographic context we were talking about. Finally, after four rehearsals of the whole text, and a dress rehearsal, there was a performance with an audience that closed the process.

With this kind of project, the staging is always susceptible to mistakes or difficulties that must be solved live in front of the audience. The success of the performance lies in the students' ability to maintain their character or their action even if conditions change due to unexpected events. Once the scene has begun, it has to continue, and the way to evaluate it is precisely the maintenance of that action in front of the audience, whatever happens.



Excerpt from The Ideal City of Berlin, Francesco di Giorgio Martini, around 1477

Building a Timeline

Of technical theatre history

Key Information

Number of learners The project can be done individually, or in small groups of 3–6 students (but several groups can work on the same timeline).

Number of staff 1 teacher

ECTS Credits Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

● Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to create a timeline that shows the development of a chosen aspect of technical theatre history in its social, cultural, technological and political context.

Aims

The project will:

- Introduce historical facts, people, equipment, theatres...
- Allow better insights into the relationships between these
- Improve understanding through the visualisation of information.

What You Will Need

Duration and schedule

This methodology can be used in different ways. It can be used as a support for personal research, it can be used as a group exercise where each individual can add a part to the whole, or it can be used as a 'summarising' or 'wrap-up' of course content during or at the end of a course of study.

The minimum continuous activity is 15 minutes. A group can create a simple timeline in 3 hours.

Room or type of space

Any space will do, as long as it has a long wall to put the timeline on. It can even be done in a corridor, showing the results to other people.

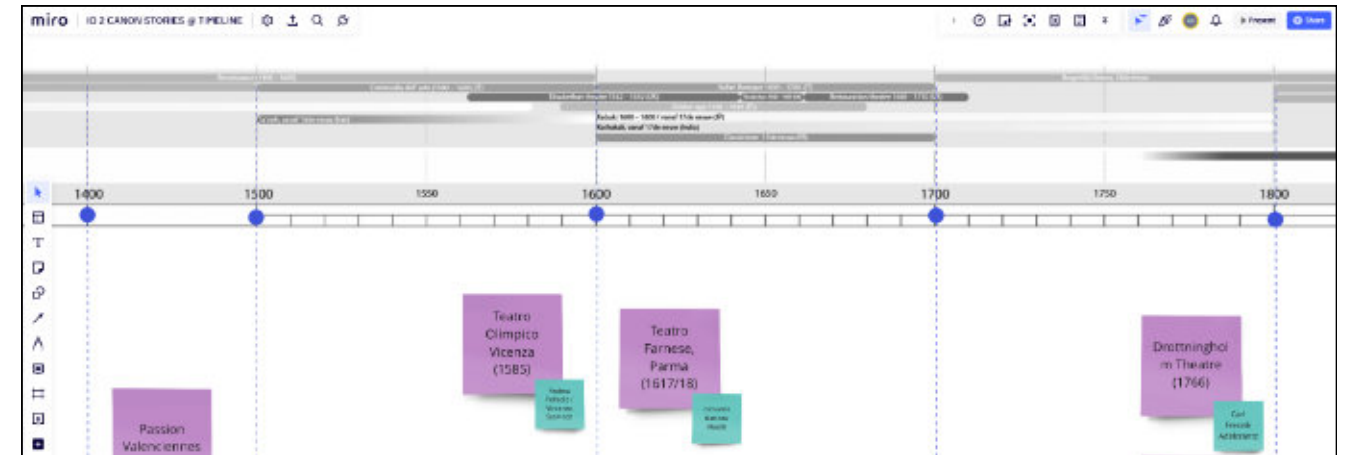
Alternatively, the project can be done online using a collaboration tool such as Miro (miro.com).

Equipment

- Printed (empty) timeline
- (if needed, pre-printed entries)
- Printer
- Writing equipment, scissors

Materials (consumables)

- Self-adhesive notes ('post-its')
- Small stickers (different coloured dots or similar)



- Paper
- Marker pens

Learning resources (books, websites)

- sources about the chosen subject, and general history
- the Canonbase!

Process

Preparation

Hang the timeline in a suitable place and gather the necessary tools and materials.

The rest of the preparation depends on how the workshop is conducted:

- If it is subject or course based, some basic timeline items can be prepared in advance.
- If it is open research, nothing needs to be prepared, but some examples can help.

The learning activity

The students are introduced to the timeline and how they will use it. Some rules can be defined on how to work together and how to treat each other's entries.

They are given the assignment to research a



specific topic, a time period, or the content of the course(s) they will follow. Students do research and note on 'post-its' or in a digital document concrete facts with a date and short description. These are put on the timeline. Additional material or pictures can be put on A4 papers below or above the timeline and linked with a line (or string). Relations can be marked directly on the timeline by drawing lines. When enough material is gathered, the group discusses the content, the importance of the facts, what information is missing, how things relate to each other, and so on.

To stimulate the discussion, students could add green or red dots to entries they see as more or less important. Only entries with dots with different colours need to be discussed.

This process is repeated a couple of times (in case of a course-based timeline, after each class).

When enough material is gathered for a topic that includes a range of items, it can be reworked as a coherent story, or can be presented as a result.

Assessment and feedback

The project is not designed to be formally assessed. Students get feedback informally during the process from the teacher. A group discussion at the end of the project will help students reflect on and embed what they have learned.

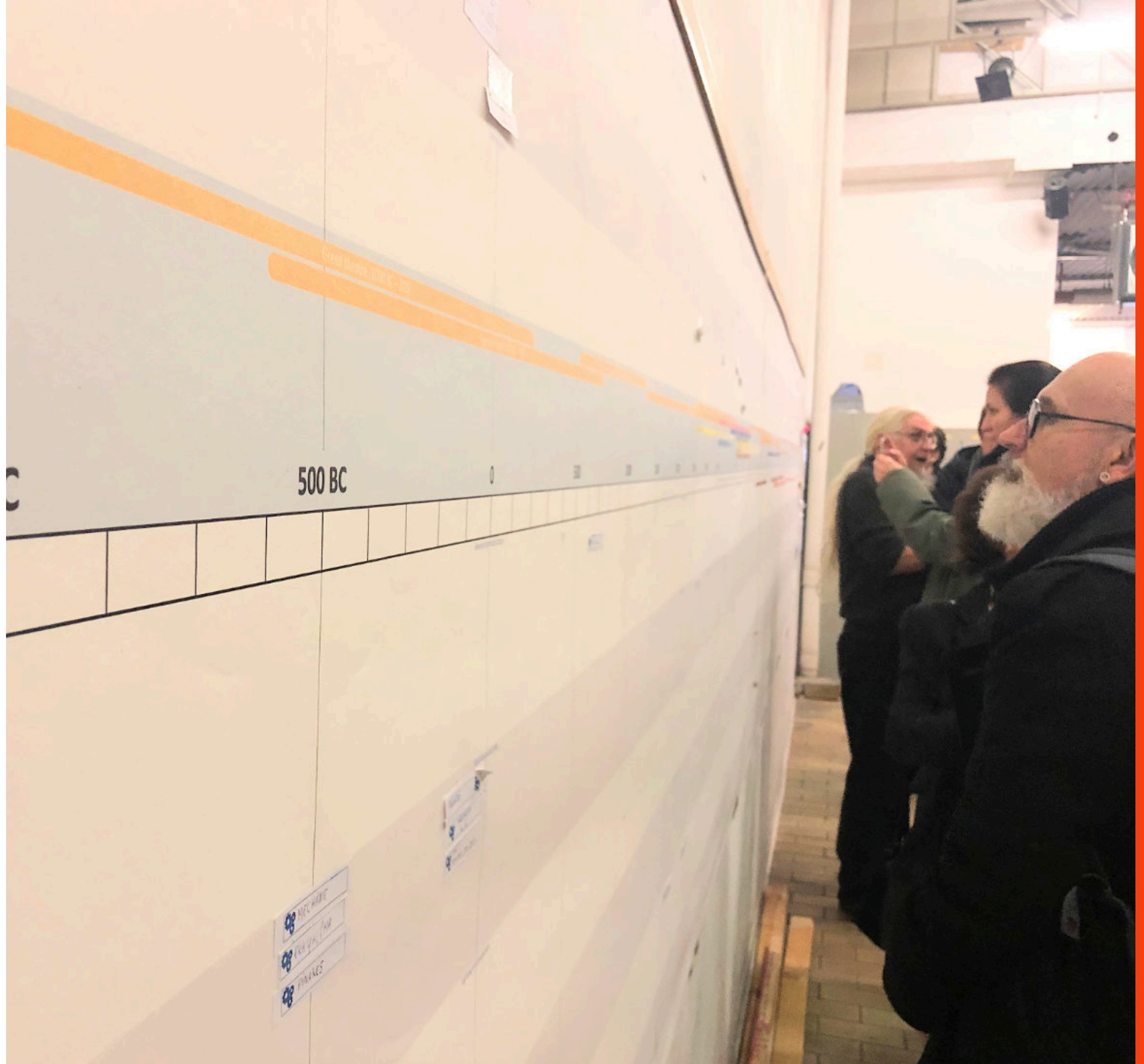
But of course, students can be assessed on a final result or could be used to assess skills such as 'long life learning', 'research skills', 'group participation' using the appropriate usual methods.

Our Experience

Tips

This methodology works best when students start with topics that are close to their world, for example 'the history of the cultural centre in your town', or 'equipment that you know or have heard of'). During the run, this can be extended to elements that influenced these topics, or that provide wider context, to end up with more general history.

Discussions on the topics should be based on why an entry is important, not on subjective matters of personal taste and preference.



Right and previous page: members of the Canon team discuss a prototype timeline

Anno Teatri

The history game of technical theatre

Key Information

Number of learners	2-10 in a group. Each group needs a set of cards.
Number of staff	Anno Teatri can be played by 2-10 people, though 3-6 is best. Play independently, or as part of a course on technical theatre history, to see what students know and what they don't.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

Anno Teatri is a card game in which players try to place historical events, inventions, people and objects in chronological order, learning about the history of technical theatre as they go.

Aims

Anno Teatri is a game that introduces players to events, inventions, people and places related to technical theatre history they may not be familiar with. It also helps players learn the chronology of the history of theatre and technology.

The game is fun to play, and can act as an 'ice breaker' for a new group coming together for the first time. It can also be used as a diagnostic exercise to see what people already know and what they don't.

What You Will Need

Duration and schedule

The game can be learnt and played in about an hour. You can then go on playing the game for as long as you like.

Room or type of space

Anywhere where the group playing can sit around a table, and lay out the cards.



Equipment

A set of Anno Teatri cards. The artwork for you to make your own or have them printed is available online, as part of the Canon Tools.

Materials (consumables)

None.

Learning resources (books, websites)

The Anno Teatri game is one of the Canon Teaching Tools. Follow the link below to read and download the rules, and to download PDF files for the card artwork to print at home, or at a commercial print shop.

Process

Preparation

If you are using Anno Teatri as part of a class, familiarise yourself with the game first.

The learning activity

Follow the rules of play, and enjoy the game!

Assessment and feedback

Anno Teatri can be useful as a diagnostic tool, to find out students' current knowledge of technical theatre history, by observing the game play.

Our Experience

Tips

Players may be concerned that they don't know enough. You can select just the easier cards from the set (each card has a difficulty rating), but it is best to encourage players to guess if they don't know. It is part of the learning process and the fun of the game – the winner may just be the luckiest or boldest player, not the most knowledgeable!

The game cards are also marked with a theme (lighting, architecture, and so on), so you can select cards to suit a particular topic you want to focus on.

Additional information and resources

Download the rules and artwork to print Anno Teatri cards for yourself from the Canonbase website:

canonbase.eu/wiki/Item:Q120

Anno Teatri is a 'work in progress,' So please don't hesitate to contact us with corrections or new facts/events/ideas: info@canon-timeline.eu





Recipes for learning and teaching
in
Architecture

Design Your Own Theatre

From a kit

Key Information

Number of learners	Students work in groups of up to four. We suggest that six groups (24 students) is a practical maximum for one teacher in a single session.
Number of staff	1 teacher
ECTS Credits	0.125 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

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Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

This activity introduces students to the basics of theatre architecture. Students design their own theatre using a kit of wooden blocks, representing the various parts of a theatre (stage, auditorium, foyers, technical areas).

Aims

The activity is a first step towards understanding theatre architecture, and the work of theatre architects. It introduces students to the main parts of a theatre and what they are called, and asks them to think about the possible spatial arrangement of foyers, technical areas, and so on.

What You Will Need

Duration and schedule

The activity takes 2 hours, if model kits are already made:

- 15 minutes preparation by the teacher, setting out the tables and kits, deciding on the groups
- 90 minutes with the students:
 - 15 minutes introduction
 - 60 minutes working in groups
 - 15 minutes presentation and discussion
- 15 minutes tidying afterwards.

Room or type of space

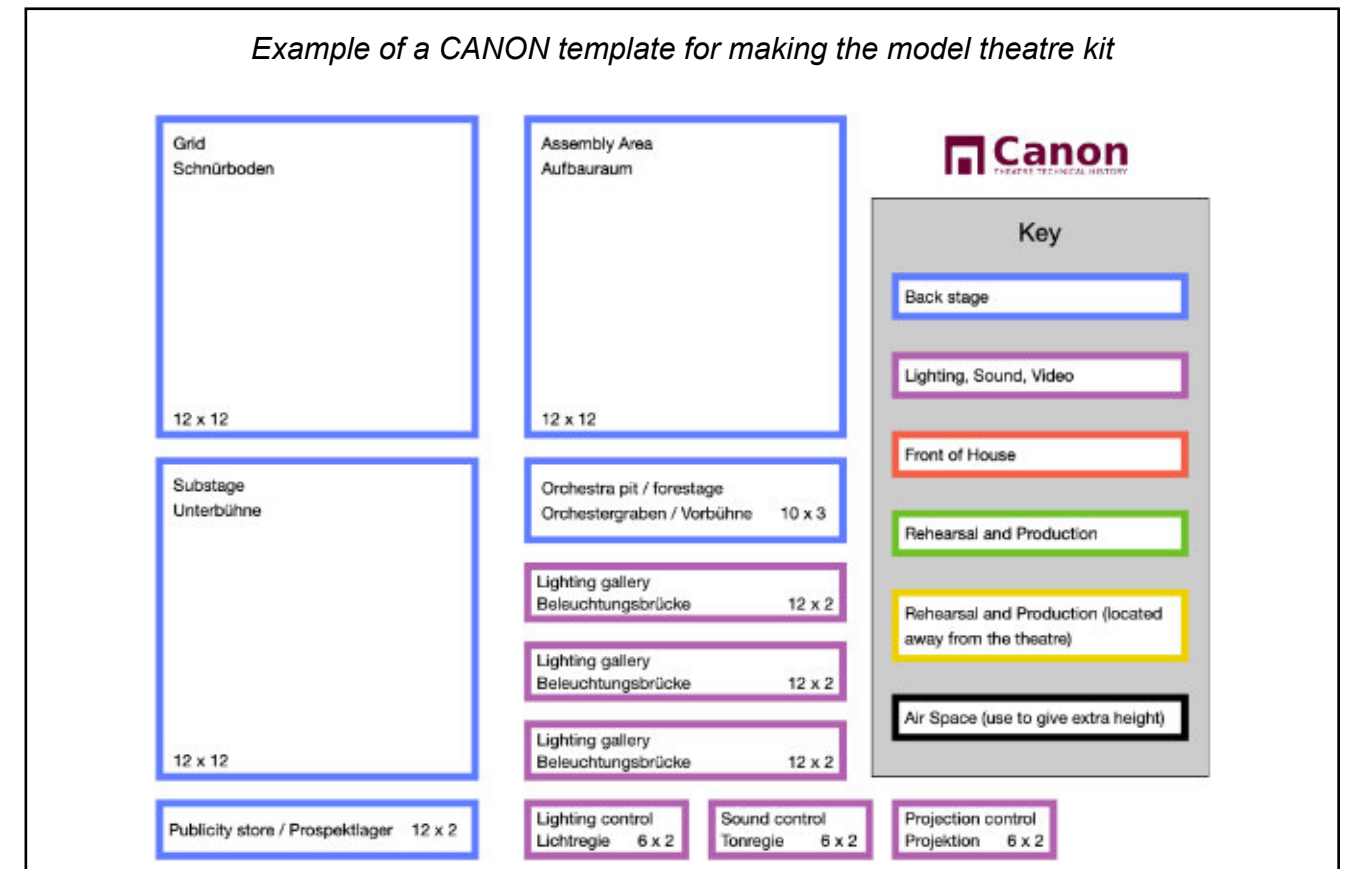
An ordinary classroom, with a table for each group of four students.

Equipment

A kit of parts for each group.

Each kit is a set of wooden blocks, each block representing a part of a theatre – stage, auditorium, technical gallery, toilet, restaurant, and so on. These can be put together like a 3D puzzle.

We have provided templates to make the blocks, available as a Canon learning tool - see the Learning Resources section. You can use all the blocks, for students with some experience of theatre architecture, or if you want a longer time working on the project. Otherwise, choose only the main parts of the theatre.



You can also adapt the kit of blocks to suit a particular type of theatre, or historical period. Our templates are based on a large theatre or opera house, with a ballet company and orchestra.

Students should use their mobile phones to take photos of their work. It is helpful if there is a way to share these photos, such as a projector or screen in the classroom.

Materials (consumables)

None.

Learning resources (books, websites)

You can get templates to make the blocks from the Canon learning tools - search canonbase.eu for Q30511. Use the template to cut out and label the blocks from 20mm thick MDF or plywood.

Architectural plans of theatres. The plans can be presented in the classroom by posters, on screen, as paper copies or in books.

Process

Preparation

Gather learning resources.

The learning activity

Start by introducing the activity, showing the students plans and diagrams of a variety of theatres, explaining and naming the different parts of the buildings.

Then give each student group one hour to use the kit to design their own theatre. At the end of this time, each group presents their ideas to the whole class, and there is a discussion of the results.

Assessment and feedback

Feedback can be immediate, as part of the discussion.

Alternatively, students can be asked to prepare a presentation for a later class.

Our Experience

Tips

The session can be very loud, because students start to discuss very quickly. It is a good idea for the teacher to around, checking on progress and making sure the students try out different ideas.

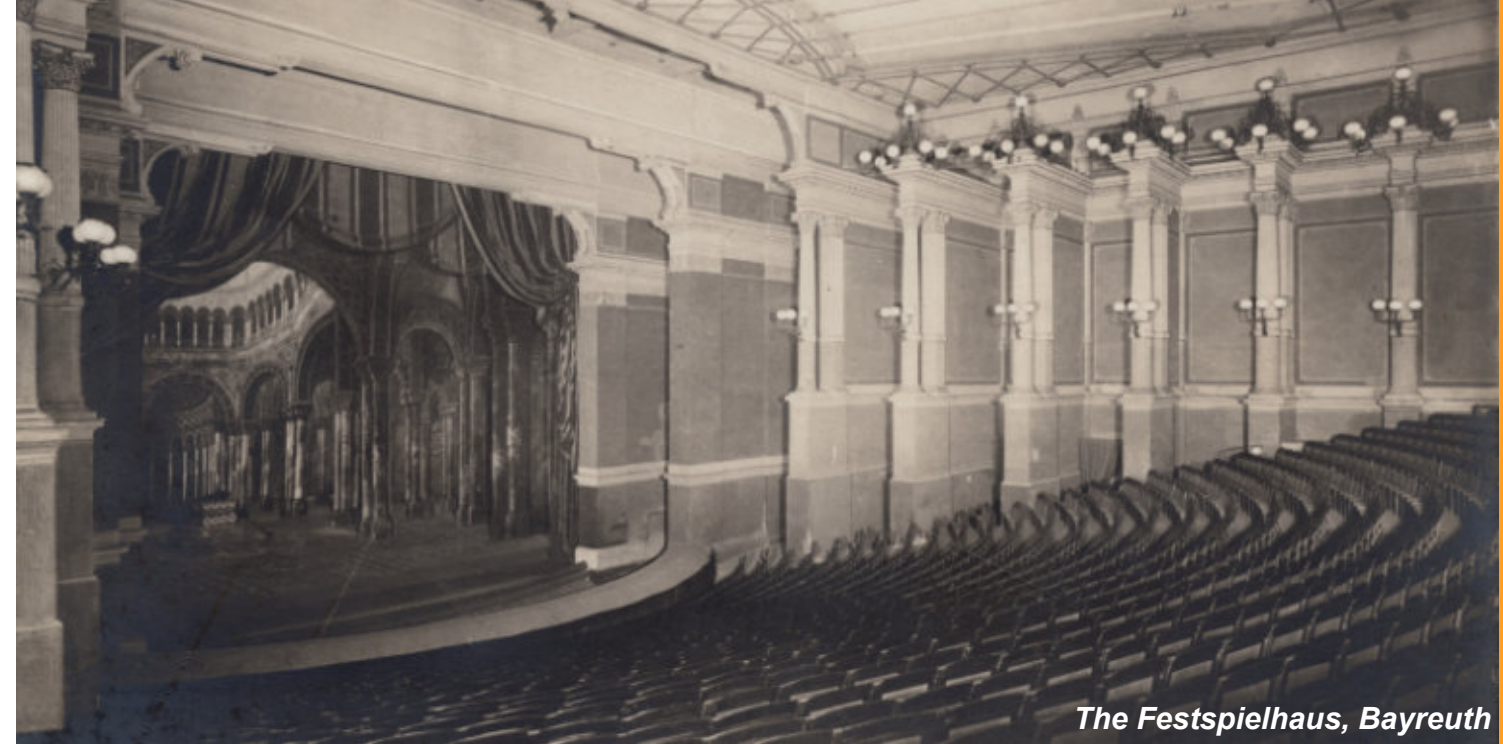
Announce the end of the session well in advance, so students have time to be ready to present their ideas.

This is an easy, quick and fun activity!

Additional information and resources

The photos show the kit of blocks used at the Berliner Hochschule für Technik, and students using them to design theatres.





The Festspielhaus, Bayreuth

Comparing Theatre Architectures

By drawing and writing

Key Information

Number of learners	Groups of two or three students. Multiple groups can do the project at the same time.
Number of staff	1 teacher
ECTS Credits	5 credits

Learning process

- **Lecture/seminar**
Lecture, presentation, discussion (face-to-face or online)
- **Making project**
Making a model, mock-up, plan or design (physical or digital)
- **Performance project**
Making a performance or demonstration (live or mediated)
- **Records and Archives**
Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)
- **Independent study**
Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- **Student of technical theatre**
- **Student of theatre design, architecture**
- **Student of theatre arts**
- **Professional**
- **Researcher**
- **General public**

A process for learners to explore and understand the key elements of the milestones in theatre architecture.

Aims

Students will develop their understanding of the milestones of theatre architecture, through a careful architectural analysis of two specific theatre buildings (built or unbuilt). By comparing the key architectural elements of the examples selected by the teacher, students will understand the history and the typological space of the theatres and the vision of a specific time in theatre history.

What You Will Need

Duration and schedule

Weekly reviews for one semester: two hours for the learners to prepare each week, plus a one hour review with the teacher.

Room or type of space

Classroom.

Equipment

Depending on the kinds of drawing and writing students will use, they may need access to various software platforms.

Materials (consumables)

Depending on the kinds of drawing and writing students will use, they may need paper, pencils, pens, and so on.

Learning resources (books, websites)

Books, journals, websites and other sources of information about the selected theatres (both physical and/or online).

Process

Preparation

Select the case studies, and gather information: texts, books, chapters, articles, drawings, and so on.

Prepare a presentation about the selected theatres.

The learning activity

Introduce students to the selected two theatres, explaining the background circumstances: time, historical period, cultural context, architect, and so on.

Each week the students research, read and start to analyse both theatres using a comparative method. Also, weekly there are sessions with the teachers to supervise, adjust and refine the comparative analyses made by the students.

Students develop and communicate their ideas by a combination of a written analysis and comparative drawings (scale drawings and sketches).

At the end of the semester we might expect to have a proficient understanding of the most important concepts of the selected theatres. Through this process, the student group gets an in-depth knowledge of the historical importance of the selected theatres and their architecture.

Assessment and feedback

Students receive feedback throughout the process. The final analyses can be formally marked if required, and written comments given.

Our Experience

Tips

It is important students dedicate enough time to the research process before starting the comparative analysis. They should read fully the resources provided by the teacher and expand their reading with other examples.

Make sure students consider all aspects of the theatre architecture: how does it work from the point of view of the audience, performers, designers, technicians, front of house staff? How does it meet the commercial needs as well as the artistic needs?

Choose the theatres for the comparison carefully. You may want to use particular theatres that fit into the students' wider learning, or you might want to use examples that students already have a connection with, from previous study, or because they have visited them, or they have a particular local significance.

You can adapt the way the students develop and express their ideas, according to their skills and areas of interest. You could ask them to:

- Make both technical drawings and expressive sketches,
- Write short accounts of the two theatres, as if they were audience members, performers, or technicians,
- Condense the most important points about the architecture into a single postcard, with a single picture on one side, and a short text on the other,
- Create 'mood boards' that respond to the design of the theatres.

Additional information and resources

Masters students at UPC studying architecture created a comparison between the Festspielhaus, Bayreuth (Q7857) and the Festspielhaus, Hellerau (Q63).

From Text to Drawing

Modelling Sabbatini's theatre

Key Information

Number of learners	Up to 20, in groups of two or three students.
Number of staff	1 teacher
ECTS Credits	5 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

● Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to explore and understand the architecture and design of a historic theatrical building such as that described by Sabbatini. Students build a digital model following Sabbatini's book *Pratica di fabricar scene e machine ne' teatri*.

Aims

By doing this workshop, you will:

- learn about the ideas and practices of Italian Renaissance and Baroque theatre
- develop your understanding of the architecture and technologies of the theatre building and stage by means of drawing
- learn to translate written descriptions of a theatrical space into 3d drawings through careful reading and understanding of the technology and the typological space
- extend your technical drawing skills using 3d modelling software
- have an opportunity to reflect on theatre, dramaturgy, architecture and scenic space.

What You Will Need

Duration and schedule

The schedule is flexible. The project can be done as an intensive activity over 1-2 weeks, or as 10-15 weekly sessions with two hours for the learners to work on the text and drawing, and one hour discussion and feedback with the teacher.

The project can be shortened by drawing only selected parts of the theatre.

Room or type of space

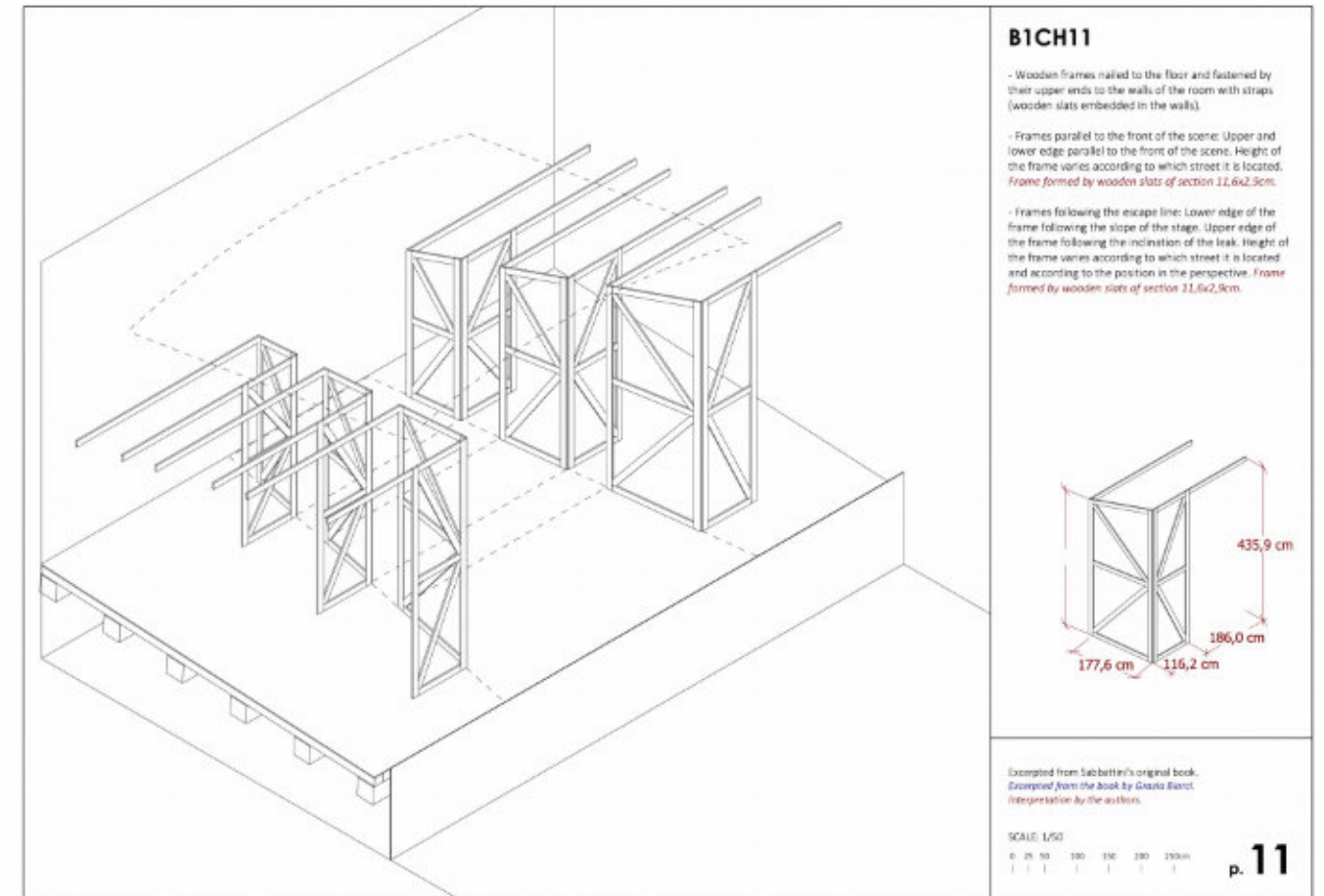
In a classroom, or online.

Equipment

Each student will need access to a computer with 3d drawing software such as SketchUp. A large screen or projector is useful for the teacher.

Materials (consumables)

Hand sketching materials are useful but not essential.



Learning resources (books, websites)

Canon stories:

- G.03 Scenography Codified: Serlio's scenes for comedy, tragedy and satire
- G.04 How to build a Theatre: The books of Sabbatini and Furttenbach

Canonbase articles:

- Nicola Sabbatini (Q13)
- *Pratica di fabricar scene e machine ne' teatri* (Q24) – includes a link to an online version of the text

Process

Preparation

Prepare a short presentation about Sabbatini and the social, cultural and theatrical context he lived in. Also describe his book, *Pratica di fabricar scene e machine ne' teatri*.

The learning activity

Give a presentation to the students, introducing the project, Sabbatini and his book.

Students then research, read and translate into 3d drawings each chapter. At regular points during the process, review the drawings being produced and give feedback. In particular, discuss any ambiguities or contradictions in the text that students have found, and how they can be resolved.

Consider how the drawings can show aspects that might not follow Sabbatini's text exactly, or which are uncertain, through the use of colour, for example. Explore how the drawings can be presented to best communicate the technical construction and the design intentions of the theatre to the viewer.

Once the drawing is complete, various extension tasks are possible, for example:

- Use a lighting visualisation software to light the theatre, either with simulated candlelight, or modern stage lighting
- Design a scenography for the theatre, based on the drawings of Sebastiano Serlio (G.03, Q568)
- Create a 'fly-through' video of the theatre

Gingerbread Theatre

Key Information

Number of learners	Working in groups, we suggest a maximum of 44 students in groups of 4. The project can also be done independently.
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

This activity introduces learners to the basics of architectural model building. Based on German Christmas bakery, learners will have an approach to 3D-modelling and space, specific to theatre architecture.

Aims

The activity is a first step towards understanding theatre architecture and modelling space. Students experiment with standard materials and prefabricated construction, as well as thinking about the audience-stage relationship, auditorium evacuation issues, and so on.

What You Will Need

Duration and schedule

The activity takes 3 hours:

30-120 minutes preparation by the teacher, gathering materials.

150 minutes with the learners: 15 minutes introduction 90 minutes working in groups 30 minutes presentation and discussion 15 minutes cleaning up together

Optionally, allow 30-90 minutes additional time for eating and celebrating the last session before the Christmas break!

Room or type of space

An ordinary classroom.

Equipment

- Kitchen equipment such as knives, bowls, and so on.
- A large wooden board for each group of learners to build the structure on.
- Cleaning materials.

Materials (consumables)

- A lot of ready-made pieces of gingerbread in all forms and sizes
- Jelly-bears in different colours (as spectators)

- Icing sugar, water and/or melted chocolate as a kind of 'cement'.

Not necessary but nice:

- Sweets in all forms and sizes for decoration and to add detail.
- Water or tea to drink.

Learning resources (books, websites)

Models, drawings, photos and books of theatre and event architecture for inspiration.

Process

Preparation

Buy cookies and organise the material. Prepare a quantity of ingredients for each group. Ask the students to come not hungry and with extremely clean hands.

The learning activity

The teacher starts by introducing the activity, showing some architectural models, talking about size, human and building proportions, different kinds of auditorium and stage relationships, and so on.

Each student group then has one and a half hours to build their model. At the end of this time the group discusses the results.

Assessment and feedback

Feedback can be immediate, as part of the discussion.

Our Experience

Tips

Ask the financial department how to cover the cost as learning material (and not food!).

The session is the favourite lesson for years in our classes. Unfortunately the pandemic meant we could not allow students to eat food which was touched by a lot of hands, so we had to stop doing this project. We will be started it again!

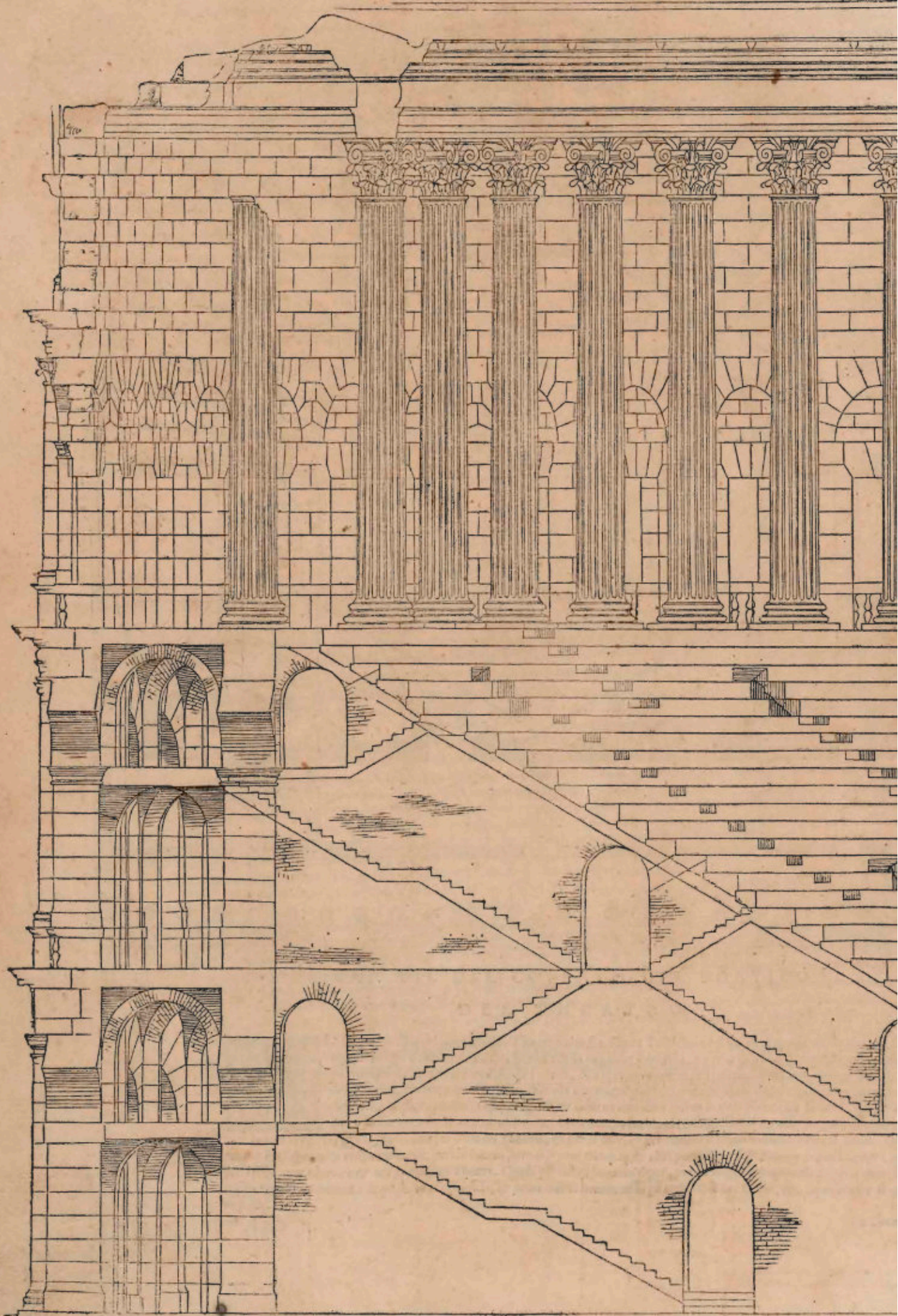
This is a very fun activity!

Additional information and resources

We built a gingerbread model of the Festspielhaus, Hellerau - see the pictures of the real thing, and our version.



Recipes for learning and teaching
in
Lighting and Projection





Workshop to Create a

Candlelit Miniature Performance

Key Information

Number of learners	Between 3 and 10
Number of staff	1 teacher. A technician is useful but not necessary.
ECTS Credits	1 credit, if combined with some additional research and study of historic candle-lighting in theatres.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop for learners to explore how candlelight can be used as a dynamic element of performance, and to tell stories.

Aims

The workshop aims to:

- Introduce learners to the limitations and opportunities of candlelight
- Show how brightness as a concept is subjective and depends on the way our eyes adapt and the contrast within a lighting scene
- Explore how different types of reflectors and lenses can be used to control light in various ways, leading to an appreciation of the differences between lux and lumens
- Show how stories can be told by the setting and lighting suggested by music
- Give an understanding of the way theatre was run for 300+ years, and how candlelight availability influenced entertainment and developed theatre as an art form
- Develop learners' ability to work together with discipline and teamwork

Note: This workshop is not about recreating a general 18th century lighting and scenery setup for an open or a vanishing point stage. It is a specific project to use candlelight imaginatively, using music as a storyline with (usually) a representative setting and signifying objects.

What You Will Need

Duration and schedule

Preparation by the teacher:

Before the day - 1-3 hours

On the day - 30 minutes

Preparation by the learners:

Look at some of the reference material to understand the historical context of candlelight in theatre (2-3 hours).

Listen to the music used as a basis for the exercise (15 minutes).

Length of time of the workshop:

One day of 6 working hours, with breaks as required.

Room or type of space

A lighting laboratory or small studio theatre is ideal.

A classroom can be used, as long as it has a good blackout, control of airflow and smoke alarms.

Local health and safety requirements, and fire regulations, must be followed. Permission to work with naked flame may be required.

Equipment

Equipment:

- An assortment of lenses and reflectors
- An extra fire extinguisher
- Several classroom tables
- A few weights
- Some small black masking drapes and 'goal post' stands to hang them on are useful

- A sound system of reasonable quality, capable of being stopped, started and taken to cue points via minute/second timer
- Recording of the chosen music

Tools:

- 2 hand-held electric torches
- Scissors
- Screwdriver or bradawl to clear out candle holders

Materials (consumables)

Candles:

The ideal candles are ecclesiastical (church) candles, preferably with a non-smoke additive. A UK supplier is Charles Farris, the oldest continuous makers, from this range:

<https://charlesfarris.co.uk/productdisplay/78-candles-beeswax>

With these candles, flame brightness is much more powerful than tea-lights or domestic candles, there is no hot liquid reservoir if they get moved,

and they will sit in lamp-holders and hand-held candleholders. Their length enables them to sit at the optical centre of larger reflectors and lenses.

Other materials:

- Matches or some way to light the candles
- Materials to make a model-scale scene: cardboard, fabric, and so on.

The following materials are not essential, but very useful:

- Gaffer tape
- String or cord, preferably black
- Blackwrap or similar (Q3203)
- Silver & white reflector materials
- 'Crocodile' clips
- One or 2 wooden battens

Learning resources (books, websites)

Recording of *Homeward Bound* by C.V. Stanford, available online.

Process

Preparation

Teacher:

Prepare the materials, candles, holders, lenses, reflectors, textures, stands or supports, music, pack for transport if necessary.

Students:

Look at some of the reference material to understand the historic context of candlelight in theatre. Listen to the music used as a basis for the exercise.

The learning activity

Summary:

During the workshop, students work as a team to create a lighting scheme to accompany a short piece of music with a narrative (a 5-minute piece of music is ideal). Students create a model-scale, table-top setting from found materials (cardboard, fabric, and so on). They then experiment with candles and light modifiers - lenses, reflectors and masking - to create lighting for each scene or 'episode' in the music and story.

Working with the music, students rehearse how the light sources and light modifiers must be operated in real time to move from one episode to the next. This process of rehearsal is used to

investigate different techniques and effects, and refine the detail and accuracy of the performance.

During the workshop:

- Listen to the music and discuss the episodes within the 5-minute piece
- Set up the stage area and surrounding tables
- Do candlelight health and safety training
- Turn working lights off
- See what candlelight does on the surfaces
- Work out which equipment needs to be where for each episode. Take photographs of these trials
- See how to get from episode to episode, working with the timing of the music
- Run the piece with music, stopping, adjusting and experimenting
- Do a performance, take photographs
- Make more adjustments and try alternative approaches
- Turn working lights on. Take picture of stage and wings under working light to record the set-up
- Clear up and pack away equipment
- Debrief and group discussion.

Example:

One song that works well for this workshop is *Homeward Bound* by C. V. Stanford. The song is a setting of a poem by Henry Newbolt.

In the song, a sailing ship comes towards its home port after a long voyage. In lighting terms, the narrative is about revealing what the crew sees as they first glimpse familiar land. The poet Newbolt spaces it out very nicely for two verses, so you can usually find around 5 cue points.

The following elements are needed, made from fabric, cardboard and other found objects and materials:

- The sea
- The ship
- Cliffs
- A lighthouse

See the photographs here and additional photos online.

Assessment and feedback

The workshop is not designed to be formally assessed. You can give students feedback informally during the process. Have a group discussion at the end of the workshop to help students reflect on and embed what they have learned.

The workshop can act as an introduction to further study of the use of candlelight for stage lighting historically, perhaps through a research project. See 'Additional information and resources' below for some possible starting points.

Our Experience

Tips

Keep a balance on the different elements as the project unfolds and make sure the learners aren't being asked to make too many leaps at once.

Take breaks to allow time to reflect on the learning process, and to allow the eye to readjust to daylight.

Students discover that much more is possible than they first assume.

It becomes instinctive to impose some 21st century lighting concepts onto an 18th century art form and candlelight then brings a gentle compromise.

Anyone looking at a mobile phone is immediately the brightest thing in the room!

Additional information and resources

The photographs here and in the online version of this methodology (Q30889) show BA Lighting Design students at Rose Bruford College doing the workshop. You can also find additional links and resources in the online version.



Right, from top to bottom:

Ship on a heaving sea

"faint on the verge"

"the phantom skyline"

"like noontide ghosts"

"there lies the home"

Making a

Room-Size Camera Obscura

Key Information

Number of learners Between 1 and 10

Number of staff 1 Teacher. The project can also be done independently, though it may involve working on ladders, so a risk assessment is required for a single person doing the project.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to create a room-sized camera obscura, to find out about the history and theory of this historic technique.

Aims

By creating a camera obscura, you will find out about:

- The fundamentals of the optical systems used in cameras and projectors
- Some of the optical theory of image and shadow sharpness
- The early history of image-making and projection
- The performance potential of simple technologies

Additionally, the project can be an opportunity to develop team-working as well as practical, craft skills working with basic materials.

What You Will Need

Duration and schedule

Preparation time for the teacher:

1-2 hours to gather physical materials and learning materials. It is recommended to do a test of the planned method of creating the camera obscura, to ensure it works effectively.

Preparation time for the learners:

None.

The project can be done in half a day, but can be extended by including a performance element, or by further experimentation.

Room or type of space

A room with a window that can be blacked-out. The ideal room has a single window looking out onto a well-lit outside space, with a light-coloured wall opposite the window.

Equipment

Required:

- Scissors, craft knife, cutting mat.

Optional:



- Video or still photography camera with a tripod to record the results of the project.
- Various lenses to experiment with, such as magnifying glasses, spectacle lenses or lenses from theatre spotlights.

Materials (consumables)

Materials to create a black-out in the room being used (black paper, cardboard, cloth, black plastic sheeting, and so on), adhesive tape, drawing pins. Use decorators' masking tape if you have room décor that can be easily damaged.

Learning resources (books, websites)

The history and basic theory of the camera obscura is described on Wikipedia: https://en.wikipedia.org/wiki/Camera_obscura

Video guide to making a camera obscura, by the George Eastman Museum: <https://youtu.be/hsXo4gD7iWI>

Process

Preparation

Ensure the room is suitable for the project – preferably, do a test. Gather the materials required.

The learning activity

Initial set-up:

Use the black paper, card, or black plastic sheeting to black out all the windows in the room. Choose one window that faces the outside scene that you want to create an image of, and leave a hole about 10cm square in the blackout at about head height. Use tape and pins to hold up the blackout materials, making sure you don't damage the room décor!

Cut a small, round hole in a piece of card, with a diameter less than 1/100th the distance

between the window and the opposite wall. So, if your room is 5m across, make the hole less than 5cm across. A smaller hole will create a sharper but less bright image – you may need to experiment to create the best effect.

Tape the card with the hole over the 10cm square hole you left in the window blackout. Turn off any inside lights in the room. The only light coming into the room now should be that coming through the small hole you created.

Wait for several minutes for your eyes to adjust to the dark. You should now be able to see the scene outside the window projected onto the opposite wall, upside down and reversed left-to-right.

Simple experiments:

- Try different sized holes; look at the effect on the brightness of the image, and its sharpness.
- Hold a large piece of white paper or card near to the hole; what happens to the image?
- Try holding different lenses over the hole; what effects do they create? If the image is completely out of focus, try holding up a large piece of white paper or card, and move it closer or further away from the hole. What happens to the image? Pay close attention to how the sharpness of the image changes with the distance between the hole and the screen.

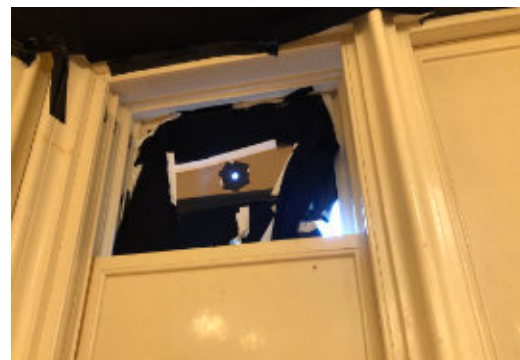
More complex experiments (these will require additional time and equipment):

- Create a performance to be played outside the window, with the audience watching inside the camera obscura. What kind of experience does this create? How can you use this effect as part of your story-telling?
- Create a lighting installation outside the window, and view it from the camera obscura at night.

Assessment and feedback

The project gives opportunities to experiment and made your own discoveries, as well as learning directed by a teacher. Teachers can use questions to guide learners towards different aspects of the project, as well as testing their understanding.

*Right, from top to bottom:
Blacking out the room
Fitting the hole
The view from the window
The piece of cardboard with the hole
The hole*



Our Experience

Tips

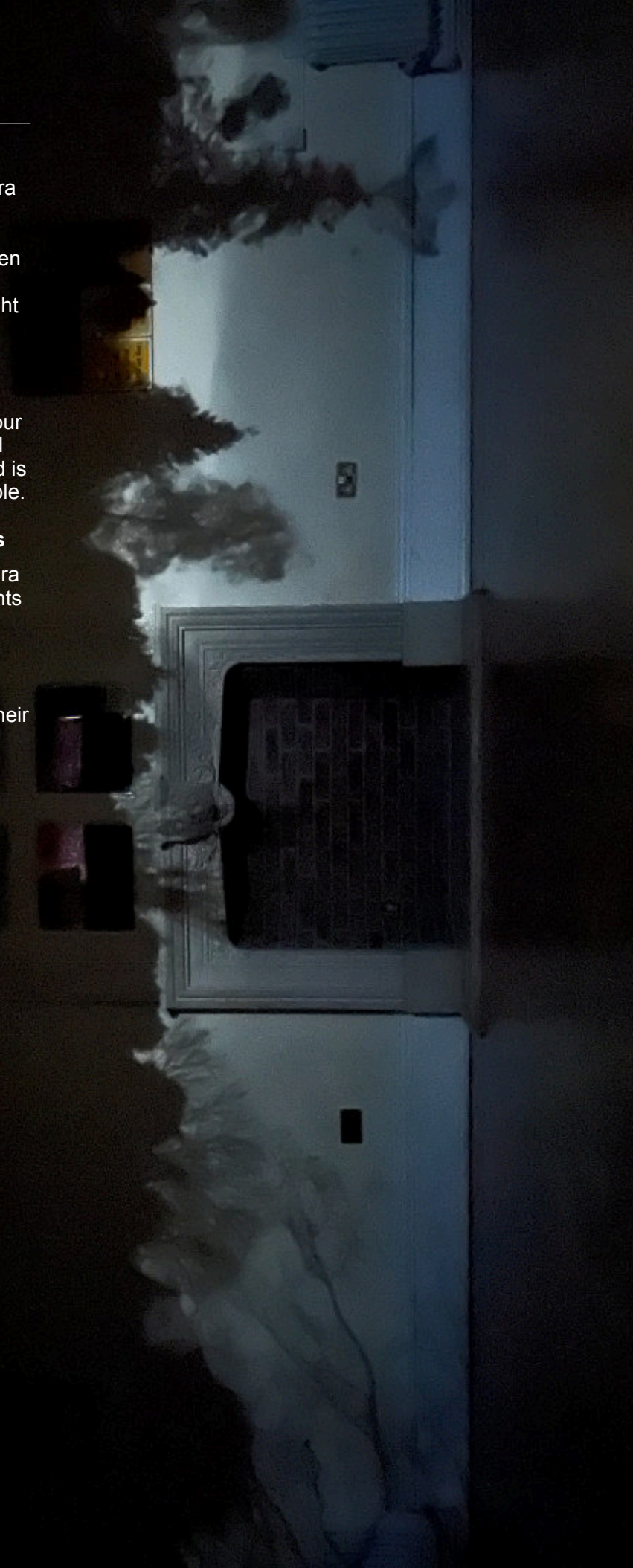
The usual difficulty with making a camera obscura is that the image is not bright enough. Experiment with the size of the hole to find the best compromise between brightness and sharpness of the image. Ensure there are no other sources of light in the room and the blackout is good – even a small light leak can make it very hard to see the image.

Make sure you allow enough time for your eyes to adapt to the low light levels. Full adaption can take up to 30 minutes, and is slower and less complete for older people.

Additional information and resources

The photographs show a camera obscura created by Rose Bruford College students Aaron Bailey, Gabriel Bisbey and Elise Hodson.

See the online version of this teaching methodology for a time-lapse video of their camera obscura (Q31013).



Making a

Miniature Camera Obscura

Key Information

Number of learners Between 1 and 10

Number of staff The project can be done as a structured classroom activity with one teacher, or by one or more people working independently.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to create a miniature camera obscura, to find out about the history and theory of this historic technique.

Aims

By creating a camera obscura, you will find out about:

- The fundamentals of the optical systems used in cameras and projectors
- Some of the optical theory of image and shadow sharpness
- The early history of image-making and projection
- The performance potential of simple technologies

Additionally, the project can be an opportunity to develop practical, craft skills working with basic materials.

What You Will Need

Duration and schedule

Preparation by teacher:

1-2 hours to gather physical materials and learning materials. It is recommended to do a test of the planned method of creating the camera obscura, to ensure it works effectively.

Preparation by learners:

None.

The project can be done in half a day, but can be extended by further experimentation.

Room or type of space

A classroom or workshop space, with tables. It is helpful to have windows with a view, to provide a well-lit scene to look at through the camera obscura.

Equipment

Required:

Scissors, craft knife, cutting mat. Something to make a small hole in an aluminium drinks can, such as a bradawl or a small nail and hammer.



Optional:

Video or still photography camera with a tripod to record the results of the project.

Materials (consumables)

Required:

A cardboard box for each person. This can be as small as a shoebox, or much larger.

Black paper, tracing paper or white tissue paper (semi-transparent), adhesive tape.

An aluminium drinks can, or an aluminium foil food dish.

For each person, piece of heavy cloth that light does not come through, large enough to go over the cardboard box and the head of the person. If necessary, you can improvise with coats, blankets, duvets, and so on.

Learning resources (books, websites)

The history and basic theory of the camera obscura is described on Wikipedia: https://en.wikipedia.org/wiki/Camera_obscura

Video guide to making a camera obscura: <https://youtu.be/5l-bOBsQT74>



1. The main materials and tools



2. The hole for the screen



3. The hole for the pin-hole



4. Aluminium foil for the pin-hole

Process

Preparation

Gather the materials required.

The learning activity

Making the camera obscura:

Use the craft knife and scissors to cut the ends off the aluminium drinks can. Then cut a square piece from the side of the can, about five centimetres square. Take care not to cut yourself with the tools or the edges of the cut can, which can be very sharp. Alternatively, use an aluminium foil food dish (such as pies come in), which can be cut with scissors.

Use the bradawl or a nail and hammer to make a small hole in the centre of the piece of aluminium. The smaller the hole, the sharper the image will be, but the darker it will be. You may need to experiment to find the best compromise.

Cut a hole in the end of your cardboard box about one or two centimetres square, and tape the piece of aluminium over it.

At the opposite end of the box, cut out a large hole, just smaller than the side of the box. Tape tracing paper or white tissue paper over this hole to form the viewing screen.

Using the camera obscura:

Point the end of the camera obscura with the small hole at a window or other brightly lit scene. If it is dark outside, try using a computer screen, with the room lights off or dimmed. Place a cloth over the top of the camera obscura and your head to cut out the light in the room.

Wait for your eyes to adjust to the dim image on the screen – this may take several minutes. You should now be able to see the scene in front of you, upside down and reversed left-to-right.

Simple experiments:

- Try different sized holes; look at the effect on the brightness of the image, and its sharpness.
- Try different sized and shaped boxes - what happens to the image?
- Try holding different lenses over the hole; what effects do they create?

More complex experiments (these will require additional time and equipment):

- Use a camera to photograph the scene on the screen of the camera obscura. You may need a tripod and a slow shutter speed to get a sharp image. Phone cameras with a 'night mode' can also work well.
- Create a performance to be played outside the window, and video it on the screen of the camera obscura. What kind of experience does this create? How can you use this effect as part of your story-telling?
- Create a lighting installation outside the window, and video it through the camera obscura at night.

Assessment and feedback

The project gives opportunities to experiment and made your own discoveries, as well as learning directed by a teacher. Teachers can use questions to guide learners towards different aspects of the project, as well as testing their understanding.

Our Experience

Tips

The usual difficulty with making a camera obscura is that the image is not bright enough. Experiment with the size of the hole to find the best compromise between brightness and sharpness of the image. Ensure there are no other sources of light in the room and the blackout from your cloth is good – even a small light leak can make it very hard to see the image.

Make sure you allow enough time for your eyes to adapt to the low light levels. Full adaption can take up to 30 minutes, and is slower and less complete for older people.

Additional information and resources

We made our camera obscura in a shed. See the photos here for the process, and over the page for how we controlled the ambient light to improve the image contrast.



5. Making the pin-hole



6. Tracing paper taped in place



7. Pin-hole taped in place



8. The pin-hole is about 3mm diameter

Controlling the ambient light

Our shed has only one window, so rather than use a coat or blanket over our heads to block out the light, we used cardboard to block out most of the daylight from the window and make it dark enough inside the shed to see the image.



9. Low contrast due to too much ambient light



10. A hood to reduce light spill on the screen



11. The set-up in the shed



12. Image and ambient light are roughly equal



13. Higher contrast compared with (9) after ambient light reduced

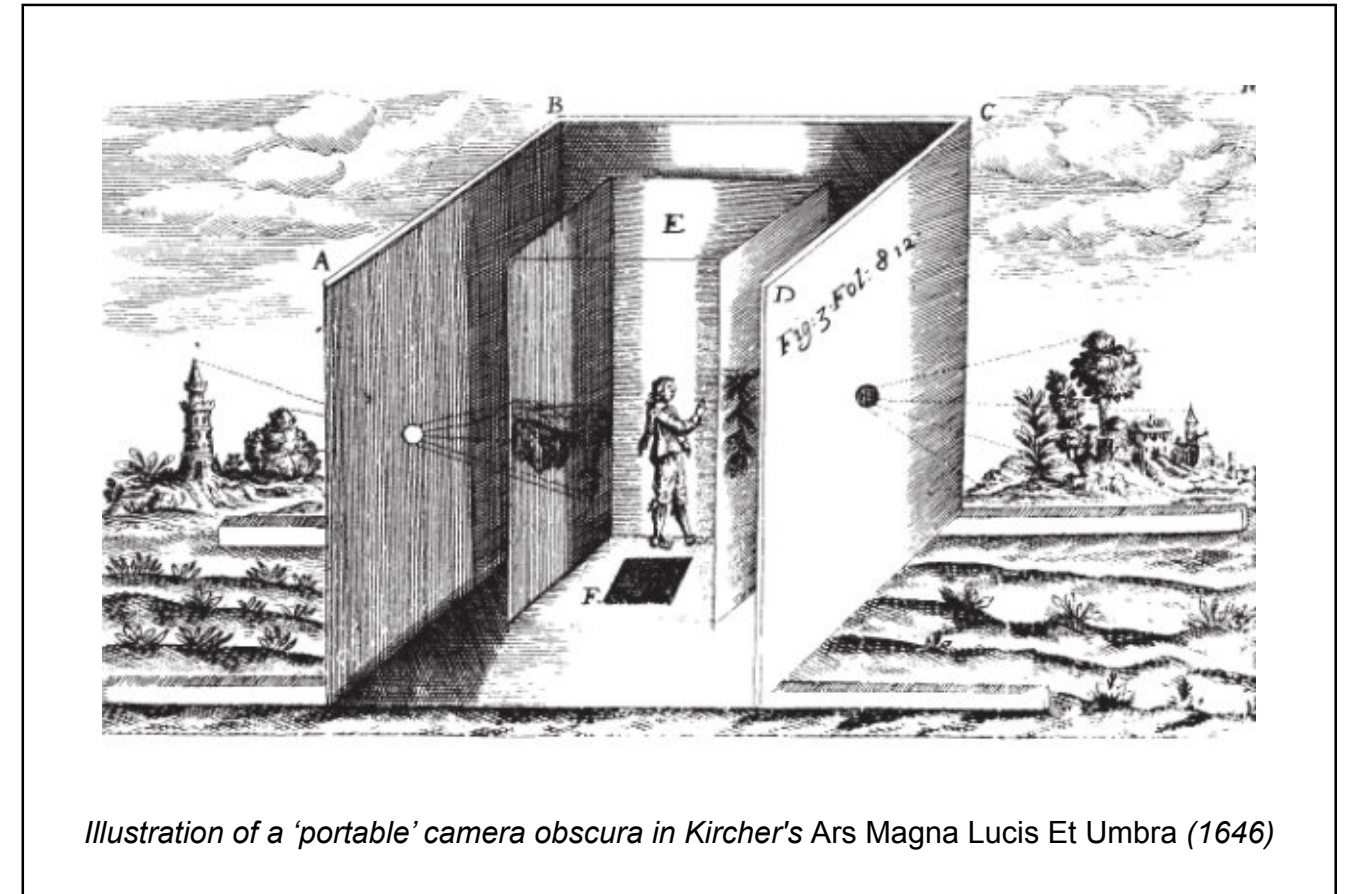


Illustration of a 'portable' camera obscura in Kircher's *Ars Magna Lucis Et Umbra* (1646)

Making a

Saltwater Dimmer

Key Information

Number of learners The project can be done by small groups of 2-4 working together, or as an individual activity.

Number of staff The teacher

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

● Student of technical theatre

Student of theatre design, architecture

Student of theatre arts

● Professional

● Researcher

● General public

A project to make a salt water dimmer. These dimmers were used in the early days of electric lighting in theatre.

Aims

The project will:

- Introduce you to the workings of a salt water dimmer
- Demonstrate basic electrical principles
- Allow you to explore the detail design considerations of salt water dimmers.

What You Will Need

Duration and schedule

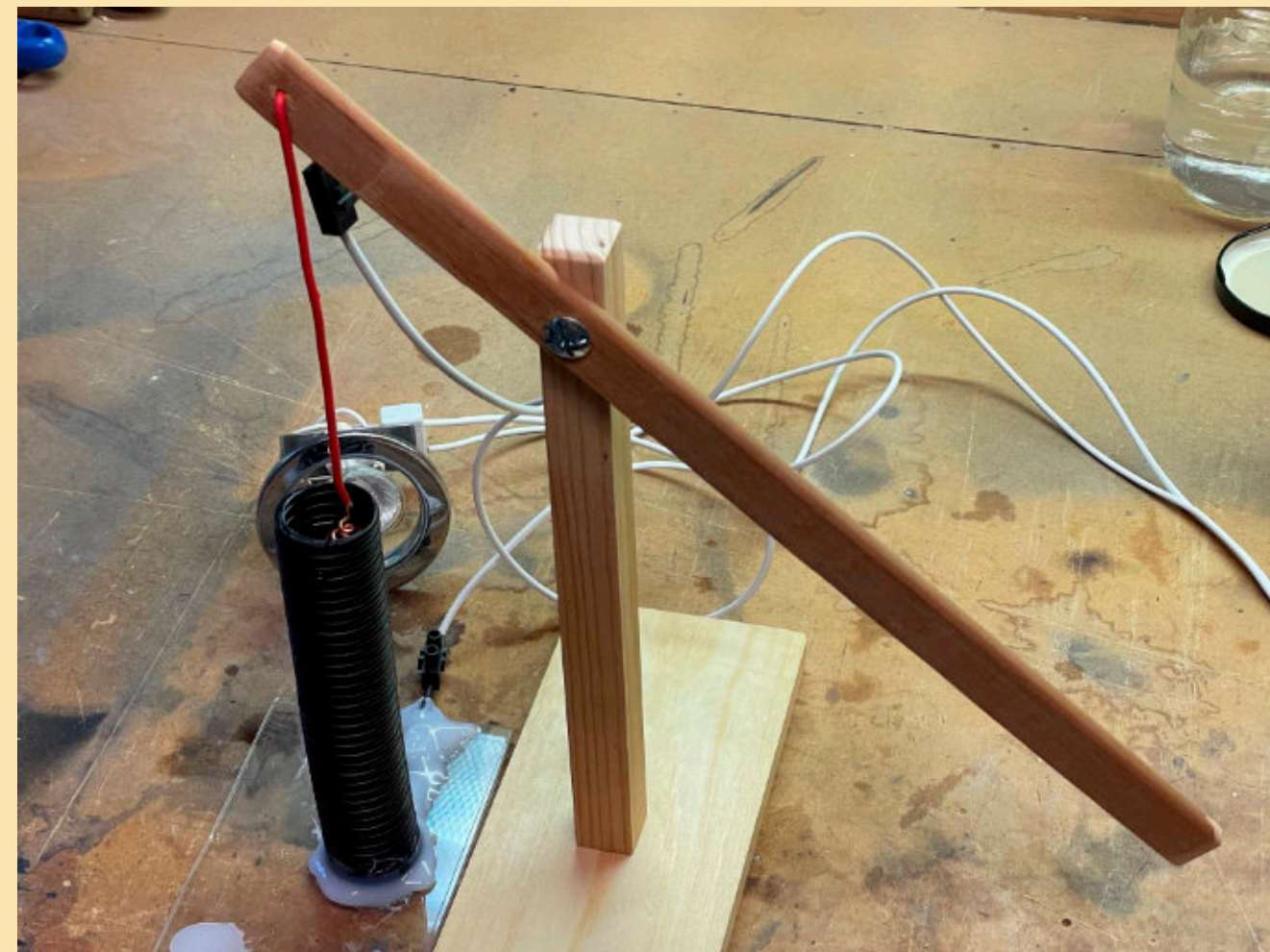
Building the dimmer takes 1-3 hours. Additional exploration of the concept can take another 1-3 hours.

Room or type of space

A workshop or making space. The project involves water, so bear this in mind when choosing a space.

Equipment

- Glass jar or similar container
- 12-volt lighting transformer. It is important the transformer outputs alternating current (AC). A direct current (DC) supply will work, but it will electrolyse the salt water, generating oxygen, hydrogen and chlorine gasses which are a potential fire and poisoning hazard.
- 12-volt light source, such as a 'birdie' spotlight, or a domestic light fitting. Lamps for car brake or side lights are also suitable.
- Tools:
 - Electrical wiring tools – cutters, wire stripper, screwdrivers
 - Hot glue gun
 - Hacksaw
 - Craft knife



Materials (consumables)

- Water
- Salt (ordinary cooking salt)
- Flexible electrical cable
- Single core electrical cable
- Connector blocks
- Plastic tube
- Plastic sheet
- Various sizes of wood
- Glue sticks
- Screws and bolts

Learning resources (books, websites)

Demonstration and explanation of the salt water dimmer by Jonathan Bastow: <https://youtu.be/wRMEAYYW0dc>

Process

Preparation

Gather tools and materials.

Prepare a short introduction to the concept of the salt water dimmer, and its historical application.

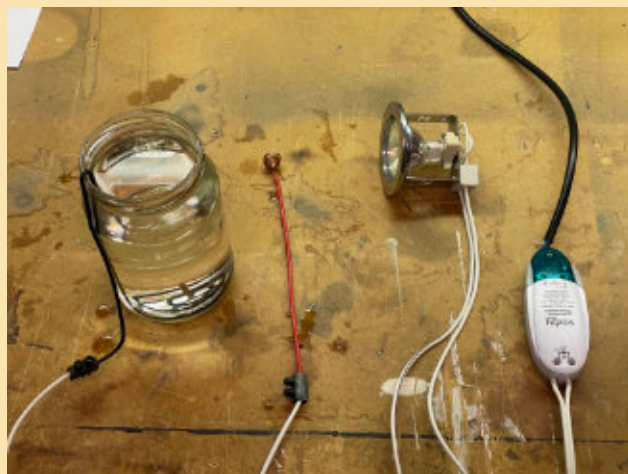
Prepare a safety briefing.

The learning activity

Introduce students to the concept of the salt water dimmer, and its use in the early days of electric lighting in theatre.

Give students a safety briefing, covering the following points:

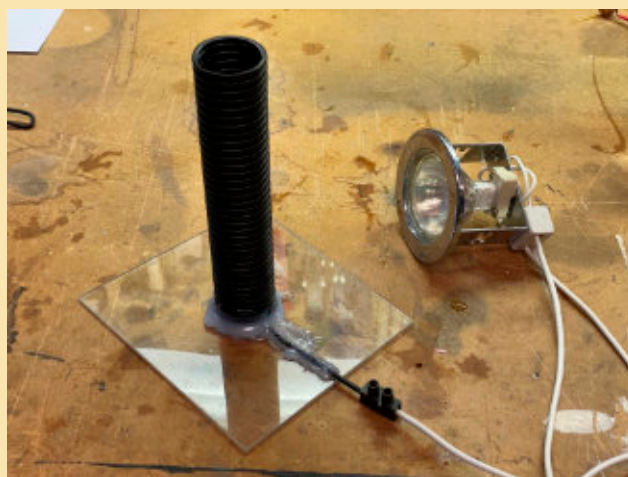
- The project operates at 12 volts, and so is electrically safe. If the transformer you are using is not pre-wired with a mains cable and plug, the mains side of the transformer should be wired by an electrically competent person.



L to R: jar with salt water; top electrode, lamp, transformer



The bottom electrode



Tube dimmer

- Safety eye coverings are advised.

Stage 1 – initial test and demonstration

The dimmer needs two electrodes – one in the bottom of the glass jar, and one to be lowered into the water. Use the single core cable to make these, so they can be bent to shape and stay in position. See the photos for the details of these.

Fill the jar with water, and add salt. The more salt you add, the better the water will conduct electricity, which can mean that the light comes on as soon as the top electrode touches the water. Start with a tablespoon of salt, and add more if necessary.

Wire up the transformer output to the dimmer and the light source - see the accompanying circuit diagram.

Once everything is wired up, plug in and turn on the transformer. Gently lower the top electrode into the water, and down towards the bottom electrode. You should see the light gradually come on. When the two electrodes touch, the light will come on to full brightness. Watch the video below to see how this works.

At this stage, you have a working dimmer, but you may find either the light starts to glow as soon as the top electrode makes contact with the water, or it only starts to fade up when the two electrodes are very close together. Try:

- adjusting the amount of salt in the water. The more salt, the more conductive the water will be, the more easily the current will flow, and the brighter the lamp will be for a given position of the top electrode.
- cutting a length of plastic tube to the height of the jar, and placing it over the bottom electrode while lowering the top electrode down through the tube. This will reduce the flow of current and make the light dimmer for a given position of the electrode.

Stage 2 – controlling the dimming action

To make your dimmer more controllable, you can build this, slightly more sophisticated design.

If you found the dimmer more controllable with the plastic tube, use the hot glue to stick the tube to a base of plastic sheet, including a bottom electrode. Use hot glue to make sure the joint is watertight, especially round the cable.

Make a lever on a stand to control the dimmer with

– the see photos. Make sure you work out the travel of the top electrode you need to give the full dimming range from off to fully on. Use a long lever on the operating end to give a high level of control.

Connect up your new dimmer, and test it out. If you have got the travel on the lever right, you will find you have a good level of control of the brightness. You will probably find that the light level 'jumps' up to full when the electrodes come into contact – this is very difficult to avoid.

Stage 3 – extension activities

Once you have made a functioning dimmer, you might want to do some of these additional activities:

- Make a scale for your dimmer handle, so you can reliably set a brightness level.
- Make several dimmers, to control multiple lights. What difficulties do you encounter when trying to control several dimmers? How can you solve them?
- Experiment with lamps of different wattages. How does this change the way the dimmer works – does the lamp start to glow at the same position of the handle? Does it face up in the same way? Investigate how you can make several dimmers work the same, so you can have all the lights fading up and down at the same rate.

Assessment and feedback

The project is not designed to be formally assessed. Students get feedback informally during the process from the teacher. A group discussion at the end of the project will help students reflect on and embed what they have learned.

Our Experience

Tips

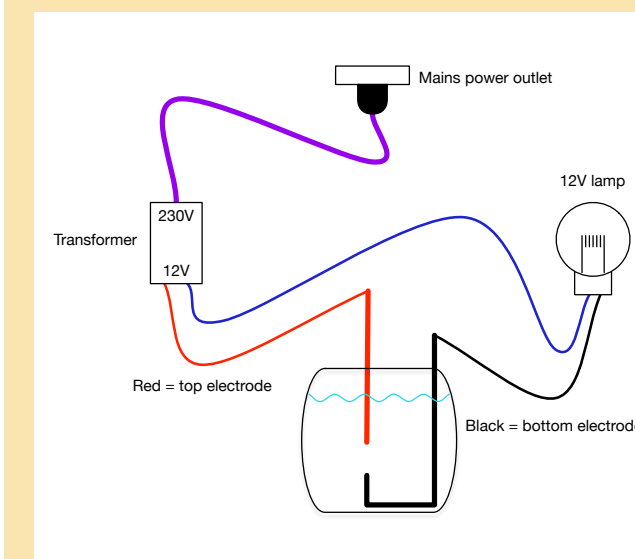
The project works best with a traditional wire-wound transformer and an incandescent (tungsten filament) lamp. These are increasingly difficult to obtain, however. Electronic transformers meant for incandescent lighting generally work well. Dimmable LED lamps should be OK, but made sure they are the 12 volt type. Most fluorescent lamps will not be suitable.

The project may require some experimentation to get it to work – small changes in the materials, size and configuration of the various parts, the type of lamps and transformer used, and the

strength of the salt solution, all make a difference. Treat it as a science experiment, testing alternative set-ups, making notes of what works, and thinking through what you observe. A basic knowledge of electrical circuits will help you here.

Additional information and resources

More photos and videos of our saltwater dimmer are available at the online version of this teaching methodology: Q31017.



Circuit diagram

Safety Notice

Please note the safety guidance above. The original salt water dimmers worked using mains electricity, and so were potentially very dangerous. They did not have to comply with modern safety standards, but you should only build this dimmer system using a 12-volt transformer and lamps. If in any doubt, consult an electrically competent person. Always undertake a risk assessment, following the safety standards in your locality.

Making a

Linnebach Projector

Key Information

Number of learners	The project can be done by small groups of 2-4 working together, or as an individual activity.
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to make a Linnebach projector. This simple form of projection, dating from the early 20th century, was the first large-format projection used in theatres.

Aims

The project will:

- Introduce you to the principle of the Linnebach projector
- Demonstrate basic optical principles
- Allow you to explore in detail the scenographic potential of projected images, light and shadow.

What You Will Need

Duration and schedule

Preparation by the teacher: 1-2 hours

Preparation by the students: none

Building the projector takes 3 hours. Additional exploration of the concept can take another 1-3 hours.

Room or type of space

A room where you can hang things, and get a good blackout. A small lighting studio is ideal, especially if it means you having access to a lighting dimming and control system. However, there are ways to make the project work without these facilities – you may need to think about how you can support the plastic sheet from the ground, rather than hanging it, for example.

Equipment

- A sheet of transparent plastic ('Perspex'), at least 60cm square. It can be helpful if it is somewhat larger.
- A theatre spotlight, either fresnel or PC type, which you can take the lens out of (see safety notes below), and a stand to rig it on.
- A projection screen. Alternatively, your room can have a plain white wall to project on.



Tools:

- Craft knife
- Scissors
- G-clamps or similar – something to grip the plastic sheet so you can hang it up
- Straight-edge
- Marker pen
- Optional: additional spotlights.

Materials (consumables)

- Cardboard – a large cardboard box you can cut up is ideal.
- Parcel tape
- Clear adhesive tape
- String
- A range of lighting gels

Learning resources (books, websites)

Canon stories:

- B.06 Infinite Skies: Lighting the cyclorama

Canonbase articles:

- Linnebach projector (Q639)
- Adolf Linnebach (Q419)

Process

Preparation

Gather tools and materials.

Remove the front lens from your fresnel or PC spotlight. Not that this is a safety hazard that needs careful managing:

- The open front of the spotlight allows access to the lamp, which is very hot when on, and stays hot for a long time even when off. It also allows access to the internal electrics, so there is the risk of shock as well as burns.
- Very high powered lamps give out UV light, which can cause burns and 'arc eye' – a burn to the retina. The UV is normally blocked by the lens, so the spotlight is quite safe under normal circumstances. Use a tungsten-lamped spotlight with maximum power of 500W. Do not use a spotlight with an HMI or similar discharge lamp.

If in any doubt, do not remove the lens. The Linnebach projector will still work, but with a softer image, which can actually be an advantage – see below.

Prepare a short introduction to the concept of the Linnebach projector, and its historical application.

Prepare a safety briefing, covering the points above.

The learning activity

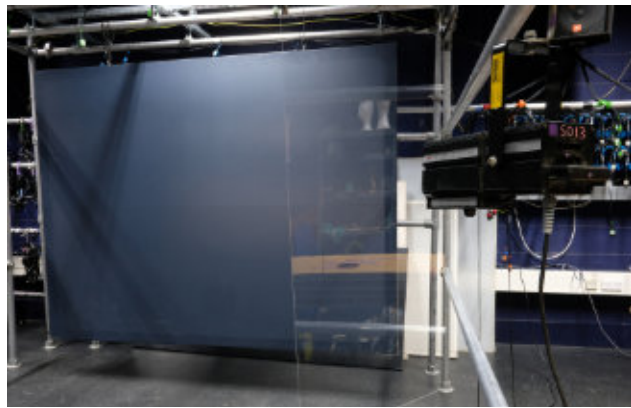
Introduce students to the concept of the Linnebach projector, and its use as the first large-format projection system in theatre.

Give students a safety briefing, covering the points noted above.

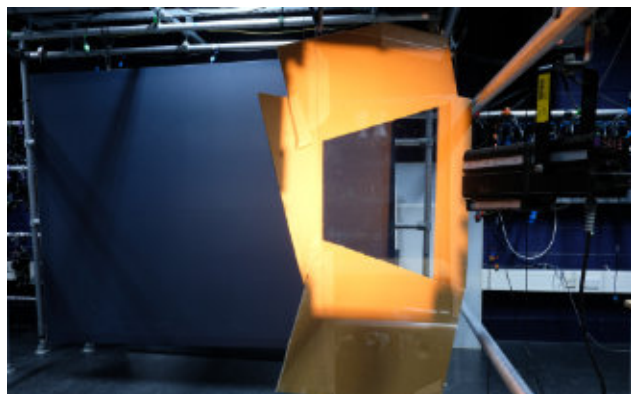
Stage 1 – initial demonstration

Position the spotlight in relation to the screen or projection surface, so it can illuminate the full screen. It is helpful to imagine the screen as the backdrop or cyclorama in a theatre, and your spotlight is positioned in one of the downstage corners, just behind the proscenium arch and so out of view.

Hang the clear plastic sheet around 50cm in front of the spotlight. Make sure that all the light falling on the screen is passing through the plastic, not around the edges, with a bit of margin to spare.

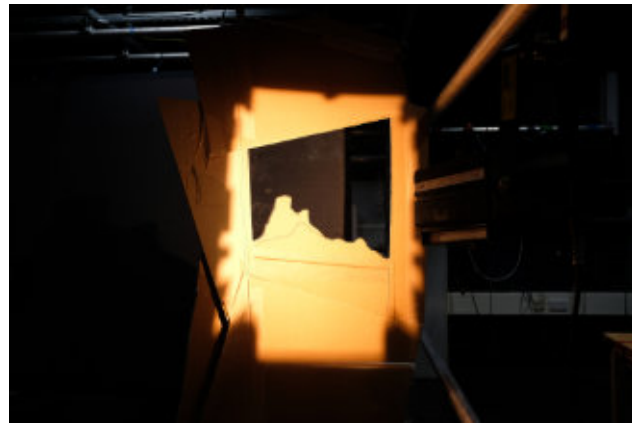


Use strips of cardboard to mask off the light that is falling outside the edges of the screen, attaching them with tape. Because you are lighting the screen at an angle, your cardboard strips will also need to be angled. This is a key principle of the Linnebach projector, and indeed all types of projection in the theatre – your artwork needs to be distorted to correct the distortion you get from projecting at an angle to the screen:



Note – you can avoid the need to distortion-correct your artwork by placing the plastic sheet parallel with the screen surface, so your spotlight is at an angle to both screen and plastic sheet. You will need a bigger piece of plastic, however.

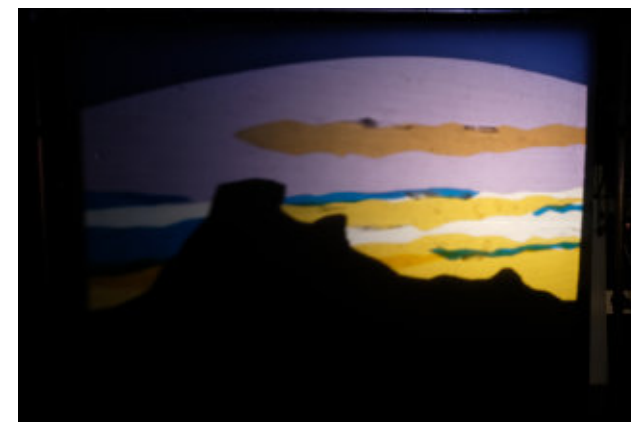
Create a horizon from another piece of card. Think about the kind of landscape you want to make – mountains, trees, buildings. Position this card so its shadow forms the horizon on the screen where you want it:



Start building up your sky from strips of different coloured lighting gel. Experiment with different colours, shapes, and the effect of overlapping pieces. Use transparent adhesive tape for this:



Once you are satisfied, your basic demonstration of the Linnebach projector is complete:



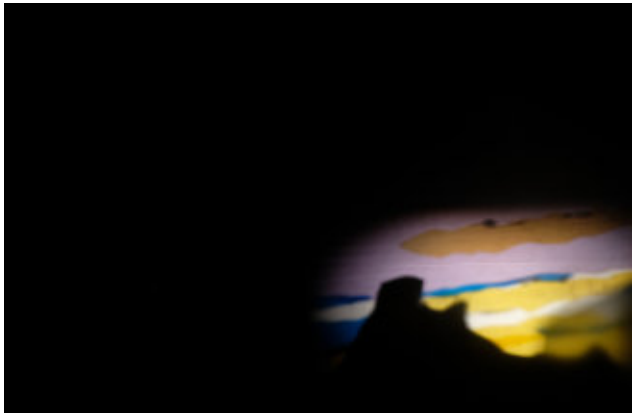
Stage 2 – extension activities

Once you have made a functioning Linnebach projector, you might want to do some of these additional activities:

- You may find the resulting image is sharper than you want, or softer. The sharpness depends on the size of the light source (the filament of the lamp if you have taken the lens out of your spotlight), the distance from the source to the artwork, and the distance from the artwork to the screen. Try experimenting with these factors. We found our image was sharper than we wanted, so we added a diffusion filter ('frost' gel):



- Experiment with lighting. Try having your spotlight at different brightnesses, and see what happens if you also light the screen with a wash of dark colour.
- Try adding a second spotlight, coming through the artwork from a different position, but still lighting the screen (see the next page).



What happens when you combine these images, or fade between them? Can you add a third source? Can you create a lighting sequence, to show, for example, 'sunrise'?

- Experiment more with the artwork – try out different transparent materials such as bubble-wrap. Can you draw directly onto the plastic with a marker pen? The original Linnebach projection used either photographic slides or artwork painted onto glass using translucent paints and dyes.
- Experiment with a second projector lighting the screen from the other side. This will balance out the inevitable fall-off in brightness across the width of the screen, and create interesting opportunities for overlapping images that combine to make the final effect.

Assessment and feedback

The project is not designed to be formally assessed. Students get feedback informally during the process from the teacher. A group discussion at the end of the project will help students reflect on and embed what they have learned.

Our Experience

Tips

The key to the project is experimentation. Once you have a basic projected image, you will probably find your initial artwork feels crude and simplistic. The secret is to keep working on it, adding layers, trying different techniques. The more you combine things, the better it is likely to look.

Also remember you are making a backdrop to the performance, not the performance itself. Keeping things slightly vague, not too clear, will give a more impressionistic effect that won't draw too much attention. Don't aim for realism or small details.

Safety Notice

Please note the safety guidance above. If in any doubt, consult a competent lighting technician. Always undertake a risk assessment, following the safety standards in your locality.

Our "sunrise in the desert" sequence. A video is available at the online version of this teaching methodology: Q31020.



Pepper's Ghost

Key Information

Number of learners The project works best with groups of 3 or 4. Up to 5 groups can work in the same room, if you have the resources. Alternatively, you can make this project working independently.

Number of staff 1 teacher

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A project to demonstrate at model scale the technique of Pepper's Ghost – a way to make a ghost appear on stage using a sheet of glass.

Aims

The project aims to:

- Demonstrate the technique of Pepper's Ghost
- Explore the technique's dramaturgical possibilities – how it can be used as part of a performance to tell stories
- Introduce students to the optical principles of mirrors
- Develop an understanding of how light can be used to control the stage picture

What You Will Need

Duration and schedule

Preparation by the teacher: 1-2 hours.

Preparation by the students: None.

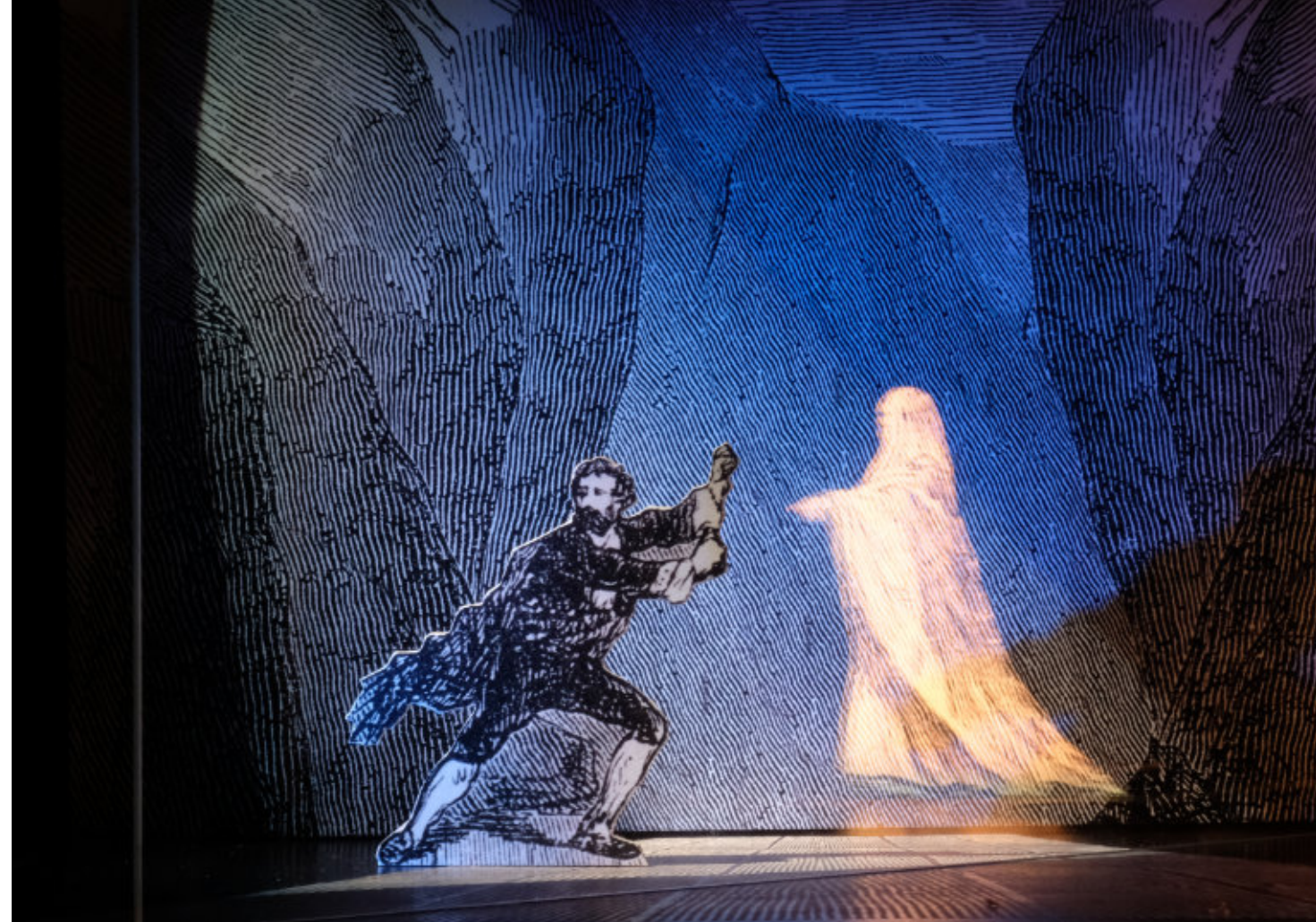
The project: 3 hours, or longer if you do the additional activities suggested.

Room or type of space

A small lighting studio is ideal, but any space that can be blacked out will work.

Equipment

- A range of light sources. Miniature spotlights are ideal, but you can improvise with desk lamps, torches, mobile phones, and so on.
- A small sheet of glass or clear plastic. The glass from a picture frame is ideal. Make sure any sharp edges are taped over.
- Tools for working with paper and card:
 - Craft knife
 - Metal ruler
 - Scissors
 - Glue
 - Adhesive tape



- Paper clips
- Marker pens

Optional:

- A camera to photograph or video the result.

Materials (consumables)

- A cardboard box. It is best if this is roughly a cube, about 30-40cm across, as this will be the basis of your model stage. Alternatively, you can make the stage from separate sheets of cardboard or wood.
- Stiff card, to cut out the characters from.
- Large sheets of paper, to draw the scenery on. Alternatively, you can print out our artwork for the scenery and characters.

Learning resources (books, websites)

Canon stories:

- B.05 Phantasmagoria: Pepper's ghost and the magic lantern

Canonbase articles:

- Pepper's Ghost (Q305)
- The Corsican Trap (Q30026)

Process

Preparation

Prepare a short presentation to the students explaining the history of Pepper's Ghost, and how the technique works.

Gather the materials. You may want to prepare the scenery and characters in advance, or you may want the students to make them.

The learning activity

Start with a short presentation to the students, explaining the history of Pepper's Ghost, and how the technique works.

Unless you have prepared it in advance, have the students make their theatre and scenery from the materials provided:

- Cut openings in the box to make a proscenium arch, and so the sides of the stage are open.
- Decide on a scene for the action to take place in. This can be based on an actual play, or invented for the project.
- Make a scenic floor for the scene.

- Make a back scene and attach it to the inside of the box at the back of the stage.
- Make the characters as cardboard cut-outs, with a base so they can stand up. At minimum, you need two characters – one to appear as a ghost, and one to be frightened!
- Rig the sheet of glass or clear plastic going diagonally across the stage.

If you are working with several groups, wait until every group has finished their theatres. Then you can turn the room lights off, and start lighting the stages. Ask the students to create lighting for:

- The stage, including the character(s) on it.
- The ghost. The ghost is placed in one of the wings at the side of the stage, so that you can see it reflected in the glass when looking from the front.

You will need to carefully adjust the placement of the glass sheet, the ghost figure and the lighting to get the right effect when viewing from the front of the stage. Once the effect is working, turning the lighting on the ghost on and off will make it 'magically' appear on stage, next to the other character.

Optional additional activities:

- Create a short performance, either based on an existing scene from a play, or one the students devise.
- Photograph and video the Pepper's Ghost effect in action.
- Explore how the staging and the lighting can be varied to create different effects:
 - What happens if you move the ghost nearer the stage, or further away?
 - Can the ghost appear in different ways – walking into the scene, or appearing as the light comes on?
 - How much can you control the transparency of the ghost? Can you make this part of the story?
 - How much does the viewing angle matter? Imagine sitting in different parts of the theatre, looking at the stage from different positions – what does this do for the effect? Who has the best view?
- The example described here uses a sheet of glass placed diagonally across the stage, with the ghost in the wings. Pepper's Ghost can be done with the glass at the front (so taking up less of the stage) and the ghost in the orchestra pit. Try rebuilding your model

stage in this configuration – what are the advantages and disadvantages of each method?

- Research other methods to bring a ghost onto the stage, such as the Corsican Trap. How do these compare to Pepper's Ghost? Why would you choose one over the other?

Assessment and feedback

The project is not designed to be formally assessed. Students get feedback informally during the process from the teacher. A group discussion at the end of the project will help students reflect on and embed what they have learned.

Our Experience

Tips

There are two things that are critical to making the Pepper's Ghost effect work well: positioning the glass and the ghost figure, and lighting.

It is a good idea to get the glass and the ghost positioned while working under general room lighting. Keep adjusting things until you can see the reflection of the ghost where you want it, when looking at the stage directly from the front. Then experiment with slight changes to the angle of the glass, and the position of the ghost, so you understand how it all works. This is an important learning aspect of the project.

Once you have got the ghost and the glass positioned, you can start lighting. You might need to cut extra holes in the box to allow light in from the directions you want. Experiment to see what lighting angles work best – in general, you want to keep light off the glass as much as possible.

Use pieces of paper or card with a hole cut in to act as a 'gobo' (go-between), to shape the beam of light. This is especially useful if you are improvising your light sources with desk lamps, torches and so on.

Relate your lighting to your story – try to create candlelight or moonlight if that fits your theme. Think about what kind of ghost you want – is it a green pantomime ghost, or a sinister cold blue ghost, or...?

Additional information and resources

You can design and make your own setting, but if you want to use the one we made from a 19th century engraving of Pepper's Ghost, it is available at the online version of this teaching methodology: Q31021.



Assembling the tools and materials.



The cardboard box with holes cut for the proscenium opening and wings, and access through the top of the stage.



Front view, with backdrop and floor in place.



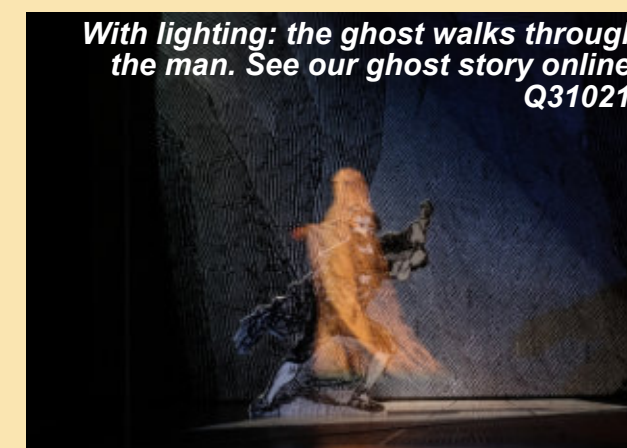
The figures in place, to check their positions and lighting angles.



The steps allow the ghost to rise up.



Top view, showing placement of the figures.



With lighting: the ghost walks through the man. See our ghost story online, Q31021.

Discovering Lighting Control

With Virtual Grand Master

Key Information

Number of learners	1-5
Number of staff	The teacher. The project can also be done by one or more learners working independently.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A practical exercise to learn how different control technologies from different periods affect the resulting lighting on stage, using a software 'virtual' Grand Master lighting control from the 1930s.

Aims

Through this exercise, learners will find out:

- How pre-electronic lighting control systems of the 1930s worked
- How the type of control system used affects the lighting changes that can be achieved
- How to plan the operation of a lighting design to suit the control system

Additionally, the exercise is an opportunity for learners to develop their team-working and practical lighting skills.

What You Will Need

Duration and schedule

Preparation by teacher:

1-2 hours to prepare equipment and decide on the brief to the students. It is recommended to try out the exercise in advance, if you are not familiar with the equipment.

Preparation by learners:

None.

The exercise can be done in half a day, but can be extended by including a performance element, or by further experimentation.

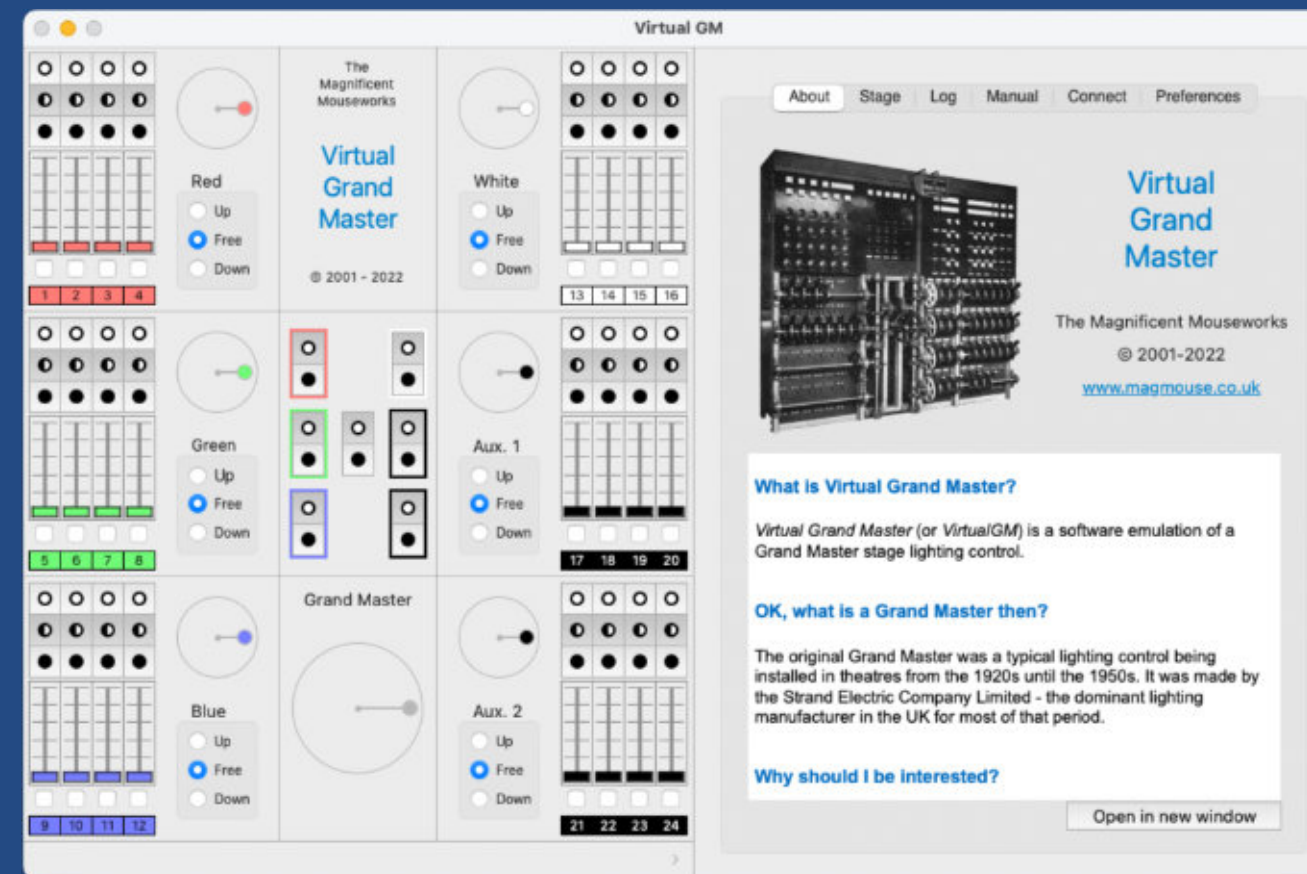
Room or type of space

Either:

A theatre or lighting studio space with a lighting rig

Or:

A computer running a lighting visualisation software such as WYSIWYG (<https://cast-soft.com/wysiwyg-lighting-design/>) or Capture (<http://www.capturesweden.com/>). Any visualiser will work, as long as it can receive DMX data via the Art-Net protocol.



The software Virtual Grand Master

In either case, you will need a modern lighting console to compare with the software 'virtual' Grand Master control.

Equipment

- Virtual Grand Master, a software emulation of a 1930s Grand Master lighting control system, running on either a PC or Mac computer. You can download Virtual GM from <http://www.magmouse.co.uk/virtual-grand-master.html>.
- If you are using a real lighting rig in a theatre or lighting studio, you will need:
 - an interface to allow Virtual GM to output DMX to connect to the real-world dimmers. Virtual GM can use the Art-Net protocol or a LanBox DMX controller – see the Virtual GM manual for more details
 - a modern lighting console to compare with Virtual GM
 - optionally, if you have a simple 2-preset manual lighting desk, that will give students another point of comparison.
- If you are using a visualiser, you will need:
 - a network link to connect Virtual GM to the computer running your visualiser, so Virtual GM can send DMX data via the Art-Net protocol to the visualiser software
 - either a modern lighting console to compare to Virtual GM, connected to the visualiser, or a modern software-only lighting control. These can usually connect with visualiser software internally within the computer.

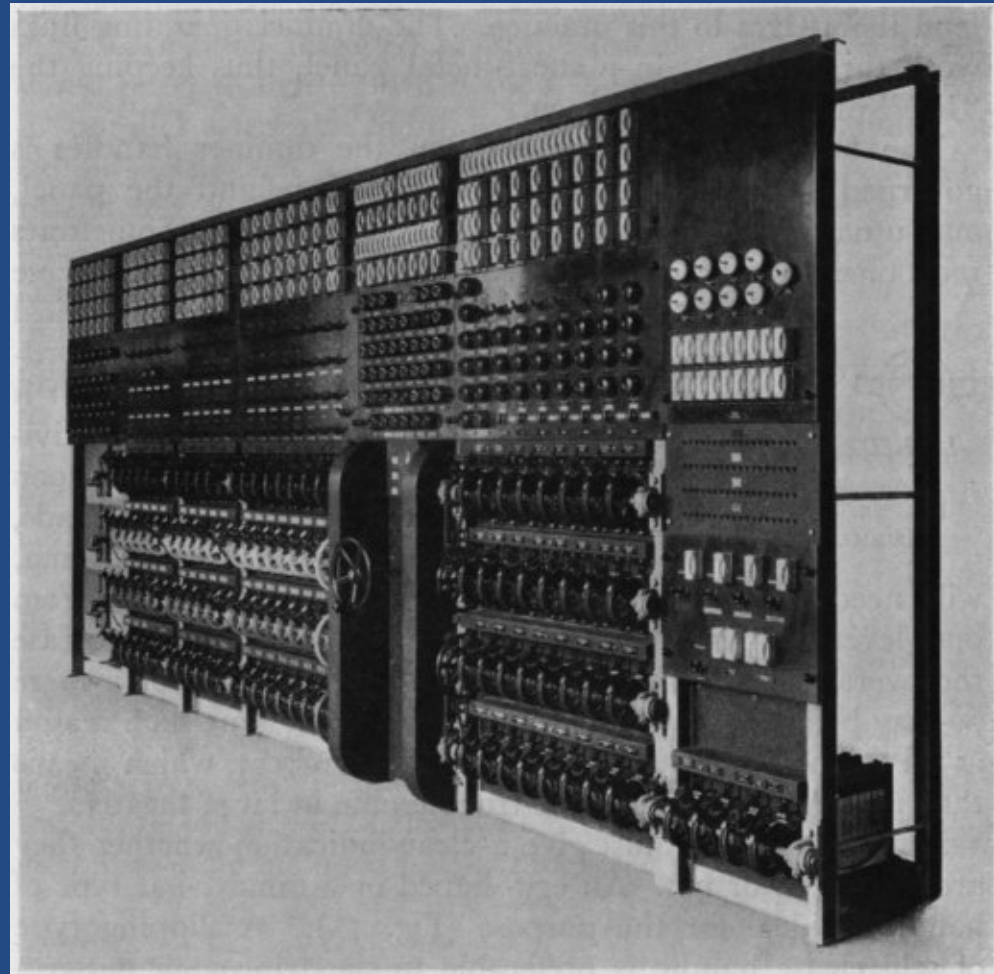
Materials (consumables)

None.

Learning resources (books, websites)

Download Virtual GM software for Mac and Windows from: www.magmouse.co.uk/virtual-grand-master.html.

Information about the Grand Master lighting control system of the 1930s: www.theatrecrafts.com/bhc/equipment/strand-grand-master-board



100-dimmer Grand Master

Information about the various lighting visualisers available: learnstagelighting.com/want-lighting-visualizer/

Information about the Art-Net protocols, that sends DMX lighting data over an ethernet computer network: art-net.org.uk

Process

Preparation

Ensure the technical set-up works – test the connections, settings, and so on so you are confident everything is working before the students start the exercise.

Prepare a brief for the students, asking them to create a lighting sequence. The sequence should include a variety of lighting states, including general lighting, ‘specials’ such as spotlights on particular areas of the stage, and colour-mixing from washes of different colours. Also include cues of different speeds, with different groups of lights increasing and decreasing in level.

You may want to prepare a lighting rig (either physical or in the visualiser), or you may want to include this as part of the students’ learning.

The learning activity

Introduce the project, giving some background to the Grand Master and similar systems from the 1930s. Ensure students understand the principles and limitations of this type of control – these are explained in the About section of the Virtual GM software.

Explain the technical set-up to the students, especially if they are not familiar with some of the equipment.

Give the students the cue sequence, and ask them to work together to plan how to plot the sequence on both the modern lighting console and the Virtual Grand Master. If you have a simple 2-preset manual lighting desk available, you can include that as well.

Allow the students time to plan and practice their

plots, then ask them to show the sequence run on the different control systems. Make sure everyone watches the results carefully – look for subtle differences in the way the lighting works between the controls. Run the sequence several times, and see how consistent the operation is.

Discuss what they have found – what difficulties did they meet? What solutions did they discover? Were there things in the sequence that were not possible to plot and operate? The Virtual Grand Master can be worked by two or more people, each operating a part of the control system – can this help overcome difficulties, and does it offer creative opportunities?

Assessment and feedback

The project gives students opportunities to experiment and make their own discoveries, as well as learning directed by the teacher. Use questions to guide students towards different aspects of the exercise, as well as testing their understanding.

Our Experience

Tips

The lighting sequence you give the students is critical to getting the most learning out of the exercise. It is a good idea to try it in advance, to make sure it is suitably challenging.

Theatre lighting in the 1930s was largely based on colour washes from over the stage, and sometimes also in footlights. Typically, red, green and blue washes from flood battens were used; sometimes the green was replaced with white, or

a fourth white light circuit was added.

This wash lighting was supplemented by a small number of spots in the auditorium providing front light, and more spots or beam lights from the side providing sculpting light and effects such as sunlight and moonlight. These washes and spots did not change greatly from production to production.

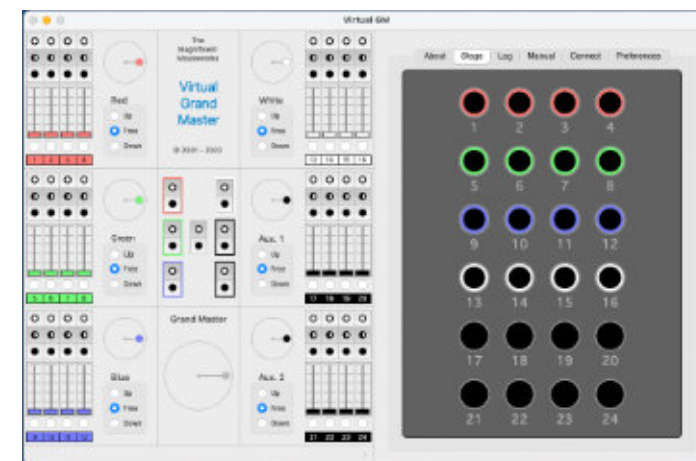
Auxiliary circuits were used for specials, such as light on specific pieces of scenery, or to pick out a performer for a speech, as well as effects such as clouds, and ‘practicals’ – lights on the set such as a table lamp.

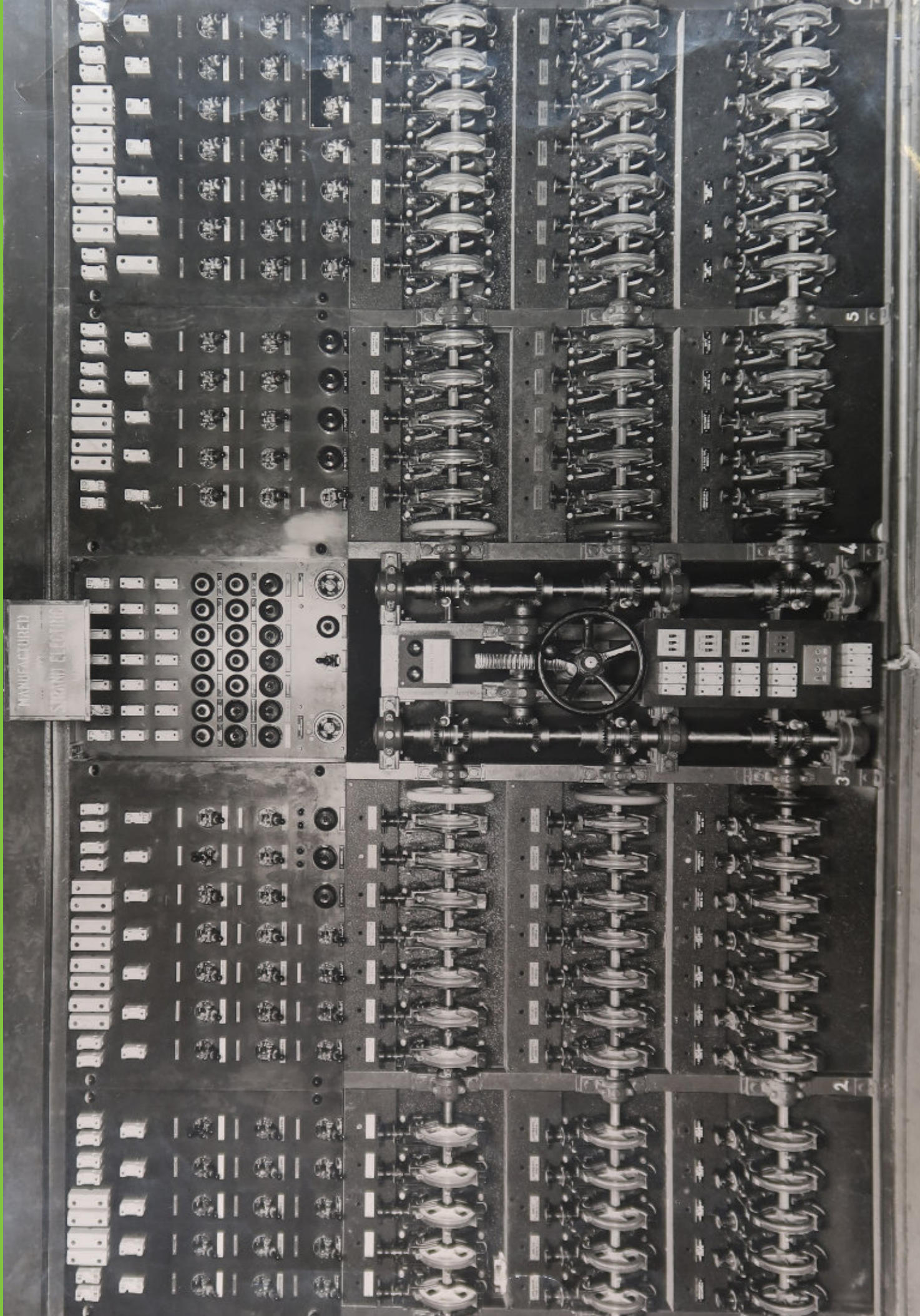
Use this information to plan the lighting rig and cue sequence, so it is realistic for the type of lighting the real Grand Master was designed for. As an extension exercise, you can have a second cue list based on more modern techniques and needs – all spotlighting, complex cue sequences and transitions between scenes, and so on.

If you have more time, you can create more elaborate scenarios, asking the students to light a scene from a play using period and modern methods. Some old play scripts, especially those aimed at amateur theatre companies, include a list of lighting cues and other production information at the back. These can be a useful basis for learning about older lighting methods.

Additional information and resources

A video of Virtual Grand Master, showing the operation of the main controls is available at the online version of this teaching methodology: Q31022.





Recipes for learning and teaching

in

Sound

Mixing and Microphone Workshop

Key Information

Number of learners	1-8
Number of staff	1 teacher, 1 drummer. A sound technician to support the workshop is useful.
ECTS Credits	2-3 credits, if combined with additional research and study.

Learning process

● Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
 - Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop to explore the difference between analogue and digital mixing consoles and learn about the history of mixing desks and microphones. Students also mix a live drummer and investigate the consoles and different microphone techniques.

Aims

Students will have the opportunity to:

- Learn about the history of mixing desks and microphones
- Explore signal paths in both analogue and digital desks
- Learn to use their 'ears' when mixing and balancing the sound
- Get to know and work with the mixing desks EQ section when mixing drums live
- Discover the differences in working with equaliser versus pads to dampen the resonances in drums
- Develop their ability to work and communicate with a musician and with the rest of the team

What You Will Need

Duration and schedule

Preparation by the teacher: Preparation in advance: 8-10 hours Preparation on the days of the workshop: 2 hours

Preparation by the learners: 2-3 hours

Length of time of the workshop: 3 days of 6 working hours, with breaks as required.

Room or type of space

A theatre or studio

Equipment:

- digital mixing desk
- analogue mixing desk
- front of house PA system (left-right active top speaker of good quality, 2 sub woofers of good quality

- amplifiers
- an effects unit to provide reverb, delay, etc for the analogue mixer
- drum kit
- microphones, including historical types if possible
- microphone stands
- all necessary cables
- monitor for the drummer
- lecture equipment: projector and screen or large display, whiteboard.

Materials (consumables)

Carpet and acoustic materials, to adjust the sound of the drum kit

Learning resources (books, websites)

Canonbase articles:

- Vintage Microphone World (Q30832)

Other resources:

Gareth Fry, *Sound Design for the Stage*, the Crowood Press Ltd, 2019.

David Collison, *The Sound of Theatre: From the Ancient Greeks to the Digital Age*, Entertainment Technology Press, 2020

Process

Preparation

Preparation by the teacher:

- hire a musician
- prepare study materials for the students
- plan the workshop days
- Check and set up the sound equipment
- check the drums

Preparation by the students:

Students should look at the reference material to understand the historical context of sound technique and mixing technique, and prepare a task:

Find music examples that you like and think about the sound quality image. Prepare a short presentation: 'why does the music sound so good and how was it achieved?'



The learning activity

Day 1:

- Each student plays their example piece of music and gives their presentation
- Seminar 1: Introduce the basic theory of analogue and digital sound (depending on the students previous knowledge and experience)
- Seminar 2: The history of microphones and mixing desks
- Seminar 3: How to set up the sound system and do a sound check

Day 2:

The teacher (in collaboration with the technician) goes through the signal paths of:

- The analogue mixer
- The digital mixer

Students have their own time with the mixer to undertake different tasks.

Day 3:

- The drummer demonstrates the drum and the setup
- Everyone does their own sound check, and mixes and records the drums being played, on the analogue and digital mixer
- All together: Listening to everyone's live mix of the drummer
- Discussion
- Summary and evaluation

Assessment and feedback

This workshop is not designed to be formally assessed. You can give feedback throughout the workshop, and students will want to ask questions and discuss the results during the practical exercises.

At the end of the session, summarise the key points of learning.

Our Experience

Tips

Make sure you are familiar with the mixing desk and the PA system.

Drum playing can be rather loud so check out the acoustics of the room you are using. Consider whether the drums should be built into a Plexiglas cage to dampen the sound. In this way, mixing also becomes easier.

The first time we conducted the workshop, we worked directly with a digital mixer in the belief that young students can go straight into the 'digital world'. That turned out to be wrong as the students found it much easier to understand the signal paths in a digital mixer when we started with the analogue console. In addition, we got the theatre technical historical aspect and the development of mixing desks.



Foley Sound Workshop

Key Information

Number of learners	12-16 maximum, working in groups of 3-4.
Number of staff	1 teacher. A sound technician to support the workshop will be useful if the teacher and students don't have technical sound skills.

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
 - Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop to introduce students to the principles and practice of Foley sound, for use in theatre and film.

Aims

The workshop aims to:

- Introduce students to the history of Foley effects in film and theatre
- Give students an understanding of the types of sound used in film
- Enable students to use Foley sound in their theatre and media productions
- Develop students' skills in using microphones, mixers and effects processors
- Increase students' awareness of sound in everyday life

What You Will Need

Duration and schedule

Teacher preparation: 4-8 hours

Student preparation: none

Workshop duration: 3-6 hours

Room or type of space

A classroom or studio. If working in several sub-groups of 3-4 students, it is helpful if the room is big enough for people to spread out. A group of 16 needs a room of 100m² minimum.

The room should be a quiet space, without outside sound interference.

Equipment

A projector or screen to show video/images

Each group needs a sound system with:

- Microphones and stands – at least one and preferably two
- A mixer with amp and speakers
- An effects unit to provide reverb, delay, etc.



Materials (consumables)

A variety of props to make noises:

- metallic objects
- things that squeak
- cellophane
- bubblewrap
- leaves
- fabric
- fruit
- sand, gravel, pebbles
- custard powder
- water (in large tubs, on a trolley so it can be moved)

Work with whatever is available – the workshop can be flexible. Use your imagination!

Learning resources (books, websites)

Gareth Fry, *Sound Design for the Stage*, the Crowood Press Ltd, 2019

Vanessa Theme Ament, *The Foley Grail: The Art of Performing Sound for Film, Games, and Animation*, Routledge, 2022

David Sonnenschein, *Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema*, Michael Wiese Productions, 2001

Robert L. Mott, *Sound Effects: Radio, Television and Film*, McFarland & Co., 2014

Video showing in split-screen Foley artists and the film action: <https://www.youtube.com/watch?v=OONaPcZ4EAs>

Excerpts from films

Process

Preparation

- Gather the materials
- Set up the equipment
- Prepare a text to work on, with copies for the students
- Prepare an introductory talk with examples

The learning activity

3-6 hours, depending on the experience of the students and how far you want to develop the practical aspect of the workshop.

Ice breaker – ask the students to say what their favourite sound is. This starts them thinking about the specificity of sound.

Give an introductory talk, covering:

- Jack Foley – who he was and who he worked with, as an introduction to the start of sound in the cinema
- The evolution of sound since then
- The components of film sound: dialogue, music, atmos, special effects, Foley
- Foley – why is it still needed?
- Sync – being in sync with the action
- Diagetic and non-diagetic sound
- How Foley sound is done

Use clips from a selection of films (Spielberg and others) to illustrate the use of sound. This could include:

- a clip showing sound perspective (close and distant sounds)
- the use of Foley to augment the sound of props being handled by actors, giving information about the state of mind of the character
- a sequence which contains only Foley sound, so you can discuss the directorial choice to use only Foley, and explore the subjective nature of sound.

Following the talk, invite students to listen to the sounds of the room – what sounds can be heard, how far can hearing reach? Ask them to consider what sounds could be emphasised to change the atmosphere in the room?

You are now ready to begin the practical workshop:

Exercise 1

Working in groups of 3-4, students use the provided materials to make the sound of a campfire (cellophane, bubble wrap, fabric, blowing into mic – a quartet). After experimenting and practicing, each group demonstrates their approach to the other groups, which is followed by a discussion.

Ask students to listen in different ways: - While watching the Foley artists at work - With closed eyes - While watching a video clip of a campfire, played with the sound off.

This process how Foley sound relies on the combination of visual and aural perception to create a unified experience.

Exercise 2

Working in groups, 2 or 3 students create Foley sound to match the actions of another student, such as walking (on different surfaces such as snow), picking something up, moving a chair, opening a door, and so on. Focus on the synchronisation of the sound with the action.

Try with and without reverb and other effects – explore the impact effects can have on story-telling, atmosphere, etc. For this exercise, it helps to have someone on the mixing desk who has technical knowledge to manipulate the sound in real time – a technically capable student or a sound technician.

Exercise 3

Create Foley sound to accompany a video clip of wildlife. Choose a clip with a calm sequence and some action, such as an animal hunting.

Exercise 4

Working in groups of 3-4, one student reads a poetic text, acting as a narrator, while the other students work with Foley sounds and effects (reverb and so on) to make an appropriate soundscape.

Assessment and feedback

This workshop is not designed to be formally assessed. You can give feedback throughout the workshop, and students will want to ask questions and discuss the results during the practical exercises.

At the end of the session, summarise the key points of learning.

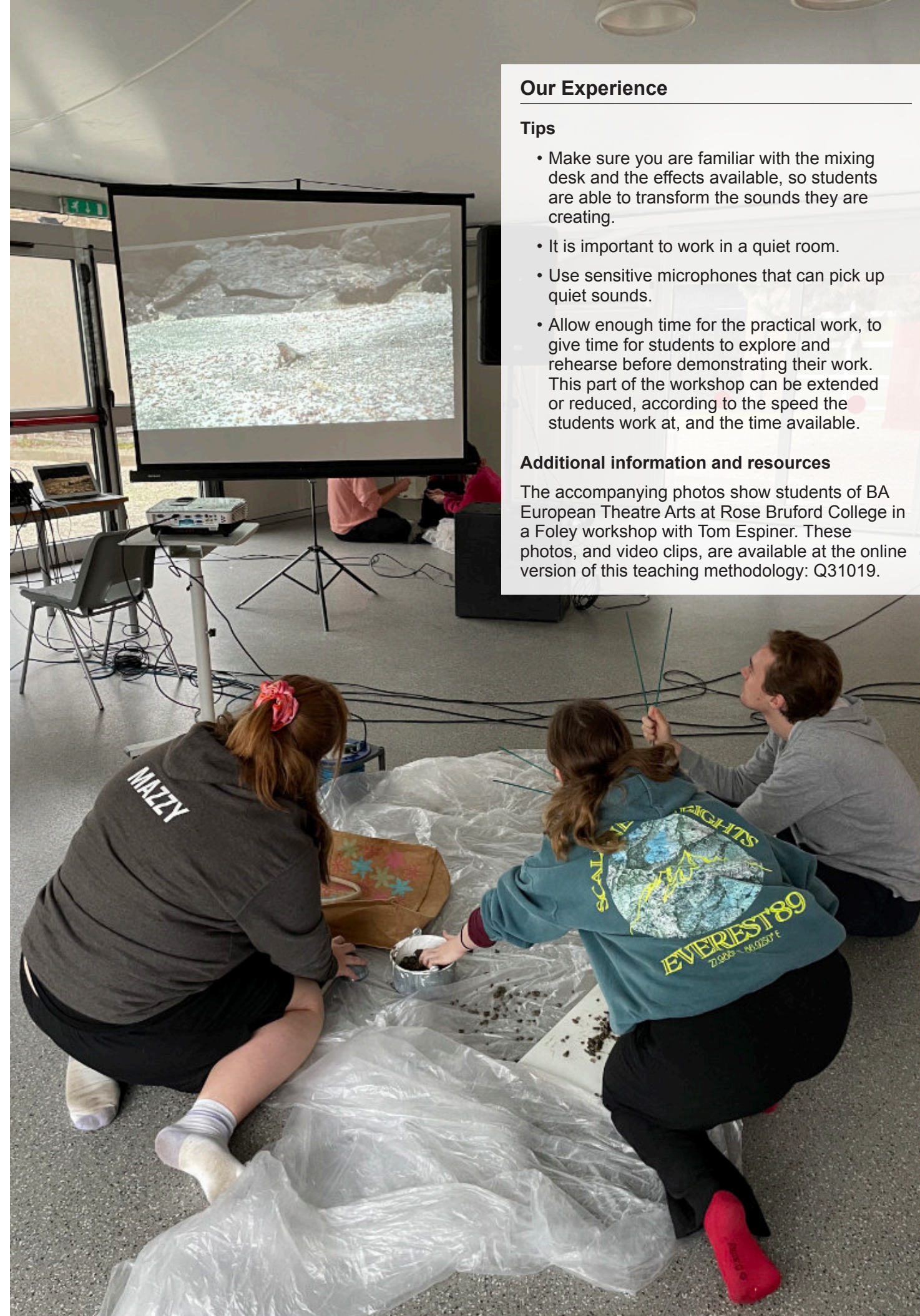
Our Experience

Tips

- Make sure you are familiar with the mixing desk and the effects available, so students are able to transform the sounds they are creating.
- It is important to work in a quiet room.
- Use sensitive microphones that can pick up quiet sounds.
- Allow enough time for the practical work, to give time for students to explore and rehearse before demonstrating their work. This part of the workshop can be extended or reduced, according to the speed the students work at, and the time available.

Additional information and resources

The accompanying photos show students of BA European Theatre Arts at Rose Bruford College in a Foley workshop with Tom Espiner. These photos, and video clips, are available at the online version of this teaching methodology: Q31019.



STAGESOUND

AUDIO REPRODUCTION EQUIPMENT

TYPE C.2 SOUND CONSOLE

This is a standard record replay console designed for theatre use, equipped with two 12-in. turntables, two lightweight pickups with provision for accurate groove location, monitor loudspeaker and 30-watt twin audio channels. Provision is made to feed one turntable into one set of speakers and the other turntable into a second set of speakers—this system being particularly useful when it is required to have two effects in operation on different parts of the stage. Also in the event of a breakdown in one of the amplifiers, instantaneous changeover is available into the second amplifier.

SPECIFICATION



TURNTABLES—Accurate aluminium cast turntables running in impregnated sleeve bearings, rim driven by a special belt system ensuring freedom from slip and "wow". Powered by 1/50th h.p. motors which are synchronous and fitted with a special filter unit mounting ensuring a minimum of transmitted vibration.

PICKUPS—Lightweight microcell crystal type employing a plug-on type head assembly for ease of replacement. The heads are fitted with a permanent sapphire stylus which can only be removed by the use of special jigs, and therefore when the sapphire requires replacement the head must be returned to our service department. Two spare heads are normally supplied and contained in special clips on the motor plates for instant changeover.

The response of these pickups is level within ± 2 db from 50-11,000 c.p.s.

LOCATORS—Locating and lowering mechanisms for each pickup are fitted which in addition to locating, incorporate a safety lowering mechanism. The final lowering of the pickup is automatically decelerated, preventing damage to records and styli. Location of pickups may be controlled with direct calibration to within 1/100 in.

AUDIO CHANNELS—Two channels are provided, each consisting of a feedback amplifier with a rated audio output of 30 watts, the general specification of the amplifiers is as follows:

Response	Level within 2 db from 50 c/s to 20 k/c.s.
Output	30 watts.
Output Impedance	Internally adjustable for 4, 7.5, and 15 ohms.
Input Impedance	High impedance for extra external pickups. 15 ohms for Microphone.
Tone Control	Variable treble attenuation. Switchable bass boost circuit for pickups to lift response 10 db at 50 c/s relative to the level of 1 k/c.

MONITOR—A built-in 8-in. monitor speaker is fitted in front of the console with the volume control and muting selector switch for audio channel A or B.

Recipes for learning and teaching

in

Scenography

<p>HEAD OFFICE AND SHOWROOMS 29, KING STREET, LONDON, W.C.2 SALES AND GOODS - 24, FLORAL ST., W.C.2 TEMPLE BAR 4444 GRAMS: SPOTLITE RAND LONDON</p>		<p>BRANCHES 313, OLDHAM ROAD, MANCHESTER 10 COLLYHURST 2736 62, DAWSON ST., DUBLIN - DUB 74030</p>
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Exploring Historic Scenographies

Through 3D modelling

Key Information

Number of learners 1-12. Individual work and group sharing.

Number of staff 1 teacher

ECTS Credits 2 credits

Learning process

Lecture/seminar
Lecture, presentation, discussion (face-to-face or online)

● **Making project**
Making a model, mock-up, plan or design (physical or digital)

Performance project
Making a performance or demonstration (live or mediated)

Records and Archives
Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study
Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A method to investigate the designs of historically significant scenographers and productions by reconstructing them through 3D modelling.

Aims

- By analysing, drawing and modelling this scenography, students will learn:
- about the ideas and designs of a selected historic scenographer and production
 - how to interpret archive documents
 - basic drawing of set and movement plans
 - basic 3D modelling, including texturing and basic lighting of a set design

What You Will Need

Duration and schedule
Preparation by the teacher: 1-2 hours

Preparation by students: none, if they have experience of working with vector drawing software and a basic knowledge of 3D modelling and computer-based lighting.

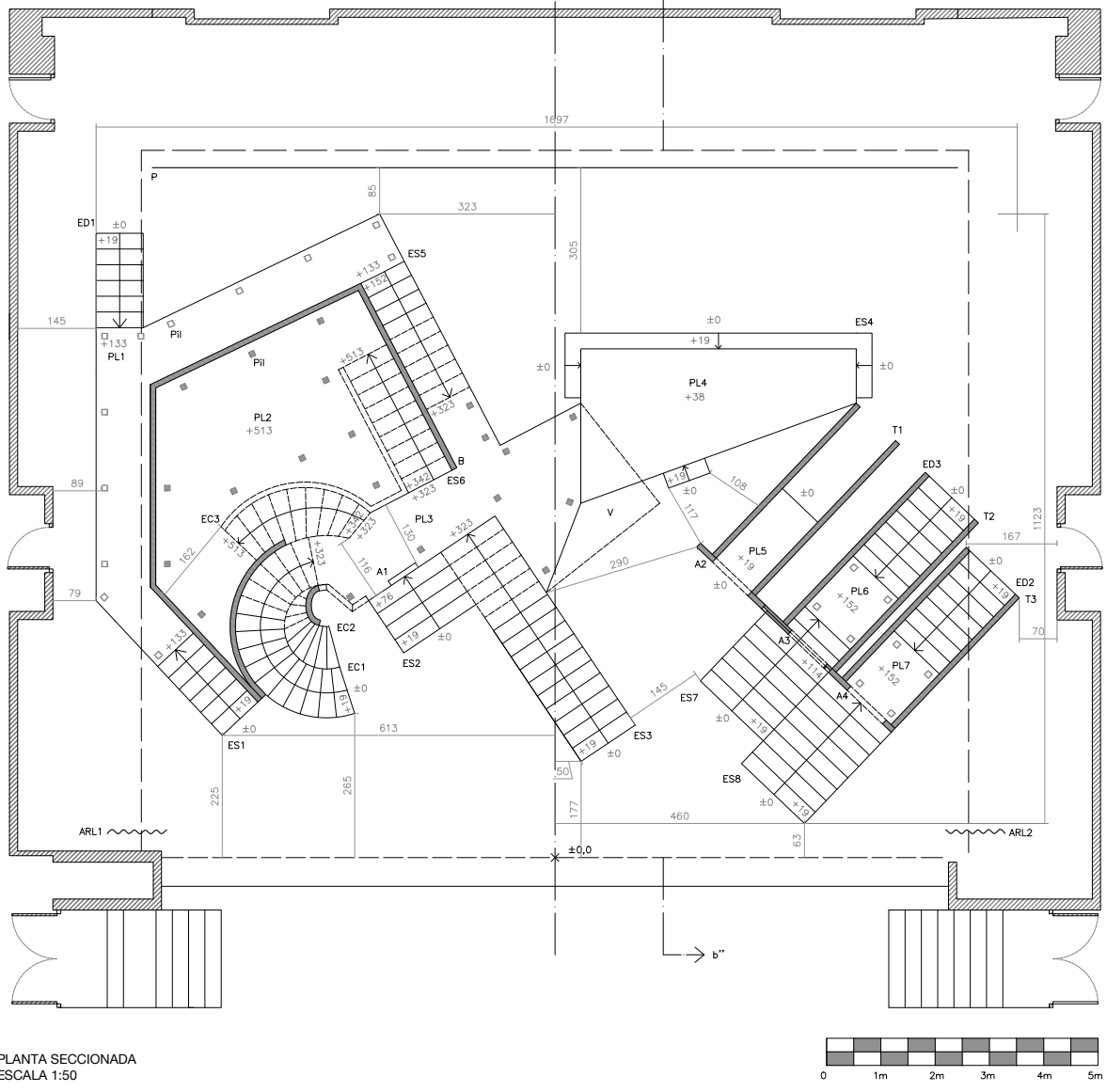
It is best to organise the workshop in several sessions: 24 hours in 8 sessions of 3 hours each, 4 for the two-dimensional work and 4 for the three-dimensional work.

Inexperienced students may need more time to develop their software skills.

Room or type of space
Classroom with drawing boards and computers.

Equipment
For each student: computer with vector drawing, 3D modelling and lighting software, set-square, protractor, scale ruler.

Materials (consumables)
For each student: sketch paper, pencils, eraser.



Learning resources (books, websites)

Canonbase articles:

- B.08 Architectures of Space and Image: The light beams and projections of Josef Svoboda
- E.06 Together in One Room: Hellerau and the fall of the fourth wall
- Josef Svoboda (Q91)
- Adolphe Appia (Q249)

Other resources:

- Jarka Burian, *The Scenography of Joseph Svoboda*, 1974 (available online at <https://digitalcollections.wesleyan.edu>)

Process

Preparation

Select a scenographer and a specific production, such as Josef Svoboda's design for *Romeo and Juliet*. Gather information about the scenographer and their work, and the selected production, including images.

Make preliminary sketches of the scenography, adapting it to a stage the students are familiar with and have the technical details for.

The learning activity

Introduce the students to the project, and the chosen scenographer and production.

Working from the teacher's preliminary drawings and archive materials such as photographs, students carry out a compositional study of the scenography, sketching it to become familiar with it.

They then make a breakdown of all the elements in the scene and proceed to draw the first approximate sketch of its layout based on general blocks and their orientations. They then carry out a study of the entrances and exits, different levels, and so on.

Students scan the final sketch and import it into the computer to trace the general layout and adjust it to the theatre plans, placing all the necessary steps and platform heights. Before dimensioning and finalising the plan, they start modelling the proposal to check if the composition matches the original design, or if any of the blocks need to be adjusted.

Finally, add dimensions the plan. The scenography can now be textured and illuminated if desired.

Assessment and feedback

The project can be assessed based on a range of criteria, according to the needs of the course: research, analysis and interpretation, 2D and 3D drawing skills, and so on. The finished model and drawings can be submitted for assessment, or students can present them to the group.

Our Experience

Tips

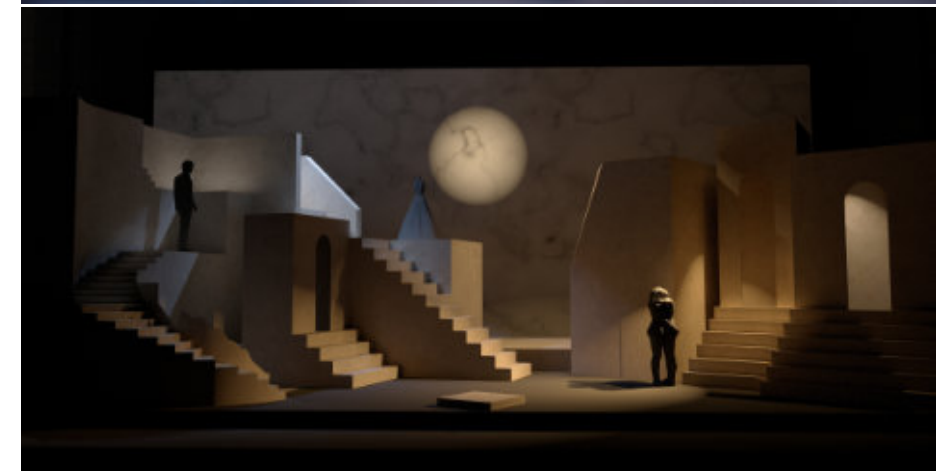
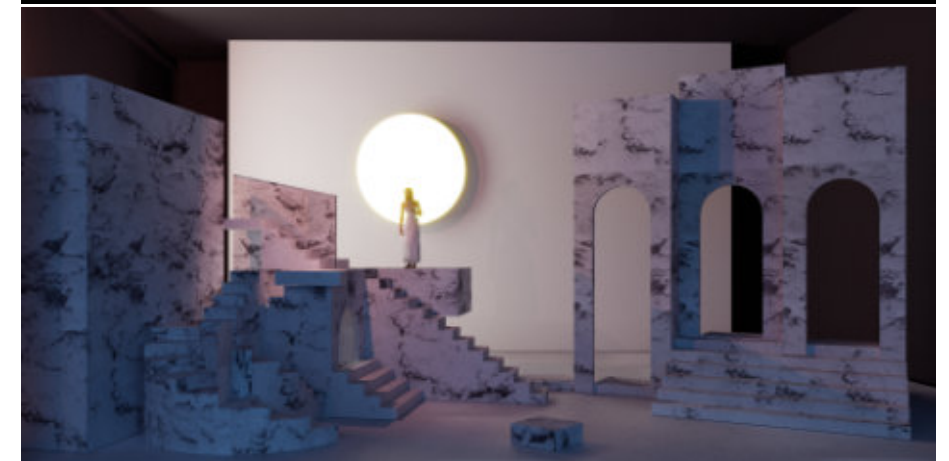
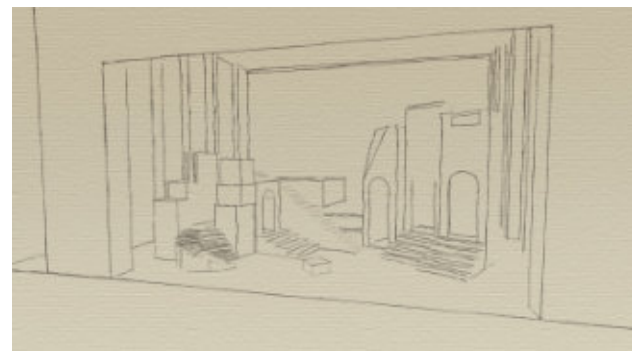
It is important that students analyse and understand the scenographic concept and the staging before starting to draw.

It is a good idea to have the students discuss their progress with the teacher at key points during the project, to ensure they don't go too far in the wrong direction.

Depending on the experience of the students, you may want to choose a historical scenography that is easier to draw, such as the staging of C.W. Gluck's *Orphée et Eurydice*, designed by Adolphe Appia for Hellerau, 1913.

Additional information and resources

The accompanying images show plans and 3D modelling by students of RESAD for their reconstructions of Josef Svoboda's design for *Romeo and Juliet*. More images are available at the online version of this teaching methodology: Q31076.



Investigating Accelerated Perspective

Using Serlio's scenes

Key Information

Number of learners 1-12. Work in pairs is possible. Group sharing.

Number of staff 1 teacher

ECTS Credits 2 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

● Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop for scenography students to make a scenographic model with accelerated ('forced') perspective, based on the scenes by Serlio and the text of Sabbatini.

Aims

Through the construction of this model, students will learn:

- the concept and application of the technique of accelerated perspective for 'houses in relief', as used in Italian Renaissance theatre
- the recreation of frontal views through the perspective of a single vanishing point on various flats and cloths on stage
- the transposition of accelerated perspective from paper to the stage model
- the construction of a concept model
- organisation and group work.

What You Will Need

Duration and schedule

Preparation by the teacher: 2-3 hours to gather and prepare the teaching materials, the work groups and the work plan.

It is best to organise the workshop in several sessions: 21 hours in 7 sessions of 3 hours each, 4 for the two-dimensional work and 3 for the three-dimensional work.

Room or type of space

Classroom or workshop with drawing tools and where work on models can be carried out. Drawing boards and the use of CAD drawing programs is recommended.

Equipment

For each student, access to:

- Technical drawing instruments (squares, mechanical pencil, scale rule...)
- Computer with CAD drawing program and printer

- Model-making tools (scalpel, cutting mat, tweezers, metal rulers...), Tools for colour sketch work (brushes, palettes, rags...)

Materials (consumables)

Sketch paper, foam board, papier-mâché, white cardboard, glue, paper and plastic adhesive tape, acetate, fine permanent markers, erasers, watercolours and/or acrylic paints.

Learning resources (books, websites)

Canonbase articles:

- F.03 A World On Stage: The illusion of perspective
- G.03 Scenography Codified: Serlio's scenes for comedy, tragedy and satire
- G.04 How to build a Theatre: The books of Sabbatini and Furttenbach
- Perspective (Q4372)
- The Renaissance stage : documents of Serlio, Sabbatini and Furttenbach (Q727)
- Sebastiano Serlio (Q568)

Original sources - available online:

- Sabbatini, Nicola. *Pratique pour fabriquer scenes et machines de theatre*. Ravenne, Pietro di Paoli et Gio Battista Giovanelli, 1638.
- Serlio Bolognese, Sebastiano. *Libro primo [secondo] d'architettura: nel quale con facile et breue modo si tratta de primi principii della geometria*. Venetia : appresso Gio. Battista et Marchio Sessa fratelli, 1560.

Modern sources:

- Sonrel, Pierre. *Traité de Scénographie*. Librairie theatrale. 1984.
- De Simoni, Luigi E Piero. *Spazio prospettico*. Roma Bonacci 1976.
- Mello, Bruno. *Tratatto di scenotecnica*. Görlich 1987.
- Navarro De Zubillaga. *Imágenes de la Perspectiva*. Siruela 1996.
- Izquierdo Asensi, F. *Geometría Descriptiva superior y aplicada*. Dossat. 12ª edición 1979. 1ª edición 1955.
- Rodríguez De Abajo, F. J.y Revilla Blanco, A. *Tratado de Perspectiva*. Ed. Donostiarra. 4ª edición 1991.
- Sloan, Annie y Kate Gwyn. *Pinturas y acabados para la decoración*. Ed la cúpula.



Top: one of Nicola Sabbatini's scenes

Middle: model under construction, with a stick to mark the point of view.

Bottom: the completed model

- Steadman, Philip. *Baldassare Peruzzi and Theatrical Scenery in Accelerated Perspective*, Nexus Network Journal (2020) 22:553–576.
- Brockett, Oscar G., Margaret Mitchell, Linda Hardberger, *Making the Scene: A history of stage design and technology in Europe and the United States*, Tobin Theatre Arts Fund, 2010

Process

Preparation

Preparation by the teacher:

Prepare the teaching materials -

- copies of the scenes by Serlio and Sabbatini and the drawings showing the construction of the flats for the houses in relief by Sabbatini
- images of paintings from Renaissance cities and current photos of the historic centres of cities such as Lyon, Ravenna, Siena...

Ensure there are sufficient supplies of model-making materials and equipment.

Prepare the work groups and the work plan.

Preparation by the students:

Students should know how to use the tools of the model workshop, the basics of planar perspective, and be able to sketch.

The learning activity

Introduce students to the project and the various sources of information – texts and drawings.

Each group then starts from the paper image of the allocated scene by Sabbatini or Serlio, and carries out an analysis of it. Subsequently, they carry out a breakdown of all the elements necessary to set up the scene on stage, leaving the necessary 'streets' for the exit of actors. They proceed to calculate the first space in Accelerated Perspective with different hypotheses of the position of the point of view and slope of the stage. With the chosen Point of View and its true horizon, the scene broken down into house-flats is redrawn in a linear way, adding the necessary detail for its 1/20 construction.

With the exact dimensions, students build a mock-up of a scenographic grid in acetate with a permanent marker of the vertical planes, and the raked stage in foam and grey cardboard. The correct point of view is marked with a vertical stick

of wood, and it is verified that the perspective lines agree and give the desired effect.

It is a good idea to check the students' progress at this stage, before they go on to draw each of the houses in detail and transfer them to cardboard (white or grey) to be cut out and coloured.

Students can use images of paintings from Renaissance cities and current photos of the historic centres of cities such as Lyon, Ravenna and Siena to establish an appropriate colour palette.

Finally, the three-dimensional details are added, such as cornices, window and door frames, and mouldings. The backdrop is drawn with the perspective of the end of the city and it is given colour.

Assessment and feedback

The project can be assessed based on a range of criteria, according to the needs of the course: research, analysis and interpretation, drawing skills, model-making skills, and so on. The finished model and drawings can be submitted for assessment, or students can present them to the group.

Our Experience

Tips

Make sure the students understand line drawing and the conical system of perspective representation beforehand, that they are very clear about the process to follow before starting. Also ensure the work has been well distributed in the groups.

It is important that students analyse and understand the concept of scenographic perspective for houses in relief, the methods of drawing on flats and the staging that is to be achieved before starting to draw.

Instead of the Serlio scenes, you can also choose historical scenery of which sketches and/or models are available, such as the collection of the Museo Nacional del Teatro de Almagro, Spain.

Additional information and resources

The accompanying images show the work of students of RESAD. The drawings of Sabbatini's scenes and more images are available at the online version of this teaching methodology: Q31077.

Rabbit Glue and Canvas

Key Information

Number of learners	4-10
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A workshop to create scenery by traditional methods using canvas and rabbit glue. The painted canvas can be used as a backcloth, or stretched onto frames to make flats.

Aims

Through the construction and painting of the set design the student will learn:

- how to translate a design from a drawing to full size
- methods to achieve three-dimensional visual impact on a flat surface
- the use of traditional painting techniques with natural colours and rabbit glue
- self-organisation and group work.

What You Will Need

Duration and schedule

Preparation by the teacher: 6 hours to prepare the teaching materials, groups and work plan.

Preparation by the students: no preparation is required, provided students are familiar with workshop tools, and have a knowledge of perspective, colour theory and drawing.

The workshop is best done as a single, continuous process. Depending on the complexity of the chosen scene and the number of students, allow 3-5 days as a minimum.

Room or type of space

A space large enough to lay out the largest piece of scenery you want to make, with a wooden floor you can nail into. The room should be well lit. You will need access to a sink and water.

Equipment

- long-handled bristle brushes
- long-handled charcoal holders
- a cooker for preparing the colours and glue
- brushes of various sizes
- rulers and squares



The scenic workshop of the Rome Opera House, where traditional techniques of painting are still used.

- paint buckets
- a large board to use as a palette
- chalk line, or a long length of string
- reciprocating and table saw
- A-ladder or platform, so the canvas can be seen from above when laid on the floor

Most of the work is done standing up. Long-handled brushes and charcoal holders reduce the amount of bending needed when working with the canvas on the floor.

Materials (consumables)

natural-coloured cotton canvas pigment paints, in powder form rabbit glue. Alternatively, use traditional size sticks of drawing charcoal large-headed tacks or nails

Learning resources (books, websites)

Canon stories:

- E.04 Fit for a King: Baroque Court Theatres
- F.04 The Architectural Scene: The work of the Galli Bibiena family

Canonbase articles:

- perspective
- The Renaissance stage: documents of Serlio, Sabbattini and Furttentbach

Other resources:

Mello Bruno: *Trattato di Scenotecnica*. De Agostini, Novara 2009

C. Ossicini and P. Bignami. *L'album di Scenotecnica di Koki Fregni*. Clueb, Bologna 2008

Susan Crabtree and Peter Beudert. *Scenic Art for the Theatre: History, Tools and Techniques*. Focal Press 2012

Theatrical chandlers, such as Flints in the UK (www.flints.co.uk) sell the materials needed, and their websites also offer advice on how to use them.

Process

Preparation

Prepare a short presentation on traditional approaches to scenography using painted scenery and *trompe l'oeil* techniques. Select a scenic design to be created, from historic designs; make sure the chosen scene is suitable for the number and experience of the students, and the time available. Gather the materials and prepare the workspace.

The learning activity

Give a short presentation, introducing traditional painted scenography and painting techniques, and the scene to be created.

Students then start with the selected scene, preparing a scale copy and drawing on a grid of scale 50cm squares.

Cut out pieces of canvas for each of the scenic elements: backdrop and flats. If you have several groups of students, each group can make a different element, provided you have enough space.

Nail the canvas to the floor, stretching it evenly to maintain the weave of the original canvas. Do not drive the nails all the way into the floor, to make it easier to get them out again later.

Prepare the canvas with a coat of gesso, made from rabbit glue or size. Once dry, mark the canvas with 50cm squares using a chalk line or charcoal and a taught string. This grid should match the one on the scale drawing, only larger, of course.

Draw the design onto the canvas using the grid as a guide. Use charcoal in a long holder, so you can stand up and see both the canvas and the drawing. Work from square to square; several people can do different parts of the canvas at the same time, taking care the different squares 'join up' correctly. The charcoal can then be fixed to the canvas by a light spray of rabbit glue.

According to the chosen colour palette for the design, prepare paints by mixing the powdered pigment with the rabbit glue and heating it. The first base coat can then be painted, providing the background tone of each area of the scene. Next,

the shadows and textures are be painted, and finally the lighter areas and highlights.

All work is done standing up, using brushes attached to long handles. Use a ladder to see the results of the drawing and the colours from a distance, checking regularly as the painting takes place.

Once the painting is complete, the nails can be removed and the canvas stretched onto the frames of the flats, or hung on a wooden batten as a backdrop.

Assessment and feedback

This activity isn't designed to be assessed formally, but discussion throughout the process will ensure that students' learning is embedded, and students understand what it is they have learned.

You can also have students write a journal of the process, or give a presentation about what they have discovered.

Our Experience

Tips

Make sure the students are clear about the process to follow before starting, and there is a good distribution of work between individuals and groups.

While painting, keep checking against the original artwork, and between different parts of the painting, to get a consistent result.

If you don't have space to paint a set of full-sized scenery, consider working at half-, third- or quarter-scale.

And remember - this workshop is not about turning you into a scenic artist in a few days, it is so you can learn about the traditional painting techniques and materials. Focus on exploring those techniques, and don't worry too much about the quality of the results!

Additional information and resources

The accompanying photographs show the scenic workshop of the Rome Opera House, where traditional techniques of painting onto canvas with rabbit glue paints are still used.



Workshop to Build a Scenography

For de' Sommi's dialogues

Key Information

Number of learners	4-14
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts

Professional

Researcher

General public

A workshop for scenography students where, starting from a sketch inspired by Sebastiano Serlio's scenes, they build the scenery, transfer the drawing and paint the scene. The built set can optionally be used to stage Leone de' Sommi's dialogues (M.07).

Aims

Through the construction and painting of this scenography, the pupils will learn:

- The basic construction of stage flats
- The scale transposition of a hand drawing to a larger surface
- The painting of flats
- How Baroque scenery created a perspective effect, as described by Serlio
- About the dialogues of de' Sommi
- Organisation and group work

What You Will Need

Duration and schedule

Preparation by the teacher:

3 hours to prepare a presentation to introduce the topic material, organise the working material, the working groups and the work plan. You may need longer if you are not familiar with the work and ideas of Serlio and de' Sommi.

The workshop:

The duration will depend on the skills and experience of the students, and how complex a design they undertake. Typically allow 5 days, preferably in a continuous period.

When planning the schedule, remember to allow drying time for the painting process.

Room or type of space

Workshop with tools for working with wood, for making scenery.

Workshop for painting, large enough to see the scenery from a distance (it can be the same space, or a different one).



Equipment

- Table saw
- Drill
- Wood mitre saw
- Square and bevel, ruler
- Hammer, screwdriver and other woodworking tools.
- Paint buckets, paint brushes of various sizes, sponge, ladder.

Materials (consumables)

- Timber for the frames of the flats
- Plywood or canvas, to clad the flats
- Mouldings and expanded polystyrene blocks, to add 3D elements to the flats
- Screws, wood glue, sandpaper
- Charcoal, various coloured paints, various paintbrushes.

Learning resources (books, websites)

Canon stories:

- G.03 Scenography Codified: Serlio's scenes for comedy, tragedy and satire
- G.04 How to Build a Theatre: The books of Sabbatini and Furttenbach

Canonbase articles:

- The Renaissance stage: documents of Serlio, Sabbatini and Furttenbach (Q727)
- Sebastiano Serlio (Q568)
- Leone de' Sommi (Q708)

Other resources:

MELLO, Bruno. *Tratatto di scenotecnica*. G. Agostini Novara 1972

SLOAN Annie y GWYN, Kate. *Pinturas y acabados para la decoración*. Ed la cúpula

Process

Preparation

Preparation by the teacher:

Prepare a presentation introducing the scene designs of Sebastiano Serlio, and the dialogues of Leone de' Sommi.

Prepare plans (technical drawings or sketch diagrams) of the frames of the flats. Alternatively, depending on the skills and objectives of the students, you may want to have them prepare the drawings.

Prepare sketches of the design for each flat, based on Serlio's drawings.

Prepare colour samples.



Preparation by the students:

Students do not have to do any preparation, but they should be familiar with the tools of the workshop, and have some knowledge of perspective, colour theory and drawing.

The learning activity

Give a presentation introducing students to the dialogues of Leone de' Sommi and the scenes of Sebastiano Serlio.

Students then construct the frames of the flats. The flats can then be canvased and sized in the traditional way, or they can be clad in plywood.

Paint the flats white as a base. Using charcoal, transfer the designs from the sketches to the flats, either by marking out a grid on each, or by projecting the sketches onto the flat from a laptop. Note that for the projection method to work, the projector needs to be exactly square-on to the flat, otherwise the image will be distorted and the perspective won't work.

Choose a colour palette for the different parts of the scene. Paint the first layer in block colour, and then add shadows and textures.

Once complete, assemble the flats in their correct positions, and check the perspective. You are now ready to act out the de' Sommi dialogues! See M.07.

Assessment and feedback

This activity isn't designed to be assessed formally, but discussion throughout the process will ensure that students' learning is embedded, and students understand what it is they have learned.

You can also have students write a journal of the process, or give a presentation about what they have discovered.

Our Experience

Tips

Depending on the time available, and the level of experience of the students, they can be responsible for tasks such as making the construction plans for the flats, and calculating the quantities of materials required and ordering them.

During the process of transferring the base sketch to the flats, it is important to move away from it to check the general proportions, and to see if any adjustments need to be made to the drawing.

Make sure students are clear about the process to be followed before starting, and that the work is well distributed amongst the groups. Plan your groups to keep everyone busy as far as possible.

Additional information and resources

The accompanying pictures show the scenography made by students of RESAD. You can find more pictures at the online version of this teaching methodology: Q31025.

See also the methodology for staging the de' Sommi dialogues, M.07, Q31096.



Opposite page, top to bottom:

Sketch of the scene, based on a scene of Sebastio Serlio.

Researching the colour palette using paintings.

Choosing the colours.

A coloured version of the sketch.

This page, top to bottom:

Cutting the plywood for the flats.

Adding three-dimensional detail to the flats.

Drawing the backscene using a projector.

Painting the backscene.

Recipes for learning and teaching
in
Stage Mechanics and Sets



Rope, Block and Tackle

Key Information

Number of learners	4-14
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture
- Student of theatre arts
- Professional
- Researcher
- General public

A series of exercises for students to explore fundamental rigging techniques using rope, block and tackle in theatres.

Aims

After the exercises, students will understand how blocks and ropes can be used to:

- gain lifting power
- gain lifting height
- create speed
- move objects
- create a change of direction.

What You Will Need

Duration and schedule

Preparation by the teacher: 2-4 hours preparing equipment and materials

Preparation by the students: None

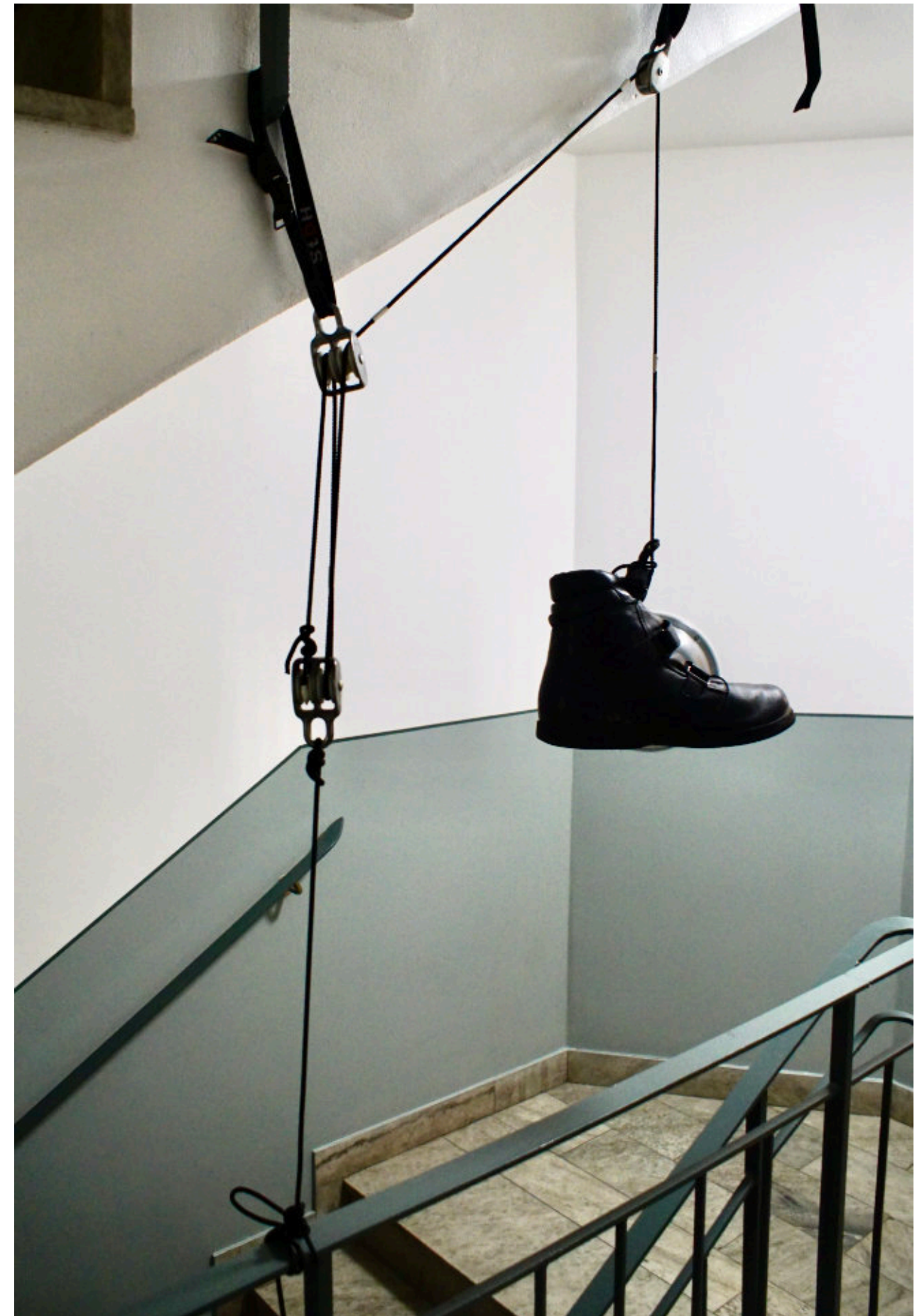
The workshop: 1 day of 6 working hours. Less if students already have knot-tying skills.

Room or type of space

Classroom, studio theatre, workshop, or other space where loads can be suspended. If you don't have a suitable space, see the 'Tips' section below for how to work at model scale.

Equipment

- 2 ropes 4-5 mm each 15 metres long
- 2 lengths of 4-5 mm rope, 10 metres each
- 2 lengths of 4-5 mm rope, 5 metres each
- 4 single blocks for 5 mm ropes
- 2 double blocks for 5 mm ropes
- 4 shackles and/or
- 6 straps
- 2 fabric bags (able to hold at least 10 kg each)
- 7 1.5-litre soft drink bottles with cap





- 4 hanging scales for 0-25 kg (the type that can weigh a suspended load, e.g. for luggage)
- 1 roll of gaffer tape
- 1 tape measure (centimetre scale)

The soft drink bottles are filled with water to act as counterweights during the laboratory sessions. A 1.5 litre bottle weighs 1.5 kg.

Materials (consumables)

None

Learning resources (books, websites)

Canonbase articles:

- B.01 Deus Ex Machina
- A.04 The Transforming Stage

Other sources:

Jay O. Glerum, *Stage Rigging Handbook*, Southern Illinois University Press, 3rd edition 2007

R. W. Boychuk, *Nobody Looks Up: The history of the counterweight rigging system 1500-1925*, Grid Well Press, 2015

Process

Preparation

Preparation by the teacher:

- collect equipment and materials
- prepare a short presentation on the historical use of rope-operated stage mechanics and pulley systems in theatres
- prepare a safety briefing - see the safety notice below

All of the exercises can be carried out in a classroom, provided that there are fixing points in the ceiling for the blocks. The attachment point should be able to support about 10 kg. If this cannot be guaranteed, another room should be used. This could be, for example, in a stairwell where the attachment points of the stairwell railing could possibly be used as attachment points for the blocks.

Always consult with the venue manager when choosing a venue for the exercises.

The learning activity

Give a short presentation on the historical use of rope-operated stage mechanics and pulley systems in theatres, to give the context for the exercises.

Give a safety briefing – see the safety notice below.

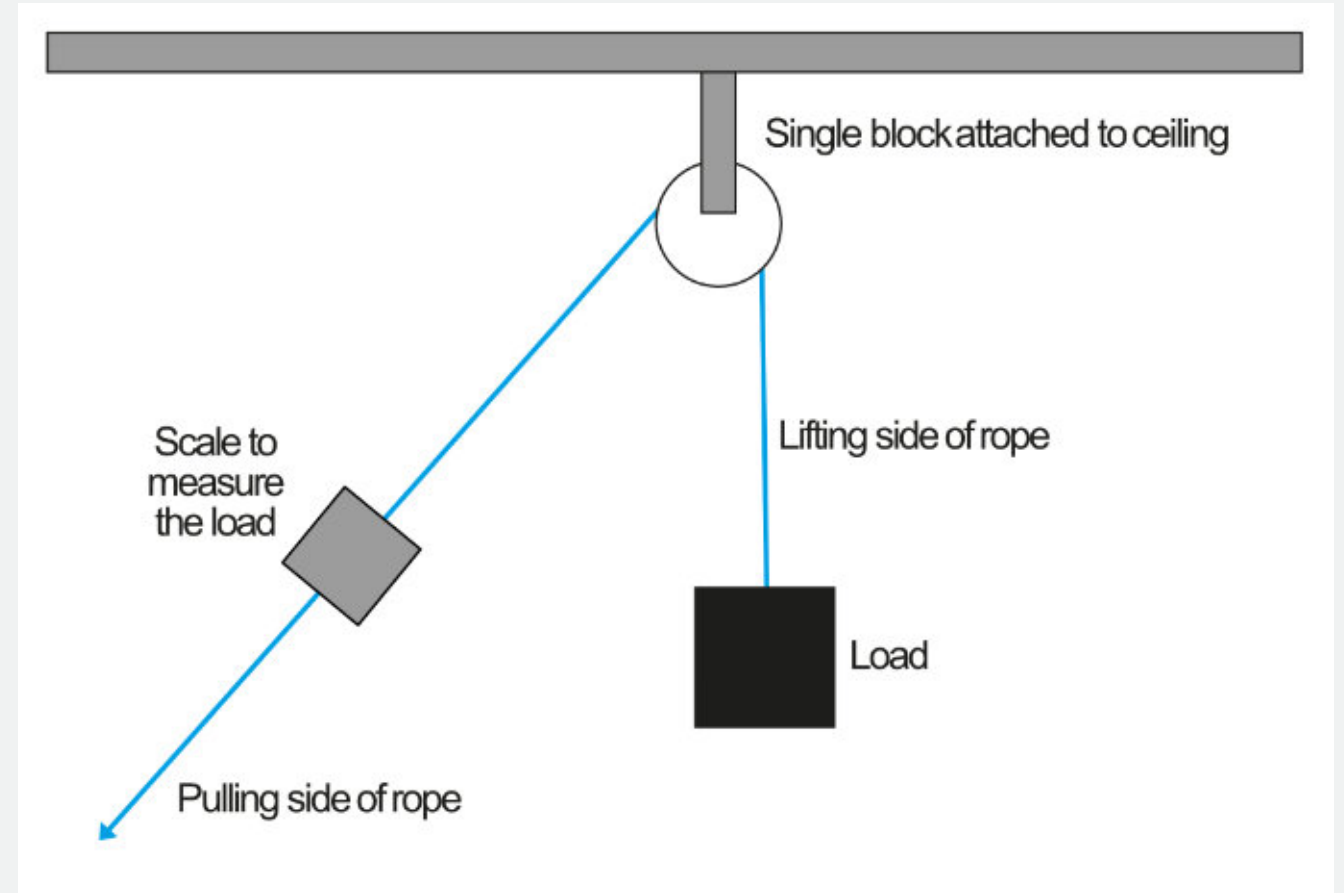
Check that the students who will be taking part in the exercises can all use the following knots:

- Clove Hitch/Clove Hitch on the bight,
- Round turn & two half hitches,
- Bowline
- Reef knot
- Overhand loop

Take time if needed to ensure all students are confident with these.

Safety Notice

The scale of the exercises as described here means they are relatively safe, but you will still be lifting weights overhead, and possibly working at height to attach pulleys, and so on. Make sure you follow safe working practices, and if in any doubt, consult a competent theatre technician. Always undertake a risk assessment, following the safety standards and regulations in your locality.



Exercise 1: Single block on the ceiling for lifting

Mount a block on the ceiling and pass a rope through it.

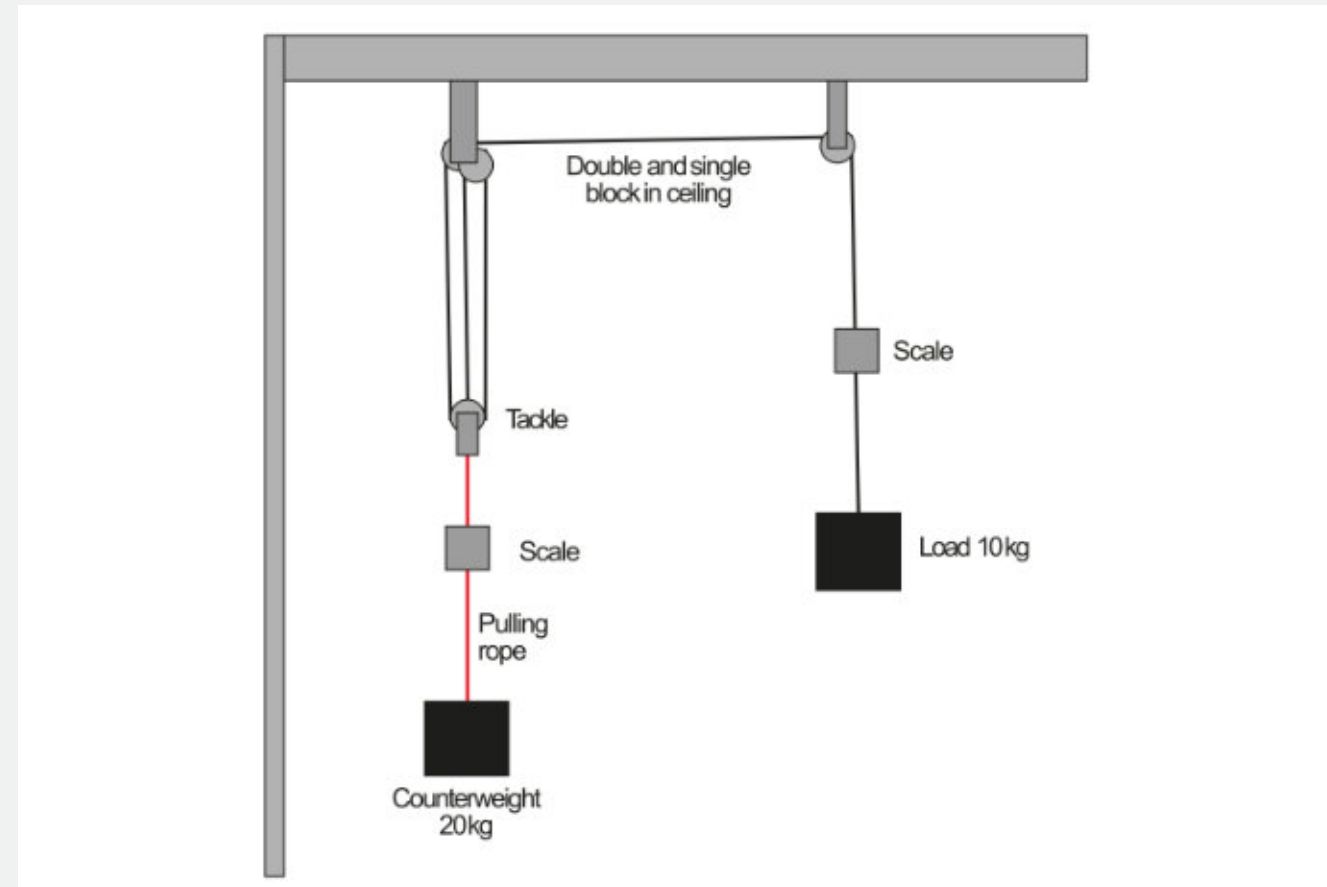
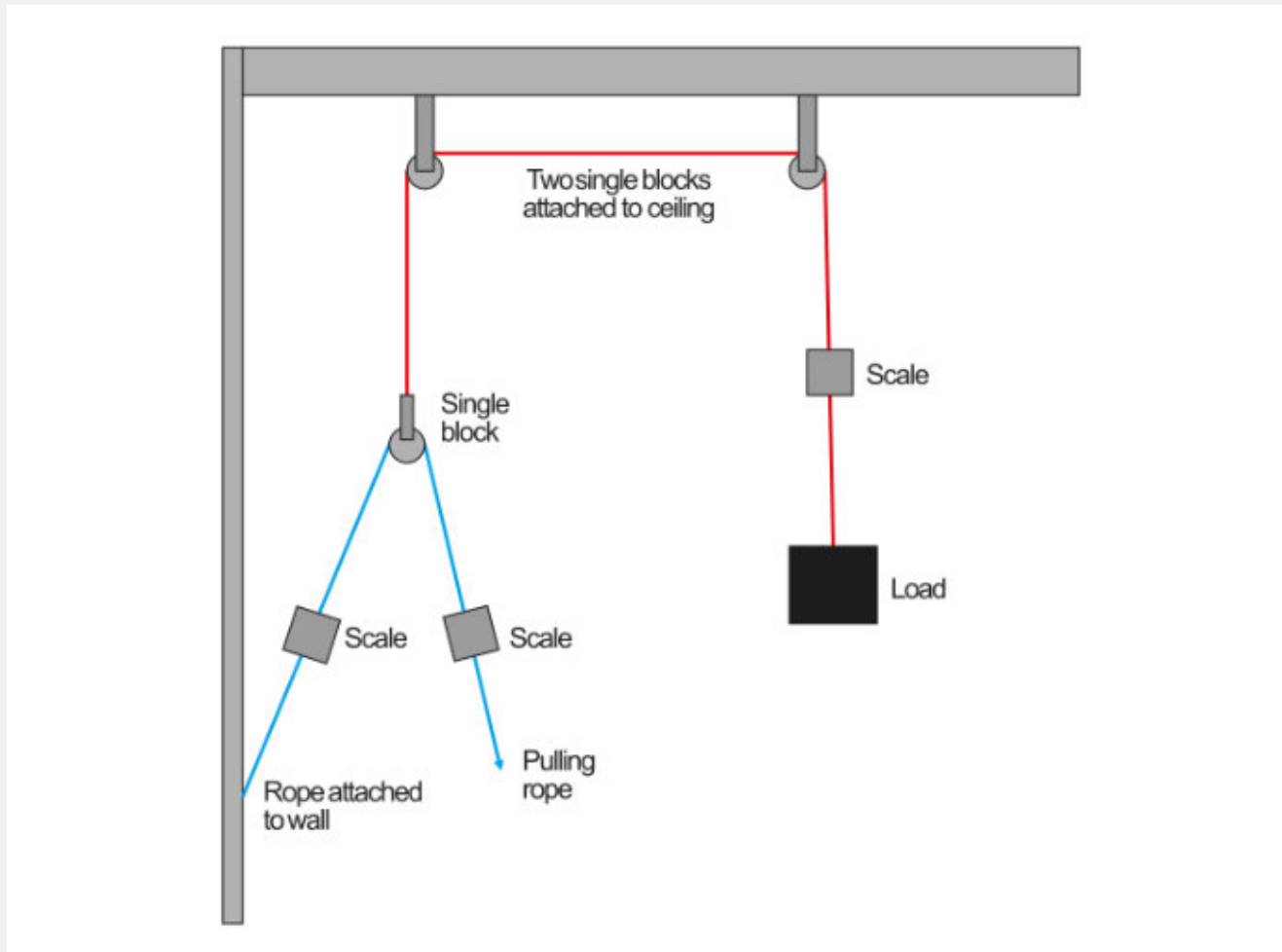
On one side (the lifting side), the rope is attached to the first scale, which in turn holds up the fabric bag with the load of three bottles (= 4.5 kg).

The second scale is attached to the other end of the rope (pull side).

Observe:

- What happens when the fabric bag with the counterweights is raised?
- Do the scales on each side of the block show the same weight?
- What conclusion can be drawn from this?
- What is the application in everyday life of arranging ropes and blocks in this way?
- What are the benefits of using a pulley, rather than lifting the load directly?





Exercise 2: Single block with pulling rope inserted in wall to gain power

Mount a block so that it is held up by a rope (lifting rope) that goes up to the ceiling where the rope runs on through a block (or two blocks if necessary) to the first scale which in turn holds up the fabric bag with the load of three bottles (= 4.5 kg).

Fix the second scale to the wall and attach a rope (pull rope) to the other side of the scale. This rope goes up and through the hanging block. The free end of the rope continues to the third scale. On the other side of the third scale, a final rope is attached, which is the pull rope.

Observe:

- What happens when the fabric bag with the counterweights is raised?
- What do the three different scales show?
- What is the length relationship between the rope used as the pulling rope and the one used as the lifting rope?
- What conclusion can be drawn from this?

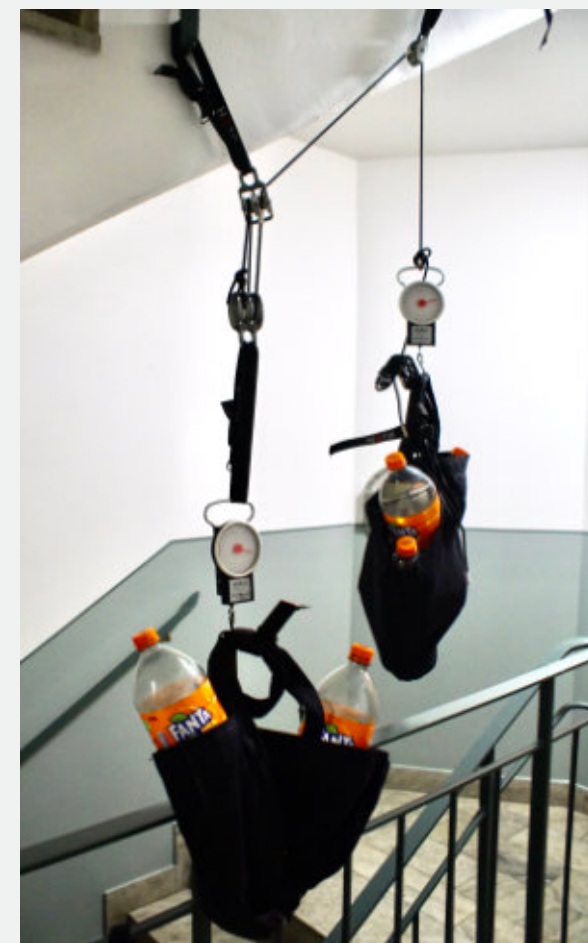
Exercise 3: Double block and tackle to gain power

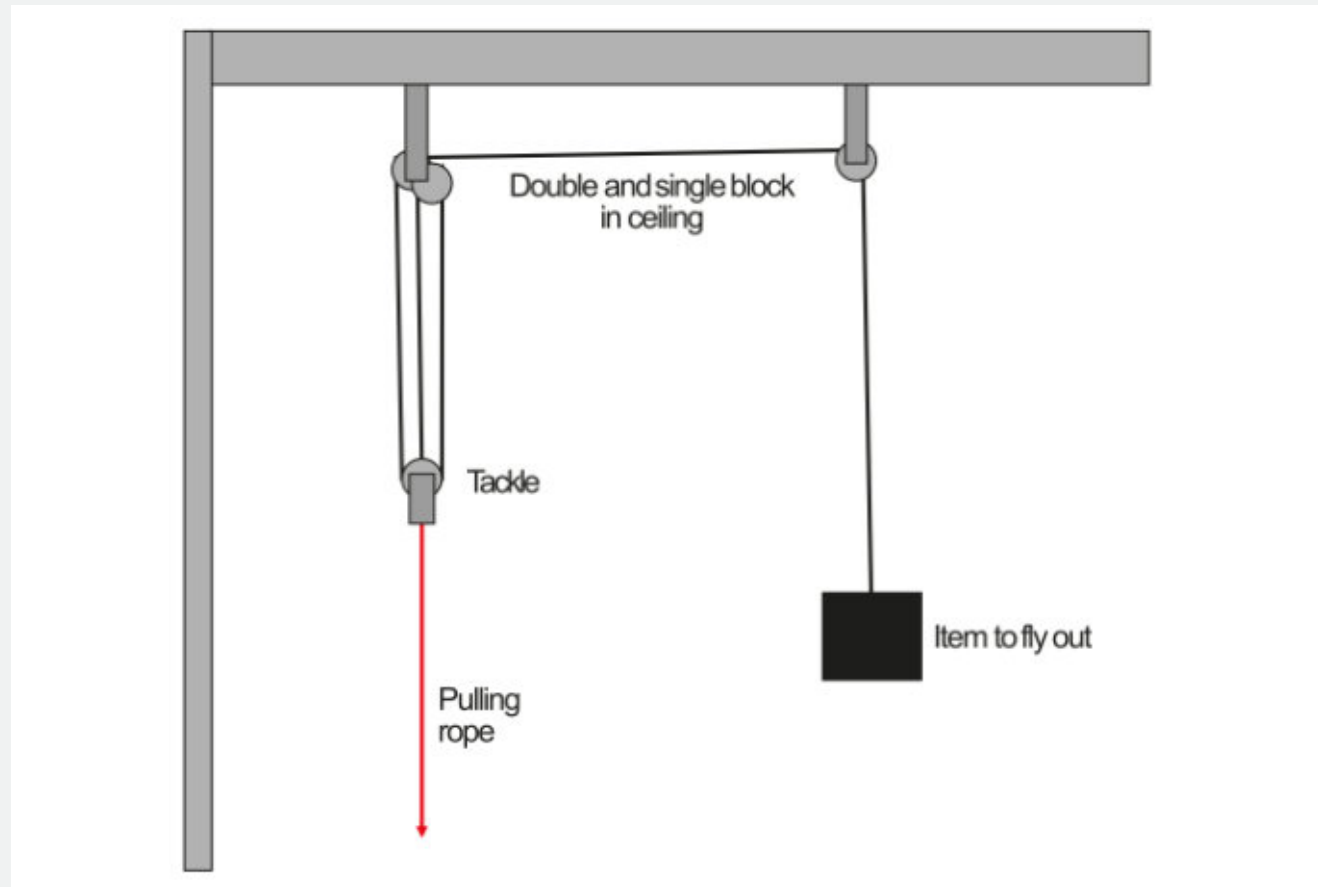
Assemble a combination of one single and one double block. The double block is attached to the ceiling. Attach the lifting rope to the lower single block first. Let the rope go up into the upper double block and return to the lower single block. The lifting rope turns one last time in the lower single block, goes up through the upper double block and then runs on through a single block until it reaches the first scale, which in turn holds up the first fabric bag containing three bottles (= 4,5 kg).

The second scale is fixed under the lower single block and under it a second fabric bag that can be loaded with bottles (balancing weights).

Observe:

- How many bottles (balancing weights) must be loaded into the second bag before the first bag starts moving?
- What do the two different scales show?
- What is the length relationship between the length of rope between the double blocks and the distance fabric bag #1 moves (measured relative to the floor or other fixed point)?
- What conclusion can be drawn from the relationship between the weights of the two bags and the length distance of the ropes?





Exercise 5: Block for changing direction when moving objects

This exercise is carried out at floor level. The aim is to move an object any distance across the floor. The exercise begins by first determining the movement to be achieved. It is optional how and where blocks are arranged and how long pull ropes are used.

In a second step, move the object in two stages, each in a different direction. In this step several blocks and ropes can be used.

Observe:

- What has been prioritised in the arrangement of the blocks - gaining power or high speed?
- Has the intention been to hide the arrangement of blocks and ropes or has it been allowed to show?
- For complex movement - how many blocks and ropes have been used?
- Are there alternative solutions to the problem?

Assessment and feedback

The exercises are not intended to be formally assessed. Give feedback throughout the workshop; students will want to ask questions and discuss the results during the practical exercises. At the end of the session, summarise the key points of learning.

Our Experience

Tips

Make sure you are familiar with how block and tackle and rope will work together to gain load, force and speed.

If you don't have access to a suitable space where you can suspend weights, you could run the workshop using smaller scale equipment. Our experience has shown that rope and pulley mechanisms work correctly and give a good simulation of the full-size mechanism at a scale of 1:4, and even 1:6 is likely to be satisfactory to demonstrate the principles. Working at scale greatly simplifies the workshop, and means you can hang the load from a camera tripod or similar improvised support.



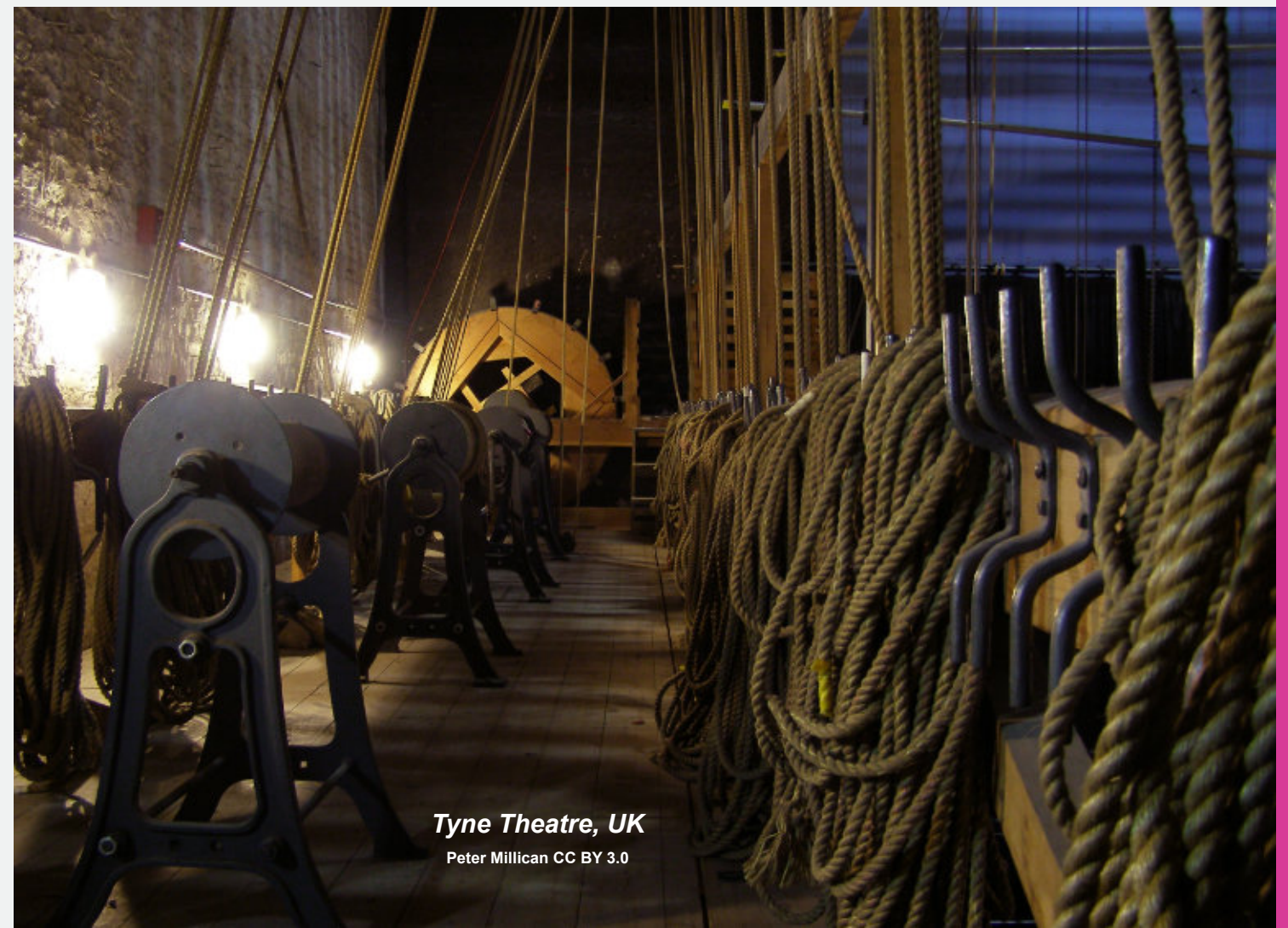
Exercise 4: Double block and tackle to gain speed

Assemble the same technical arrangement as in Exercise 3, but without the load and balance bags. The two scales can be removed if desired.

Attach a light object (piece of clothing, hat, shoe, etc.) to the end of the rope where the fabric bag with the weight was previously attached.

Observe:

- How fast can the light object (load) be moved when pulling on the lower free block?
- How heavy an object (load) can be moved in this arrangement?
- How can this arrangement be used to quickly remove an object from, for example, a stage?



Tyne Theatre, UK

Peter Millican CC BY 3.0

Baroque Elevator Workshop

Key Information	
Number of learners	2-12, working in pairs, or as an independent project for one person.
Number of staff	1 teacher
ECTS Credits	Not applicable
Learning process	
Lecture/seminar	Lecture, presentation, discussion (face-to-face or online)
● Making project	Making a model, mock-up, plan or design (physical or digital)
Performance project	Making a performance or demonstration (live or mediated)
● Records and Archives	Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)
● Independent study	Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone
Type of Learner	
● Student of technical theatre	
● Student of theatre design, architecture	
● Student of theatre arts	
Professional	
Researcher	
General public	

A workshop to build a scale model of a baroque stage elevator (lift), to learn how it works and to develop basic workshop construction skills.

Aims

Through studying and building the model elevator, students will learn:

- The basics of the lifting machine and the trap door.
- The use of pulleys.
- The proportions of the baroque elevator, its placement on the stage and its use on stage.
- Working with wood to make simple models.
- Drawing and interpreting plans to construct a working item of stage machinery.

What You Will Need

Duration and schedule

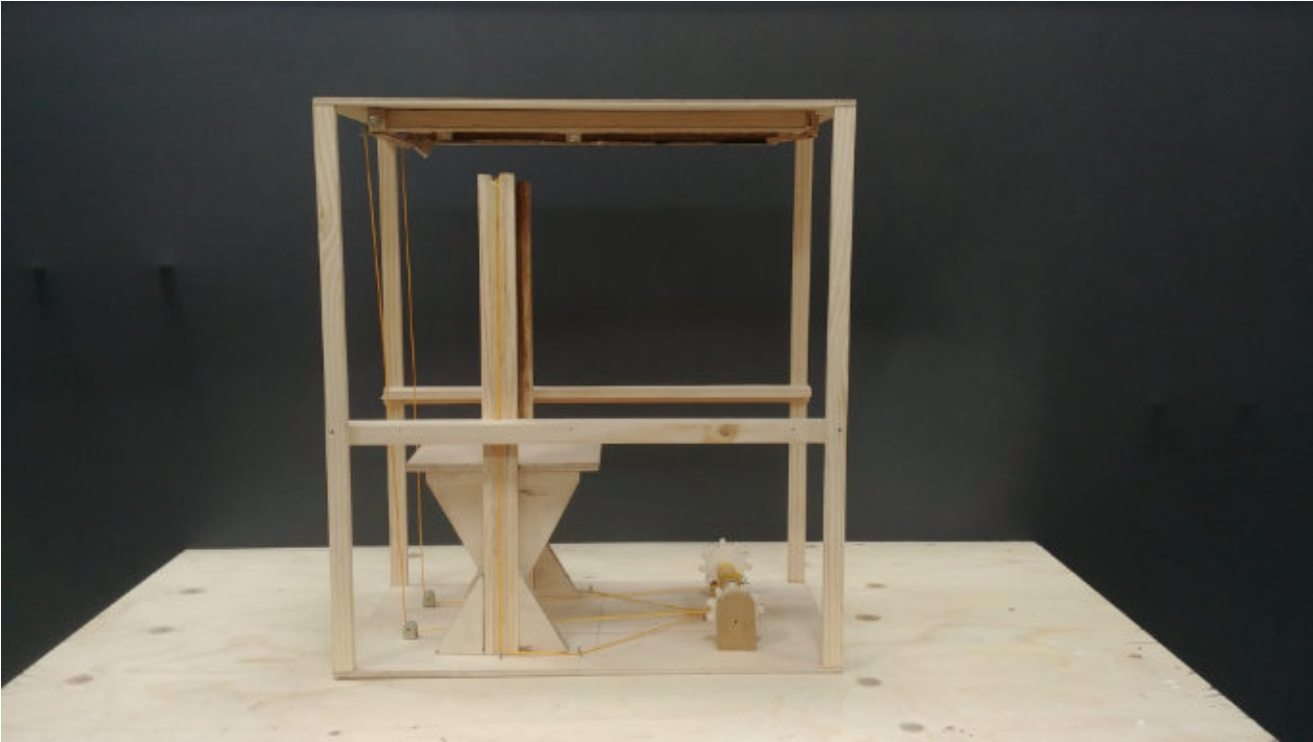
Preparation by the teacher:
1-8 hours to gather materials, tools and teaching materials. The time required will depend on whether you have to make a working demonstration model beforehand, or you already have a finished model.

Preparation by the students:
The time required will depend on whether students already have the required practical woodworking skills, or if they will need the teacher's help to cut and assemble the pieces. Depending on the students' previous knowledge, it could be structured as follows:
• For beginners, around 7.5 hours, structured in 3 classes of 2.5 hours each.
• For advanced students, a single 4-hour workshop.

Room or type of space

Workshop with tools for working with wood to make the model.

Classroom with drawing board and computer (optional) to make the plans.



Equipment

- Tools:
- Circular table saw
 - Dremel type mini drill
 - Wood mitre saw
 - Hammers
 - Screwdrivers
 - Square
 - Sliding bevel
 - Tape measure
 - Scale ruler
 - Pencil
 - Eraser
 - Computer with CAD drawing software (optional).

Materials (consumables)

- Plywood
- Pulleys
- Rope/cord
- Assorted screws
- Wood glue
- Sandpaper
- Sketch paper

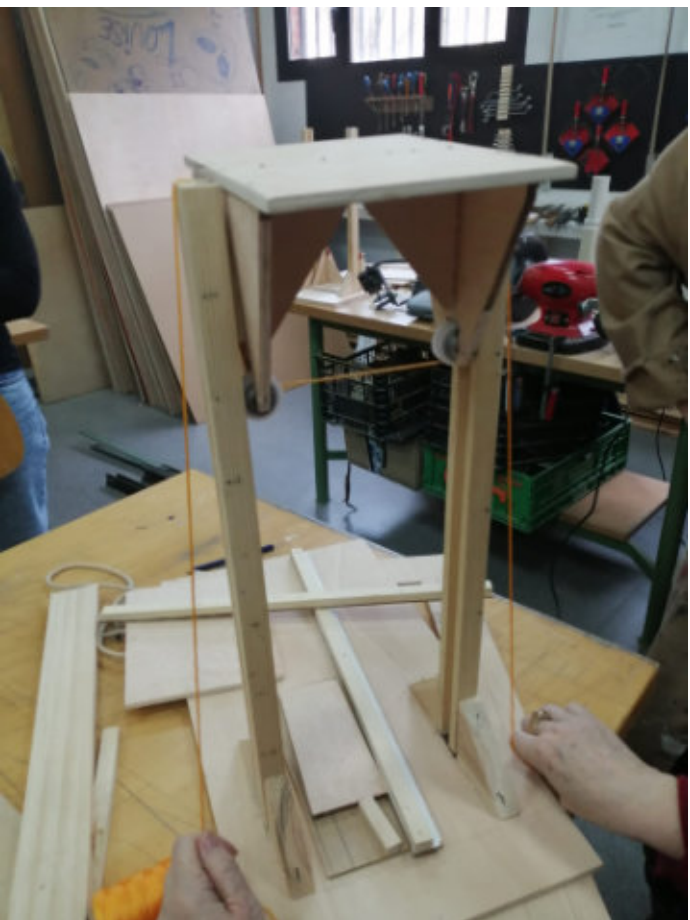
Learning resources (books, websites)

- Canonbase articles:
- The elevating stage (Q3519)
 - Corral de comedias (Q13175)
 - El escenario de la ilusión: sonido, luz e ingeniería en el teatro barroco (exhibition catalogue, Q713)
 - El Corral de Comedias (exhibition catalogue, Q199)
- Other resources:
- MELLO, Bruno. *Tratatto di scenotecnica*. G. Agostini Novara 1972
 - López de Guereñu, Francisco Javier. *Decorado y Tramoya*. Ed Ñaque. C. Real 1998
 - COPELLI, Dino. *Manuale Pratico di scenotecnica. Le macchine teatrali*. Patron editore, Bologna 2006.

Process

Preparation
Have the learning materials (various documentary sources) and a model mock-up ready.

Gather the construction materials, and ensure the workshop has all the tools required.



The learning activity

Introduce the students to the project, and the historical context of the baroque stage elevator.

The students then study the learning materials and compare with the model provided by the teacher. They analyse the model and take measurements to build it to a different scale.

The students then make hand-drawn sketches of the different elements, and a plan for assembly to achieve the final product. They make all the necessary adjustments to achieve a working machine.

After building the model, students should draw plans of the final result to scale, to capture the 'as built' design.

Assessment and feedback

If the students manage to assemble a model that works as an elevator, they will have achieved the objective. After the first result, you can discuss whether it can be improved by varying the proportions, layout and size of the elements it is made from. These revisions should be shown in the final plans.

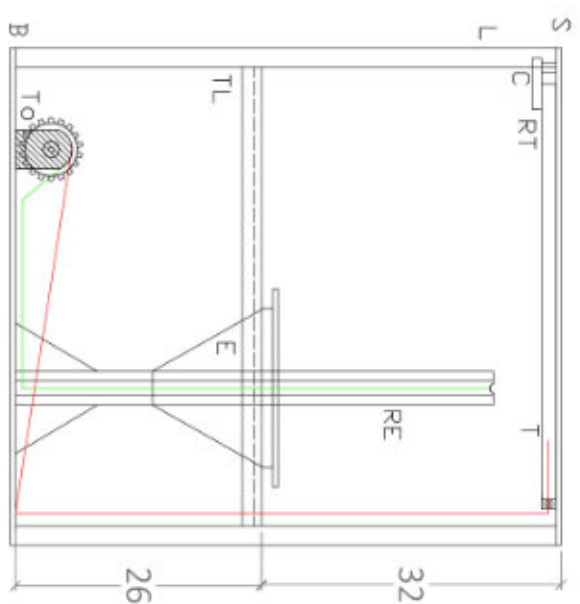
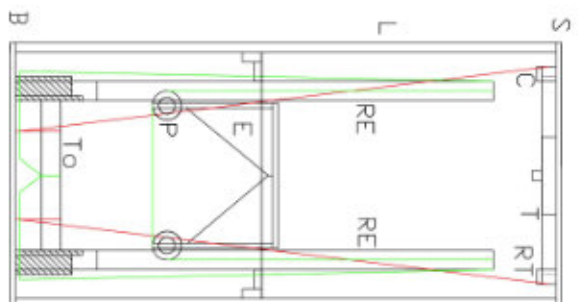
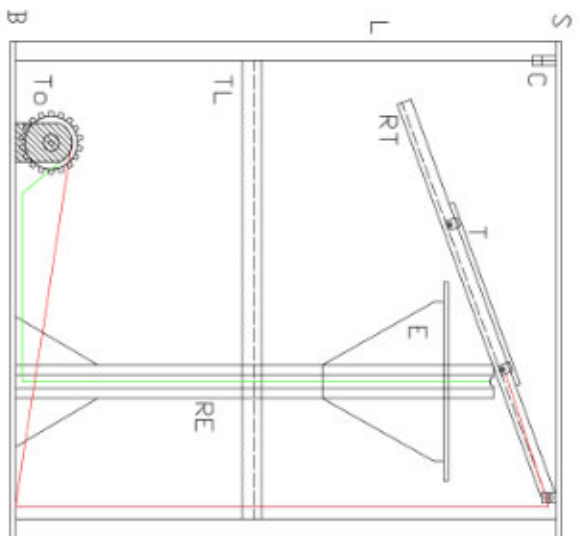
Our Experience

Tips

It is important for the student to analyse and understand the elevator mechanism before cutting and assembling the model material.

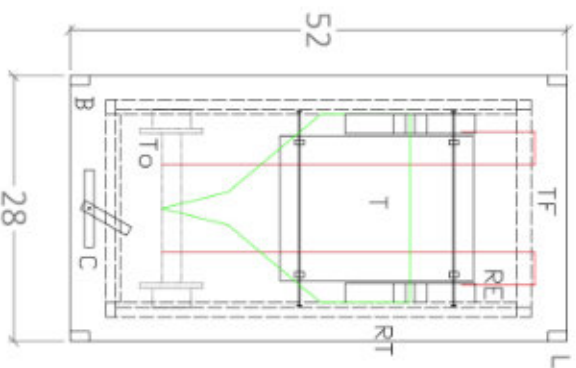
Additional information and resources

The accompanying pictures show the work of RESAD students. Further pictures, plans for the elevator and videos of models in action are available at the online version of this teaching methodology: Q31024.



DESGLOSE DE ELEMENTOS

- S: parte superior de la estructura
 - B: base de la estructura
 - L: largueros estructura
 - TL: travesaños laterales
 - TF: travesaños frontales
 - T: trampilla
 - RT: rail trampilla
 - E: elevador
 - RE: rail elevador
 - P: poleas
 - To: torno
- CUERDA VERDE: movimiento elevador
CUERDA ROJA: movimiento trampilla



PLANOS ELEVADOR BARROCO	
PLANTA, ALZADO Y PERFIL	1
SARA PADILLA Y ANDRÉS PÉREZ 3º ESC	
31-mar.-22	ESCALA 1:2
RESAD	MAQUETA ELEVADOR BARROCO
PROYECTO CANON	COTAS EN CM

Scenotechnic Movements

Key Information

Number of learners 2-8. For 2-4 people increase the setup time.

Number of staff 1 teacher

ECTS Credits 2.5 credits

Learning process

Lecture/seminar

Lecture, presentation, discussion (face-to-face or online)

● Making project

Making a model, mock-up, plan or design (physical or digital)

● Performance project

Making a performance or demonstration (live or mediated)

Records and Archives

Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)

Independent study

Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- Student of technical theatre
- Student of theatre design, architecture

Student of theatre arts

Professional

Researcher

General public

A project to explore the different types of movements that can be carried out on a stage (vertical, horizontal, diagonal) and the different mechanisms used to perform them (rails, counterweights, gearbox drums, stage wagons, etc.).

Aims

- Give students the skills to propose, install and manipulate scenotechnic movements to meet an artistic demand according to technical and safety requirements.
- Apply acquired knowledge, procedures and skills
- Gain knowledge of the different historic machinery types used for different scenic movements, and their design
- Understand how the different historic machinery mechanisms work
- Develop skills to find technical solutions to artistic needs
- Develop skills to set up mechanisms
- Develop skills of manipulating mechanisms during performance
- Develop skills of planning, and technical and human resource management
- Develop skills of teamwork and leadership.

What You Will Need

Duration and schedule

This learning activity involves solving several cases or small practical projects. Each case addresses a type of scenic movement or a combination of them.

Each part of the activity has a duration of 4.5 hours in the lecture room.

Estimated student's preparation time at home: 3 hours.

The teacher's preparation time depends on the type of lecture room (preferably a small theatre) and the technical resources available.

Each project follows the same structure:

Preparation - usually over one week (students' homework 3 hours):

- Delivery of the brief to the students with enough anticipation so they can work on how to solve it.
- Students present the solution and proposed mechanism to the teacher for review and approval.
- Students deliver a project plan and list of the required technical equipment.

Project (one day - 4.5 hours)

- Preparation: Setup review, task distribution and equipment gathering
- Setup: Setup and adjustment of the design mechanism
- Rehearsal: Rehearse the movement and adjustments
- Play: Execution of the movement according to the script
- Discussion: Analysis of the weaknesses and strength of the proposal. Proposals for improvements.

Room or type of space

A small theatre or workshop with some type of grid or flyloft (for vertical suspended movements) and scenic floor that allows fixing and screwing.

Equipment

Historic types of stage machinery and technical equipment, according to the cases to be solved. This could include:

- Counterweight bars
- Components for setting up counterweight systems
- Pulleys
- Ropes
- Rail systems
- Stage wagons
- Gearbox drum
- Scenographic elements (flats, suspended objects, parts of a set, etc.)

Required tools: hammer, screwdriver, drill, saw, hex keys, and so on, according to the equipment to be used.



Wing flats on floor tracks and clouds on overhead track



Detail of wing flats on floor tracks



Clouds rigged on a track

Materials (consumables)

Expendable materials to perform the setup: gaffer tape, screws, cables, wood sleepers/boards, etc.

Learning resources (books, websites)

Process

Preparation

Prepare a safety briefing and risk assessments, following the safety standards and regulations in your locality. This workshop involves lifting weights, rigging overhead, and working at height. Make sure everyone involved knows how to follow safe working practices and the risk assessment.

Prepare briefs for the different cases that students have to solve.

Each case must describe a scenic movement of elements (not the used mechanism) related to a timeline or music fragment indicating the moment of execution and its duration. The description of the movement can be complemented by a stage plot or sketch. If the element to move has some specifications that need to be taken into account (size, weight, anchor points, etc) include this in the brief.

Example of case description:

After the first 4 musical measures and when the sound of the wind comes in, a cloud must appear from the left-hand side of stage and travel to the right-hand side while the wind keeps blowing (8 musical measures) and finally disappear on the left-hand side of stage.

The first cases should describe simple movements that need to be solved by using simple mechanisms. The resolution of each case should imply the use of a different type of mechanism (counterweight, gearbox drum, hoist, rails, etc).

The final cases should describe complex movements that combine several mechanisms and techniques (stage wagon + counterweight vertical movement, diagonal movement with rail and counterweight, flight of person, etc).

Also, prepare the scenographic elements to be moved. Simple elements are best (curtains, flats, suspended objects, parts of a set, etc.).

The learning activity

The activity is divided into three parts: preparation, execution and evaluation.

Preparation:

- Give the safety briefing.
- Give the brief to the students.
- Students analyse the brief and develop a proposed mechanism to provide the required movement.
- The teacher analyses the proposal and approves the proposed mechanism, or suggests some modifications if necessary.
- Students create a list of required equipment, tools and resources and return it in time for the items to be prepared
- Students create a plan for the day of the project.

Execution:

- Review the proposed plan by all the participants (10 min)
- Analyse any safety issues and put in place control measures
- Distribute tasks in the group
- Check the requested materials, equipment and tools
- Set up the mechanism
- First performance test
- Make modifications, adjustments and fine-tune
- Rehearse according to the artistic requirement
- Perform (with audience if possible)
- Disassembly

Evaluation:

- Identify the strengths of the mechanism
- Identify the weaknesses of the mechanism
- Evaluate the mechanism's suitability to satisfy the artistic requirement
- Propose improvements
- Evaluate the process, and the overall success of the project. What has been learnt?

Assessment and feedback

Give feedback to students during the final discussion of each case and at the end of the whole activity if several cases are studied.

You can use an assessment chart to assess

different aspects of learning. Each assessed aspect has indicators to determine its accomplishment. Some of the items are for assessing each student individually and some are for assessing the whole group. Teamwork and leadership are key features of stage technician skills.

Our Experience

Tips

If you use music, always use the same fragment of music for all the cases so students get used to it and become more skilful during the operation.

Deliver the brief to students with enough time to check their proposed mechanism and suggest modifications.

Allow a certain amount of error in the students' proposals so when implementing the mechanism dysfunctions can be solved and some amount of tuning can be done. Solving dysfunctions on sight and system tuning are valuable skills.

Make all the necessary equipment, materials and tools available at the start to avoid loss of time. Give some room for improvisation (extra tools, equipment and materials).

For each case, designate one student as team leader to organise the group and distribute tasks during the execution.

For the final execution of the movement (after rehearsal), get other teachers or students to attend if possible, so the situation is more realistic and students put in more effort to perform a precise execution.

Time control is important when implementing the mechanism. The implementation of the mechanism should always be achieved and the movement should always be executed even if it doesn't work as expected. Students benefit from analysing errors and proposing improvements for a hypothetical second setup.

Safety Notice

This workshop involves lifting weights, rigging overhead, and working at height. Make sure you follow safe working practices, and if in any doubt, consult a competent theatre technician. Always undertake a risk assessment, following the safety standards and regulations in your locality.



One-person swing ("bosun's cradle")

Baroque Stage Machinery

Key Information

Number of learners	Groups of 2 – 5 students
Number of staff	1 teacher
ECTS Credits	Not applicable

Learning process

- Lecture/seminar**
Lecture, presentation, discussion (face-to-face or online)
- **Making project**
Making a model, mock-up, plan or design (physical or digital)
- Performance project**
Making a performance or demonstration (live or mediated)
- Records and Archives**
Interviews, photographs and videos of artefacts, annotating archives, creating learning materials (physical or digital)
- Independent study**
Reading, researching, analysing and evaluating learning materials (physical or digital) in groups or alone

Type of Learner

- **Student of technical theatre**
- **Student of theatre design, architecture**
- **Student of theatre arts**
- **Professional**
- **Researcher**
- General public**

A project to build different Baroque stage machineries at 1:4 scale, to understand their technical principles and practical workings.

Aims

- The project will:
- Introduce the functioning of Baroque stage machinery
 - Give better insights into the mechanical principles involved
 - Demonstrate the real-life issues with mechanics (friction, inertia, and so on)
 - Inspire you to use traditional techniques in contemporary applications

What You Will Need

Duration and schedule
The duration depends on the how far the setup is already prepared.
Setting up a system takes 3 to 4 hours.
Rigging and testing, which is the core of the exercise, takes about 30 min – 1 hour per system, depending on the type of system.

Room or type of space
A theatre studio or construction workshop, or other space where equipment can be suspended from the ceiling.

- Equipment**
This workshop is equipment intensive, but most of the equipment can easily be made in a basic workshop or ordered in a CNC workshop (see Additional Information and Resources, below).
- Ropes of different sizes
 - Different types of pulleys (ceiling attached, fixed on ground, ...)
 - Cleat rail or other attachment system
 - Small counterweights
 - Scale drum and shaft



- Scale winch
- Scale multiple speed drum
- Wooden sticks (scale battens)
- Fly rail
- Fly wagon
- Stage structure (some rostra/risers or similar)
- Ladder

Optionally, some scale scenery.

The RITCS 1:4 stage shown here is a sophisticated version of what is needed, but most of the exercises can be done with a much simpler set-up.

Materials (consumables)

A range of screws and fasteners

Learning resources (books, websites)

Canon stories:

- J.01 Reconstructing the Past: The stage machinery of the Colosseum
- A.04 The Transforming Stage: Synchronised scene changes

Canonbase articles:

- Photographs of the Bourla Theatre wooden stage machinery (Q12965)

Canon tools:

- Detailed instructions for building various items of stage machinery at 1:4 scale (Q31058)

Other resources:

- Sonrel, Pierre. *Traité de la Scenography* (Q224)
- The RITCS 1:4 Stage (www.podiumtechnieken.be/en/history-of-technical-theatre/one-to-four-theatre/)

Process

Preparation

Setting up the system(s): each mechanical system can be set up separately or as a complete model, as required. This is done only once and stays the same for different groups.

The basic techniques are:

- Stage wagons

- Cassettes
- Elevators
- Hemp flying system with battens
- Person flying system with wagon

Prepare an introduction to historical techniques, and a safety briefing.

The learning activity

Introduce students to the different historical techniques, focusing on what the result is, but not how they work.

Give students the safety briefing, covering following points:

- Even when working at 1:4 scale, we are still working at height
- Weights will be lifted or moved. The same rules as in full-size practice apply
- Equipment will be rigged overhead – again, the normal rules apply.

If needed, students are given some training on making basic, but safe knots.

The students are given different assignments. These can be done in one model stage, by one group, or in several stages simultaneously, with groups rotating between them.

Assignment 1: stage wagons

Students are given 4 wagons and a setup with two rails on the (under)floor. In a first phase, they are asked to make them move simultaneously (two go in, two go out) and in both directions. Only one rope is allowed to control the final movement.

In the second phase, they can use counterweights. They are asked to make the movement without applying any force.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

Assignment 2: cassettes

Students are given a (pre-mounted) cassette and a winch. In the first phase they are asked to rig it and move the cassette up and down with the drum.

In the second phase, they can use counterweights. They are asked to make the movement without applying any force.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

The assignment can be extended with multiple cassettes, to be moved simultaneously.

Assignment 3: elevator

Students are given pulleys, ropes, two cassettes and an elevator platform. In the first phase they are asked to build and rig the elevator and move it up and down.

In a second phase, they get a drum and counterweights. They are asked to adapt the elevator for smooth functioning with minimum effort.

In a third phase they get a sliding stage floor. They are asked to build the elevator under the sliding stage floor and rig the floor. At the end, they should show a smooth changeover with an actor coming or leaving the stage.

Assignment 4: hemp fly system

Students are given pulleys, ropes, a batten and a prepared backdrop (for folded flying). In the first phase they are asked to rig the set with 3 lines and move it up and down.

In a second phase the batten for folding is added to the set. They are asked to make different types of movement to get the best result for the set.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

Assignment 5: drum fly system with two sets

Students are given a shaft and drum, pulleys, ropes, two battens with prepared backdrops or borders. They are asked to rig the sets with 2 lines in a way that one moves up when the other moves down.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

Ideally, the drum is at a height, but it can be done also with a drum at ground level.

Assignment 6: rail fly system

Students are given a fly rail with a small wagon, pulleys, ropes, a puppet (Barbie or Ken type). They are asked to rig different flying movements:

- A horizontal flight



The RITCS 1:4 stage

- A vertical flight (swing)
- A bench flight (seat for two puppets) vertical
- A two-dimensional flight (with independent movements)
- A diagonal flight

For each flight they have to test, experiment with, show smooth movement operating options.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

Assignment 7: rope wagon fly system

Students are given a rope wagon, pulleys, ropes, a puppet (Barbie or Ken type). they are asked to rig different flying movements:

- A diagonal flight
- A curving flight
- A random flight (two dimensional)

For each flight they have to test, experiment with, show smooth movement operating options.

Ideally, they find the solutions themselves, but if they get stuck they can fall back on schematics.

Assignment 8: flying clouds

Students are given a multi speed drum, pulleys, ropes, and a set of clouds. They are asked to rig the clouds so that they use minimum space when up and align as a complete picture when they are down. (This could be combined with a bench flight for the 'Gods'.)

Alternative versions

It is also possible to conduct project as more of a lecture/presentation type of activity. This can be done with a larger group, where for every assignment a couple of students are asked to do the rigging and the others can support them, ask questions, give ideas, document...

A gamified variation on this gives each student the option to forward the assignment to a student of choice. This creates a maximum of engagement and turn-around.

Presentation

Presentation is not core to this assignment, but students could after each round present their solutions. If there is insufficient time for all groups to do all assignments, each group can present and explain their assignment to the others.

Assessment and feedback

The project is not designed to be formally assessed. Students get feedback informally during the process from the teacher. A group discussion at the end of the project will help students reflect on and embed what they have learned.

On the other hand, the project could be used to assess skills like 'long life learning', 'technical creative thinking', 'research skills', 'problem solving', ... using the usual methods.

Our Experience

Tips

The choice for a scale one to four is essential but not absolute. Smaller scales will not demonstrate the problems with friction and so on, because a human can easily overcome these forces. Larger scales are more labour-intensive and require greater risk management for the same result.

When sets or puppets are used, it may help to add some weight to them for proper functioning.

Students learn most from finding solutions themselves. Ask questions, give hints, but no answers!

Even if this looks like a very technical exercise, enough focus should be on operating and smooth movement – the performance aesthetics of the machinery. This is the most difficult part.

Additional information and resources

The Canon teaching tools includes a growing collection of wooden stage machinery construction drawings, with both 2D drawings and 3D models, which can be used to build 1:4 scale stage machinery (Q31058).

A time-lapse video of the 1:4 stage being constructed is available at the online version of this teaching methodology: Q31079.

Safety Notice

This is a relatively low risk activity, depending on the setup. There is working at height risks for some assignments, but limited, as well as suspended loads and manual handling. In a full-size version, or with a general audience, further safety considerations will be required. In any case, ensure you follow the procedures and regulations in your locality, and always do a risk assessment.

Tambour de degradation / triple speed drum

Construction manual for Scale one to four model

Scale model of a "Tambour de degradation" - triple drum, used for baroque machinery experiments and demonstrations. A triple drum is used to move different objects like clouds in a way they move synchronically but at different speeds. The model can be built in a basic, but well equipped workshop.



Content

Materials list 2
 Detail drawings 3
 Construction 5
 Credits 8

Canon	Tambour de degradation / triple speed drum	Drawing by: Beno Van Goethem	
Canon Tools	Construction drawing	Version: 02.01	Version date: 20/12/2022

Not the End

“
Every day,
there is
one more
day of
history...”

