

jove

A CATALYST FOR SCIENTIFIC
EDUCATION



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WHAT IS JoVE?

JoVE creates scientific videos for four unique resources:

- **JoVE Video Journal**

Publishes experimental techniques in visual format with detailed text protocols to increase scientific reproducibility and productivity.

- **JoVE Science Education**

Teaching scientific fundamentals through simple easy-to-understand video demonstrations.

- **JoVE Core**

An animated text book. Foundational concepts are explained through high-impact animations and real-life experimentation.

- **JoVE Lab Manual**



Videos for both instructors and students in introductory biology lab courses.



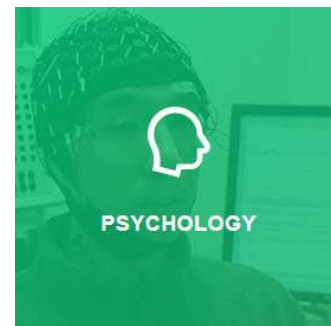
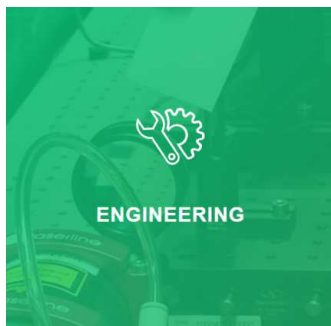
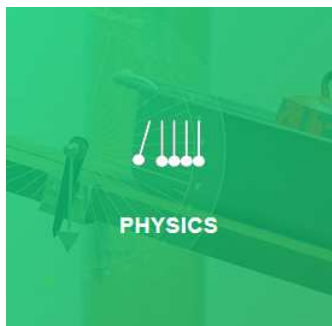
SCIENCE EDUCATION: YOUR ACCESS



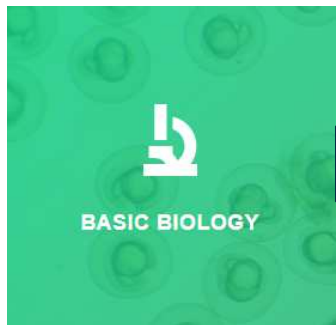
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SCIENCE EDUCATION



- ▶ **General laboratory techniques**
- ▶ **Basic methods in cellular and molecular biology**
- ▶ **Biology 1: Yeast, Drosophila, and *C. elegans***
- ▶ **Biology 2: Mouse, zebrafish and chick**
- ▶ **Lab animal research**
- ▶ **Lab safety**

- ▶ **Using a haemocytometer to count cells**
- ▶ **Restriction enzyme digests**
- ▶ **DNA ligation reactions**
- ▶ **An introduction to transduction**
- ▶ **The western blot**
- ▶ **Gel purification**
- ▶ **Plasmid purification**
- ▶ **The ELISA method**
- ▶ **Bacterial Transformation: Electroporation**
- ▶ **Bacterial Transformation: The heat shock method**
- ▶ **Separating protein with SDS-PAGE**
- ▶ **DNA gel electrophoresis**
- ▶ **PCR: The polymerase chain reaction**
- ▶ **Passaging cells**
- ▶ **Molecular cloning**

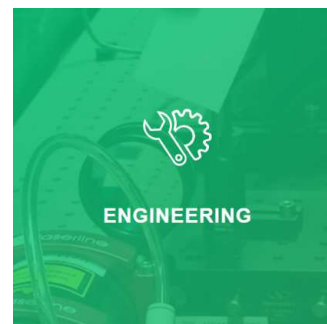
SCIENCE EDUCATION



- ▶ **Neuroscience**
- ▶ **Genetics**
- ▶ **Cell biology**
- ▶ **Developmental biology**



- ▶ **Environmental Science**
- ▶ **Environmental Microbiology**
- ▶ **Earth Science**



- ▶ **Bioengineering**
- ▶ **Biomedical Engineering**



- ▶ **General Chemistry**
- ▶ **Biochemistry**

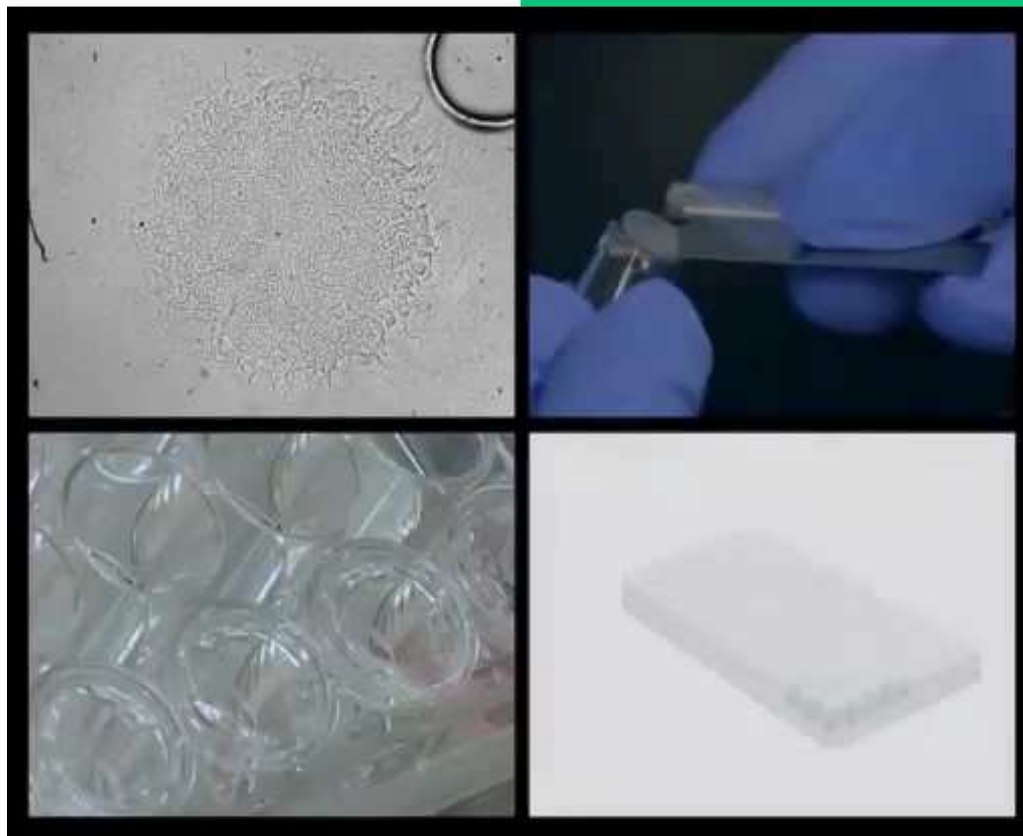
SCIENCE EDUCATION

ADVANCED BIOLOGY > CELL BIOLOGY

The Transwell Migration Assay

USE JoVE IN YOUR CLASSROOM

CREATE A JoVE TEST



THIS ARTICLE IS FREE ACCESS.

RECOMMEND JoVE

CHAPTERS

0:00 Overview

The transwell migration assay is a classical technique that allows scientists to quantify cell movement. Migration refers to a cell's ability to move individually or in clusters. Cell movements are made possible through precise restructuring of their cytoskeleton and migration usually occurs in response to stimuli that act as cues.

Today, we'll discuss the transwell migration assay, which utilizes a simple chamber setup to assess migration in response to attracting cues.

0:42 Background on the Transwell Chamber

2:21 Experimental Considerations

3:43 Protocol for Measuring Migration of Adherent Cells

5:13 Applications

7:52 Summary

JoVE TEST

[View Video](#)

4. Select Questions ①

1. **Why is RCF a better way to describe the magnitude of centrifugation when compared to r.p.m.?**

- A) RCF is more accurate compared to r.p.m., which is an estimate.
- B) RCF is a measure of relative force.
- C) RCF is specific to centrifugation, whereas r.p.m. is more general.
- D) RCF takes into account the duration of the centrifugation.

Choose File No file chosen

Use

6. **What parameter of a centrifuge rotor relates to calculating the centrifugal force?**

- A) The number of samples that the rotor holds.
- B) The weight of the rotor.
- C) The angle with which the sample is held.
- D) The distance between the sample and the central axis.

Choose File No file chosen

Use

JoVE TEST

Test Results

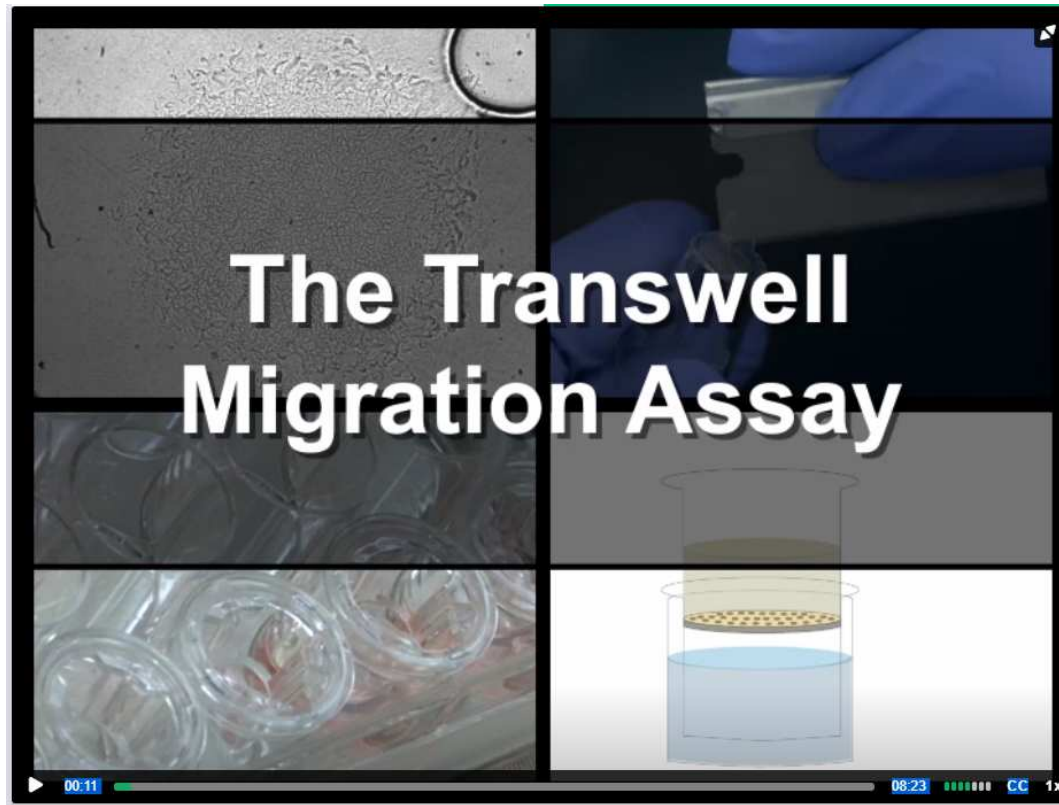
Introduction to the Centrifuge

Below is a list of all students that were sent invitations about this test, as well as information about their scores, if they have taken the test:

Revision #1: Invitation Date 08/30/2018

Email		Test Taken	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Pawel.Kania@jove.com	<input type="text" value="08/31/2018"/> Current Deadline		Test Not Taken - Resend Test									
Roman.Lyashenko@jove.co	4/10 40 %	08/30/2018 at 8:25AM	■	■	■	■	■	■	■	■	■	■
Marita.Eleftheriadou@jove.	3/10 30 %	08/30/2018 at 5:16AM	■	■	■	■	■	■	■	■	■	■
Christophe.Deschamps@jove.com	<input type="text" value="08/31/2018"/> Current Deadline		Test Not Taken - Resend Test									
Rubin.Zajsi@jove.com	2/10 20 %	08/31/2018 at 11:31AM	■	■	■	■	■	■	■	■	■	■

SCIENCE EDUCATION



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EMBED



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EMBED VIDEOS ONTO BLACKBOARD LEARN

The screenshot displays the Blackboard Learn interface for a course titled "Biomedical Sciences 2 (2015-2016)[YR]". The page is titled "Course Content" and shows a navigation menu on the left with options like "News and Announcements", "Course Content", "Lectures", "Practicals", "Tutorials", "Review Quizzes", "In-Course Assessment", "SSLC", "Discussion Board", "Staff Help", "Student Help", "My Grades", "Groups", "Course Management", "Control Panel", "Content Collection", and "Course Tools". The main content area is titled "Course Content" and contains a folder icon labeled "Practicals" with the text "Practical handbook, practical group allocations and all practicals related information can be found here." Below this is a document icon labeled "Hemacytometer video" with the title "Using a Hemacytometer to Count Cells". The video player shows a grid of images with the "jove" logo and a play button. A "LOG IN" button is visible in the top left corner of the video player.

TERC STUDY

94 Molecular Biology students from



DESALLES UNIVERSITY

252 Biology students from



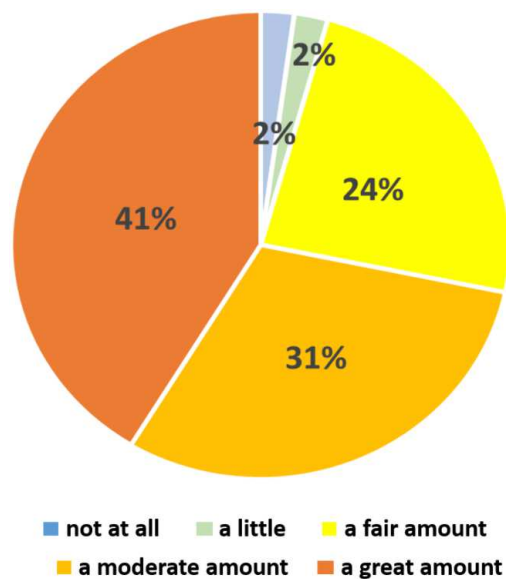
The study was performed by TERC, Cambridge MA; STEM Education Evaluation Centre.

Students were divided into two groups:

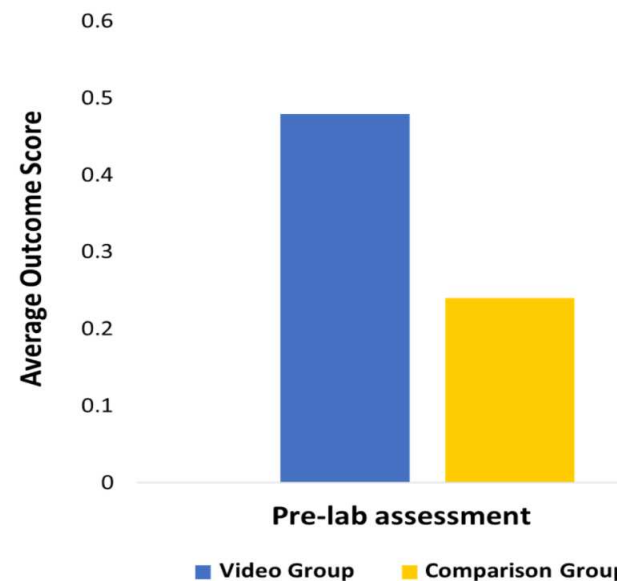
- ▶ Group 1: Watched videos twice before lab and read the hand-out
- ▶ Group 2: Just read the hand-out



TERC STUDY



- ▶ **89%** Felt they were more confident during the lab
- ▶ **92%** Felt they understood how to conduct the practical better
- ▶ **96%** found JoVE useful in explaining core scientific concepts



- ▶ **Students scored 100% higher on pre-lab tests**
- ▶ **Students scored 46% higher on post-lab test**

JoVE CORE

The image shows the top navigation bar of the JoVE website. On the left is the JoVE logo. To its right is a search bar containing the text "Search 10,777 video articles" and an "Advanced" search option with a magnifying glass icon. Further right are two buttons: "START TRIAL" and "LOG IN". Below the search bar is a horizontal menu with several items: "BIOPHARMA NEW", "ABOUT JoVE", "FOR LIBRARIANS", "PUBLISH", "VIDEO JOURNAL", and "SCIENCE EDUCATION". The "SCIENCE EDUCATION" item is highlighted with a red rectangular border. Below the navigation bar is a promotional banner for "JoVE Core. The Ultimate Video Resource for Biology." The banner features a computer monitor displaying a blue molecular structure with a DNA double helix and a play button icon. To the right of the monitor, the text "JoVE Core. The Ultimate Video Resource for Biology." is written in a large, blue, serif font. The background of the banner is a light-colored brick wall.

joVE

Search 10,777 video articles Advanced

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BIOPHARMA NEW ABOUT JoVE FOR LIBRARIANS PUBLISH VIDEO JOURNAL SCIENCE EDUCATION

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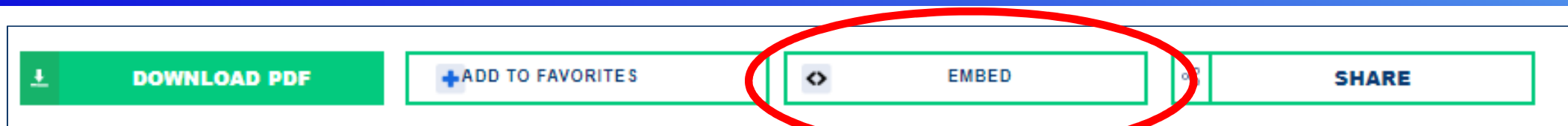
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Use this code to embed a JoVE article on a website. You are using the access key **n9qutya1f3**.

```
<iframe allowTransparency="true" allowfullscreen height="415" width="460" border="0" scrolling="no" frameborder="0" marginwheight="0" marginwidth="0" src="https://www.jove.com/embed/player?id=5644&access=n9qutya1f3&t=1&s=1" ><p><a title="The Transwell Migration Assay" href="https://www.jove.com/video/5644/the-transwell-migration-assay">The Transwell Migration Assay</a></p></iframe>
```

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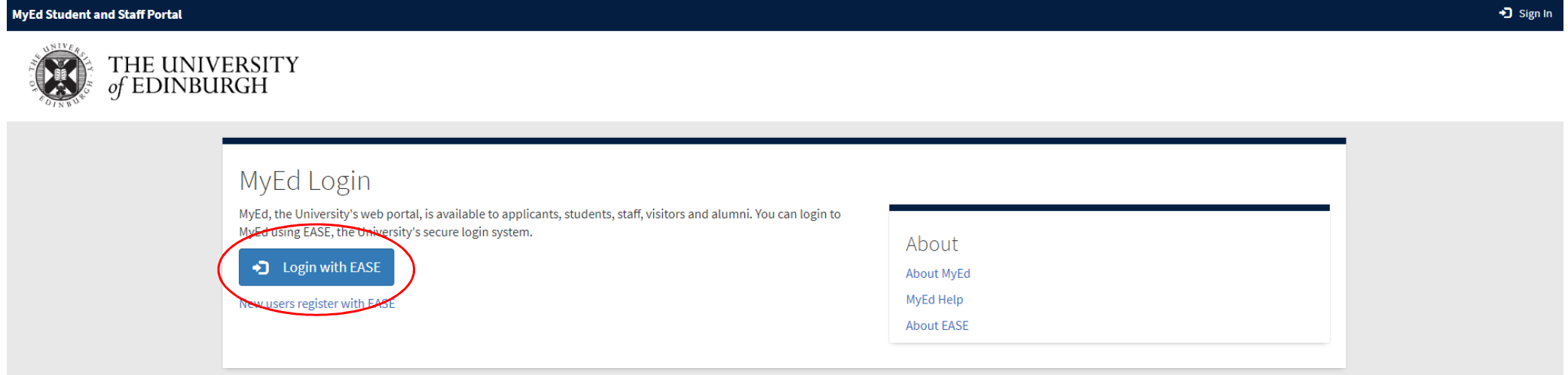
Show this article's:

- Title
- Chapters
- Disable Autostart




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► In a separate tab login to Blackboard Learn



MyEd Student and Staff Portal Sign In

 THE UNIVERSITY of EDINBURGH

MyEd Login

MyEd, the University's web portal, is available to applicants, students, staff, visitors and alumni. You can login to MyEd using EASE, the University's secure login system.

[Login with EASE](#)

NEW users register with EASE

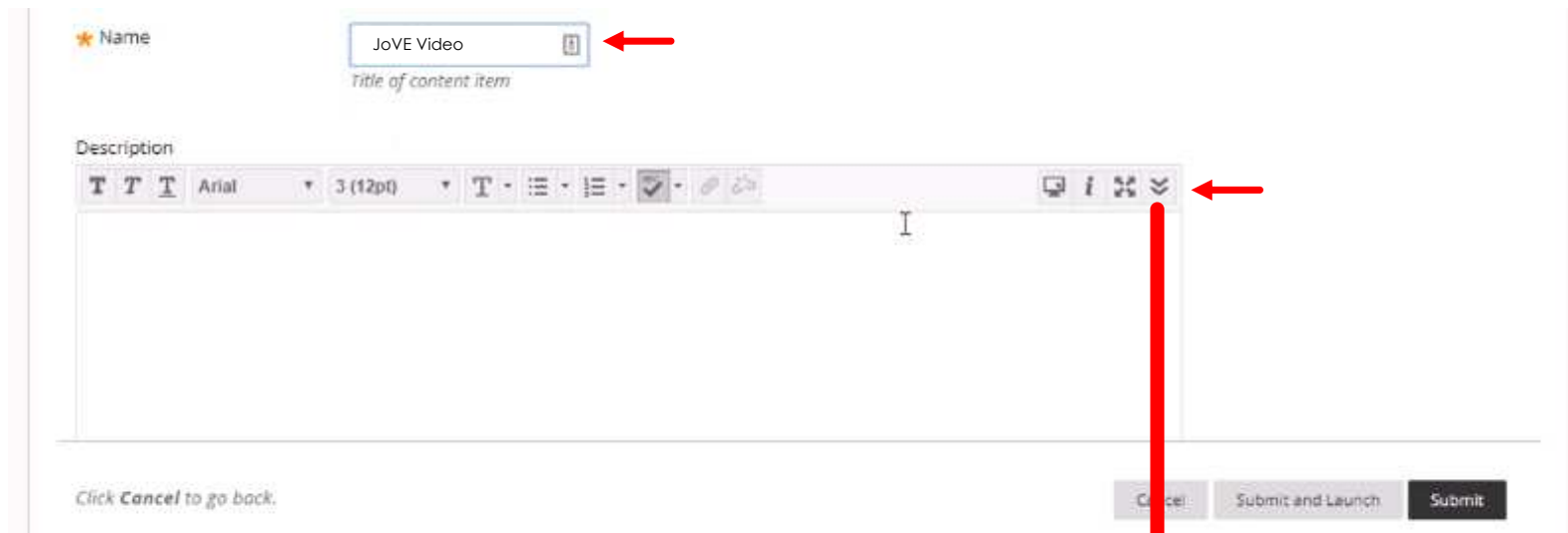
- About
- About MyEd
- MyEd Help
- About EASE

► Then navigate to the Module page you wish to add the video to.

EMBED VIDEOS ONTO BLACKBOARD LEARN

The screenshot displays the Blackboard Learn interface for 'THE UNIVERSITY of EDINBURGH'. The user is logged in as 'James Slack'. The main navigation bar includes 'My Learn', 'Self-Enrol', and 'Help'. The current page is titled 'Content' and features an 'Edit Mode is: ON' indicator. A sidebar on the left contains a 'Control Panel' with various options like 'Content Collection', 'Course Tools', and 'Evaluation'. The main content area shows a 'Build Content' dropdown menu with 'Create Item' selected, indicated by red arrows. The page also includes 'Assessments' and 'Tools' dropdowns. A message in the center reads: 'It's time to add content... Use functions above to add it.'

EMBED VIDEOS ONTO BLACKBOARD LEARN



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- ▶ **Paste the embed code in the pop-up box**
- ▶ **Click "Submit" at the bottom of the pop-up box**
- ▶ **Click "Update" at the bottom of the module page**