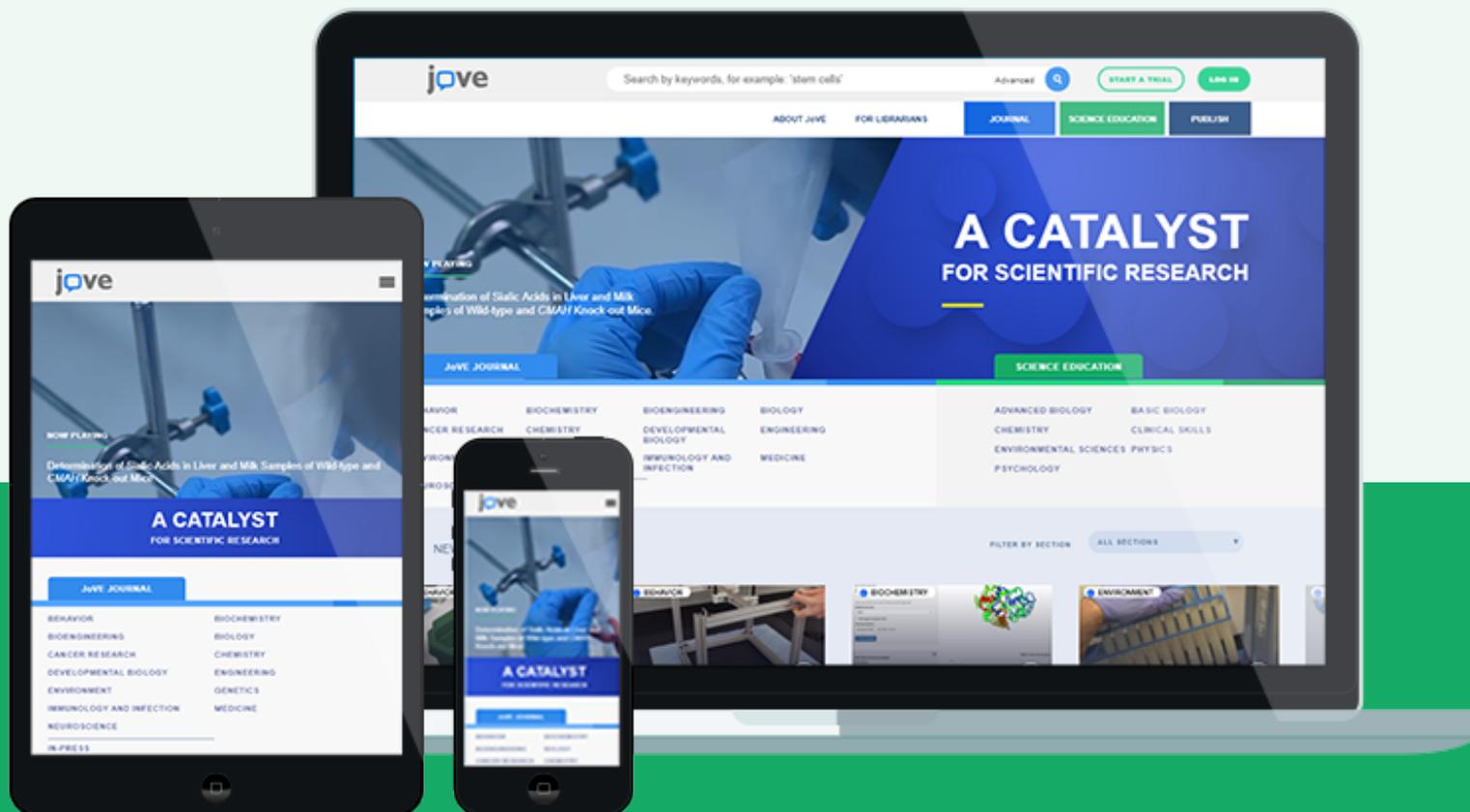




JoVE SCIENCE EDUCATION USER GUIDE

Edited September 2017



ABOUT JOVE SCIENCE EDUCATION

JoVE Science Education is an innovative library of video collections that teach key concepts and fundamental techniques. These simple, easy-to-understand video demonstrations cover a wide range of subjects in science, medicine, and engineering.

Our library is divided into 8 subject-based series, each containing multiple collections.

- | | |
|--|--|
|  BASIC BIOLOGY |  PSYCHOLOGY |
|  ADVANCED BIOLOGY |  ENVIRONMENTAL SCIENCES |
|  CLINICAL SKILLS |  PHYSICS |
|  CHEMISTRY |  ENGINEERING* |

*See the full list of collections at [JoVE.com/scienceeducationlibrary](https://www.jove.com/scienceeducationlibrary)

LIBRARY FACTS

The library includes 
8 Series, 38 Collections,
and **570** videos

Videos include 
animations of concepts,
live-action demos of
techniques and a detailed
transcription

Collections are produced 
in collaboration with
scientists and faculty at **top**
universities

QUICK SEARCH & BROWSE

1 QUICK SEARCH

Search by keyword in the main search bar for direct access to our library of scientific videos.

1b ADVANCED SEARCH

Refine your keyword search and/or add author, institution, date, or sections filters by clicking on 'Advanced' in the search bar.

2 VIDEO JOURNAL ACCESS

See which Video Journal sections you have access to while in your institution's IP range, or when logged in to your account.

3 SCIENCE EDUCATION ACCESS

See which Science Education series you have access to while in your institution's IP range, or when logged in to your account.

4 ACCOUNT LOGIN

Log in to your account using your institutional email address and access additional features.

5 NAVIGATION BAR

Browse our site for additional information on JoVE - including guides on how best to use JoVE in your classroom.

The screenshot displays the JoVE website interface with several key features highlighted by numbered callouts:

- 1**: Main search bar with the placeholder text "Search by keywords, for example: 'stem cells'".
- 1b**: Advanced search dropdown menu, which includes a search bar, a list of operators (and, or, not), a plus sign for additional operators, and filter options: "FILTER BY AUTHOR OR INSTITUTION", "FILTER BY PUBLICATION DATE", and "FILTER BY SECTION".
- 2**: Video Journal section, featuring a "NOW PLAYING" list with a video titled "Nitrogen Cavitation and Differential Centrifugation Allows for Monitoring the Distribution of Peripheral Membrane Proteins in Cultured Cells".
- 3**: Science Education section, displaying a grid of categories including Behavior, Cancer Research, Environment, Biochemistry, Chemistry, Genetics, Bioengineering, Developmental Biology, Immunology and Infection, Biology, Engineering, and Medicine.
- 4**: "START A TRIAL" and "LOG IN" buttons.
- 5**: Navigation bar with links for "ABOUT JOVE", "FOR LIBRARIANS", "VIDEO JOURNAL", "SCIENCE EDUCATION", and "PUBLISH".

SCIENCE EDUCATION STRUCTURE: INDEX PAGE

The Science Education library is divided into 8 subject specific series, each of which includes collections focused on a specific discipline.

1 ACCESS

See which Science Education series you have access to while in your institution's IP range, or when logged in to your account.

2 SERIES

Series are displayed on the left. Click through a series to see more information on its curation and the collections that it contains.

3 COLLECTIONS

Click through a specific collection here to see the list of the 15 videos it is made of.

The screenshot displays the JoVE Science Education index page. At the top, there is a navigation bar with the JoVE logo, a search bar, and links for 'ABOUT JoVE', 'FOR LIBRARIANS', 'VIDEO JOURNAL', 'SCIENCE EDUCATION', and 'PUBLISH'. A large banner image shows a scientist in a lab. Below the banner, there are three numbered callouts: 1. A list of subject series: Advanced Biology, Environmental Sciences, Basic Biology, Physics, Chemistry, Psychology, and Clinical Skills. 2. A vertical list of series cards: Advanced Biology, Basic Biology, and Chemistry. 3. A grid of collection cards for each series, such as 'Neuroscience' and 'Developmental Biology' under Advanced Biology, and 'General Laboratory Techniques' and 'Basic Methods in Cellular and Molecular Biology' under Basic Biology.

SCIENCE EDUCATION STRUCTURE: SERIES LEVEL

Each Series contains multiple collections of videos within a specific subject.

1 SERIES

Series name and icon is displayed here.

2 COLLECTION

Each collection is described here with a preview image, text overview and two video previews. Click through the collection you want to explore.

3 SAMPLE VIDEOS

Each collection has two open access videos for users to get a sense of the content.

The screenshot shows the JoVE Science Education website interface. At the top, there is a search bar with the text "Search by keywords, for example: 'stem cells'", an "Advanced" search option, and buttons for "START A TRIAL" and "LOG IN". Below the search bar are navigation links: "ABOUT JoVE", "FOR LIBRARIANS", "VIDEO JOURNAL", "SCIENCE EDUCATION", and "PUBLISH". The main header is green and features the JoVE logo and the text "SCIENCE EDUCATION PSYCHOLOGY". Below the header, there are two main collection cards. The first card is for "BEHAVIORAL SCIENCE" and includes a description: "This collection presents the fundamentals of behavior neuroscience and focuses on the concepts of learning, memory, cognition, movement, addiction and behavioral disorders." It also features two video thumbnails: "An Introduction to Learning and Memory" and "Fear Conditioning". The second card is for "EXPERIMENTAL PSYCHOLOGY" and includes a description: "This collection provides a framework for observing how psychological experiments are embedded in the actual research process, starting from the initial research design to arriving at conclusions in a study." It features two video thumbnails: "From Theory to Design: The Role of Creativity in Designing Experiments" and "Ethics in Psychology Research". At the bottom of the page, there are two more video thumbnails: "COGNITIVE PSYCHOLOGY" and "DEVELOPMENTAL PSYCHOLOGY".

SCIENCE EDUCATION STRUCTURE: COLLECTION LEVEL

On this page, you can browse through the videos that make up a collection.

1 COLLECTION INFORMATION

The green banner provides the name and description of the specific collection, and shows where the collection is positioned within the library.

2 VIDEO THUMBNAIL

Get a glimpse of the video and check the length directly on the thumbnail.

3 SOURCE

A list the scientists and institutions that collaborated with JoVE to develop the video.

The screenshot shows the JoVE website interface. At the top, there is a search bar with the text "Search by keywords, for example: 'stem cells'", a search icon, and buttons for "START A TRIAL" and "LOG IN". Below the search bar are navigation links: "ABOUT JOVE", "FOR LIBRARIANS", "VIDEO JOURNAL", "SCIENCE EDUCATION", and "PUBLISH". The main content area has a green banner with the text "SCIENCE EDUCATION > PSYCHOLOGY" and "1 COGNITIVE PSYCHOLOGY". Below the banner, there is a description: "This collection describes a number of influential paradigms used to study complex mental processes underlying attention, perception, learning and memory." Below the banner, there is a list of video thumbnails. Each thumbnail has a number in a yellow circle (1, 2, 3) indicating its position in the collection. The thumbnails are: 1. "Dichotic Listening" (06:10) with a source of "Laboratory of Jonathan Flombaum—Johns Hopkins University". 2. "Measuring Reaction Time and Donders' Method of Subtraction" (09:42) with a source of "Laboratory of Jonathan Flombaum—Johns Hopkins University". 3. "Perspectives on Cognitive Psychology" (04:56) with a source of "Laboratory of Jonathan Flombaum—Johns Hopkins University". 4. "Visual Search for Features and Conjunctions" (05:41) with a source of "Laboratory of Jonathan Flombaum—Johns Hopkins University". 5. "Binocular Rivalry" with a source of "Laboratory of Jonathan Flombaum—Johns Hopkins University".

SCIENCE EDUCATION STRUCTURE: VIDEO LEVEL

1 VIDEO TITLE

Video title and breadcrumbs.

2 JoVE IN THE CLASSROOM

JoVE in the Classroom is a resource for JoVE Science Education users. This page is new and will be updated often with new resources.

3 CREATE A JoVE TEST

This feature allows you to create customized exams to ensure to gauge your students comprehension before or after viewing the video.

4 ACCESS TYPE

Check whether your access to a specific article is provided by your institution or if it is open access.

5 VIDEO CHAPTERS

Jump to a specific place in the video by clicking on the corresponding chapter.

6 DOWNLOAD PDF

Download the transcript of the video to your device.

7 ADD TO FAVORITE

Create a playlist of your favorite video articles. Access your playlist from your user account.

8 EMBED

In a few clicks, embed the videos in any learning management or ERP system.

9 SHARE

Easily post this article on social media: Twitter, Facebook, or LinkedIn.

The screenshot shows a JoVE article page for 'An Introduction to Endocytosis and Exocytosis'. The page includes a search bar, navigation tabs (ABOUT JOVE, FOR LIBRARIANS, VIDEO JOURNAL, SCIENCE EDUCATION, PUBLISH), and a 'START A TRIAL' button. The article title is 'An Introduction to Endocytosis and Exocytosis'. Below the title are two buttons: 'USE JOVE IN YOUR CLASSROOM' and 'CREATE A JOVE TEST'. A video player is embedded, showing a diagram of a cell with a vesicle. Below the video player are buttons for 'DOWNLOAD PDF', 'ADD TO FAVORITES', 'EMBED', and 'Share'. A 'TRANSLATE TEXT TO:' section is also present. On the right side, there is a 'CHAPTERS' section with a table of contents. At the bottom, there is a 'CITE THIS VIDEO' section with a citation.

Time	Chapter
0:00	Overview
1:10	A Brief History of the Field
4:14	Key Questions
5:46	Prominent Methods
7:24	Applications
8:52	Summary

11 CITE THIS VIDEO
JoVE Science Education Database. *Cell Biology*. An Introduction to Endocytosis and Exocytosis. JoVE, Cambridge, MA, (2017).

10 SUMMARY

Description of the video content.

11 CITE THIS VIDEO

Copying a citation automatically adds it to a citations list available in your user account.

SCIENCE EDUCATION STRUCTURE: VIDEO LEVEL (2)

Below the Science Education videos you'll find a list of application videos or a full text procedure, depending on the subject matter and content found in the video.

1

APPLICATIONS

Selected applications videos show the method described in the Science Education video in real life.

2

PROCEDURE

Some Science Education videos have a full text protocol. These detail the step-by-step process used to reproduce the protocol shown in the video.

6	3	3	3
7	5	5	5

Table 1. Volumes of stock standards used to prepare the 7 provided working standards (total volume of each standard is 50 mL).

PROCEDURE

1. Making the Mobile Phase

1. Prepare the mobile phase by adding 400 mL of acetonitrile to approximately 1.5 L of purified DI water.
2. Carefully add 2.4 mL of glacial acetic acid to this solution.
3. Dilute the solution to a total volume of 2.0 L in a volumetric flask with purified DI water. The resulting solution should have a pH between 2.8 to 3.2.
4. Adjust the pH to 4.2 by adding 40% sodium hydroxide, drop-wise with the use of a calibrated digital pH meter. Add very slowly once the pH reaches 4.0. This should take around 50 drops to accomplish.
5. Filter the mobile phase through a 0.47- μ m Nylon 66 membrane filter under vacuum to degas the solution and to remove solids that could plug the chromatographic column. It is important to degas the mobile phase to avoid having a bubble, which could either cause a void in the stationary phase at the inlet of the column or work its way into the detector cell, causing instability with the UV absorbance.

2. Creating the Component Solutions

The three components that need to be made are caffeine (0.8 mg/mL), potassium benzoate (1.4 mg/mL), and aspartame (L-aspartyl-L-phenylalanine methyl ester) (6.0 mg/mL). These concentrations, once diluted in the same fashion, put the standards at the levels found in the soda samples.

1. Add 0.40 g of caffeine to a 500-mL volumetric flask, then dilute to the 500-mL mark with DI water.
2. Add 0.70 g of benzoate to a 500-mL volumetric flask, then dilute to the 500-mL mark with DI water.
3. Add 0.60 g of aspartame to a 100-mL volumetric flask, then dilute to the 100-mL mark with DI water. Place this solution in a refrigerator to avoid decomposition during storage.

CHAPTERS

0:00	Overview
	High-performance liquid chromatography, or HPLC, is a highly versatile technique that separates components of a liquid mixture based on their different interactions with a stationary phase.
	HPLC is an adaptation of column chromatography. In column chromatography,
1:22	Principles of HPLC

USER ACCOUNT & FEATURES

Users can create an account with their institutional emails in order to have access off campus. They will also have access to the following features:

1 USER ACCOUNT DASHBOARD

2 VIEW WATCH HISTORY

Find a previously watched article easily with this watch history feature.

3 FAVORITE ARTICLES

Access your favorite video articles playlist here. To add a video, simply click the 'add to favorite' button under the video player on the article page.

4 CITATIONS LISTING

Access the list of all the video articles you have cited. To add an article, simply click the 'cite this' button at the top of the video player on an article page.

5 MY TESTS

Faculty using Science Education in their classrooms or labs can manage their customized tests from here.

6 ACCOUNT INFO

Manage your account settings, update your information, or change your password.

The screenshot shows the JoVE user account dashboard for a user named Diana. At the top, there is a search bar with the text "Search by keywords, for example: 'stem cells'", an "Advanced" search option, and buttons for "START A TRIAL" and "SIGN OUT". Below the search bar is a navigation menu with options: "ABOUT JoVE", "FOR LIBRARIANS", "VIDEO JOURNAL", "SCIENCE EDUCATION", and "PUBLISH". The main content area features a large blue banner with the text "1 WELCOME DIANA". Below the banner is a row of buttons: "HOME", "2 VIEW WATCH HISTORY", "3 FAVORITE ARTICLES", and "4 CITATIONS LISTING". Below this row are three more buttons: "5 MY TESTS", "6 ACCOUNT INFO", and "7 JoVE ACCESS". At the bottom, there is a section for "8 RECENT JOURNAL ARTICLES" with a "FILTER BY SECTION" dropdown menu set to "ALL SECTIONS". Below the filter are four video thumbnails with titles: "GENETICS: Quantification of Information Encoded by Gene Expression Levels During Lifespan ...", "BEHAVIOR: Creating and Applying a Reference to Facilitate the Discussion and...", "BIOENGINEERING: Characterizing Cell Migration Within Three-dimensional *In Vitro* Wound...", and "BIOLOGY: A Protocol for Using Gene Set Enrichment Analysis to Identify the Appropriate...".

7 JoVE ACCESS

Check what access you have to JoVE through your institution.

8 RECENT JOURNAL ARTICLES

The latest published articles will be visible here. You can filter them by section.

Having technical difficulties?

Fill out our Technical Support form online:

→ [JoVE.com/about/contact](https://www.jove.com/about/contact)

Want to be updated on the latest science published in JoVE?

Sign-up for our scientist newsletter from the homepage footer:

→ [JoVE.com](https://www.jove.com)

For more information please visit [JoVE.com](https://www.jove.com)