



Beta Presentation

Making STEM Papers Accessible to ASL Users

The Capstone Experience

Team Microsoft

Aditya Ashok
Aidan O'Rourke
Alex Woodring
Jiancong Huang
Ricky Pennepalli
Tommy Kocab

Department of Computer Science and Engineering
Michigan State University

Fall 2022



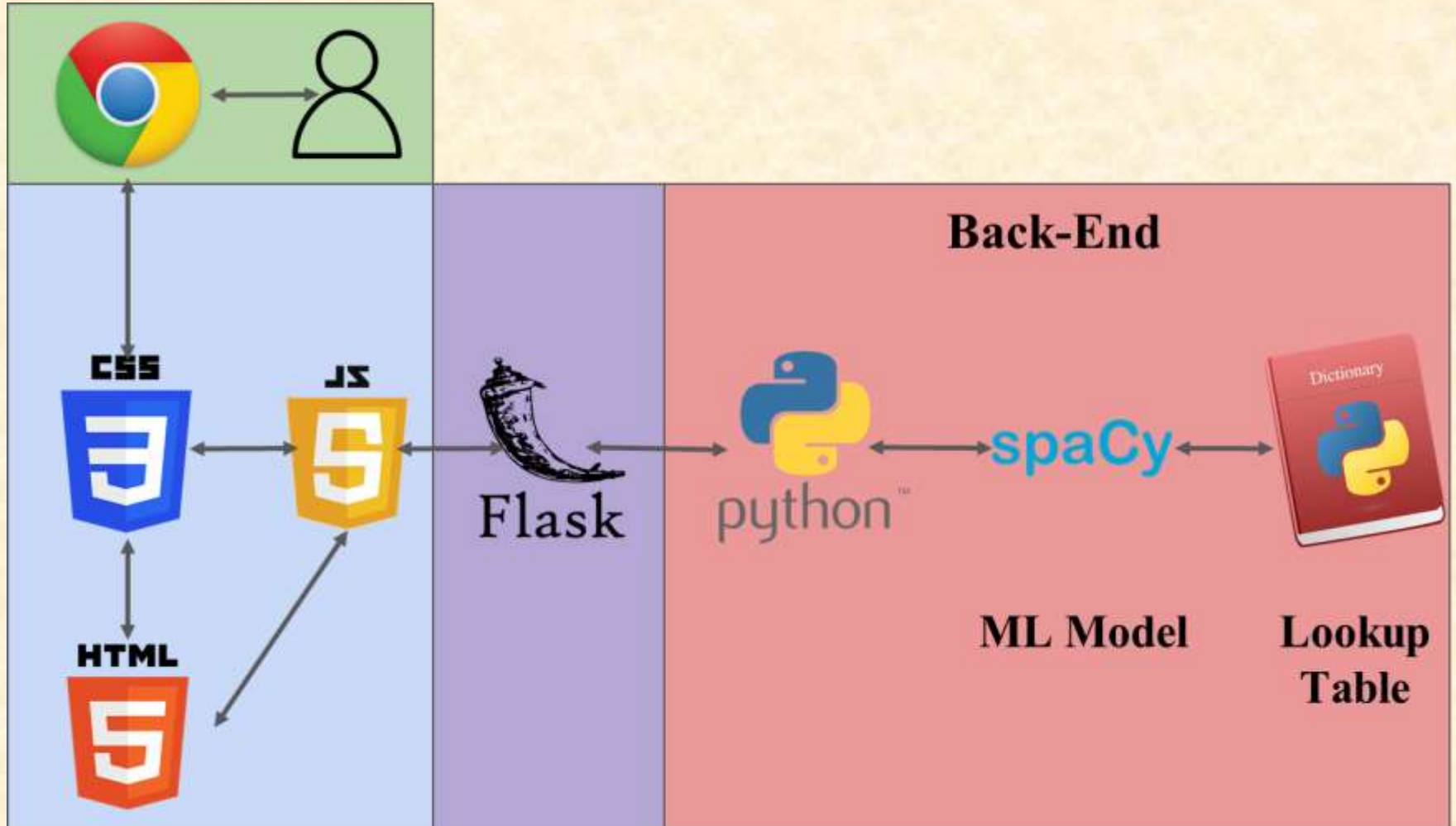
*From Students...
...to Professionals*

Project Overview

- Enable ASL users to interpret STEM papers
- By making a translation reading tool
- Accessible as a Chrome extension



System Architecture



Input using Highlight Functionality

The image shows a screenshot of a web browser displaying the Wikipedia page for "Science". The browser's address bar shows the URL "en.wikipedia.org/wiki/Science". The Wikipedia logo is visible on the left side of the page. The main content area of the page is titled "Science" and includes a sub-header "From Wikipedia, the free encyclopedia". Below this, there is a paragraph of text about the history of science, with the word "Science" highlighted in blue. An overlay window titled "English to ASL Lookup" is positioned over the highlighted word. The overlay contains the text "Press the Button to Lookup the Highlighted Word" and a button labeled "Lookup". The overlay also has a search bar with the text "Enter an input...".

Science - Wikipedia

en.wikipedia.org/wiki/Science

WIKIPEDIA
The Free Encyclopedia

Article Talk

Science

From Wikipedia, the free encyclopedia

For other uses, see *Science (disambiguation)*.

Science is a systematic endeavor that builds and organizes knowledge in the form of testable explanations and predic...

Science may be as old as the human species,^[2] and some of the earliest archeological evidence for scientific reasoning years old.^[4] The earliest written records in the history of science come from Ancient Egypt and Mesopotamia in around Their contributions to mathematics, astronomy, and medicine entered and shaped Greek natural philosophy of classical attempts were made to provide explanations of events in the physical world based on natural causes.^{[5][6]} After the fall of the Roman Empire, knowledge of Greek conceptions of the world deteriorated in Western Europe during the early centuries (400 to 1000 AD),^[7] but was preserved in the Muslim world during the Islamic Golden Age^[8] and later by the efforts of Byzantine Greek manuscripts from the dying Byzantine Empire to Western Europe in the Renaissance.

The recovery and assimilation of Greek works and Islamic inquiries into Western Europe from the 10th to 13th century, along with the philosophy^{[7][9]} which was later transformed by the Scientific Revolution that began in the 16th century^[10] as new ideas emerged from previous Greek conceptions and traditions.^{[11][12]} The scientific method soon played a greater role in knowledge of the 19th century that many of the institutional and professional features of science began to take shape,^{[13][14]} along with the philosophy to "natural science".^[15]

Modern science is typically divided into three major branches:^[16] natural sciences (e.g., biology, chemistry, and physics), psychology, and sociology), which study individuals and societies;^{[17][18]} and the formal sciences (e.g., logic, mathematics, and computer science), which study axioms and rules.^{[19][20]} There is disagreement whether the formal sciences are science disciplines,^{[21][22][23]} because they do not use scientific knowledge for practical purposes, such as in engineering and medicine.^{[24][25][26]}

New knowledge in science is advanced by research from scientists who are motivated by curiosity about the world and a desire to solve problems.^{[27][28]} Contemporary scientific research is highly collaborative and is usually done by teams in academic and research institutions,^[29] government agencies, and companies.^{[31][32]} The practical impact of their work has led to the emergence of science policies that seek to influence the scientific enterprise by prioritizing the ethical and moral development of commercial products, armaments, health care, public infrastructure, and environmental protection.

Contents [hide]

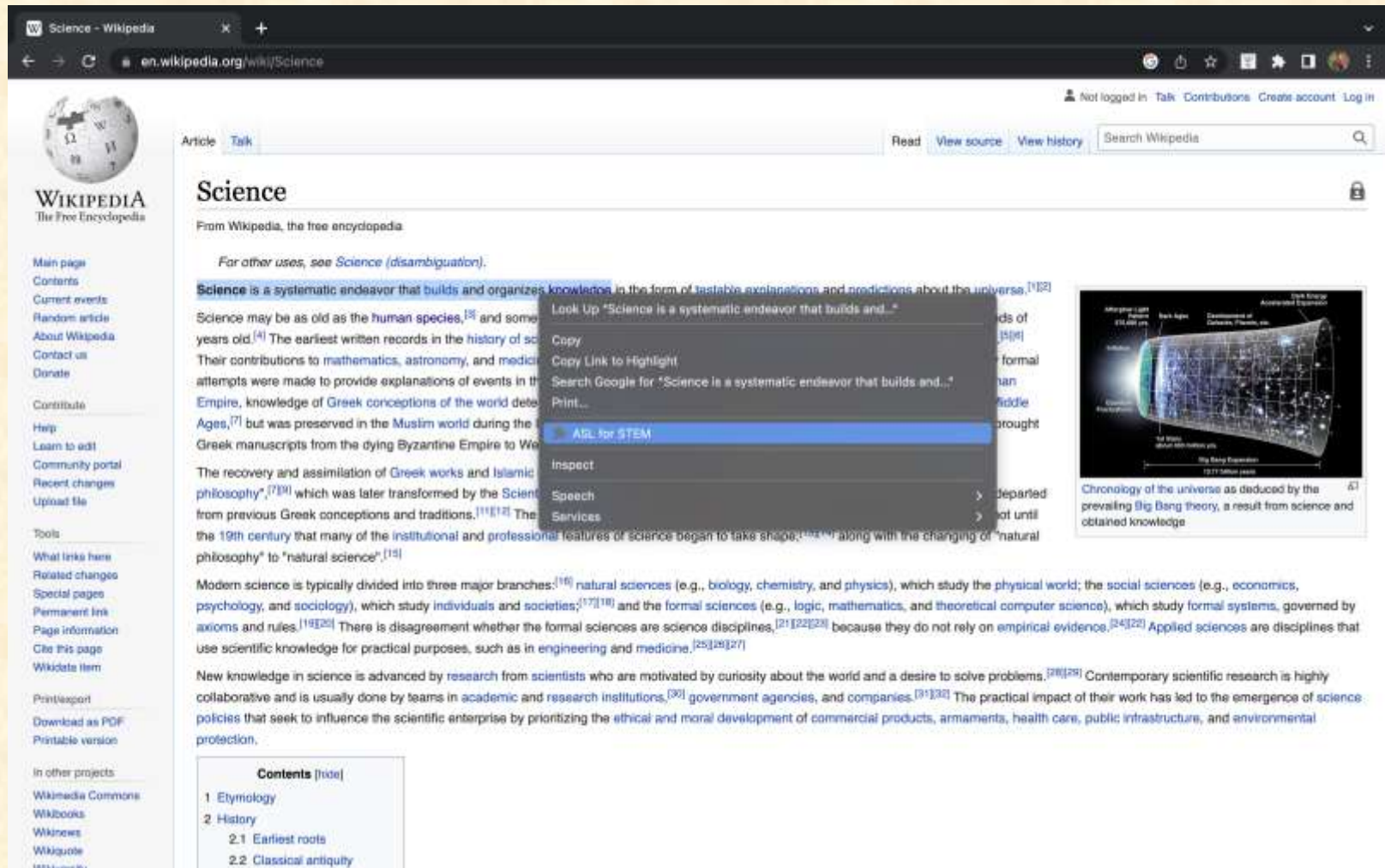
- 1 Etymology
- 2 History
 - 2.1 Earliest roots
 - 2.2 Classical antiquity

Output

The image shows a web browser window displaying the Wikipedia page for "Science". The browser's address bar shows "en.wikipedia.org/wiki/Science". The Wikipedia page includes the standard sidebar with navigation links, the article title "Science", and the beginning of the article text. An overlay application titled "English to ASL Lookup" is positioned on the right side of the browser window. This application has a search bar with the text "Enter an input...", a "Lookup" button, and a section for "Lookup Videos:". Under this section, a video player is visible, showing a person in a blue shirt. Below the video player, the word "Systematic" is displayed, followed by a search result snippet: "We watched found for Systematic... click here for YouTube search results".



Input using Right-Click Functionality



The screenshot shows the Wikipedia article for 'Science'. A right-click context menu is open over the word 'Science' in the first sentence. The menu options include: Look Up "Science is a systematic endeavor that builds and...", Copy, Copy Link to Highlight, Search Google for "Science is a systematic endeavor that builds and...", Print..., Add for STEM (highlighted), Inspect, Speech, and Services. The article text describes science as a systematic endeavor that builds and organizes knowledge in the form of testable explanations and predictions about the universe. It mentions that science may be as old as the human species and that the earliest written records in the history of science are found in ancient Mesopotamia. The article also discusses the recovery and assimilation of Greek works and Islamic philosophy, and the modern division of science into natural sciences, social sciences, and formal sciences. A diagram on the right illustrates the chronology of the universe as deduced by the prevailing Big Bang theory, showing the expansion from a singularity through various stages like inflation, radiation, and matter domination, leading to the formation of galaxies and stars.

Science - Wikipedia

en.wikipedia.org/wiki/Science

Not logged in | Talk | Contributions | Create account | Log in

Article | Talk

Read | View source | View history | Search Wikipedia

Science

From Wikipedia, the free encyclopedia

For other uses, see *Science (disambiguation)*.

Science is a systematic endeavor that builds and organizes knowledge in the form of testable explanations and predictions about the universe.^{[1][2]} Look Up "Science is a systematic endeavor that builds and..."

Science may be as old as the human species,^[3] and some years old.^[4] The earliest written records in the history of science are found in ancient Mesopotamia. Their contributions to mathematics, astronomy, and medicine were made to provide explanations of events in the Empire, knowledge of Greek conceptions of the world date back to the 5th century BCE. The knowledge of the Greeks was preserved in the Muslim world during the Islamic Golden Age,^[7] but was preserved in the Muslim world during the Middle Ages. The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method. The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method. The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method.

The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method. The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method. The recovery and assimilation of Greek works and Islamic philosophy,^{[7][8]} which was later transformed by the Scientific Revolution, led to the modern scientific method.

Modern science is typically divided into three major branches:^[16] *natural sciences* (e.g., biology, chemistry, and physics), which study the physical world; the *social sciences* (e.g., economics, psychology, and sociology), which study individuals and societies;^{[17][18]} and the *formal sciences* (e.g., logic, mathematics, and theoretical computer science), which study formal systems, governed by axioms and rules.^{[19][20]} There is disagreement whether the formal sciences are science disciplines,^{[21][22][23]} because they do not rely on empirical evidence.^{[24][22]} *Applied sciences* are disciplines that use scientific knowledge for practical purposes, such as in engineering and medicine.^{[25][26][27]}

New knowledge in science is advanced by *research* from scientists who are motivated by curiosity about the world and a desire to solve problems.^{[28][29]} Contemporary scientific research is highly collaborative and is usually done by teams in academic and research institutions,^[30] government agencies, and companies.^{[31][32]} The practical impact of their work has led to the emergence of science policies that seek to influence the scientific enterprise by prioritizing the ethical and moral development of commercial products, armaments, health care, public infrastructure, and environmental protection.

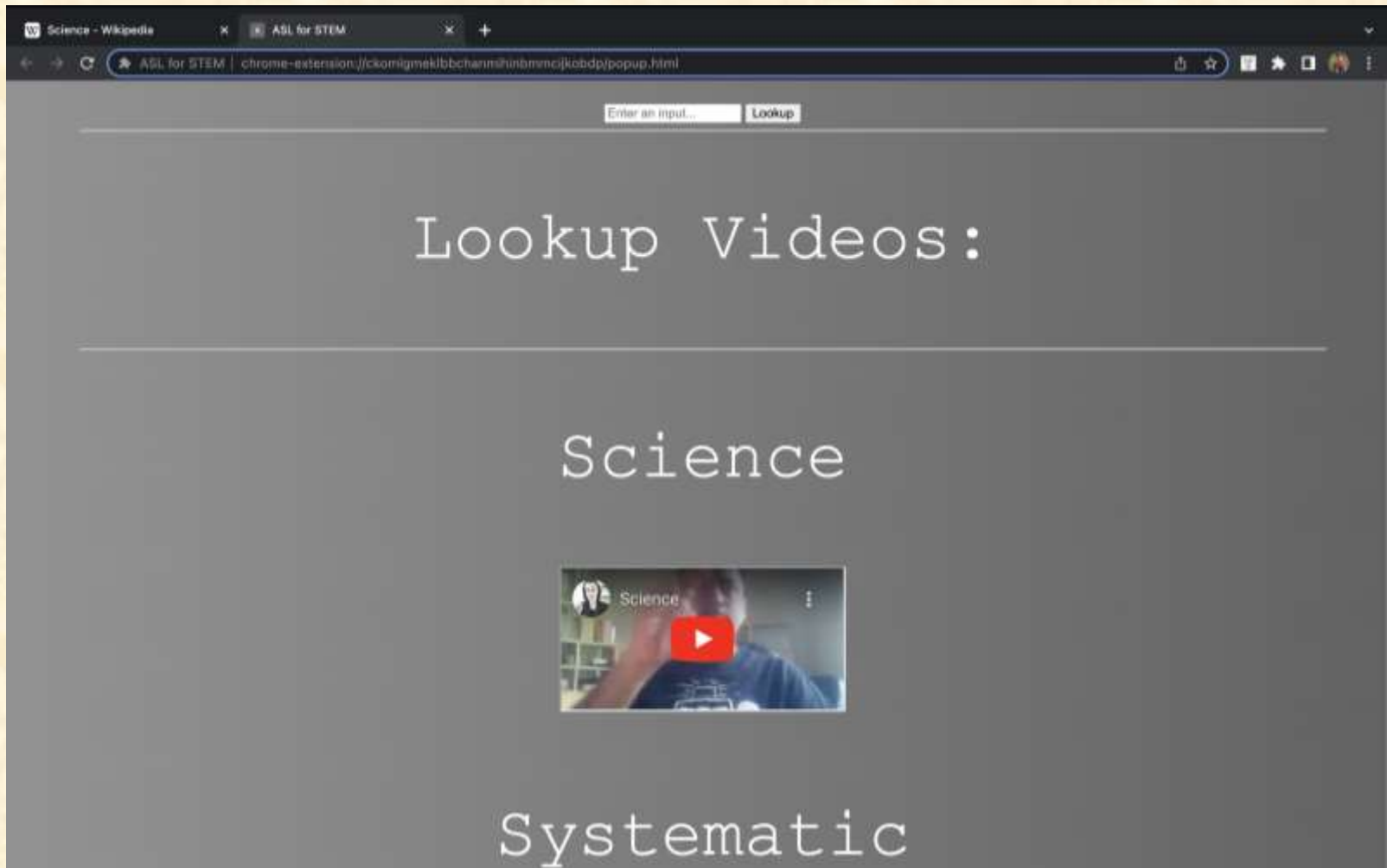
Contents [hide]

- 1 Etymology
- 2 History
 - 2.1 Earliest roots
 - 2.2 Classical antiquity

Chronology of the universe as deduced by the prevailing Big Bang theory, a result from science and obtained knowledge



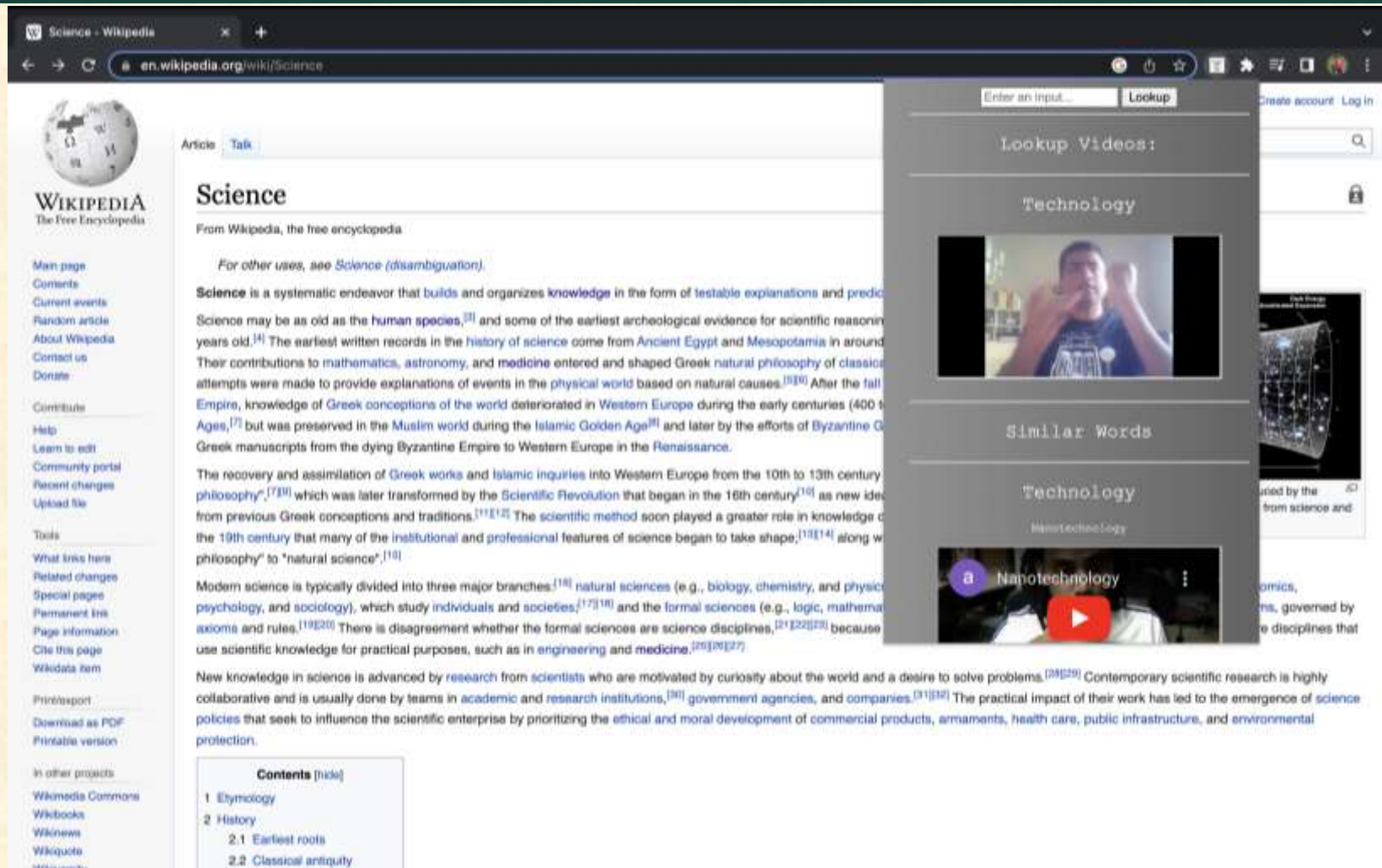
Output



Input using Search Bar

The image shows a screenshot of the Wikipedia website, specifically the article for "Science". The browser address bar shows "en.wikipedia.org/wiki/Science". On the left side of the page, there is a sidebar with various links including "Main page", "Contents", "Current events", "Random article", "About Wikipedia", "Contact us", "Donate", "Contribute", "Help", "Learn to edit", "Community portal", "Recent changes", "Upload file", "Tools", "What links here", "Related changes", "Special pages", "Permanent link", "Page information", "Cite this page", "Wikidata item", "Print/export", "Download as PDF", "Printable version", and "In other projects". The main content area of the article is titled "Science" and includes a sub-header "From Wikipedia, the free encyclopedia". Below this, there is a paragraph of text about the history and nature of science. An overlay window titled "English to ASL Lookup" is positioned on the right side of the article. This window contains the text "Press the Button to Lookup the Highlighted Word" and a search bar with the word "Technology" entered. A "Lookup" button is next to the search bar. The background of the overlay is dark grey, and the text is white. The Wikipedia logo is visible in the top left corner of the page.

Output



The image shows a screenshot of the Wikipedia page for "Science". The page is in English and includes a sidebar with navigation links, a main content area with text and a "Contents" table, and a right-hand sidebar with a "Lookup" widget. The "Lookup" widget displays a video of a person speaking, with the title "Technology" and a "Similar Words" section below it. The video is a YouTube clip showing a man in a blue shirt speaking into a microphone.

Science - Wikipedia

en.wikipedia.org/wiki/Science

Article Talk

Science

From Wikipedia, the free encyclopedia

For other uses, see Science (disambiguation).

Science is a systematic endeavor that builds and organizes knowledge in the form of testable explanations and predictions of natural phenomena. Science may be as old as the human species,^[3] and some of the earliest archeological evidence for scientific reasoning is around 500,000 years old.^[4] The earliest written records in the history of science come from Ancient Egypt and Mesopotamia in around 3000 BC. Their contributions to mathematics, astronomy, and medicine entered and shaped Greek natural philosophy of classical antiquity. Attempts were made to provide explanations of events in the physical world based on natural causes.^{[5][6]} After the fall of the Roman Empire, knowledge of Greek conceptions of the world deteriorated in Western Europe during the early centuries (400 to 1000 AD),^[7] but was preserved in the Muslim world during the Islamic Golden Age^[8] and later by the efforts of Byzantine Greek manuscripts from the dying Byzantine Empire to Western Europe in the Renaissance.

The recovery and assimilation of Greek works and Islamic inquiries into Western Europe from the 10th to 13th century produced a "new philosophy",^{[7][9]} which was later transformed by the Scientific Revolution that began in the 16th century^[10] as new ideas emerged from previous Greek conceptions and traditions.^{[11][12]} The scientific method soon played a greater role in knowledge of the natural world in the 17th century that many of the institutional and professional features of science began to take shape,^{[13][14]} along with the transition from "natural philosophy" to "natural science".^[15]

Modern science is typically divided into three major branches:^[16] natural sciences (e.g., biology, chemistry, and physics), social sciences (e.g., psychology, and sociology), which study individuals and societies,^{[17][18]} and the formal sciences (e.g., logic, mathematics, and computer science), which study abstract structures and rules.^{[19][20]} There is disagreement whether the formal sciences are science disciplines,^{[21][22][23]} because they do not use scientific knowledge for practical purposes, such as in engineering and medicine.^{[24][25][26]}

New knowledge in science is advanced by research from scientists who are motivated by curiosity about the world and a desire to solve problems.^{[28][29]} Contemporary scientific research is highly collaborative and is usually done by teams in academic and research institutions,^[30] government agencies, and companies.^{[31][32]} The practical impact of their work has led to the emergence of science policies that seek to influence the scientific enterprise by prioritizing the ethical and moral development of commercial products, armaments, health care, public infrastructure, and environmental protection.

Contents [hide]

- Etymology
- History
 - Earliest roots
 - Classical antiquity

Lookup Videos:

Technology

Similar Words

Technology

Nanotechnology



What's left to do?

- Stretch Goals
 - Resizing
- Other Tasks
 - Bug Fixes
 - Refine ML Model

Questions?

?

?

?

?

?

?

?

?

?

