

Social Science: Geography

Around the World in Forty Hours

Objectives

Students will be able to:

- Compare distances and travel times between different locations on Earth.
- Research cultural and demographic information about foreign countries.
- Create a travel narrative conveying new knowledge to others.

Warm-Up

Ask students if they can name people who have traveled around the world, and how they have done so—ship, airplane, balloon, or other means? W|A can help students identify the first person to travel around the globe, who traveled by ship.

The screenshot shows the WolframAlpha interface. At the top, the search bar contains the text "First circumnavigation of the earth". Below the search bar, the input interpretation is "Ferdinand Magellan's circumnavigation". Underneath, a table titled "Basic information:" provides the following data:

date	1519
countries involved	Kingdom Portugal
people involved	Ferdinand Magellan

Below the table is a timeline titled "Timeline:" showing a horizontal axis from 1400 to 1600. A red dot on the axis marks the year 1519, labeled "Ferdinand Magellan's circumnavigation". At the bottom of the screenshot, there are links for "Computed by: Wolfram Mathematica", "Source information", and "Download as: PDF | Live Mathematica".

Ask students how they would travel if they wished to circle the globe today. What form or forms of transportation would they use? Where might they stop along the way?

Lesson

- *Around the World in Eighty Days*: Ask students to read the third chapter of the Jules Verne novel, either from a school library or from an online text (the work is in the public domain). Discuss "the bet" aloud as a class. Does rounding the world in eighty days by steamship and railroad seem plausible? Point out that the story describes travel times, but says nothing about travel *schedules*; is it reasonable to assume that all ships and trains will be leaving as soon as possible after the traveler arrives?
- Try a similar estimation using W|A. Have students pick a collection of five cities forming a rough circle around the world, then compute travel times between them.

The screenshot shows the WolframAlpha interface. At the top, the search bar contains the query: "What is the flight time from Boston, MA to Casablanca, Morocco?". Below the search bar, the input interpretation is shown as "time from Boston, Massachusetts to Casablanca, Morocco". The results section lists travel times for different modes of transport, assuming direct great-circle paths:

Mode of Transport	Travel Time
aircraft (550 mph)	6 hours 10 minutes
sound	4 hours 30 minutes
light in fiber	25.8 ms (milliseconds)
light in vacuum	18.5 ms (milliseconds)

Below the results, the distance is given as 3437 miles. A map shows the great-circle path between Boston, MA and Casablanca, Morocco. At the bottom, it indicates the results were computed by Wolfram|Mathematics and provides links for source information and downloading as PDF or Live Mathematica.

WolframAlpha computational knowledge engine

What is the flight time from Casablanca, Morocco to Moscow, Russia?

Input interpretation:
time from Casablanca, Morocco to Moscow, Russia

Results: [More](#)

aircraft (550 mph)	4 hours 50 minutes
sound	3 hours 30 minutes
light in fiber	19.8 ms (milliseconds)
light in vacuum	14.1 ms (milliseconds)

(assuming direct great-circle paths)

Distance: [Show metric units](#)
2633 miles

Map:

Computed by [Wolfram Mathematica](#) | [Source information](#) | Download as: [PDF](#) | [Live Mathematica](#)

WolframAlpha computational knowledge engine

What is the flight time from Moscow, Russia to Tokyo, Japan?

Input interpretation:
time from Moscow, Russia to Tokyo, Japan

Results: [More](#)

aircraft (550 mph)	8 hours 30 minutes
sound	6 hours 7 minutes
light in fiber	35.1 ms (milliseconds)
light in vacuum	25 ms (milliseconds)

(assuming direct great-circle paths)

Distance: [Show metric units](#)
4662 miles

Map:

Computed by [Wolfram Mathematica](#) | [Source information](#) | Download as: [PDF](#) | [Live Mathematica](#)



What is the flight time from Tokyo, Japan to Juneau, Alaska?

Input interpretation:

time from Tokyo, Japan to Juneau, Alaska

Results:

[More](#)

aircraft (550 mph)	7 hours 20 minutes
sound	5 hours 20 minutes
light in fiber	30.3 ms (milliseconds)
light in vacuum	21.6 ms (milliseconds)

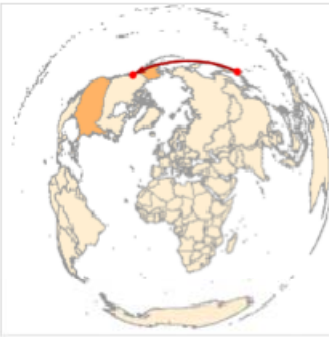
(assuming direct great-circle paths)

Distance:

[Show metric units](#)

4025 miles

Map:



Computed by: [Wolfram|Mathematica](#)

[Source information](#)

Download as: [PDF](#) | [Live Mathematica](#)

WolframAlpha computational knowledge engine

What is the flight time from Juneau, Alaska to Boston, MA?

Input interpretation: time from Juneau, Alaska to Boston, Massachusetts

Results:

aircraft (550 mph)	5 hours 10 minutes
sound	3 hours 50 minutes
light in fiber	21.7 ms (milliseconds)
light in vacuum	15.5 ms (milliseconds)

(assuming direct great-circle paths)

Distance: 2888 miles

Map:

Computed by: Wolfram|Mathematica Source information » Download as: PDF | Live Mathematics

- Now ask students to research the different cities and countries that appeared on their flight plans. Ask W|A about languages, religions, ethnic groups, or other information.

WolframAlpha computational knowledge engine

Languages spoken in Morocco, Russia, Japan

Input Interpretation: Morocco, Russia, Japan, languages

Result:

Morocco	Moroccan Arabic (71%) Tachelhi (11%) Central Atlas Tamazight (11%) Tarifit (5.7%) Hassaniyya (0.15%) Spanish (0.076%) Judeo-Moroccan Arabic (0.034%)
Russia	Russian (79.95%) English (3.208%) German (0.5416%) French (0.1604%) Turkish (0.0802%)
Japan	Japanese (98%) Central Okinawan (0.8%) Korean (0.54%) Japanese Sign Language (0.26%) Ainu Amami-Oshima Northern Amami-Oshima Southern Kunigami Oki-No-Enbu Toku-No-Shima Yonaguni Yoron

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WolframAlpha computational knowledge engine

Ethnic groups in Russia

Input interpretation: **Russia ethnic groups** Mathematica form

Result:
Bashkir | Chuvash | Russian | Tatar | Ukrainian | other

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WolframAlpha computational knowledge engine

Religions in Morocco

Input interpretation: **Morocco religions** Mathematica form

Result:
Muslim | Christian | Jewish

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- Ask each student to pick one location and conduct further research with W|A and library sources. How large is the city through which the student plans to travel? What is the weather like?

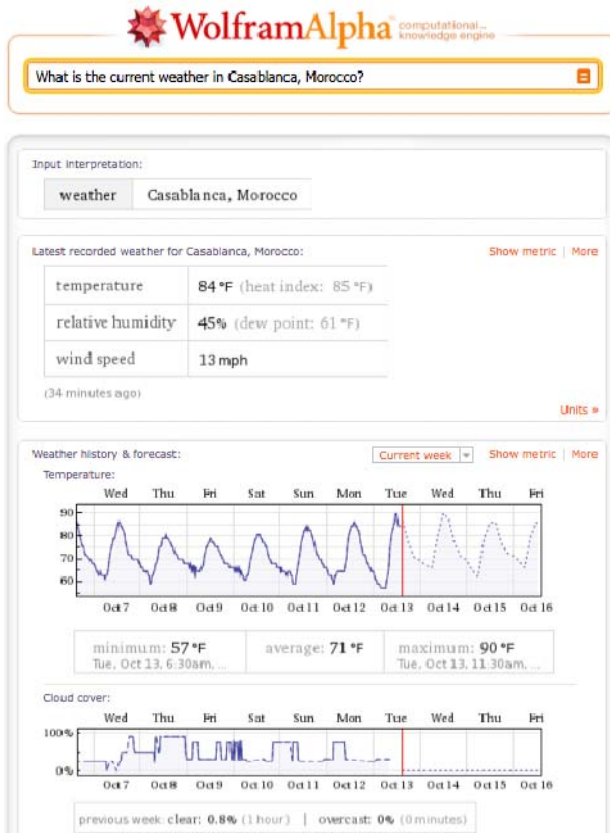
WolframAlpha computational knowledge engine

What is the population of Casablanca, Morocco?

Input interpretation: **Casablanca, Morocco city population** Mathematica form

Result:
3.145 million people (2004 estimate)

Computed by: Wolfram Mathematica Source information » Download as: PDF | Live Mathematica



- Ask each student to construct a short narrative describing a modern-day journey around the world, writing one or two paragraphs describing their passage through a particular city. Have students include the types of languages they might hear, weather conditions they might experience, different religions or ethnicities they might encounter, etc.

Closing

- Ask students to compare flight plans and see whose hypothetical trip took the least time. Then divide the class into five groups and assign each group to research one of the cities on the shortest flight plan in greater detail. Ask each group of students to prepare a written report on their assigned city and to create a short skit acting out what a hypothetical world traveler might encounter there.

Demonstrations

Comparing Data on Countries

Captain Cook 's Voyages

Colorcoded Country Comparison