GREAT NORTH AMERICAN

ECLIPSE

Eclipse Math

Problem 1 - Get ready to crunch some numbers! Eagle Pass, Texas is set to be the lucky first city to witness the Great North American Eclipse of 2024, while Sharp, Maine will be the last before it heads to Canada. But, hold onto your space helmets! We've got a table filled with juicy details about the eclipse path from Texas to Maine, including the time and distance from each spot. Your mission, should you choose to accept it, is to calculate the average speed of the lunar shadow between each pair of points along the path. Let's start with the first one as an example (check the next page for the full table). Record your answers in this column.

Location	Time (CDT)	Distance (miles)	Speed (miles/hr)
Eagle Pass, TX	12:10:14 p.m.	0	1662 miles/hr
Gatesville, TX	12:19:18 p.m	251	
Texarkana, TX	12:28:34 p.m	506	
Doniphan, MO	12:38:51 p.m	785	
Carbondale, Il	12:43.01 p.m	900	
South Salem, IN	12:53:02 p.m	1107	
Buffalo, NY	1:04:56 p.m	1550	
Sharp, MA	1:22:19 p.m	2139	

NEED HELP? YOU CAN USE THIS ONLINE TIME CALCULATOR TO HELP YOU DETERMINE THE TIME BETWEEN LOCATIONS.
HTTPS://WWW.CALCULATOR.NET/TIME-DURATION-CALCULATOR.HTML

GREAT NORTH AMERICAN

ECLIPSE

Example

Speed is found by using the equation S = *d/t,* where *d* is the distance in miles and *t* is the time in hours.

- **The distance from Gatesville, TX to Eagle Pass, TX is 251 miles.**
- **To change the time from seconds to hours you will need to convert the seconds into hours.** To do this, take the total seconds and divide by the number of seconds in an hour. Since there are 60 seconds in a minute and 60 minutes in an hour there are 3600 seconds/hour (60 sec/min x 60 min/hour).

The time for the shadow to reach Gatesville, TX from Eagle Pass is 9 minutes and 4 seconds.

(9 x 60) + 4 = **544 seconds**

↓

(544 sec)/(3600 sec/hour) = **0.151 hours**

↓

S = *d/t*

S = (251 miles)/(0.151 hours) = **1662 mph!**

Let's crunch some numbers! How far does the path of totality stretch from Eagle Pass, TX to Sharp, MA during the epic 2024 Great North American Eclipse? And, what's the average speed of the shadow race from Texas to Maine?

GREAT NORTH AMERICAN

ECLIPSE

Problem 2 - Ready, set, research! Find out which of these superhero vehicles will give you the best shot at keeping up with the shadow and witnessing the most epic eclipse of all time!

Vehicle	Top Speed (miles/hour)
Superman	
Spiderman	
Hennessey Venom F5	
SR71 Blackbird	
Bugatti Chiron Super Sport 300+	
MIG-25 Fox Bat Jet	
Thrust SCC (driven by Andy Green)	
XB-70 Valkyrie	
X-15	
Millennium Falcon	

GREAT NORTH AMERICAN

ECLIPSE

Get ready to be wowed by a fantastic math trick involving our favorite celestial bodies - the Earth, Moon, and Sun. It's all thanks to a simple, yet mind-bending ratio that makes eclipses possible!

	Diameter (miles)	Distance from Earth (miles)
Sun	864,938	93,000,000
Moon	2,159	238,900

Divide these two numbers!

Put answer here! : Put answer here!

This is the ratio you seek!

(or approximately 1:1)

It's a cosmic coincidence! The Sun's size dwarfs the Moon's, but it's also much farther away. By some magical math, this distance-to-size ratio lands at a sweet spot where the Sun and Moon look almost equal in size from our viewpoint. That's why we get to witness total solar eclipses, where the Moon can perfectly block the Sun's light show.

https://mynasadata.larc.nasa.gov/phenomenon/solar-eclipse

SOLAR PALOOZA
UNIVERSITY OF SOUTHERN INDIANA®
2024

GREAT NORTH AMERICAN

ECLIPSE

GET READY TO UNLEASH YOUR INNER WORD HUNTER WITH A TWIST! THIS PUZZLE IS A CRAFTY WORD SEARCH THAT CONCEALS A SECRET MESSAGE. SPOT ALL THE WORDS IN THE LIST BY SEARCHING HIGH AND LOW, LEFT AND RIGHT, AND EVEN DIAGONAL. ONCE YOU'VE FOUND ALL THE WORDS, GRAB A PEN AND COPY THE UNUSED LETTERS STARTING FROM THE TOP LEFT CORNER INTO THE BLANKS TO UNVEIL THE HIDDEN MESSAGE!

E	S	B	E	E	Y	O	M	U	I	N	T	H	S	U
A	C	E	E	R	S	H	O	C	A	D	R	Y	M	O
Z	W	N	I	A	O	D	O	F	S	A	E	B	Y	T
O	H	N	A	H	D	N	N	P	L	L	R	M	T	E
O	G	T	M	T	T	S	E	O	I	A	O	O	I	N
L	X	T	R	A	S	E	S	A	M	I	D	F	L	T
A	S	D	C	A	D	I	B	C	S	A	N	B	A	E
P	H	T	H	X	E	Q	D	A	O	P	I	F	T	S
R	A	L	I	G	H	T	F	Q	E	R	B	D	O	P
A	D	Y	W	B	I	E	E	N	Y	Q	O	R	T	I
L	O	X	E	D	T	H	U	A	U	L	C	N	O	L
O	W	A	R	Y	V	M	N	O	I	T	A	R	A	C
S	K	P	A	R	B	M	U	N	E	P	E	K	B	E
N	G	E	G	R	F	W	S	S	N	M	G	S	D	W
Z	C	W	A	G	Y	W	I	E	Y	E	K	O	C	C

baileys	beads	contact
corona	diamond	distance
earth	eclipse	eye
light	moon	penumbra
penumbra	ratio	ring
safety	shadow	solar
solarpalooza	speed	sun
time	totality	umbra

Note: "Penumbra" must be found 2 times to solve the puzzle correctly.

___ ___ ___   ___ ___ ___   ___ ___   ___ ___ ___

___ ___ ___ ___ ___ ___   ___ ___   ___ ___ ___   ___ ___ ___ ___!