HOW DID SHIPS FIND THEIR LATITUDE?

IN THE 1600s AND 1700s, THE WEALTH OF THE WORLD FLOATS ON THE OCEANS: SPANISH GALLEONS CARRYING GOLD AND ENGLISH SHIPS CARRYING TOBACCO...

...ARE ALL SAILING BLIND!

SAILING BLONDE ?!?

MR. WEEDS, HOW CLOSE DO YOU THINK WE ARE TO JAMAICA?

WELL, WE USE A SEXTANT TO LOOK AT THE SUN AND STARS TO FIND OUR **LATITUDE** ON THIS MAP. LATITUDE LINES RUN PARALLEL TO EACH OTHER, HORIZONTALLY AROUND OUR ROUND PLANET.

30° NORTH LATITUDE

FLORIDA

25° NORTH LATITUDE

CUBA

20° NORTH

JAMAICA

...AND THE TROPIC OF CANCER MARKS THE NORTHERN BOUNDARY OF THE SUN'S PATH IN THE SKY. THE TROPIC OF CAPRICORN IS THE SOUTHERN BOUNDARY. I **KNOW**!! BUT HOW **FAR** ARE WE ALONG THIS LATITUDE??!!

THE **EQUATOR** IS THE MIDDLE LATITUDE. IT IS WHERE WE CAN SEE THE SUN, THE MOON, AND THE PLANETS PASS ALMOST DIRECTLY OVERHEAD IN THE SKY.

1/2 1/2

THE EQUATOR DIVIDES EARTH INTO NORTHERN AND SOUTHERN HEMISPHERES (**HEMISPHERE** MEANS HALF A GLOBE!).

SIR, MY BEST GUESS IS WE HAVE . . .

RRRIP

PIRATES!

BECAUSE SAILORS CAN RELIABLY FIND ONLY LATITUDES, SHIPS CROSS THE OCEAN IN ONLY A FEW WELL-KNOWN SHIPPING LANES. THIS MAKES THEM EASY TARGETS FOR ENEMY WARSHIPS OR PIRATES!

WE NEED SOME MORE LINES ON OUR MAPS.

NEXT: LONGING FOR LONGITUDE

CHESTER THE CRAB | 1630 PURITANS IN MASSACHUSETTS | 1676 BACON'S REBELLION | 1699 | 1733 GEORGIA FOUNDED

WHERE ARE EARTH'S LINES OF LONGITUDE?

ENGLAND IN THE 1700s:

MR. STOKES, YOUR SHIP WAS LOST TO PIRATES!

NOOO! THAT WAS HALF MY BANK ACCOUNT!!

WE...WE NEED A WAY TO SAIL THROUGH SAFER SEAS!

WELL, WE CAN MEASURE MOVEMENT OF THE SUN TO FIND OUR **LATITUDE** ON THE GLOBE. BUT WE NEED A SECOND SET OF LINES TO MAKE A **GRID** WE CAN FOLLOW!

LET'S DRAW LINES OF **LONGITUDE** UP AND DOWN. THEY FORM CIRCLES THAT COME TOGETHER AT THE NORTH AND SOUTH POLES. (LONGITUDE GOES THE **LONG** WAY OVER THE EARTH.)

LATITUDE

LONGITUDE

15°

15°

THE PROBLEM IS THAT LONGITUDE MEAN DIFFERENT DISTANCES ON DIFFERENT PARTS OF THE GLOBE. HERE IS WHY:

EARTH TAKES 24 HOURS TO MAKE ONE **ROTATION** OF 360°

ONE HOUR = 1/24 OF A SPIN, OR 15°. FINDING LONGITUDE REQUIRES FINDING TIME, BECAUSE THE EARTH IS ALWAYS TURNING UNDER US!

(YOU STILL NEED TO KNOW YOUR LATITUDE, BECAUSE AT THE EQUATOR, 15° EQUALS 1,000 MILES!)

BUT 15° HERE IS WORTH ONLY A FEW HUNDRED MILES.

SO SAILORS SHOULD CARRY TWO CLOCKS. ONE KEEPS THE TIME OF YOUR HOME PORT. THE SECOND KEEPS LOCAL TIME ON YOUR SHIP AT SEA.

WANG

MEASURING TIME TELLS US HOW LONG WE HAVE TRAVELED — BUT PENDULUM CLOCKS GET A BIT WILD ON ROLLING DECKS!

NEXT: MAGNETIC

Label the Latitude and Longitude fill in the blanks

90° N 45° N 0° Latitude 45° S 90° S	180° W 135° W 90° W 45° W 0° Longitude	45° E 90° E 135° E 180° E

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USA Latitude and Longitude Activity #2

1. The location 26 degrees N, 105 degrees W is in what country? Mark the spot on the map with a black X.	
2. Is the location 35 degrees N latitude, 75 degrees W longitude in the Atlantic or Pacific Ocean? Mark it on the map with a green X.	
3. Is the location 30 degrees N, 87 degrees W on land or under water. Mark it on the map with a blue X.	
4. On the map, label the location 38 degrees N latitude, 105 degrees W longitude with a red X and write the name of the state it is in.	
5. The location 43 degrees N, 75 degrees W is in what state? On the map, write the state's name.	
6. Name the state whose southern border is latitude 35 degrees N, and label the state on the map.	

What is the absolute location of: 1) Boulder, 2) Denver, 3) Pikes Peak? 4) Mesa Verde? 5) What about our school?

Activity: Using Longitude and Latitude in the World

- **Directions**: You can do it the old fashioned way or use Google Earth! Don't have Google Earth? Download it for free at http://www.google.com/earth/download/ge/agree.html

- 1. What is the approximate latitude and longitude of Rome, Italy?
- 2. What is the approximate latitude and longitude of Cairo, Egypt?
- 3. What is the approximate latitude and longitude of the Falkland Islands (Islas Malvinas)?
- 4. What is the approximate latitude and longitude of Mt. Everest (Chomolungma)?
- 5. What is the approximate latitude and longitude of the Torres Strait (separating New Guinea and Australia)?
- 6.What locations interest you? What are their latitudes and longitudes?

The World

ARCTIC
ARCTIC OCEAN
EUROPE
ASIA
NORTH AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
PACIFIC OCEAN
CARIBBEAN
AFRICA
Equator
SOUTH AMERICA
OCEANIA
INDIAN OCEAN
OCEANIA
ATLANTIC OCEAN
PACIFIC OCEAN
0 2,000 Miles
0 2,000 Kilometers
ANTARCTICA
180° 140° 100° 60° 20° 20° 60° 100° 140° 180°
80° 60° 40° 20° 0° 20° 40° 60° 80°
160° 120° 80° 40° 0° 40° 80° 120° 160°