

Diane Gitler's Technology Lesson

Objectives of lesson:

1. Students will be able to effectively analyze data tables.
 2. Students will be able to create logical graphs or charts using Google Spreadsheet.
 3. Students will be able to effectively label all parts of the graphs or charts they create.
 4. Students will be able to relate common shark names to their species and genus names.
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- Students were given data tables prepared by the International Shark Attack File. Data tables featured quantitative data of shark attacks by species and world location.
 - Students were instructed to analyze data to identify the total number of shark attacks worldwide between 2004 and 2013.
 - Students were instructed to analyze data to identify the five species of shark responsible for the greatest number of shark attacks between 1580 and 2013.
 - Students were instructed to create two graphs or charts based on the two data analysis assignments.
 - Students were instructed to further analyze and rationalize the shark attack data.

This lesson was effective because:

1. Students were able to experiment with various graphs and charts in Google spreadsheet. They were able to change the styles of graphs and charts without losing their data. Also, they realized that certain graphs and charts did not effectively organize the data.
2. Students were able to recognize that statistical analysis does not always lead to the most rational conclusion. In this activity, the "deadliest" shark according to the data would be the shark whose attacks were 100% deadly. The deadliest shark in the data had 1 recorded attack and it was a fatal attack. However, other sharks had many more attacks recorded which were not 100% deadly but still yielded many more fatalities.
3. Students recognized the complexity of scientific naming.

**ISAF Statistics for the World Locations
with the Highest Shark Attack Activity (2004-2013)**

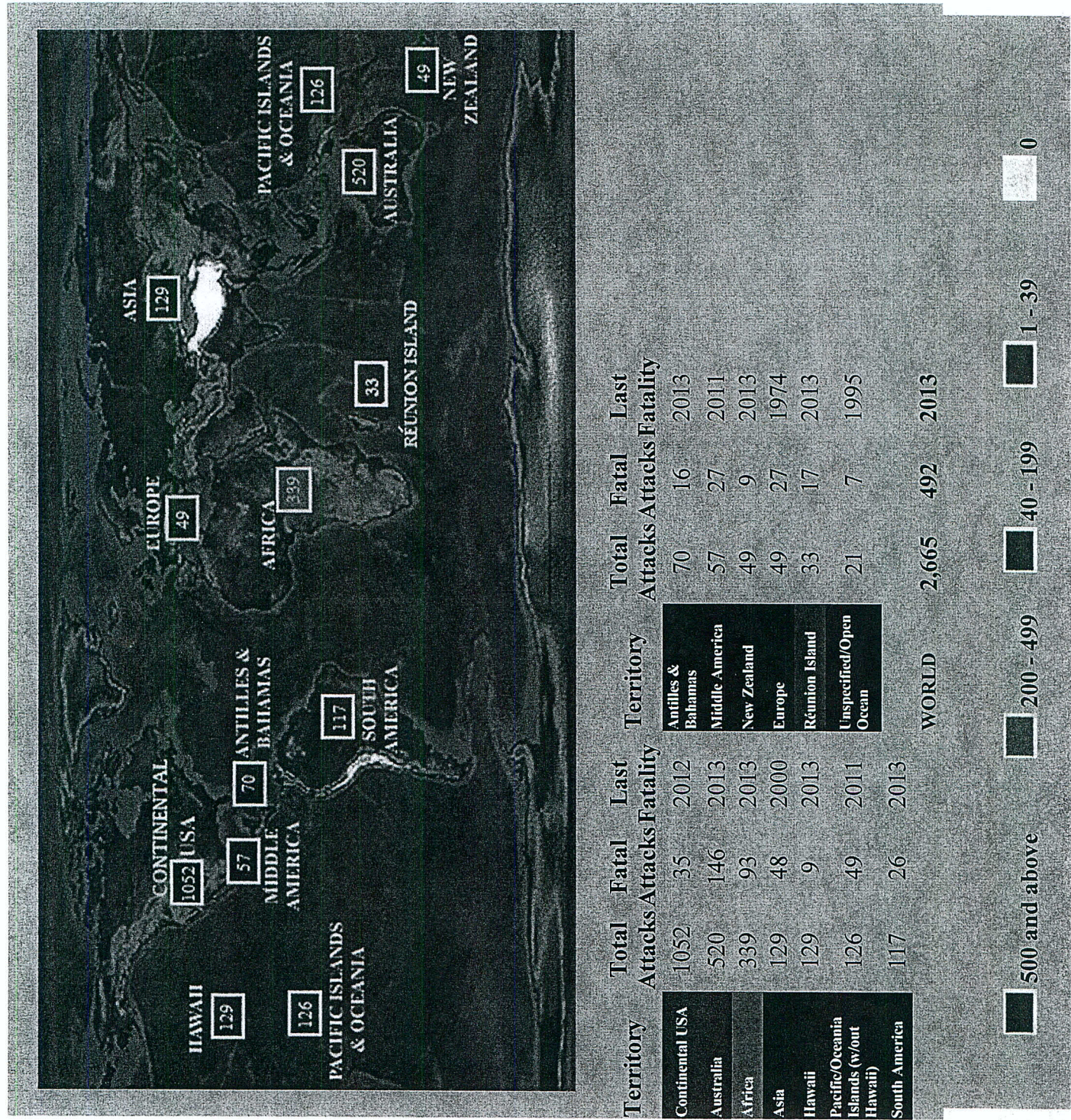
WORLD (N=689)			
YEAR	Total Attacks	Fatal	Non-fatal
2004	66	7	59
2005	58	4	54
2006	59	4	55
2007	71	1	70
2008	53	4	49
2009	68	7	61
2010	82	6	76
2011	79	13	66
2012	81	7	74
2013	72	10	62

FLORIDA (N=203)				AUSTRALIA (N=125)			
YEAR	Total Attacks	Fatal	Non-fatal	YEAR	Total Attacks	Fatal	Non-fatal
2004	12	0	12	2004	13	2	11
2005	17	1	16	2005	10	2	8
2006	21	0	21	2006	7	1	6
2007	31	0	31	2007	13	0	13
2008	28	0	28	2008	9	1	8
2009	19	0	19	2009	22	0	22
2010	14	1	13	2010	14	1	13
2011	11	0	11	2011	13	4	9
2012	27	0	27	2012	14	2	12
2013	23	0	23	2013	10	2	8

HAWAII (N=51)				SOUTH AFRICA (N=43)			
YEAR	Total Attacks	Fatal	Non-fatal	YEAR	Total Attacks	Fatal	Non-fatal
2004	3	1	2	2004	5	1	4
2005	4	0	4	2005	4	0	4
2006	3	0	3	2006	4	0	4
2007	7	0	7	2007	2	0	2
2008	1	0	1	2008	0	0	0
2009	3	0	3	2009	6	4	2
2010	4	0	4	2010	8	2	6
2011	3	0	3	2011	5	2	3
2012	10	0	10	2012	4	3	1
2013	13	1	12	2013	5	1	4
SOUTH CAROLINA (N=34)				CALIFORNIA (N=33)			
YEAR	Total Attacks	Fatal	Non-fatal	YEAR	Total Attacks	Fatal	Non-fatal
2004	1	0	1	2004	6	1	5
2005	5	0	5	2005	3	0	3
2006	4	0	4	2006	1	0	1
2007	5	0	5	2007	4	0	4
2008	2	0	2	2008	2	1	1
2009	0	0	0	2009	4	0	4
2010	4	0	4	2010	4	1	3
2011	2	0	2	2011	3	0	3
2012	5	0	5	2012	5	1	4
2013	6	0	6	2013	1	0	1

NORTH CAROLINA (N=22)				RÉUNION ISLAND (N=17)			
YEAR	Total Attacks	Fatal	Non-fatal	YEAR	Total Attacks	Fatal	Non-fatal
2004	2	0	2	2004	3	0	3
2005	2	0	2	2005	0	0	0
2006	1	0	1	2006	2	1	1
2007	2	0	2	2007	1	0	1
2008	3	0	3	2008	0	0	0
2009	0	0	0	2009	0	0	0
2010	4	0	4	2010	1	0	1
2011	2	0	2	2011	4	2	2
2012	5	0	5	2012	3	1	2
2013	1	0	1	2013	3	2	1
BRAZIL (N=16)				BAHAMAS (N=6)			
YEAR	Total Attacks	Fatal	Non-fatal	YEAR	Total Attacks	Fatal	Non-fatal
2004	5	1	4	2004	1	0	1
2005	1	0	1	2005	1	0	1
2006	3	1	2	2006	2	0	2
2007	0	0	0	2007	0	0	0
2008	3	0	2	2008	0	0	0
2009	0	1	0	2009	0	0	0
2010	1	0	1	2010	2	0	2
2011	2	0	2	2011	0	0	0
2012	0	0	0	2012	0	0	0
2013	1	1	0	2013	0	0	0

1580-2013 Map of World's Confirmed Unprovoked Shark Attacks (N=2,665)



ISAF Statistics on Attacking Species of Shark
Species of shark implicated in confirmed unprovoked attacks around the world, 1580 – 2013

USE THIS TABLE WITH CAUTION! Positive identification of attacking sharks is very difficult since victims rarely make adequate observations of the attacker during the "heat" of the interaction. Tooth remains are seldom found in wounds and diagnostic characters for many requiem sharks (family Carcharhinidae) are difficult to discern even by trained professionals. That said, this list must be used with caution because attacks involving easily identified species, such as white, tiger, sandtiger, hammerhead and nurse sharks, nearly always identify the attacking species, while cases involving difficult to identify species, such as requiem sharks of the genus *Carcharhinus*, seldom correctly identify the attacker. Thus the list is skewed to readily identified species. A number of requiem sharks in the genus *Carcharhinus* likely are involved in many more attacks than they are credited in this list and, if the list could reflect that reality, *Carcharhinus* bites would push such species as the sandtiger, hammerhead and nurse sharks towards the bottom of the list. Nonetheless, the white, tiger and bull sharks are the "Big Three" in the shark attack world because they are large species that are capable of inflicting serious injuries to a victim, are commonly found in areas where humans enter the water, and have teeth designed to shear rather than hold. Realistically, almost any shark in the right size range, roughly six feet (1.8 meters) or greater, is a potential threat to humans because, even if a bite is not intended as a directed feeding attempt on a human, the power of the jaw and tooth morphology can lead to injury. --- George H. Burgess, ISAF

<u>Species</u>	<u>Common Name</u>	<u>Non-fatal Unprovoked</u>	<u>Fatal Unprovoked</u>	<u>Total</u>
<i>Carcharhinus amblyrhynchos</i> ,	grey reef	7	1	8
<i>Carcharhinus brachyurus</i> ,	bronze whaler	19	1	20
<i>Carcharhinus brevipinna</i> ,	spinner	16	0	16
<i>Carcharhinus falciformis</i> ,	silky	3	0	3
<i>Carcharhinus galapagensis</i> ,	Galapagos	0	1	1
<i>Carcharhinus leucas</i> ,	bull	67	26	93
<i>Carcharhinus limbatus</i> ,	blacktip	28	0	28
<i>Carcharhinus longimanus</i> ,	oceanic whitetip	7	3	10
<i>Carcharhinus melanopterus</i> ,	blacktip reef	11	0	11
<i>Carcharhinus obscurus</i> ,	dusky	1	1	2
<i>Carcharhinus perezii</i> ,	Caribbean reef	4	0	4
<i>Carcharhinus plumbeus</i> ,	sandbar	5	0	5
<i>Carcharhinus</i> spp.,	requiem	39	7	46
<i>Carcharias taurus</i> ,	sand tiger	29	0	29
<i>Carcharias</i> spp.,	lamniform	0	2	2
<i>Carcharodon carcharias</i> ,	white	201	78	279
<i>Galeocerdo cuvier</i> ,	tiger	73	28	101
<i>Galeorhinus galeus</i>	tope	1	0	1
<i>Ginglymostoma cirratum</i> ,	nurse	10	0	10
<i>Heterodontis portusjacksoni</i> ,	port jackson	1	0	1
<i>Isistius brasiliensis</i> ,	cookiecutter	1	0	1
<i>Isurus oxyrinchus</i> ,	shortfin mako	9	1	10
<i>Isurus</i> spp.,	mako	8	0	8
<i>Lamna nasus</i> ,	porbeagle	2	0	2

<i>Negaprion brevirostris</i> ,	lemon	10	0	10
<i>Notorhynchus cepedianus</i> ,	sevengill	5	0	5
<i>Orectolobus macalatus</i> ,	spotted wobbegong	4	0	4
<i>Orectolobus</i> spp.,	wobbegong	19	0	19
<i>Prionace glauca</i>	blue	9	4	13
<i>Rhinobatos</i> spp.,	guitarfish	1	0	1
<i>Sphyrna</i> spp.,	hammerhead	17	0	17
<i>Triaenodon obesus</i> ,	whitetip reef	5	0	5
<i>Triakis semifasciata</i> ,	leopard	1	0	1
<i>Trygonorrhina fasciata</i>	southern fiddler	1	0	1
TOTALS	34+ species	614	153	767

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Florida Museum of Natural History, University of Florida

Name _____

Period _____

Shark Attack Graphing

Objective: The objective of this lab activity is

- to become familiar with the classification of sharks
- to analyze shark attack statistics
- to identify shark attack trends between 2004-2013
- to create tables and charts in Google Spreadsheet

Procedure:

1. Analyze the ISAF Statistics for the World Locations with the Highest Shark Attack Activity (2004-2013). Using Google Spreadsheet, prepare a data table of total worldwide shark attacks between years 2004 and 2013.
2. Use the data table to create a chart.
3. Analyze the ISAF Statistics on Attacking Species of Shark (1580-2013)
4. Using Google Spreadsheet, prepare a data table of the five sharks with the most total attacks. Use the scientific names for the sharks.
5. Use the data table to create a chart.

Conclusion:

Use the data tables provided, in addition to your charts, to answer the following questions:

1. Identify the year (2004-2013) with the most worldwide shark attacks. _____
2. Identify the year (2004-2013) with the most fatal worldwide shark attacks. _____
3. Identify the species of shark responsible for the most unprovoked attacks worldwide between years 1580-2013 (indicate scientific & common name).

4. Identify the species of shark responsible for the most unprovoked fatal attacks worldwide between years 1580-2013.

5. According to the table of ISAF Statistics on Attacking Species of Shark, which species has the highest percentage of fatal attacks, and, therefore, could be classified as the "deadliest" shark?

6. Does your answer to #5 seem rational? Explain.

