ACTIVITIES GUIDE

EVERY DARK CLOUD HAS A SILVER LINING HURRRICANE

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Øuragan FILMS

Hurricane.nWave.com

GRADES K-2 ACTIVITY I HURRICANE COMING!

Part 1: The film *Hurricane* follows a fictional hurricane named Lucy as it travels from east to west. Lucy's path is described below. Fill in the blanks with words from the word bank to tell where Lucy traveled. Then mark these places on the map that your teacher gives you. Work with a classmate to draw Lucy's path across the ocean.

Lucy begins as a rain storm in the country of						
on the continent of Lucy				en travels		
west across the				ean. Lucy bec	comes a hurrican	e and arrives in
	Ne:	xt, the sto	rm hits the island na	ation of	Fin	ally, Lucy travels
across the			а	nd makes land	dfall again in	
Word Bank						
Africa	Atlantic	Cuba	Gulf of Mexico	Louisiana	Puerto Rico	Senegal

Part 2: You have seen what people do to stay safe when a hurricane is on the way. Now find out how to prepare for other kinds of emergencies.

Here is a list of emergencies. Circle the ones that could happen where you live.

lightning blizzard earthquake flood hurricane tornado tsunami wildfire

Work with a group of classmates to learn more about one of these emergencies. Find out what kind of damage the emergency can cause. Find out if there are warning signs that the emergency might happen and what you should do to stay safe. Share what you learn in class.

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REPRODUCIBLE MASTER

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GRADES K-2 reproducible master ACTIVITY 2 WHAT WILL HAPPEN?

In the film *Hurricane*, we see how Lucy's winds blow stronger as it grows into a dangerous hurricane. The winds blow gently when the storm starts in Africa. They build as the storm travels across the Atlantic Ocean. By the time the storm reaches Cuba, we see very strong winds that batter the island.

Follow your teacher's directions to experiment with wind power using a bowl of water. Use this chart to record what you think will happen for each trial. Then describe your observations.



Force of Wind	What I Think Will Happen	Observations
Trial 1: Blowing gently		
Trial 2: Blowing harder		
Trial 3: Blowing as hard as I can		

Imagine a strong wind – like the one you created in trial 3 – blowing over the ocean and onto the land. What do you think would happen to the beaches, trees, and buildings?



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GRADES 3-5 REPROE ACTIVITY I RAINFOREST EFFECTS

In the film Hurricane, we see the powerful effects of the fictitious hurricane Lucy on the El Yunque rainforest in Puerto Rico. Covering 29,000 acres, El Yunque is the only tropical rainforest in the U.S. National Forest system. Scientists estimate that as many as 15,000 hurricanes have struck El Yunque during its existence!

Many species of animals and plants live in this vibrant Caribbean forest. Learn about them – and other important information about the effects of hurricanes on the



rainforest – from the clues given below. Find the correct words and circle them in the puzzle.

Large, old trees are in the greatest danger of ______ in a hurricane. When that happens, the cleared areas in the forest give young seedlings a chance to grow because ______ can now reach the forest floor.

Freshwater shrimp living in the rainforest will eat leaf ______ that remains after the hurricane, clearing the ______ that make up their habitat.

In the film, we see a colony of ______ form a raft to survive after their nest was submerged. They float off to colonize new _____.

_____ are as important to forests as are light and water. They bring ______, _____ the ocean, ______ the forests, _____ heat, and restore the

Earth's ______.

В	Х	F	С	N	Ο	R	Т	А	С	G	Q	Ζ	В	0
Ζ	D	Μ	0	S	U	L	W	С	0	L	R	Т	D	U
Μ	Р	А	0	Т	R	А	С	В	Ν	Е	Р	Q	Е	R
S	F	А	L	L	Ι	Ν	G	Т	С	В	G	L	В	V
W	Т	Ν	С	Ι	А	D	Р	D	0	Х	М	Y	R	С
А	Η	Т	Е	G	Ι	В	F	R	J	G	С	Κ	Ι	D
L	Р	S	Ν	Η	U	R	R	Ι	С	А	Ν	Е	S	М
Q	Т	0	U	Т	V	Е	Х	V	Y	R	Ζ	А	S	W
G	А	Κ	L	Η	В	G	0	Е	Ι	С	J	Μ	D	Ν
В	А	L	А	Ν	С	Е	Е	R	А	Ι	Ν	Р	S	F
Q	V	А	R	Y	W	Ν	Т	S	В	Ι	U	Х	J	С
Ζ	Κ	Н	L	D	0	Е	Р	М	Е	R	Т	F	V	Ν
G	W	Q	Y	А	S	R	Е	С	Y	С	L	Е	Ζ	U
Х	F	J	В	0	Κ	А	G	М	С	Р	L	D	Η	Ν
Е	Q	Ι	V	R	Х	Т	D	S	С	Y	Т	Ζ	А	U
F	W	S	А	Μ	Т	Е	L	U	Κ	В	Р	С	J	0

Word Bank

falling	light	debris	rivers
ants	land	hurricanes	rain
cool	regenerate	recycle	balance



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GRADES 3-5 REPRODUCIBLE MASTER ACTIVITY 2 HURRICANE TRACKING

Part 1: In the film *Hurricane*, you follow the path of fictional Hurricane Lucy from its start as a warm wind in Africa to its death over the United States, and you experience all the effects in between.

Use the hurricane tracking chart that your teacher gives you to plot the course of Hurricane Lucy as it moved from place to place, using the place names in the word bank. Then use the longitude and latitude data given below to plot the course of the infamous Hurricane Katrina from 2005 on your tracking chart. When you have plotted courses for both hurricanes, look for similarities and differences.



Word Bank

Africa	Atlantic	Cuba	Gulf of Mexico	Louisiar
Anica	Allantic	Cuba	Guil OI MEXICO	Louisiai

ana Puerto Rico

Senegal

Hurricane Katrina Location					
Date	Latitude (North)	Longitude (West)			
24 August 2005	23.4	75.7			
25 August 2005	26.0	77.7			
26 August 2005	25.9	80.3			
27 August 2005	24.6	83.3			
28 August 2005	24.8	85.9			
29 August 2005	27.2	89.2			
30 August 2005	32.6	89.1			
31 August 2005	38.6	85.3			

Part 2: Now use your map of Hurricane Katrina's path to estimate how many miles the storm traveled in each 24-hour period. Then, using your data, write a formula here to calculate the average speed the storm traveled each day, and complete the chart below.

	Aug. 24-25	Aug. 25-26	Aug. 26-27	Aug. 27-28	Aug. 28-29	Aug. 29-30	Aug. 30-31
Distance (Miles)							
Speed (mph)							

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In the film *Hurricane*, we see the strong winds that make a hurricane so dangerous. The winds are blowing gently when the storm starts in Africa. They build as the storm travels across the Atlantic Ocean. By the time the storm reaches Cuba, we see the strong winds batter the island, especially where the group taking shelter is huddled in their reinforced hut. The winds also cause a storm surge and flooding, as we see when Lucy reaches Louisiana.

Follow your teacher's directions and the illustrations below to experiment with different wind strengths and the waves they generate in shallow and deeper water. Use this chart to record the height of the waves you generate.





Figure B: Deeper Water

After you perform the experiment, think about how similar winds and waves might affect the landscape when a hurricane makes landfall.

Force of air through the straw	Wave height in shallow water	Wave height in deeper water
Trial 1: gentle		
Trial 2: medium		
Trial 3: strong		

Imagine a strong wind – like the one you created in trial 3 – blowing over the ocean and onto the land. What do you think would happen to the beaches, trees, and buildings?

Now, with your partner, write a report that draws conclusions from the experiments your team just performed:

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GRADES 6-8 REPRODUCIBLE MASTER ACTIVITY I CORAL REEFS: TEMPERATURE CHECK

In the film *Hurricane*, we see how the fictional hurricane Lucy affects even the submerged world of coral reefs. The power of a hurricane can destroy coral reefs, but there can be positive outcomes as well. By drawing heat from the ocean, a hurricane can provide coral reefs with the colder water they need to thrive.

Learn more about the effect of hurricanes on ocean temperatures at <u>https://weather.com/storms/hurricane/</u> <u>news/hurricane-landfall-benefits-2016</u>. Then, using your own research at the following links and what you learned from watching the film *Hurricane*, answer these questions about the impact of hurricanes on coral reefs.

- Where are Reef-Building Corals Found? http://oceanservice.noaa.gov/education/kits/corals/coral05_distribution.html
- Natural Threats to Coral Reefs
 http://oceanservice.noaa.gov/education/kits/corals/coral08_naturalthreats.html
- Human-Caused Threats to Coral Reefs
 <u>http://oceanservice.noaa.gov/education/kits/corals/coral09_humanthreats.html</u>
- 1. How are coral reefs formed?______

2. Name two ways in which coral reefs can be damaged, and two ways in which their survival can be threatened.

- **3.** Use the tracking map your teacher will give you to locate the following reefs, all of which exist in areas that are prone to hurricane activity:
 - Key West, Florida 24°N 81°W
 - Puerto Rico 17°N 66°W
- Jamaica 18°N 77°W
- Bahamas Islands 24°N 76°W

4. What is the relationship between water temperature and coral reef distribution?

5. Why might the trail of cold water a hurricane leaves behind it be good for coral reefs?

6. What do tropical rainforests and coral reefs have in common?



GRADES 6-8 REPRODUCIBLE MASTER ACTIVITY 2 HURRICANE HISTORY

Step into the role of a hurricane researcher by learning about the specific hurricane your teacher has assigned to you and your teammate. Use this link to a list of notable storms at the National Hurricane Center to learn more about your hurricane: **www.nhc.noaa.gov/outreach/history/**. Complete the information below.

Hurricane name:

Dates: _____

Storm surge height at landfall:_____

Damage to hardest hit areas: ______

Now find your hurricane at **https://coast.noaa.gov/hurricanes/** to review the map that shows its path and the chart that shows its wind speed and atmospheric pressure from day to day. Complete this information:

Longitude and latitude at 5 points on the path: _____

Wind speed at those 5 points: _____

Click on Storm Report for additional information about your hurricane. Answer these questions:

- Estimate how far the storm traveled from south to north in miles. Identify the southernmost latitude and the northernmost latitude, then calculate the difference between the two to find the change in latitude. Use the scale on the tracking chart your teacher will give you to estimate the miles the storm traveled south to north (scale is approximate):
- Find the change in longitude in degrees from the first location where the storm is at least a tropical depression to the last location where it is at least a tropical depression.
 These locations are indicated in blue on the map: ______

Now plot the course of your hurricane on the tracking chart. Be prepared to share your information with your classmates to determine "Worst of" characteristics for all the hurricanes researched by your class.



GRADES 6-8 REPRODUCIBLE MASTER ACTIVITY 3 STORM SURGE

The storm surge can sometimes be the most devastating part of a hurricane. To observe firsthand the power of a storm surge, follow your teacher's directions to create a model that will show how the forces that govern the surge can affect its impact. Record your findings below, then answer the questions.

	OBSERVATIONS		
	Type of disturbance		Distance felt inland
	Gentle waves		
	Medium waves		
	Storm surge		
1.	Describe what happened in the model when you created gentle waves:	6.	Was there any area of your model that was "safe" during your hurricane storm surge?
2.	Which area of your model was most impacted from the waves?		Explain your answer:
	Explain why:	7.	If an evacuation had been ordered, how far should people travel from the shore in order to be out of harm's way? Support your answer using ideas from the model and further research if necessary:
3.	Describe what happened in your model when you created a stronger storm:	8.	What recommendations would you make to people who want to build on coastal areas?
4.	Which area of your model was most impacted by the waves?		
5.	Describe what happened in the model when you created the hurricane storm surge. Include a description of areas inland:	9.	Describe how the effects of a storm surge can impact the lives of people living in that area as well as the economy of the community:
		Сс pr	onclusion: As a class, discuss what a storm surge is, how it is oduced, and how it affects the low-lying areas along a coast.





GRADES 6-8 REPRODUCIBLE MASTER ACTIVITY 4 TO REBUILD OR RELOCATE?



In the film *Hurricane*, we see the tremendous damage that can be caused by such a powerful storm. We also learn that certain areas are more likely to be affected by hurricanes. Some people insist on rebuilding in the same spot where they might have experienced losses from previous storms. Why would people do this? Why not relocate to somewhere safer? Should money continue to be spent rebuilding?

In this activity, you will research and debate the question: Should communities rebuild in hurricane prone areas? Note your findings below, then list the points—both pro and con—to support or refute this idea.

Note	Source

Pro	Con
1	1
2	2
3	3

Atlantic Basin Hurricane Tracking Chart National Hurricane Center, Miami, Florida



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A film by Cyril Barbançon, Andy Byatt and Jacqueline Farmer









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For additional educational resources and online activities, please log on to Hurricane.nWave.com



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