

## Lesson Twelve: Story – The Eye of the Storm

Titus did not yet know the ancient Hawaiian tongue fluently. But he knew enough to decipher the meaning of "Iniki" as meaning: a sharp, piercing sword. It appeared that this storm would indeed live up to its name: as a dagger into the heart of the island itself. Little could Titus and his uncle foresee that the hurricane would hit within the short span of about nine hours from the warning, that the island would be covered by the eye of the storm for a total of forty-hours, and that "Iniki" would prove to be the deadliest storm since to encompass Hawaii's beautiful, white sands.

Hurricanes...it was a much different thing hearing or reading about them than actually experiencing them. Titus sighed deeply. Power was completely out. Uncle Sage had blown out the candles (a potential fire hazard for the storm's strong winds) hours ago, and everything was pitch dark. He could hear nothing but the storm outside, heavy winds and rain and waves, and the panting of Lemi. Sitting in the dark, Titus was left to his thoughts. It had only been only weeks before his arrival in Kauai after Hurricane Andrew made groundbreaking news as one of the deadliest storms to hit the States, killing most, it seemed, not by the waves themselves, but the by the tornadoes spawned from it.

That morning he sat alone at the kitchen table reading 2 Kings 2 during his quiet time---the story of how Elijah was taken up into a whirlwind---"whirlwind," of course, being another name for a tornado. Titus thought about this for a time, and wondered with a smile if Elijah was taken up by an "updraft," and if the prophet had been at all apprehensive about that.

An "updraft" is a rising of wind. If this wind reaches a certain "altitude" or height, and meets currents going in different directions, "rotation" can begin. Rotation is what causes the spiral form of the tornado. If there is only one updraft, a single cumulonimbus cloud is formed. If more than one, a supercell storm occurs. This is a common, perfect setting for tornadoes. Ironically, this is what Titus

had been meditating when news of Hurricane Andrew flashed along the television screen on the kitchen cabinet that morning.

Hurricane Andrew had begun off the coast of Africa, drifting west along the coast of Florida, brought still further into the Gulf of Mexico. It had weakened from a Category 4 to a Category 3 storm and had caused, in total, approximately 65 deaths and over one-million evacuations.

There is another "perfect setting" for tornadoes; that is, in the context of a hurricane. When a hurricane makes landfall, the rotation at ground-level slows down while the rotation at the top of the storm continues at its swift speed. These speeds coupled can spawn, or birth, many tornadoes at any time. In fact, dozens of tornadoes spawned from Hurricane Andrew. This was exactly the case of Hurricane Andrew---a particularly strong tornado formed in this way hit Southeastern Louisiana. It had even struck a blow to a man with a refrigerator. The story was all over the news.

Any resource specializing in weather will convey the distinctions between tornadoes and hurricanes. In fact, besides the fact that both strike fear in the hearts of men, they have little else truly in common. Where tornadoes form on land, hurricanes form as massive storms over the water. Hurricane storms in themselves cannot exist on land as they are generated and energized by heat. Rising, warm air causes low pressure, and storm is birthed. Tornadoes have been noted to occur on every continent though they are most common in the Plains-lands; hurricanes in contrast occur within 80 and 150 north and south of the equator in water-temperatures reaching up to 27 degrees celsius. Whereas hurricanes can reach thousands of miles in width, tornadoes normally expand to a maximum one-mile around. Tornadoes have a lifespan of minutes while hurricanes can last for days. Now if a hurricane is great enough and has collected enough energy, it can develop tornadoes which originate and can flourish on land.

Suddenly, everything was quiet. For forty hours, Uncle Sage and Titus and Lemi sat in the bathroom. "The storm must be over, Uncle Sage." Uncle Sage looked doubtful. He had much intuition, "Not yet,

Titus. We're in the eye of the storm." The eye of the storm. Ironically, it was the calmest place to be...

Rubble still littered the streets. Felled trees, with their scattered limbs and foliage, had to be stepped over and moved out of the way. Once-proud buildings looked like shells; feet of water rested knee-deep in places, growing more stagnant by the day. This was the reason he was out there, Titus reminded himself. His eyes looked heavenward, and then toward the masses of people before him, some huddled in corners. All with distraught faces. They had no hope. Titus determined to show them Hope. He inhaled deeply. From the corner of his eye, he could see that Uncle Sage was close behind him, his head bowed and eyes closed. He was praying. For Titus, for all who heard.

## Lesson Twelve: Tornado Alley

In the United States, there is an area ranging from northern Texas, Oklahoma, Kansas and Nebraska known as “Tornado Alley,” called this moniker because of the great number of tornadoes which occur there.

There is another “Tornado Alley” in Canada, running from the Great Lakes region in Ontario to the upper St. Lawrence valley.

Read about these Tornado Alley’s, and write a summary about why you think so many tornados occur in these places.



## Lesson Twelve: Hands-On Activity – Create a Tornado

This activity will not create an actual tornado, but it will allow you to see how a vortex forms. The vortex is the type of motion that causes liquids, as in this experiment, or gasses, in the case of a funnel cloud or tornado, to move in a spiraling motion around a center opening.

Here's what you will need:

- 2 empty plastic water or soda bottles  
(labels removed)
- 5 drops food coloring (optional)
- 1 metal washer as close to the size  
of the bottle opening as possible
- Duct Tape

Here's what to do:

Drop 5 drops of food coloring into one of the empty bottles, and fill with water.

Place the washer over the top of this bottle where the lid would go (do not put the lid on.)

Place the empty bottle over top of the washer, upside down. Duct tape the bottles together, opening against opening, with the washer in between them, in the shape of an hourglass. Keep the connection as tight as possible, and seal with several layers of duct tape. Test your seal by holding your bottles over the sink and turning the connected bottles sideways. Seal any leaks you find with duct tape.

Once you have a sturdy seal, turn your bottles so that the empty bottle is on the bottom, and give it a swirl. The water will form a vortex much like a tornado as it begins to drain from the top bottle to the bottom. The vortex is created by the swirling action, and makes it easier for the air to come into the bottle, allowing the water to pour out more quickly than if it was not swirled.



## Lesson Twelve: Interesting Facts About Tornadoes

Here are some interesting facts about tornadoes which you may not know:

**A tornado is sometimes called a “twister.”**

**A tornado is a spinning tube of air which touches a cloud at its top and the ground at its bottom.**

**It is possible for an extreme tornado to travel over 100 miles, though most tornadoes travel only a few miles.**

**There is an average of 1,200 tornadoes in the United States each year.**

**When multiple tornadoes begin from the same storm cell, they are known as a “tornado family.”**

**A tornado can rotate either clockwise or counter clockwise, but each tornado only rotates in one direction.**

**Tornadoes have occurred on every continent except Antarctica.**

## Lesson Twelve: More Types of Clouds

This week's story mentions another type of cloud. Look up the following types of clouds, and sketch each one in the boxes below.

