

## PLAY

### Kai'ulani and Kekahu Make Pancakes

#### *An Aerospace Engineering Story*

**Tūtū Wahine:** "... The end. Good night, my loves. Aloha wau iā 'olua,"

**Narrator:** Tūtū Wahine whispered as she gently put the puke down on the bookshelf and left the room. As Kekahu drifted off to sleep, his sister called to him from across the room.

**Kai'ulani:** "Kekahu, Kekahu. Tomorrow is Tūtū Wahine's birthday. We should do something really special for her."

**Kekahu:** "What if we make her breakfast in bed? We can make her favorite 'ulu pancakes."

**Kai'ulani:** "That's a great idea! Aloha wau iā 'oe."

**Kekahu:** "Aloha wau iā 'oe,"

**Narrator:** Kekahu replied as they both fell asleep. ... The next morning, the early summer sun peeked through the window and shined directly on Kekahu's sleepy face. Kekahu slowly opened his eyes and wiped away the maka piapia from his face. He knew that if Ka Lā was peeking through his window, it was time to get up and greet the day. Kekahu stood at the edge of his bed and started to chant.

**Kekahu:** "E ala e, ka lā i ka hikina..."

**Narrator:** Kai'ulani heard Kekahu greeting Ka Lā and jumped out of bed, excited to cook breakfast for Tūtū Wahine. The two siblings quickly changed clothes and went outside to pick some oh-so-sweet 'ulu. With a mango picker in hand, Kai'ulani stood on her tippy toes and tried to reach the lowest-hanging fruit. To her surprise, no 'ulu fruits were in reach.

**Kai'ulani:** "Auwē! I guess one of us needs to climb the tree. Jan-ken-po?"

**Narrator:** Kai'ulani clenched her fist.

**Kekahu:** "Ready... Jan-ken-po. Rock beats scissors!"

**Narrator:** Kekahu yelled with a grin on his face. Kai'ulani laughed and made her way up the tall 'ulu tree. As she gently tossed a ripe 'ulu fruit from the top of the tree, she shouted,

**Kai'ulani:** "Hūi! Catch!"

*SPLAT!*

**Kekahu:** “E Kai’ulani maka’ala. You are throwing it so hard!”

**Kai’ulani:** “A’ole, it’s not me—it’s gravity! I think gravity is pulling it down, making it fall a lot faster than I tossed it.”

**Kekahu:** “Just keep going. I will catch one eventually.”

**Narrator:** Kai’ulani sighed.

**Kai’ulani:** “A’ole. We can't waste good food. Don't you remember the story that Tūtū Kāne told us? He said that long ago the people of Hawai’i experienced a famine, and the god Kū made the ultimate sacrifice to save the people. Kū saw that his family and community were in need, so he dug head-first into the earth and disappeared into the ‘āina. A few days later, an ‘ulu tree grew from the same spot. That tree provided fruit for his whole family and community. Just like that ‘ulu tree in the story, this tree feeds our ‘ohana. We have to think of another way to get this sweet fruit down without wasting it.”

**Narrator:** Kekahu called back to his sister with his hands cupped around his mouth,

**Kekahu:** “Okay, then let's Facetime Anakē Likolani for some advice. She is very akamai.”

*RING! RING!*

**Anakē Likolani:** “Aloha kāua!”

**Narrator:** Likolani greeted them as she appeared on the screen of Kekahu’s phone.

**Kekahu:** “Aloha Anakē Likolani! Kai’ulani and I are trying to get sweet ‘ulu down from the tree so we can make Tūtū Wahine her favorite ‘ulu pancakes. The problem is the fruits are too high to use the mango stick, but it’s too risky to throw the ‘ulu from the tree. I know you are akamai because you are an aerospace engineer. Can you help us think of a solution to our problem?”

**Narrator:** Anakē Likolani was currently working at the Hawai’i Space Exploration Analog and Simulation Site on Mauna Loa. Kekahu could see her smile and nod her head, but there was a delay in her audio response. After a few seconds, Likolani replied,

**Anakē Likolani:** “Sure thing! Right now, I’m working on parts for a spacecraft that will land on Mars, and our biggest concern is ensuring we make a parachute large enough to create as much drag as possible, while taking into consideration the type of atmosphere that surrounds Mars.”

**Narrator:** Kai'ulani called out as she climbed down from the tree,

**Kai'ulani:** "Drag! What's that?"

**Anakē Likolani:** "Drag has to do with the atmosphere. Even though we can't see or touch the atmosphere, it is still made up of stuff. So when an object moves through the atmosphere, it pushes all that stuff around, and that stuff pushes back. That stuff pushing back is called drag—and a well-designed parachute will create drag to slow down an object, just like your 'ulu."

**Kai'ulani:** "A parachute! What a great idea, Anakē. Mahalo! I wish we were cool like you and got to create the newest technology."

**Narrator:** Likolani rushed to reassure the keiki.

**Anakē Likolani:** "You are still creating technology, Kai'ulani. Remember, technology is anything that people create or design to help them solve problems, and I know you will make a great parachute to solve your problem. Don't forget to use the engineering design process that I taught you both. I only wish I could be there to eat those 'ono 'ulu pancakes."

**Both keiki:** "Mahalo, Anakē, a hui hou!"

**Narrator:** Both keiki waved goodbye, and Kekahu ended the Facetime call. The two siblings started collecting the items they wanted to use for their parachute.

**Kekahu:** "Okay, so I'm thinking we will need a canopy, a suspension line, and a load or a basket to hold our 'ulu fruit."

**Kai'ulani:** "That's a great idea! Let's make a plan by drawing out what we imagine and then creating a list of materials."

**Narrator:** Kai'ulani ran inside the house to grab a notebook and a pencil. After a few minutes, their plan was created, and the two of them worked on a parachute with some string, a towel, and a bucket. Kekahu grabbed a handful of small rocks and dumped them into the bucket.

**Kekahu:** "Let's pretend these rocks are the 'ulu fruit and test it out!"

**Narrator:** Kekahu grabbed the heavy parachute and climbed up the tree. He dropped the parachute, and it quickly hit the ground with a *thud*.

**Kai'ulani:** "Oh no! All the rocks fell out, and the bucket still fell really fast. I think we need a bigger parachute to create more drag."

**Narrator:** Kai'ulani ran away in search of a new parachute to use. Minutes later, she came back holding an old tarp they used to cover the kennel of Bully, their pet dog.

**Kai'ulani:** "Mom and Dad said they were going to throw this away. Maybe we can cut it to make a bigger parachute that will create more drag."

**Narrator:** Kai'ulani and Kekahu worked hard, cutting the materials and testing their design over and over again to ensure a safe landing. After several attempts, their parachute was finally ready to hold the sweet 'ulu.

**Kai'ulani:** "Ready?"

**Narrator:** Kai'ulani shouted from the top of the tree, holding the parachute and bucket with the 'ulu fruit inside. Kekahu nodded.

**Kai'ulani:** "Okay, here it comes!"

**Narrator:** Kai'ulani released the parachute, and it floated down safely.

**Kekahu:** "YES! It worked!"

**Narrator:** Kekahu yelled as he jumped for joy. The two siblings took the 'ulu fruit back into the house and started to cook Tūtū Wahine's favorite pancakes. When they were done, the kids entered Tūtū Wahine's room and sang,

**Both keiki:** "Hau'oli lā hanau iā 'oe, hau'oli lā hanau iā 'oe."

**Narrator:** The sweet smell of the 'ulu pancakes filled the room, and Tūtū Wahine smiled.

## Vocabulary

<b>Aloha wau iā ‘olua</b>	I love you both
<b>Tūtū Wahine</b>	Grandmother
<b>Puke</b>	Book
<b>‘Ulu</b>	Breadfruit
<b>Aloha wau iā ‘oe</b>	I love you
<b>Maka piapia</b>	Encrusted white matter in the eyes from sleeping or irritation
<b>Lā</b>	Sun
<b>“E ala e, ka lā i ka hikina...”</b>	The beginning of the chant <i>E Ala E</i>
<b>Auwē</b>	Alas, oh dear
<b>Jan-ken-po</b>	Rock-paper-scissors game
<b>Hūi</b>	Hey
<b>Maka‘ala</b>	Watch out
<b>A‘ole</b>	No
<b>Tūtū Kāne</b>	Grandfather
<b>‘Āina</b>	Land, earth
<b>‘Ohana</b>	Family, community
<b>Anakē</b>	Auntie
<b>Akamai</b>	Smart
<b>Aloha kāua</b>	Hello
<b>Aerospace Engineer</b>	An engineer who helps design and test aircraft and spacecraft
<b>Mahalo</b>	Thank you
<b>Keiki</b>	Child
<b>‘Ono</b>	Sweet
<b>A hui hou</b>	See you later
<b>Hau‘oli lā hanau iā ‘oe</b>	Happy birthday to you

### Sources

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