



Teacher's Guide for:  
**Sound Effects with Cup**

Note: All activities in this document should be performed with adult supervision. Likewise, common sense and care are essential to the conduct of any and all activities, whether described in this document or otherwise. Parents or guardians should supervise children. Rock-it Science assumes no responsibility for any injuries or damages arising from any activities.

**NOTE:** This is the transcript of a lesson that was videotaped during an actual Rock-it Science class with real students, not actors. The students' brainstorming comments are included on the video but are not transcribed here because they're not part of the lesson presentation.

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Sound Effects with Cup  
A Rock-it Science Lesson  
Filmed June, 2009

***Rock-it Science***  
2110 Walsh Ave, Unit F  
Santa Clara, CA 95050  
[www.rockitscience.org](http://www.rockitscience.org)

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## Intro Quick Recap:



- Teacher holds one end of a long flexible spring, while a student holds the other end. Teacher rotates the spring like a jump rope, creating a wave form that represents a low note.
- Teacher rotates the spring at increasing speeds, creating wave forms with multiple peaks, representing increasingly higher notes.
- A quiet sound makes small waves, and a loud sound makes big waves.



## Experiment Quick Recap: "Make Sounds with String"

- Give each student a piece of string about 18" long. Tell them to make sounds with it any way they can.
- Do the same with a rubber band. Caution students not to shoot the rubber band at anyone.
- Each student attaches a piece of string to the bottom of a cup with hot glue. Then they hold the cup to their ear and make noises with the string.
- Wet the string to see how the sound changes.
- Tie a rubber band to the string to get different sounds.
- Teacher uses a pair of cups connected by about 10 feet of string. Teacher speaks into one cup while students take turns listening with the other cup.



## ***Equipment List: "Sound Effects with Cup"***

### **Items needed for Instructor:**

- Long flexible spring
- Two Plastic Cups
- String, about 10 ft
- Scissors

### **Items needed for Students:**

#### **Consumables (per student):**

- String, about 18"
- Cup, plastic, 16-oz
- Rubber Band
- Water, small amount

#### **Other:**

- Couple of Glue Guns
- Glue Sticks
- Permanent Markers

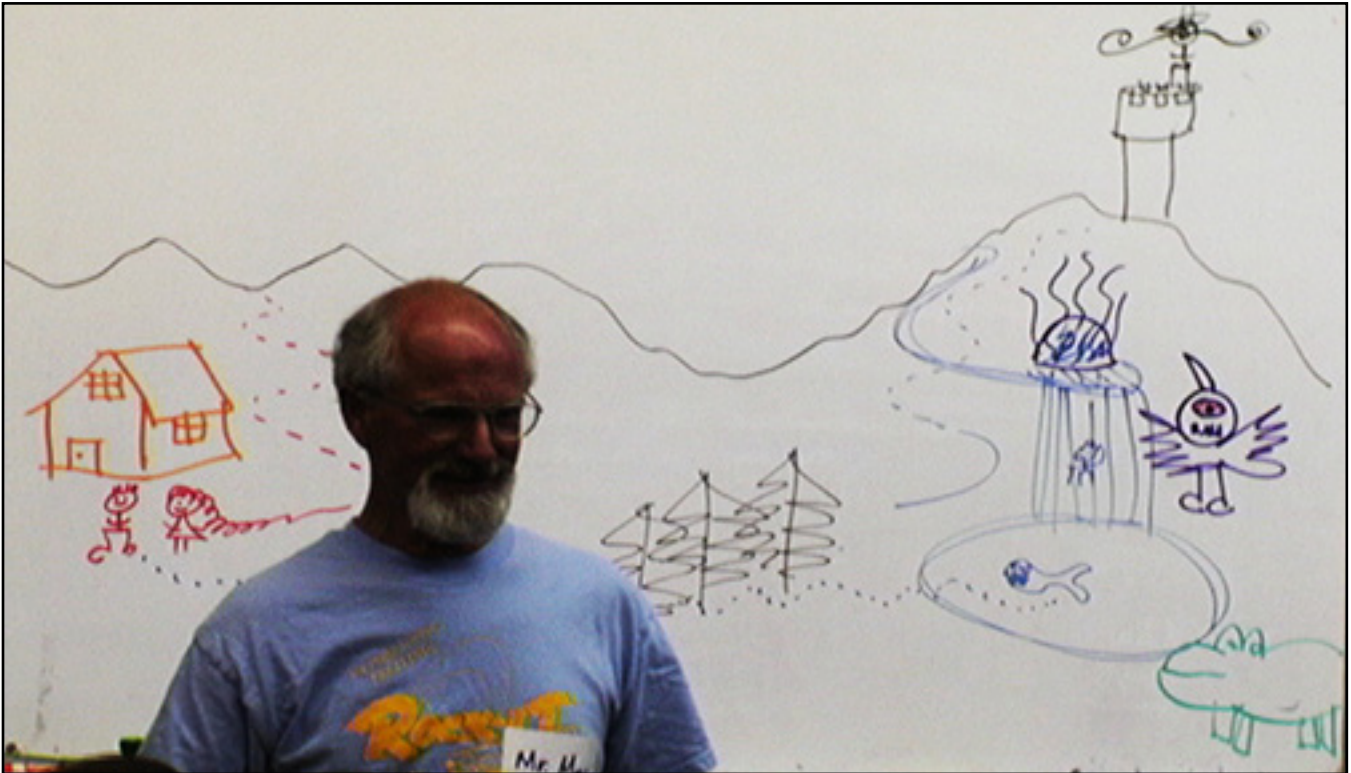
### **Prep Work:**

- Attach a 10-foot string between two plastic cups.
- Cut string to 18" lengths for students.



Cup and string

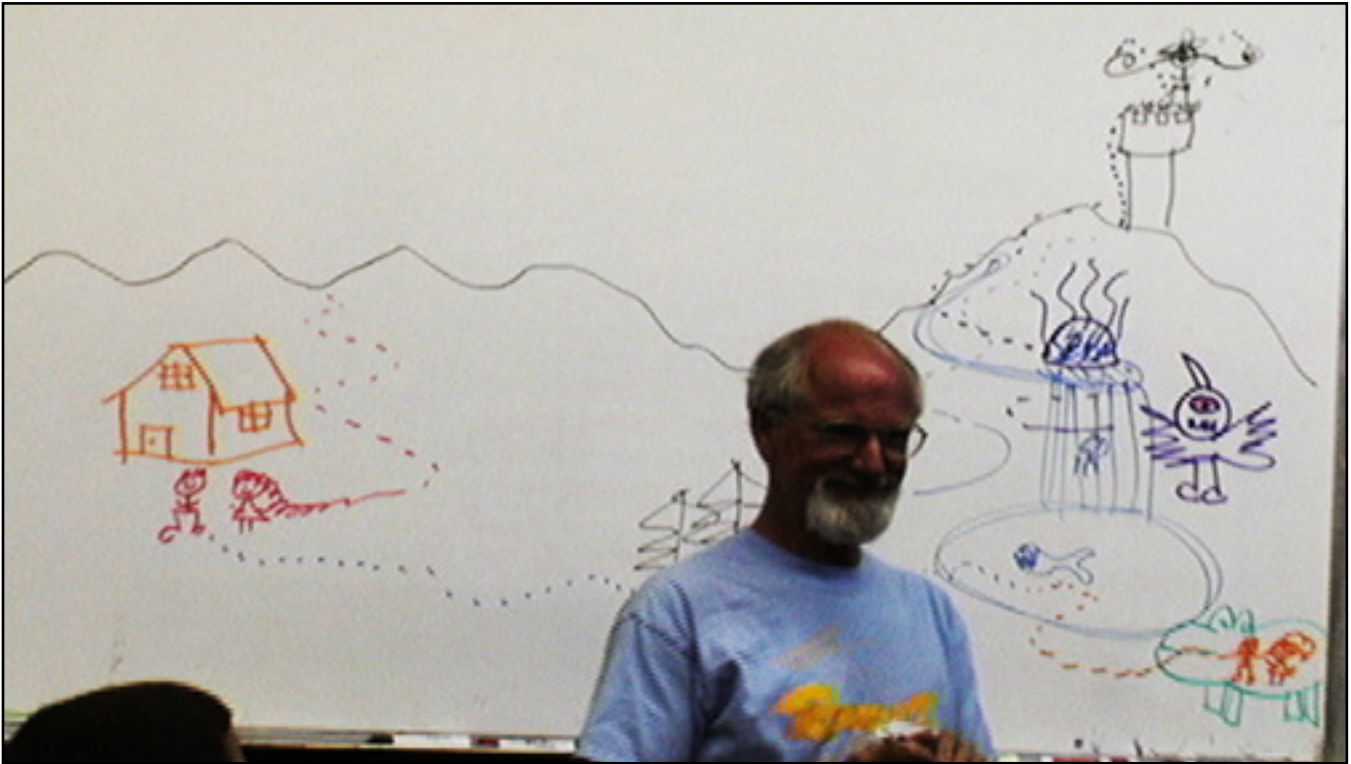
## Story Recap: "Jack and Jill and the Purple People Eater"



### Part 1:

- Evil Mister Fred was experimenting with butterflies. He's afraid of butterflies and hates them. He put a butterfly in a microwave oven with peanut butter, pickles, and some flies.
- The microwave oven exploded and produced a one-eyed, one-horned, flying purple people eater. When it saw Evil Mister Fred, it screamed and ran away.
- The people eater went to live in a cave with a flat spot in front of it. The cave was stinky and messy. A river flowed in front of the cave and made a waterfall with a pool at the bottom. There were piranha in the pool.
- Jack and Jill lived nearby in their house. That day, they decided to do everything the hard way.
- They rolled out of bed and fell on the floor. They put their clothes on backwards, tumbled down the stairs, and ate nails for breakfast. They dove out the front window through the glass and crawled on their hands and knees to the forest. They crawled through thorny bushes, came to the pond, and decided to swim with the piranhas. The piranhas tried to bite them, but Jack and Jill bit them back, and the piranhas swam away.
- Jack and Jill swam up the waterfall and entered the cave. They started sliding downward on the slime and landed on something soft. It was the people eater.
- The people eater was going to eat Jack and Jill, but he was out of mustard. So he made a growling noise that made his stone hippo open its mouth. He put Jack and Jill inside the hippo and made the growling noise again, and the hippo closed its mouth. Jack and Jill were trapped.

## Story Recap (cont.)



### Ending:

- The purple people eater flew off to buy mustard, leaving Jack and Jill trapped inside the hippo.
- Jack took a strand of Jill's hair, got it wet in the hippo's spit, and told Jill to open her mouth.
- When he pulled on the string, Jill's head made a loud sound like the plastic cups in the experiment. The sound made the hippo open its mouth.
- Just as Jack and Jill jumped out, the people eater came back.
- Jack knew he could see them in the dark, so he offered to shake the people eater's hand.
- The people eater was so shocked that someone treated him with respect, that he started to shrink. But as he got smaller and smaller, he also got meaner and started flying around really fast like a hornet.
- Jack and Jill ran out of the cave and up the hill to Evil Mister Fred's castle.
- They climbed the castle and ran right onto Evil Mister Fred's mustache. The tiny people eater landed on Evil Mister Fred's face and wouldn't get loose. Jack and Jill jumped off.

## Transcript: Introduction

[Instructor makes a high-pitched sound with the spring.] But it's hard to see that way. So I'm going to make the sound waves look like a jump-rope. [Turns the spring while a student holds the other end.] You just hold your end steady, don't wiggle your hand. Hold with both hands, like this, and don't wiggle your hands. Keep your hands still, that's the way -- perfect.

[Spring makes one large arc from end to end.] That would be like a low sound. Oooohhh [sings a low note] -- like that.

Now, if you have a higher-pitched sound, it may look like this. [Turns the spring faster, creating two arcs with a node in the center.] There's two waves in the space where there'd usually be just one wave, and it could be two jump-ropes.

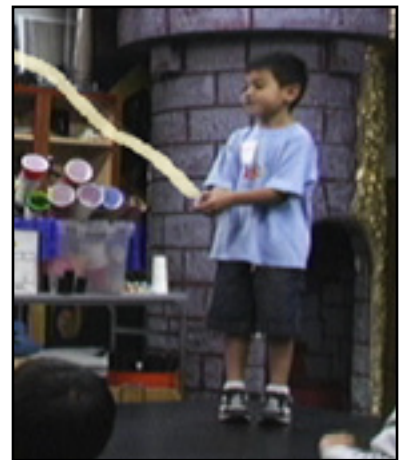
Now if we make even a higher-pitched sound, here we go -- hang on tight. [Turns spring fast enough to create two nodes.] Now there's three jump-ropes. That would be a higher-pitched sound. And there's a spot right there [points to a node] where there's no sound.

We're going to a higher-pitched sound than that. If I hit you, you get extra points. Okay, here we go. [Turns spring fast enough to create three nodes.] Is that four?

The higher the pitched sound you have, the more waves there are in a certain amount of space. And if it's a quiet sound, it'll look like this -- small waves [turns spring gently]. If it's a loud sound, it'll be big, like that [turns spring with more force, to make larger waves]. So sound can be big and loud or small and soft. It can have a high pitch with lots of waves, or a low pitch with a few waves. Okay, you can let go, now. [Student lets go of spring.] Good job -- thanks.



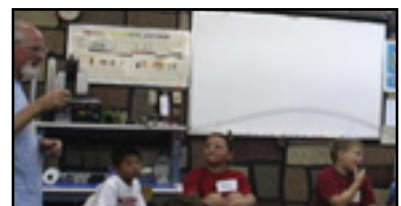
Instructor holds one end of a long spring and turns it like a jump-rope. . .



. . . while a student holds the other end.



A student points to a node, where the spring appears to be still.



A low sound produces a small wave.

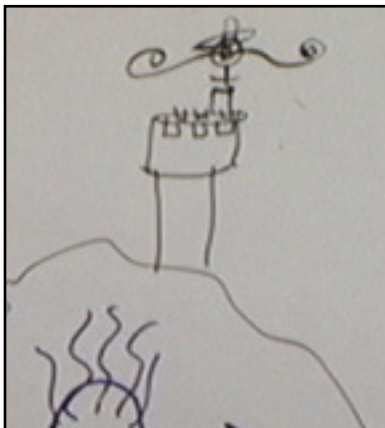
## Story: "Jack and Jill and the Purple People Eater"

Now we need a crazy story. Our stories always feature Jack and Jill and the Evil Mister Fred. Once upon a time, Evil Mister Fred was experimenting with butterflies. He hates butterflies, he's very much afraid of butterflies. He put a butterfly in a microwave oven with some peanut butter on it, and some pickles, and some flies. And he turned it on, and the microwave oven exploded. Next thing he knew, he had a one-eyed, one-horned, flying purple people eater. And the one-eyed, one-horned, flying purple people eater took one look at Evil Mister Fred and went, "Aaaaahhhh!" and ran away.

And he went to live in a cave. And one-eyed, one-horned, flying purple people eaters don't smell good. And they're messy. So there's all these stinky lines coming out of the cave. And there was a flat spot in front of the cave. There was a river that came right in front of the cave and made a waterfall. And there was a pool below the cave, and in the pool there were piranha. Piranha are fish with razor-sharp teeth. And not too far from that there was a black forest. And let's put our one-eyed, one-horned, flying purple people eater inside. He's got wings, and he's got some feet, like that. That's our purple people eater.

And Evil Mister Fred has his castle right up here. There's his castle. And here's Evil Mister Fred.

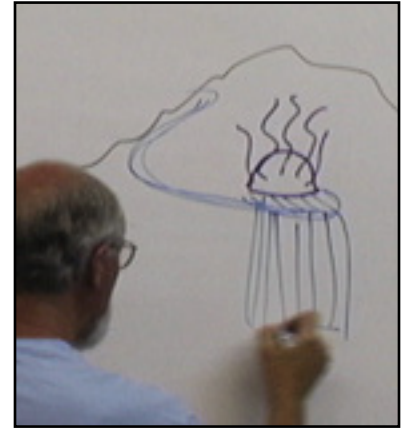
Not too far away there was a house. This is the house where Jack and Jill lived. Now, Jack and Jill lived there, and they woke up this particular morning and they decided they weren't going to do anything the easy way. They're going to spend the whole day doing everything the hard way.



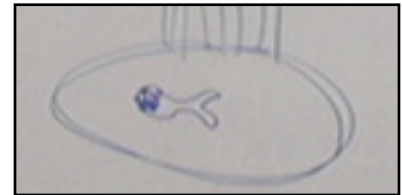
Evil Mister Fred's Castle on top of the mountain.

When they woke up, they didn't just get out of bed. They rolled over and fell on the floor -- ka-plop! And they put on their clothes backwards. And they decided to go downstairs for breakfast. And instead of walking down the stairs, they tumbled down the stairs -- ba-dum-ba-dum-ba-dum-ba-dum! And for breakfast, instead of cereal they ate nails. And after breakfast, Jack and Jill decided to go for a walk. And rather than go through the front door of the house (Jill has long hair, by the way) -- rather than going through the front door of the house, they ran and dove through the window and broke the glass.

Then Jack and Jill headed off to the woods. And rather than walk, of course, they crawled on their hands and knees. They got to the black forest, and there were thorny bushes there. They crawled through the



Purple People Eater's cave with flat ledge, river and waterfall.



Piranha in the pool.



The Purple People Eater.

thorny bushes. There was poison oak there, and mosquitos, and they got all beat up. And they came through the forest to the pond where the piranhas were. And Jack and Jill said, "Ooooh! Lookit there. We want to go up the mountain, there's this perfect trail up the mountain, we could go walk that, but instead let's go swim with the piranhas." So they go in, and the piranhas decided they were going to bite Jack and Jill. The piranhas swam up and tried to bite Jack and Jill, and Jack ate the first piranha (gulp). And Jill ate a few of them (chomp, chomp, chomp). And the piranhas got afraid and ran away.

Then Jack and Jill wanted to go up. They could have gotten out and climbed up, but no, too easy. They decided to swim up the waterfall. So Jack and Jill swam up the waterfall and they climbed out on the ledge. And then they saw the cave. They didn't know what was inside the cave. It was really dark in there, and it smelled terrible. And they thought, "Oh, boy, this smells terrible. Should we go in there? We could die if we go in there." And Jack said, "Yahhh!" And he ran inside. And Jill followed him in. Now the ground was so slippery because it was a dripping, deep, dank, dark cave. And the ground was all slippery and slimey. And Jack fell down and started sliding downhill -- fwheeww! And Jill came sliding right after him -- fwheewww!

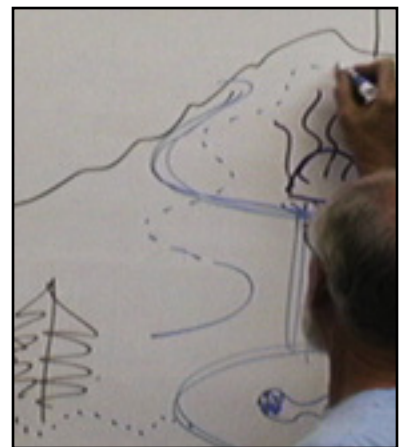
And Jack looked at Jill in the darkness and he said, "Jill, are you there?" And she said, "Yeah." And Jack said, "We're going fast, aren't we?" And Jill said, "Yeah!" And Jack said, "We're going to die, aren't we?" And Jill said, "Yeah . . ."

And at that moment, they started flying. It was pitch dark, and they didn't know what was going on. They just knew they were flying. And they said, "Well, been nice knowing you." And their life flashed before their eyes. Then all of a sudden, plop! plop! Both Jack and Jill landed, but they didn't die. They landed on something soft and warm. They said, "Oh, this is nice. I like it here. Whatever this was, it saved our lives."

And then whatever it was opened its one big red eye. They landed right in the hands of the one-eyed, one-horned, flying purple people eater. And the purple people eater looked at them and said, "Ooooh, breakfast!" And Jack and Jill said, "Oh, no! Please don't eat us!" And the one-eyed, one-horned, flying purple people eater took them over to his counter and set them down, got out two slices of bread, put Jack and Jill on one slice. And then he opened his refrigerator looking for some mustard. Lo and behold, the mustard was empty. And he said, "Aw, darn! No mustard. I can't eat people without mustard." So he put the other slice of bread on Jack and Jill and went over to his giant hippopotamus. He has a giant hippopotamus in there, and it's made out of stone. There's a



Jack and Jill's house.



Jack &amp; Jill didn't take the path.



They climbed the waterfall.

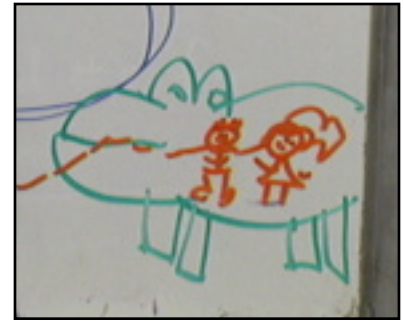


The stone Hippo.



hippopotamus. And the flying purple people eater said to the hippopotamus, "Rrraaaaggghhhhhh!" And the hippopotamus opened its mouth. And then he put Jack and Jill in there and he said, "Wait right there. I'll be back. I'm going to the store to buy mustard." And then he made that weird sound again, "Rrraaaaggghhhhhh!" and the hippopotamus closed its mouth.

Now Jack and Jill are locked inside a giant hippopotamus. And they felt the ground shake as the flying purple people eater walked to the opening of his cave to fly away. And they said, "Oh boy, we're trapped. He's going to come back and eat us alive. This is terrible. What a way to go."



Jack & Jill inside the Hippo, with Jill's hair trailing out.

If you were Jack and Jill, what would you do to escape from the hippopotamus' mouth?

### Imagination and Brainstorming Time

*[Students make suggestions]* (THERE ARE NO WRONG ANSWERS! Whatever they say, you should reply: "That's a good idea," "They might do that," etc. After brainstorming, proceed with the experiments, then finish the story.)

Well, we're going to leave Jack and Jill trapped in the hippopotamus. Let's put them in there so you know that's where they are. There's Jack. Here's Jill. Some of Jill's hair always works its way out. And we're going to leave this "To be continued . . ."

## Experiment:

And we'll do some experiments. Let's see. First experiment, we're going to need a piece of string. We're going to give you each a piece of string, and you're going to try to make loud noises with your string. So if I wanted a bunch of pieces of string, there's a simple way to do it, wrap it around my arm like this. Then we cut them off. And then I'll give you a string, and you see if you can make a loud sound with the string.

*[A student bites one end of the string and twangs it with his finger.]* Oh, lookit -- if you put it in your teeth, it makes better noise. That's a great thing to discover! Did you come up with that? That's perfect.

*[Another student holds one end of the string in each hand and pulls it taut, then relaxes it, repeatedly.]* Oh, that's good! If you pull on it sideways, it makes noise.

Now, we're going to see if you can make noise with a rubber band. Don't shoot them unless you're going to go get them. Guys, don't shoot the rubber bands around -- you might hit somebody in the eye.

Now, what you're going to do is take a cup, and we're going to put a string on the end of the cup. I'm going to put a little bit of glue on the end of the cup and stick the string in the glue. Put the glue on there and put the string in the glue, and use the tip of the *[glue]* gun to kind of gush it in there so it will stay. If you burn your finger, you get extra points. You set it down and don't touch it until you're a hundred years old. Because the glue has to get hard. After you grow a beard like mine, then you can pick it up again.

*[Passes out plastic cups and sets up some glue guns.]* First four people come glue yours. Then you take it back and set it on the table until it gets hard. Okay, next four people come. Bring your string, cups are right here.

Now, after the glue is hard -- let's see if the glue's hard yet. Feel your glue and see if it feels hard. So when yours feels hard, then you can listen to it *[holds cup to his ear]*, and gently tug on the string and see if you hear wind inside. Let it slide through your fingers. Then, just gently twang the string. Don't do it in anybody's ear -- it's too loud for their ears.

*[Pours some water on the table in front of each student]* This is just water. Get the string wet and see if it does anything different. This isn't water, it's bat spit. Get the string all wet.



You can hold the string in your teeth and pluck it to make a sound.



You can also make a noise by pulling the string sideways.



Use a glue gun to attach string to the bottom of the cup.



Gently tug on the string to make a sound.

*[Student: The sound gets deeper.]*

Yeah, it does, yeah.

*[Students continue making various sounds with the string and cup.]*

*[After awhile, Instructor ties a rubber band near the end of the string on each student's cup, and they experiment making sounds with the rubber band.]*

Okay, everybody sit down. Put your names on them *[passes out markers]*. Once you put your name on it, then you need to put it somewhere where you can find it again to take it home.

*[Instructor brings out two cups connected by a string and has a student hold one cup to his ear.]*

When I was a kid, we used to string these between our houses, with a neighbor of mine. If you hold that end, and I hold this end, and we talk into it -- Hello, hello, can you hear me? -- and he says no, he can't hear me. How come he can't hear me? The string isn't tight? Okay. Let's get further apart. Now try -- Hello, can you hear me? *[Student answers yes.]* Okay, that works. If you want to hear what this sounds like, pass it on to someone else, and make a line behind *[student]*.



You can also gently twang it.



Pour water on the table and wet the string.



Tie a rubber band to the string to get different sounds.



You can talk from one cup to another if the string is taut.



## End of Story

***\* DO NOT \* present this part of the lesson until after the experiments!***

So Jack and Jill are trapped inside of a giant hippopotamus. The one-eyed one-horned flying purple people eater is flying off to buy mustard, and is coming back and is going to eat them up. And they heard that he made a loud noise. And Jack and Jill started screaming inside, "Aaaaaah-hhh!" but the hippopotamus didn't open his mouth. And they jumped up and down, but the hippopotamus didn't open his mouth. And then Jack said, "Jill, I've got a good idea. Open your mouth." And Jill opened her mouth, and Jack took Jill's hair, put it in the hippopotamus' spit, got it all wet, and then pulled on her hair. "Rrrrhooommmfff!" Her head made the sound just like your cup. And the hippopotamus opened up its mouth. And Jack and Jill said, "Yeah, all right!" And they jumped out.

Well, right about that time, the purple people eater came back. And Jack and Jill were trying to hide in the dark. But the purple people eater could see them, because he has infra-red sensing eyes. He said, "You can't hide from me. I can see you wherever you are." And Jack said, "All right. So you can find us. I'd like to come and shake your hand." And the purple people eater said, "Well, what a fine gesture." And Jack walked right up to him and said, "Shake!" And he went shakey, shakey, shakey with the purple people eater's hand. And the purple people eater was so shocked that somebody treated him with respect, he started to shrink. And he became smaller, and smaller, and smaller. Well, as he got smaller, he got meaner, too. And he started flying all around really fast. And Jill said, "Jack, I think we'd better leave. He looks like a mean hornet." And Jack and Jill started running out of the cave as fast as they could. And Jack and Jill managed to get out the front and were running up towards the top, with the purple people eater right behind them. And he was mad.

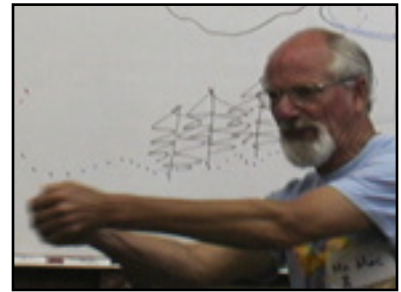
And Jack and Jill ran right up the side of the castle. And Jack ran onto one side of Evil Mister Fred's mustache and Jill onto the other side. And they both bounced as high as they could -- boing! -- and jumped off. At the exact time that they bounced off, the purple people eater landed on Evil Mister Fred's face and wouldn't get loose. And everybody lived happily ever after except Evil Mister Fred.

## End of Lesson

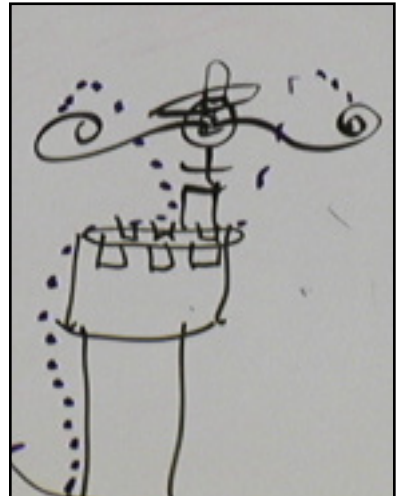
***If you have questions about this lesson, please ask them through the online [Teacher Support Forum](#) on our web site.***



Jill opened her mouth really wide.



Jack pulled on Jill's hair to make a loud noise.



Jack and Jill ran up onto Evil Mister Fred's mustache.