

**The Pop Ups.** Stay seated. Three, two, one, ignition. Get ready for an adventure of magnificent proportion.

**The Pop Ups.** (Singing.) I don't know what you've been told, but we're in a golden age - so many discoveries that are jumping off the page. Wow in the world. Wow in the world. Wow in the world. Wow in the world. Wow in the world. Wow in the world. Wow in the world. Wow in the world.

**The Pop Ups.** With Guy and Mindy. We're on our way, Houston.

**Guy Raz.** (Singing to self.) Someone told me it's all happening at the zoo, I do believe it, I do believe it's true...mmm mmm mmmm...

(Soundbite of door knocking, door bell, and crash.)

**Guy.** Mindy?!

**Mindy Thomas.** We gotta do something about that door, Guy Raz! It really blocks the entry to get inside your house!

**Guy.** Did you just run right through it?

**Mindy.** Don't worry, I'm fine...only a few scratches.

**Guy.** My beautiful door!

**Mindy.** Well, you ready for a day at the zoom?

**Guy.** Am I ever! I've checked off just about everything on my safety spreadsheet. Let's see, sunscreen...I've got my first aid kit, bubble wrap, some toilet seat covers...I've got shovel to dig you out of trouble, Mindy...

**Mindy.** What?

**Guy.** Yeah I'd say we're all set for an accident free day at the zoo!

**Mindy.** Right...so in that case, I brought along some bright reflective clothing for you to wear. You know just in case there are hunters or something.

**Guy.** Hunters?

**Mindy.** Yeah, or if we get separated in a crowd of people and I need to find you more easily. You should definitely have these bright clothes on.

**Guy.** Well, normally I'm not really one for flashy clothing...

**Mindy.** You can still wear your wool pants and tweed blazer. Just put this stuff on top, okay?

**Guy.** Well, okay...but only for safety reasons, Mindy.

**Mindy.** What other reasons could I possibly have?

**Guy.** Uhh...

**Mindy.** Here. Put these on first.

**Guy.** Hot pink leggings? Okay...

**Mindy.** Yeah! Just squeeze them on right over your wool trousers. Looking great.

**Guy.** This seems a little weird...

**Mindy.** Just remember, we're doing this for safety.

**Guy.** Right. Oh—

**Mindy.** Now climb into this hot pink unitard...Easy does it...Got it!

**Guy.** OK, hold it right there! What's this all about?

**Mindy.** Ah, okay. Well...remember how you once said you'd do anything for science?

**Guy.** Yeah. Pretty much anything, I guess.

**Mindy.** Well, would you go into a dark cave filled with bats?

**Guy.** Sure.

**Mindy.** Would you spend a year living with a pack of wolves?

**Guy.** Sure, especially if they listen to Prokofiev.

**Mindy.** Well. I'm asking you now. If you believe in science...

**Guy.** OK...

**Mindy.** I need you to dress up like a pink flamingo.

**Guy.** Ahh, now I get it. But I am absolutely drawing the line at the beak.

**Mindy.** Oh no worries, I can just paint your nose to look like one.

**Guy.** Okay...if you're sure this is gonna help science.

**Mindy.** Now come here, we've got to squeeze you into this pink leotard.

(Soundbite of rubber stretching.)

**Mindy.** Awh yeah, that's the stuff.

**Guy.** All of this pink spandex is starting to feel a little tight.

**Mindy.** It's just doing its job, Guy Raz! Now for the final touch I just need to glue all of these to you, so stay really really still, okay?

**Guy.** Pink feathers?!

**Mindy.** Remember, this is for science!

**Guy.** I...

**Mindy.** Okay, now hand me that crazy glue and turn around. I got to get the back.

**Guy.** Are you sure about this, Mindy?

**Mindy.** Do I not look like I know what I'm doing?

**Guy.** Hey! What are you going to wear?

**Mindy.** Oh. I'm just going to wear a sensible, tailored pantsuit.

**Guy.** To the zoo?!

**Mindy.** Yeah, people already think I'm ridiculous, so this is gonna show them my serious side.

**Guy.** I have no idea what's going on anymore.

**Mindy.** Okay, let me just glue one last little feather to your forehead...and we are done! Guy Raz, the look is complete and you are one fabulous flamingo.

**Guy.** Ooh!

**Mindy.** Now grab your safety sack, it is time to go to the zoo. We got to hurry though because there's something I want to investigate when we get there.

**Guy.** Investigate?

**Mindy.** Come on! Let's go! My carrier pigeon is waiting outside, and he charges by the minute! Okay, saddle up and get ready for take off, because here we go!

(Soundbite of pigeon cooing.)

**Guy and Mindy.** Whoaaaaa!

(Soundbite of crash.)

**Guy.** Phew! Mindy, your carrier pigeon moves fast! I still can't believe you trained him to carry you everywhere you want to go!

**Mindy.** I can't believe we made it to the zoo in one piece!

**Guy.** Mindy, are you sure that all of this pink feathered spandex was a good idea? I feel like everyone is staring at me weird.

**Mindy.** Oh, well, if that's what you're worried about, then I know a place you will fit right in!

**Guy.** Oh no.

**Mindy.** Come on! Let's go!

(Soundbite of running.)

**Guy.** Woah, okay.

**Mindy.** Okay, here we are.

**Guy.** Ugh. The flamingo pen?! Really, Mindy?

**Mindy.** Now, with your beak held high, I want you to march right on into the middle of that flock and I want you to start to flamingle, okay?

**Guy.** Wha? Why is everyone taking my picture?!

(Soundbite of camera shutter.)

**Mindy.** Own it Guy Raz! Look at me. Look at me. You are the most beautiful and unique flamingo in the flock.

**Guy.** Wha, I-I-

**Mindy.** There is literally no other flamingo like you. So own it! Okay?

**Guy.** Okay...

**Mindy.** Now, just follow my directions.

**Guy.** Ugh.

**Mindy.** First, squat down like you're going to sit on an invisible chair, like a toilet or something. Now, with your back straight, use your hips as a hinge, and push your butt backward

**Guy.** This feels weird.

**Mindy.** Great! That means you're doing it right. Now stay steady. Don't lean forward. Your knees and ankles should be at a ninety degree angle...

**Guy.** Okay...

**Mindy.** Yeah you're doing great! Now try it with just one leg, close your eyes, and try to fall asleep, okay?

**Guy.** Mindy, I'm not sure what the point of this is!

**Mindy.** Easy does it. Now without losing your balance, switch over to the other leg.

**Guy.** I am not understanding the science here.

**Mindy.** Oh, well, for that I have a really good explanation.

**Guy.** Okay, this better be good.

**Mindy.** Well Guy Raz, remember how I told you that I wanted to come to the zoo today to conduct sort of an investigative science experiment?

**Guy.** So is there a scientific reason why I'm standing here in a flock of flamingos dressed in pink feathers?

**Mindy.** Of course there is! Sort of.

**Guy.** This better be good.

**Mindy.** Okay yesterday, I read this crazy study led by two scientists in Georgia, Lena Ting, a biomedical engineer at Emory University and Young-Hui Chang, a neuromachinist at the Georgia Institute of Technology.

**Guy.** So I know that a biomedical engineer is a scientist that helps doctors invent new devices and tools to help them do their jobs better, but I'm not as familiar with neuromachinists. It sounds like maybe someone who works with machines and the brain?

**Mindy.** Well yeah, sort of. So the way I understand it is a neuromachinist is a scientist who works with prosthetics. Meaning like artificial arms and legs for people who have either lost them or were born without them.

**Guy.** Wow. So how did their study leave me to standing here in the middle of a zoo in a homemade flamingo suit?

**Mindy.** Well, it didn't really. Technically, I led you here.

**Guy.** Ugh!

**Mindy.** But, what these scientists noticed is that flamingos can stand for a really really long time on one leg. So long that they even sleep while standing on one leg!

**Guy.** Yeah, but don't lots of birds stand on one leg?

**Mindy.** Yeah, they do, but flamingos make it look effortless. I mean, they can stand on one leg for hours at a time. Whereas most birds have to shift from one leg to the other after a while, or just give up altogether and use both legs.

**Guy.** I'll say I'm definitely not cut out for flamingo life. This one leg thing is a workout!

**Mindy.** Well, that's the thing! When we humans, and even other birds, stand on one leg, it takes a lot of muscle strength to hold us up and help us keep our balance.

**Guy.** But with flamingos?

**Mindy.** These scientists discovered that they used almost no force at all. The baby flamingos just slept there on one leg like nobody's business!

**Guy.** Wow, so how did they discover this?

**Mindy.** So the first thing they did was go to the zoo, just like us.

**Guy.** Uh...were they dressed like flamingos?

**Mindy.** What? No! That would be ridiculous! They're respected scientists, Guy Raz.

**Guy.** Oh right.

**Mindy.** So they went to the zoo, and with the help of the zookeepers, they got eight baby flamingos, and they put them on this measuring device called a force plate.

**Guy.** And what's it look like?

**Mindy.** Well, a force plate is like a little flat square that looks sort of like a tiny dance floor, and it's used to measure things like balance in whatever's standing on it.

**Guy.** And I guess in this case...baby flamingos.

**Mindy.** Right. And so they fed the babies, put them on the force plate, and then they waited for them to get sleepy.

**Guy.** This is starting to sound really cute

**Mindy.** Oh, you have no idea, Guy Raz. Anywho...once the baby flamingos started to fall asleep, they used the force plate to measure how much force they were using to keep their balance as they slept there on one leg.

**Guy.** And what did they discover?

**Mindy.** They discovered that they used almost no force at all. The baby flamingos just slept there on one leg like nobody's business!

**Guy.** So how is this possible? When I stood here on one leg and closed my eyes, I almost fell into that pond over there!

**Mindy.** That's because when we humans start to lose our balance, our brains freak out, and start shouting things like, Mayday! Mayday! to our muscles, so they tighten up and start doing their jobs!

**Guy.** But don't flamingos have the same signals running between their brains and their muscles?

**Mindy.** Very little. They don't even need it, because their bodies are just designed to balance on one leg like that.

**Guy.** Wow! So how did they find this out?

**Mindy.** Okay, so this part is a little gross.

**Guy.** Gross?

**Mindy.** These scientists used flamingo cadavers...

**Guy.** Ohhhh.



**Mindy.** Dead flamingos.

**Guy.** Who I guess donated their bodies to science?

**Mindy.** I guess you could say that. The reason they used cadavers is because they don't have any muscles at all, because, you know...cadavers are...

**Guy.** Thanks. I got it. They're dead.

**Mindy.** So they took the cadavers, and they set them up on one leg, with nothing else to hold them up. And guess what happened?

**Guy.** They...keeled over and died all over again?

**Mindy.** Nope! They stood there steady. Completely upright. Never flopped.

**Guy.** Wow!

**Mindy.** And so then they decided to press their luck. In an effort to throw the flamingo cadavers off-balance, they tilted the upper part of their bodies forward, and backward, and no matter what they did, those cadavers just stood there majestically.

**Guy.** Huh.

**Mindy.** And what's even crazier is that because of that hinge in the flamingos hips, the scientists were able to move their legs so easily, that they were still able to stand upright in a way that required almost no energy or muscle strength!

**Guy.** Amazing!

**Mindy.** So, in living flamingos, if they have to jump out of the mud and run from a predator or an animal that is trying to eat it, or even just stay steady on a windy day, they can easily switch their legs and stay upright without really having to activate any of their muscles.

**Guy.** That's incredible, Mindy!

**Mindy.** I know, right?

**Guy.** You know, earlier you mentioned that Dr. Ting works with prosthetics, or artificial arms and legs. So, did her discovery lead to any helpful connections between the two?

**Mindy.** yes! So, Dr. Ting studies how people can start to move again after they've been hurt really bad or lose an arm or a leg in an accident. And sometimes this requires the help of prosthetics. So the idea here is that if flamingos can go back and forth standing on one leg with almost no energy, then maybe this discovery will lead to improvements in robotics or robot powered prosthetics for humans....or just people like you who really want to be flamingos.

**Guy.** Mindy, I did this for science.

**Mindy.** Guy Raz. You did this for the crowd of people taking pictures of you.

**Guy.** Yeah.

**Mindy.** Come on! You're a fancy flamingo!

**Guy.** Oh no.

**Mindy.** Now give the people what they want.

**Guy.** Woah woah woah.

**Mindy.** Step right up! Step right up! Come and get your souvenir photos of the human flamingo boy!

**Guy.** Whoaaaaaaa!

(Soundbite of splash.)

**Mindy.** Okay! I'm coming in to save you, little buddy!

**Guy.** Look at my beautiful feathers! They're ruined!

**Mindy.** You're a good Guy Raz, but a terrible bird. Come on...let's get you out of this pink spandex and flaming-go!

**Guy.** Yeah. Adios, flamingos!

