

**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.** Come on, just a little bit.

**Mindy Thomas.** Guy Raz, what are you doing over here? It sounds like you're going - anyway, do you need some help?

**Guy.** Yeah. Mindy, can you sit on the suitcase so I can zip it shut?

**Mindy.** Yeah, here we go. One, two, three and...

(Soundbite of crash.)

**Guy.** Ohhh. Ah.

**Mindy.** OK, so the bad news is I broke it. The good news is - there's no good news. So what'd you pack a suitcase for anyway?

**Guy.** Nothing, nothing really, just a quick scientific trip, that's all.

**Mindy.** Yeah, just a quick little scientific trip, huh?

**Guy.** Yes, but...

**Mindy.** To where?

**Guy.** Oh, nowhere really. I'm not really sure you'd be interested in it. It's kind of...

**Mindy.** Oh, no, Guy Raz, the fact that you're not telling me suggests that it might actually be really interesting, only you don't want me to know.

**Guy.** Well, it's nothing, nothing, Mindy.

**Mindy.** OK, so let me see here. You're packing a bag. You say that you're leaving for a scientific trip. You're wearing dark sunglasses, a white linen suit, a brand new straw fedora, and you want me to believe it's not interesting?

**Guy.** Well, OK, if you must know, I'm going on a scientific trip to a study the theobroma cacao plant.

**Mindy.** Oh, well, why didn't you just say so in the first place?

**Guy.** I told you it wasn't that interesting. OK, bye.

**Mindy.** Bye! Bring me back a souvenir. Ok, let's see here. Theobroma angustifolium - not it. Theobroma bicolor - nope. Oh, here it is. Theobroma cacao. OK, got it. Theobroma cacao - the taxonomic classification for the plant also called the cacao tree which is a small evergreen tree native to the tropical regions of Central and South America which produces a fruit whose seeds are used to make cocoa mass, cocoa powder...and chocolate.

(Soundbite of dramatic music.)

**Mindy.** Wait a minute! Guy Raz, you're going to a chocolate forest? Hold up. I'm coming with you!

(Soundbite of footsteps.)

**Mindy.** Slow down, slow down. (Panting).

**Guy.** Oh, hey, Mindy. Why are you panting? (Laughter).

**Mindy.** You didn't tell me that you were going to a chocolate forest.

**Guy.** Well...

**Mindy.** I'm coming with you.

**Guy.** But...

**Mindy.** No buts. There is no way that you are going to the candy land without me.

**Guy.** But...

**Mindy.** I know - you're trying to pull a fast one on me, but it's not gonna work this time.

**Guy.** Mindy, I'm not going to candy land. I'm just going to investigate a scientific study.

**Mindy.** Well, it sounds like you've got the golden ticket, and me and Reggie here want a piece of the action.

(Soundbite of pigeon coo.)

**Guy.** Well...

**Mindy.** Reggie, get your flight goggles on you batty, old pigeon. You're flying us to South America.

**Guy.** Mindy, I'm not so sure this is a good idea. I mean, remember the last time you had access to unlimited chocolate?

**Mindy.** Remember? It felt like it was just yesterday.

(Soundbite of harp.)

**Mindy.** I'm just going to take one more. Oh, it's so -

(Soundbite of eating. Soundbite of stomach ache.)

**Mindy.** Hey, Guy Raz.

**Guy.** Mindy, what happened?

(Soundbite of harp.)

**Mindy.** OK, I got your point, but that was the old me. This is the new me. The new me promises to limit my chocolate consumption to under 25 pounds in a sitting.

**Guy.** OK, but just so you know, this is a scientific field investigation. This is serious stuff.

**Mindy.** Guy Raz, I understand. I agree completely. There is nothing more serious than the science of stuffing your face full of chocolate ice cream topped with hot fudge sauce, topped with chocolate sprinkles, topped with Cocoa Puffs, topped with a hot Choco Taco.

**Guy.** Oh, boy, this is not going to end well.

**Mindy.** This is going to be an epic scientific expedition.

**Guy.** Well, I...

**Mindy.** Guy Raz, saddle up. Reggie, next stop South - wait a minute, where in South America are we going?

**Guy.** Well, most cacao in the world is grown in the Ivory Coast in West Africa. But I thought we'd head to the birthplace of the cocoa tree, to Colombia.

**Mindy.** Yes, I've always wanted to visit Colombia. Colombia, Guy Raz, is the country in South America that's right on the equator. It's the halfway point on Earth.

**Guy.** Yes, exactly. It's there we should find plenty of examples of the theobroma cacao tree.

**Mindy.** Oh, man, I am so excited. Reggie, fire it up. Guy Raz, hold on for your life. And get ready because...

**Mindy and Guy.** Here we go!

(Soundbite of music. Soundbite of pigeon coo. Soundbite of crash. Soundbite of forest.)

**Guy.** Mindy? Mindy?

**Mindy.** (Groaning.) Over here, Guy Raz.

**Guy.** Mindy, you OK?

**Mindy.** Yeah, I just got to teach Reggie how to land.

**Guy.** Well, at least he still allows free baggage. I mean, all the other birds are even charging for carry-on now.

**Mindy.** Yeah, I heard that one bird even charges money just to let you sit next to your family.

**Guy.** Yeah. Well, at least we've landed safely, more or less. Hey, Mindy, look over there.

**Mindy.** Over where? What?

**Guy.** The chocolate forest. We're surrounded by cacao trees.

**Mindy.** This is the chocolate forest, Guy Raz?

**Guy.** Well, I...

**Mindy.** Well, where's Count Chocula? Where are the M&M guys? Where's Willy Wonka? Where's the Nesquik bunny? Yoohoo. I don't even see Kathy, and I know she loves chocolate.

**Guy.** I think Kathy was retired in 2010.

**Mindy.** Well, my point is that I'm not seeing any chocolate. I see trees with little orange footballs growing out of them.

**Guy.** These are them, Mindy.

**Mindy.** The what?

**Guy.** The cacao fruits.

**Mindy.** Fruits? Man, I'm going home.

**Guy.** But, but...

**Mindy.** Reggie!

**Guy.** But these are the chocolate trees. Those cocoa fruits are where chocolate comes from.

**Mindy.** Wait a minute, the chocolate is hidden inside these fruits?

**Guy.** Well...

**Mindy.** This is like the best Easter egg hunt of all time. Hold onto your swiss chard, Guy Raz. I'm going in.

**Guy.** No, no, wait, wait, Mindy.

**Mindy.** Got it! Ok, here goes nothing. (Chewing.) This tastes kind of like a sweet lime. Guy Raz, I thought you said this was chocolate.

**Guy.** Mindy, I tried to tell you that this is definitely not what you were expecting.

**Mindy.** You could say that again.

**Guy.** This is not what you were expecting.

**Mindy.** Hold on, let me just spit out these giant seeds (spitting).

**Guy.** Mindy, Mindy, that's what we're here for.

**Mindy.** You said we were coming here for chocolate, and all I'm tasting is a slightly sweet and sour lime thing with a bunch of annoying seeds inside of it.

**Guy.** Well, that's just it, Mindy. Those seeds you're spitting out? That's where the chocolate comes from.

**Mindy.** Wait, these things? Hang on a second. (Chewing. Spitting.) Disgusting.

**Guy.** A little bitter, right?

**Mindy.** A little?

**Guy.** Well, these seeds are better known as cocoa beans.

**Mindy.** Well, I'm not tasting any cocoa. All I taste is gross.

**Guy.** I know, weird, right?

**Mindy.** You can say that again.

**Guy.** I know, weird.

**Mindy.** Yeah, no, you don't really need to say it again.

**Guy.** Oh, sorry. Well, as I was about to say, you have to dry these seeds and then roast them and then grind them up into a paste. And that's what produces cocoa.

**Mindy.** Oh, so that's how it works. OK, so then what happens?

**Guy.** Well, what you get is a paste that still needs other ingredients to make it taste like the chocolate you and I love to eat, so ingredients like sugar and milk and cocoa butter, which is a type of fat that you get from roasting and grinding down the cocoa beans.

**Mindy.** Oh, well, now that we have the recipe, let's make ourselves some chocolate.

**Guy.** Well...

**Mindy.** Wait a minute. You said the purpose of this field trip was for a scientific investigation.

**Guy.** Oh, it is, Mindy, and it has to do with memory.

**Mindy.** Wait. I forgot what you just said.

**Guy.** It has to do with memory.

**Mindy.** Wait. I just forgot again. You were saying?

**Guy.** Mindy, as we humans grow older, our memories become less reliable. We tend to forget things like where we left our keys or the names of the people we meet.

**Mindy.** Or that time I forgot to tell you that Memmott, our neighborhood skunk, was using your toilet, and you walked in and freaked out.

**Guy.** Yeah. So you get the picture here, right?

**Mindy.** Yeah. We humans, especially as we get older, have a harder time remembering all of the little details in our lives. But what I want to know is what any of this has to do with chocolate. Why did we have to come all the way to Colombia to investigate memory?

**Guy.** Well, Mindy, what if I told you that a naturally occurring chemical in chocolate can actually help improve your memory?

**Mindy.** What? I knew it. I knew it all along. Boys, bring in the Butterfingers.

(Soundbite of delivery truck backing up.)

**Guy.** Mindy...

**Mindy.** All right, move forward a little. All right, now back it up, back it up. A little further. Yup, there - right there. Stop. Stop. Stop.

**Guy.** Mindy, where did this chocolate delivery truck come from? And who are these guys?

**Mindy.** Oh, this is my chocolate posse. I like to keep them close by especially for occasions like this.

**Guy.** Well, that type of chocolate won't actually do much good. And besides, all that sugar, you know.

**Mindy.** Yeah, yeah, not good for you. I know, Guy Raz. But you said chocolate could actually improve my memory, and I just remembered that I traveled with a truck load of chocolate bars.

**Guy.** Well, it is true that some types of chocolate will help with memory, but it has to have high levels of that natural chemical I mentioned.

**Mindy.** Well, I'm pretty sure these chocolate bars are chock-full of chemicals.

**Guy.** Well...

**Mindy.** You get it? Choc-full of chemicals?

**Guy.** Well, but not the right chemicals. The ones I'm talking about are called flavonoids, and it's a chemical that is found naturally in the cocoa bean, so



generally, in things like cocoa nibs, which are crushed and roasted pieces of cocoa beans and also in things like dark chocolate.

**Mindy.** OK, so how does it help your memory?

**Guy.** Well, a team of scientists from the University of L'Aquila in Italy studied the effects of flavonoids on memory. And they found that if you regularly eat or drink dark chocolate drinks, they can actually help older people, especially grandparents, with their memories.

**Mindy.** Wow. So how does that work?

**Guy.** Well, flavonoids that are concentrated in some types of dark chocolate - so chocolate that isn't mixed with too much stuff, like sugar and milk - can actually cause more blood in your body to go to your brain.

**Mindy.** And more blood to your brain means more oxygen to your brain, too.

**Guy.** Exactly. And flavonoids are found in several other foods, like blueberries and parsley and black tea and, of course...

**Mindy.** Chocolate.

**Guy.** And so the scientists in Italy found that eating lots of flavonoids can boost the blood to a part of the brain called the dentate gyrus. It's in the hippocampus, which is hidden deep inside our brains.

**Mindy.** What's so important about the dentate gyrus?

**Guy.** Well, it's thought to be the part of the brain that creates memories.

**Mindy.** OK, got it. But you'd need a lot of flavonoids to get it all to work, right?

**Guy.** Yes, precisely.

**Mindy.** That's what I thought you said. Time for some chocolate indulgence.

**Guy.** Yeah, but the average chocolate bar won't do the trick. Here, here, try this. Try some of these cacao nibs. (Chewing.) They're pretty crunchy and good for you, too.

**Mindy.** Hand them over here. (Chewing, spitting.) It tastes like rocks.

**Guy.** Well, I didn't say they taste like chocolate.

**Mindy.** All right, enough of these nibs. Hey, Reggie, strap your goggles on. Next stop, Hershey, Pennsylvania. I'm going to get me some flavonoids.

**Guy.** Oh, boy, here we go again.