

## 1. Character sketch

Alright everybody, the topic for today is, well, we're gonna take a look at how to start creating the characters for the story you're writing. One way of doing that is to come up with what's called "a character sketch", I don't mean a sketch like a drawing, I guess that's obvious. It's um...it's a...a sketch as a way of getting started on defining your characters' personalities. To begin, how do we create fictional characters? We don't just pull them from thin air, do we? I mean we don't create them out of nothing. We base them, consciously or unconsciously, we base them on real people, or we blend several people's traits, their attributes into one character. But when people think fiction, they may assume the characters come from the author's imagination. But the writer's imagination is influenced by... by real people, could be anyone, so, pay attention to the people you meet, someone in class, at the gym, that guy who is always sitting in the corner of the coffee house, um... your cousin, who's always getting into dangerous situations. We're pulling from reality, gathering bits and pieces of real people. You use these people, and the bits of behavior or characteristics as a starting point as you begin to sketch out your characters. Here is what you should think about doing first. When you begin to formulate a story, make a list of interesting people you know or have observed. Consider why they're unique or annoying. Then make notes about their unusual or dominant attributes. As you create fictional characters, you'll almost always combine characteristics from several different people on your list to form the identity and personality of just one character. Keeping this kind of character sketch can help you solidify your character's personality, so that it remains consistent throughout your story. You need to define your characters, know their personalities so that you can have them acting in ways that are predictable, consistent with their personalities. Get to know them like a friend, you know your friends well enough to know how they'll act in certain situations, right? Say you have three friends, their car runs out of gas on the highway. John gets upset. Mary remains calm. Teresa takes charge of handling the situation. And let's say, both John and Mary defer to her leadership. They call you to explain what happen. And when John tells you he got mad, you're not surprised, because he always gets frustrated when things go wrong. Then he tells you how Teresa took charge, calmed him down, assigned tasks for each person and got them on their way. Again, you're not surprised. It's exactly what you'd expect. Well, you need to know your characters, like you know your friends. If you know a lot about a person's character, it's easy to predict how they'll behave. So if your character's personalities are well defined, it will be easy for you as the writer to portray them realistically...er... believably, in any given situation. While writing character sketches, do think about details. Ask yourself questions, even if you don't use the details in your story, um...what does each character like to eat, what setting does each prefer, the mountains, the city, what about educational background, their reactions to success or defeat, write it all down. But, here I need to warn you about a possible pitfall. Don't make you character into a stereotype. Remember the reader needs to know how your character is different from other people who might fall in the same category. Maybe your character loves the mountains and has lived in a remote area for years. To make sure he is not a stereotype, ask yourself how he sees life differently from other people who live in that kind of setting. Be careful not to make him into the cliché of the "ragged mountain dweller". Okay, now, I'll throw out a little terminology. It's easy stuff.

Major characters are sometimes called "round characters". Minor characters are sometimes called, well, just the opposite, "flat". A round character is fully developed; a flat character isn't, character development is fairly limited. The flat character tends to serve mainly as a motivating factor. For instance, you introduce a flat character who has experienced some sort of defeat. And then your round, your main character who loves success and loves to show off, comes and boasts about succeeding and jokes about the flat character's defeat in front of others, humiliates the other guy. The flat character is introduced solely for the purpose of allowing the round character to show off.

## 2. Linguistics-Dialect

(Student) Professor Martin?

(Professor) Uh, hi, Lisa, what can I do for you?

(Student) Well, I've been thinking about, you know, what you were saying in class last week, about how we shouldn't wait until the last minute to find an idea and get started working on our term paper.

(Professor) Good, good, and have you come up with anything?

(Student) Well, yeah, sort of. See, I've never had a linguistics class before, so I was sort of, I mean, I was looking over the course description and a lot of the stuff you described there, I just don't know what it is talking about, you know, or what it means. But there was one thing that really did jump out at me

(Professor) Yes?

(Student) The section on dialects, cos...like, that's the kind of thing that's always sort of intrigued me, you know?

(Professor) Well, that's certainly an interesting topic. But you may not realize, I mean, the scope...

(Student) Well, especially now, cos I've got like one roommate who is from the south and another one from New York. And we all talk like totally different, you know?

(Professor) Yes, I understand. But...

(Student) But then I was noticing, like, we don't really get into this till the end of the semester, you know. So I...

(Professor) So, you want some pointers where to go for information on the subject? Well, you could always start by reading the chapter in the book on social linguistics. That will give you a basic understanding of the key issues involved here.

(Student) Yeah, that's what I thought. So I started reading the chapter, you know, about how everyone speaks some dialect of a language. And I'm wondering like, well, how do we even manage to understand each other at all?

(Professor) Ah, yes, an interesting question. You see...

(Student) So then I read the part about dialect accommodation. You know, the idea that people tend to adapt their speaking to make it closer to the speech of whomever they're talking to, and I'm thinking, yeah, I do that when I talk with my roommates, and without even thinking about it or anything, you know.

(Professor) OK, all right. Dialect accommodation is a more manageable sort of topic.

(Student) So I was thinking like, I wonder just how much other people do the same thing. I mean, there are students here from all over the place. Does everyone change the way they talk to some degree depending on whom they are talking to?

(Professor) You'd be surprised.

(Student) So, anyway, my question is, do you think it'd be OK if I did a project like that for my term paper? You know, find students from different parts of the country, record them talking to each other in different combinations, report on how they accommodate their speech or not, that kind of thing?

(Professor) Tell you what, Lisa, write me up a short proposal for this project, how you're going to carry out the experiment and everything, a design plan. And I think this'll work out just fine.

### 3. Moving Rocks

Now we've got a few minutes before we leave for today. So I'll just touch on an interesting subject that I think makes an important point. We've been covering rocks and different types of rocks for the last several weeks. But next week we are going to do something a bit different. And to get started I thought I'd mention something that shows how uh...as a geologist, you need to know about more than just rocks and the structure of solid matter, moving rocks, you may have heard about them. It's quite a mystery. Death valley is this desert plane, a dry lake bed in California surrounded by mountains and on the desert floor these huge rocks, some of them hundreds of pounds. And they move. They leave long trails behind them, tracks you might say as they move from one point to another. But nobody has been able to figure out how they are moving because no one has ever seen it happen. Now there are a lot of theories, but all we know for sure is that people aren't moving the rocks. There are no footprints, no tyre tracks and no heavy machinery like a bulldozer...uh, nothing was ever brought in to move these heavy rocks. So what's going on? Theory NO.1 ---Wind? Some researchers think powerful uh...windstorms might move the rocks. Most of the rocks move in the same direction as the dominant wind pattern from southwest to northeast. But some, and this is interesting, move straight west while some zigzag or even move in large circles. Um...How can that be? How about wind combined with rain? The ground of this desert is made of clay. It's a desert, so it's dry. But when there is the occasional rain, the clay ground becomes extremely slippery. It's hard for anyone to stand on, walk on. Some scientists theorized that perhaps when the ground is slippery the high winds can then move the rocks. There's a problem with this theory. One team of scientists flooded an area of the desert with water, then try to establish how much wind force would be necessary to move the rocks. And guess this, you need winds of at least five hundred miles an hour to move just the smallest rocks. And winds that strong have never been recorded. Ever! Not on this planet. So I think it's safe to say that that issues has been settled. Here is another possibility – ice. It's possible that rain on the desert floor could turn to thin sheets of ice when temperatures drop at night. So if rocks...uh becoming better than ice, uh ... OK, could a piece of ice with rocks in it be pushed around by the wind? But there's a problem with this theory, too. Rocks trapped in ice together would have moved together when the ice moved. But that doesn't always happen. The rocks seem to take separate routes. There are a few other theories. Maybe the ground vibrates, or maybe the ground itself is shifting, tilting. Maybe the rocks are moved by a magnetic force. But sadly all these ideas have been eliminated as possibilities. There's just no evidence. I bet you are saying to yourself well, why don't scientists just set up video cameras to record what actually happens? Thing is this is a protective wilderness area. So by law that type of

research isn't allowed. Besides, in powerful windstorms, sensitive camera equipment would be destroyed. So why can't researchers just live there for a while until they observe the rocks' moving? Same reason. So where are we now? Well, right now we still don't have any answers. So all this leads back to my main point – you need to know about more than just rocks as geologists. The researchers studying moving rocks, well, they combine their knowledge of rocks with knowledge of wind, ice and such...um not successfully, not yet. But you know, they wouldn't even have been able to get started without uh... earth science understanding – knowledge about wind, storms, you know, meteorology. You need to understand physics. So for several weeks like I said we'll be addressing geology from a wider perspective. I guess that's all for today. See you next time.

#### 4. Psychology

Why do we do the things we do? What drives us to participate in certain activities, to buy a certain car or even to choose a certain career? In other words, what motivates us to do what we do?

Well, in studies of motivation, psychologists distinguish between two very different types, our reasons for doing something; our motivations can be extrinsic, in other words, based on some kind of external reward like praise or money. Or they can be intrinsic, meaning we engage in the activity because it pleases us internally.

Both create strong forces that lead us to behave in certain ways. However, intrinsic motivation is generally considered to be more long-lasting than the other. As I said, extrinsic motivation is external. It's the desire to behave in a certain way in order to obtain some kind of external reward. A child, for example, who regularly does small jobs around the house, does them not because she enjoys taking out the garbage or doing the dishes but because she knows if she does these things she'll be given a small amount of money for doing them. But how motivated would the child be to continue doing the work if her parents suddenly stop giving her money for it?

With intrinsic or internal motivation, we want to do something because we enjoy it, or get us a sense of accomplishment from it. Most people who are internally motivated get pleasure from the activity. So they just feel good about doing it. For example, I go to the gym several times a week. I don't go because I'm training for a marathon or anything, I just enjoy it. I have more energy after I exercise and I know it's good for my health. So it makes me feel good about myself. And that's what's kept me going there for the past five years.

#### 5. Sprained Wrist

(man) Susan, what happened to your arm?

(woman) It's my wrist, actually. I sprained it last weekend and I am kind of upset about it because I'm supposed to play the violin in my string quartet's big concert next week. We've been practicing for weeks and we've already sold a bunch of tickets.

(man) Oh, I'm sorry to hear that. What are you gonna do?

(woman) Well, I was thinking about trying to play anyway, I mean, I really don't want to let the other three group members down. Plus the doctor said my wrist should be feeling better by then.

(man) Oh, OK, so problem solved, right?

(woman) Not exactly. I'm worried I'm gonna be out of practice, like I haven't been able to play the violin since I sprained my wrist. What if I don't play well? I'd make the rest of the

group sound bad.

(man) Why don't you get somebody else to take your place?

(woman) Well, there's only one other person I know who could do it and that's Jim. He's a great violinist and I'm sure he'd say yes. The thing is he's not very reliable. I mean, I'm in the orchestra with him and he's always showing up late for rehearsals.

(man) Oh, so you're not sure you can depend on him.

(woman) Exactly, and we have less than a week left to rehearse for the concert. We'd really need him to show up on time for all our rehearsals.

## 6. Communal Online Encyclopedia

The communal online encyclopedia will probably never be perfect, but that's a small price to pay for what it does offer. The criticisms in the reading are largely the result of prejudice against and ignorance about how far online encyclopedias have come.

First, errors. It's hardly a fair criticism that encyclopedias online have errors. Traditional encyclopedias have never been close to perfectly accurate, if you are looking for a really comprehensive reference work without any mistakes, you are not going to find it, on or off line. The real point is that it's easy for errors in factual material to be corrected in an online encyclopedia. But with the printed and bound encyclopedia, the errors remain for decades.

Second, hacking. Online encyclopedias have recognized the importance of protecting their articles from malicious hackers. One strategy they started using is to put the crucial facts in the articles that nobody disputes in a read-only format, which is a format that no one can make changes to. That way you are making sure that the crucial facts in the articles are reliable. Another strategy that's being used is to have special editors whose job is to monitor all changes made to the articles and eliminate those changes that are clearly malicious.

Third, what's worth knowing about? The problem for traditional encyclopedias is that they have limited space, so they have to decide what's important and what's not. And in practice, the judgments of the group of academics that make these decisions don't reflect the great range of interests that people really have. But space is definitely not an issue for online encyclopedias. The academic articles are still represented in online encyclopedias, but there can be a great variety of articles and topics that accurately reflect the great diversity of users' interests. The diversity of use in topics that online encyclopedias offer is one of their strongest advantages.

## 7. Attention

One of the hardest parts of teaching is keeping your students' attention. Now, the key to doing this is understanding the concept of attention. Basically, there are two types of attention. The first type is active, active attention is voluntary. It's when you intentionally make yourself focus on something. And since it requires effort, it's hard to keep up for long a time. OK, so, um, let's say you are teaching a Biology class. And today's topic is frogs. All right? You're standing in front of the room lecturing: a frog is a type of animal known as an amphibian..., well, this isn't necessarily going to keep the students' interest. But most of them will force themselves to pay active attention to your lecture. But it's only a matter of time before they get distracted.

Now, the other type of attention is passive attention, when it's involuntary. Passive attention requires no effort because it happens naturally. If something is really interesting

students don't have to force themselves to pay attention to it. They do it without even thinking about it. So back to our Biology lecture, you start talking about frogs and then you pull a live frog out of your briefcase. You're describing it while holding it up. Show the students how long its legs are, and how they're used for jumping, for example. Then maybe even let the frog jump around a bit on the desk or the floor. In this case, by doing something unexpected, something more engaging, you can tap into their passive attention. And it can last much longer than active attention. As long as the frog is still there your students will be interested.

### **8. National Endowment for the Arts**

(Professor) OK, last time we were talking about government support for the arts. Who can sum up some of the main points? Frank?

(Frank) Well, I guess there wasn't really any, you know, official government support for the arts until the twentieth century. But the first attempt the United States government made to, you know, to support the arts was the Federal Art Project.

(Professor) Right, so what can you say about the project?

(Frank) Um...it was started during the Depression, um...in the 1930s to employ out-of-work artists.

(Professor) So was it successful? Janet? What do you say?

(Janet) Yeah, sure, it was successful. I mean, for one thing, the project established a lot of...uh like community art centers and galleries and places like rural areas where people hadn't really had access to the arts.

(Professor) Right.

(Frank) Yeah. But didn't the government end up wasting a lot of money for art that wasn't even very good?

(Professor) Uh...some people might say that. But wasn't the primary objective of the Federal Art Project to provide jobs?

(Frank) That's true. I mean...it did provide jobs for thousands of unemployed artists.

(Professor) Right. But then when the United States became involved in the Second World War, unemployment was down and it seems that these programs weren't really necessary any longer. So, moving on, we don't actually see any government...well any real government involvement in the arts again until the early 1960s, when President Kennedy and other politicians started to push for major funding to support and promote the arts. It was felt by a number of politicians that...well that the government had a responsibility to support the arts as sort of... oh, what can we say?...the the soul...or spirit of the country.

The idea was that there be a federal subsidy...um...uh...financial assistance to artists and artistic or cultural institutions.

And for just those reasons, in 1965, the National Endowment for the Arts was created. So it was through the NEA, the National Endowment for the Arts, um...that the arts would develop, would be promoted throughout the nation. And then individual states throughout the country started to establish their own state arts councils to help support the arts. There was kind of uh...cultural explosion. And by the mid 1970s, by 1974 I think, all fifty states had their own arts agencies, their own state arts councils that work with the federal government with corporations, artists, performers, you name it.

(Frank) Did you just say corporations? How are they involved?

(Professor) Well, you see, corporations aren't always altruistic. They might not support the arts unless...well, unless the government made it attractive for them to do so, by offering corporations tax incentives to support the arts, that is, by letting corporations pay less in taxes if they were patrons of the arts. Um, the Kennedy Centre in Washington D.C. , you may uh...maybe you've been there, or Lincoln Centre in New York. Both of these were built with substantial financial support from corporations. And the Kennedy and Lincoln center's aren't the only examples. Many of your cultural establishments in the United States will have a plaque somewhere acknowledging the support – the money they received from whatever corporation. Oh, yes, Janet?

(Janet) But aren't there a lot of people who don't think it's the government's role to support the arts?

(Professor) Well, as a matter of fact, a lot of politicians who did not believe in government support for the arts, they wanted to do away with the agency entirely, for that very reason, to get rid of governmental support. But they only succeeded in taking away about half the annual budget. And as far as the public goes, well...there are about as many individuals who disagree with the government support as there are those who agree. In fact, with artists in particular, you have lots of artists who support and who have benefited from this agency, although it seems that just as many artists suppose a government agency being involved in the arts, for many different reasons, reasons like they don't want the government to control what they create. In other words, the arguments both for and against government funding of the arts are as many and, and as varied as the individual styles of the artists who hold them.

## 9. Sahara Desert

(Professor) We're really just now beginning to understand how quickly drastic climate change can take place. We can see past occurrences of climate change that took place over just a few hundred years. Take uh... the Sahara Desert in Northern Africa. The Sahara was really different 6,000 years ago. I mean, you wouldn't call it a tropical paradise or anything, uh...or maybe you would if you think about how today in some parts of the Sahara it...it only rains about once a century. Um... but basically, you had granary and you had water. And what I find particularly interesting and amazing really, what really indicates how un-desert-like the Sahara was thousands of years ago, was something painted on the rock, pre-historic art, hippopotamuses, 'cos you know hippos need a lot of water and hence? Hence what?

(Student) They need to live near a large source of water year round

(Professor) That's right.

(Student) But how is that proved that the Sahara used to be a lot wetter? I mean the people who painted those hippos, well, couldn't they have seen them on their travels?

(Professor) Okay, in principal they could, Karl. But the rock paintings aren't the only evidence. Beneath the Sahara are huge aquifers, basically a sea of fresh water, that's perhaps a million years old filtered through rock layers. And...er...and then there is fossilized pollen, from low shrubs and grasses that once grew in the Sahara. In fact these plants still grow, er...but hundreds of miles away, in more vegetated areas. Anyway, it's this fossilized pollen along with the aquifers and the rock paintings, these three things are all evidence hat the Sahara was once much greener than it is today, that there were hippos and probably

elephants and giraffes and so on. So what happened? How did it happen? Now, we're so used to hearing about how human activities are affecting the climate, right? But that takes the focus away from the natural variations in the earth climate, like the Ice Age, right? The planet was practically covered in ice just a few thousand years ago. Now as far as the Sahara goes, there is some recent literature that points to the migration of the monsoon in that area.

(Students) Huh?

(Professor) What do I mean? Okay, a monsoon is a seasonal wind that can bring in a large amount of rainfall. Now if the monsoon migrates, well, that means that the rains move to another area, right? So what caused the monsoon to migrate? Well, the answer is: the dynamics of earth's motions, the same thing that caused the Ice Age by the way. The earth's not always the same distance from the sun, and it's not always tilting toward the sun at the same angle. There are slight variations in these two parameters. They're gradual variations but their effects can be pretty abrupt. And can cause the climate to change in just a few hundred years.

(Student) That's abrupt?

(Professor) Well, yeah, considering that other climate shifts take thousands of years, this one is pretty abrupt. So these changes in the planet's motions, they called it "the climate change", but it was also compounded. What the Sahara experienced was um...a sort of "runaway drying effect". As I said the monsoon migrated itself, so there was less rain in the Sahara. The land started to get drier, which in turn caused huge decrease in the amount of vegetation, because vegetation doesn't grow as well in dry soil, right? And then, less vegetation means the soil can't hold water as well, the soil loses its ability to retain water when it does rain. So then you have less moisture to help clouds form, nothing to evaporate for cloud formation. And then the cycle continues, less rain, drier soil, less vegetation, fewer clouds, less rain etc.

(Student) But, what about the people who made the rock paintings?

(Professor) Good question. No one really knows. But there might be some connections to ancient Egypt. At about the same time that the Sahara was becoming a desert...

(Student) Uh-huh

(Professor) 5,000 years ago, Egypt really began to flourish out in the Nile River valley. And that's not that far away. So it's only logical to hypothesize that a lot of these people migrated to the Nile valley when they realized that this was more than a temporary drought. And some people take this a step further. And that's okay, that's science and they hypothesize that this migration actually provided an important impetus in the development of ancient Egypt. Well, we'll stay tuned on that.

### **10. Boom and Bust**

(Professor) Now when I mention the terms "boom and bust", what is that going to mind?

(Student) The dotcom crash of the '90s.

(Professor) Ok. The boom in the late 1990s when all those new Internet companies sprung up and then sold for huge amounts of money. Then the bust around 2000...2001 when many of those same Internet companies went out of business.

Of course, booms aren't always followed by busts. We've certainly seen times when local economies expanded rapidly for a while and then went back to a normal pace of growth.



But, there's a type of rapid expansion, what might be called the hysterical or irrational boom that pretty much always leads to a bust. See, people often create and intensify a boom when they get carried away by some new industry that seems like it will make them lots of money fast. You'd think that by the 90s, people would have learned from the past. If they did, well, look at tulips.

(Student) Tulips? You mean like the flower?

(Professor) Exactly. For instance, do you have any idea where tulips are from? Originally I mean.

(Student) Well, the Netherlands, right?

(Professor) That's what most people think, but no. They are not native to the Netherlands, or even Europe. Tulips actually hail from an area that Chinese call the Celestial Mountains in Central Asia. A very remote mountainous region. It was Turkish nomads who first discovered tulips and spread them slowly westward. Now, around the 16th century, Europeans were traveling to Istanbul and Turkey as merchants and diplomats. And the Turks often gave the Europeans tulip bulbs as gifts which they would carry home with them. For the Europeans, tulips were totally unheard of. Er... a great novelty. The first bulb to show up in the Netherlands, the merchant who received them roasted and ate them. He thought they were kind of onion. It turns out that the Netherlands was an ideal country for growing tulips. It had the right kind of sandy soil for one thing, but also, it was a wealthy nation with a growing economy, willing to spend lots of money on new exotic things. Plus, the Dutch had a history of gardening. Wealthy people would compete, spending enormous amounts of money to buy the rarest flowers for their gardens.

Soon tulips were beginning to show up in different colors as growers tried to breed them specifically for colors which would make them even more valuable. But they were never completely sure what they would get. Some of the most priced tulips were white with purple streaks, or red with yellow streaks on the petals, even a dark purple tulip that was very much priced. What happened then was a craze for these specialized tulips. We called that craze "tulip mania". So, here we've got all the conditions for an irrational boom: a prospering economy, so more people had more disposable income—money to spend on luxuries, but they weren't experienced at investing their new wealth. Then along comes a thrilling commodity. Sure the first specimens were just plain tulips, but they could be bred into some extraordinary variations, like that dark purple tulip. And finally, you have an unregulated market place, no government constraints, where price could explode. And explode they did, starting in the 1630s. There was always much more demand for tulips than supply. Tulips didn't bloom frequently like roses. Tulips bloomed once in the early spring. And that was it for the year. Eventually, specially-bred multi-colored tulips became so valuable, well, according to records, one tulip bulb was worth 24 tons of wheat, or thousand pounds of cheese. One particular tulip bulb was sold and exchanged for a small sheep. In other words, tulips were literally worth their weight in gold. As demand grew, people began selling promissory notes guaranteeing the future delivery of priced tulip bulbs. The buyers of these pieces of paper would resell the notes and mark up prices. These promissory notes kept changing hands from buyer to buyer until the tulip was ready for delivery. But it was all pure speculation because as I said, there was no way to know if the bulb was really going to produce the variety, the color that was promised. But that didn't

matter to the owner of the note. The owner only cared about having that piece of paper so it could be traded later at a profit. And people were borrowing, mortgaging their homes in many cases to obtain those bits of paper because they were sure they'd find an easy way to make money. So now, you've got all the ingredients for a huge bust. And bust it did, when one cold February morning in 1637, a group of bulb traders got together and discovered that suddenly there were no bidders. Nobody wanted to buy. Panic spread like wild fire and the tulip market collapsed totally.

### **11. The Key to Success**

(0:11) When I was 27 years old, I left a very demanding job in management consulting for a job that was even more demanding: teaching. I went to teach seventh graders math in the New York City public schools. And like any teacher, I made quizzes and tests. I gave out homework assignments. When the work came back, I calculated grades.

(0:35) What struck me was that I.Q. was not the only difference between my best and my worst students. Some of my strongest performers did not have stratospheric I.Q. scores. Some of my smartest kids weren't doing so well.

(0:53) And that got me thinking. The kinds of things you need to learn in seventh grade math, sure, they're hard: ratios, decimals, the area of a parallelogram. But these concepts are not impossible, and I was firmly convinced that every one of my students could learn the material if they worked hard and long enough.

(1:15) After several more years of teaching, I came to the conclusion that what we need in education is a much better understanding of students and learning from a motivational perspective, from a psychological perspective. In education, the one thing we know how to measure best is I.Q., but what if doing well in school and in life depends on much more than your ability to learn quickly and easily?

(1:47) So I left the classroom, and I went to graduate school to become a psychologist. I started studying kids and adults in all kinds of super challenging settings, and in every study my question was, who is successful here and why? My research team and I went to West Point Military Academy. We tried to predict which cadets would stay in military training and which would drop out. We went to the National Spelling Bee and tried to predict which children would advance farthest in competition. We studied rookie teachers working in really tough neighborhoods, asking which teachers are still going to be here in teaching by the end of the school year, and of those, who will be the most effective at improving learning outcomes for their students? We partnered with private companies, asking, which of these salespeople is going to keep their jobs? And who's going to earn the most money? In all those very different contexts, one characteristic emerged as a significant predictor of success. And it wasn't social intelligence. It wasn't good looks, physical health, and it wasn't I.Q. It was grit.

(3:00) Grit is passion and perseverance for very long-term goals. Grit is having stamina. Grit is sticking with your future, day in, day out, not just for the week, not just for the month, but for years, and working really hard to make that future a reality. Grit is living life like it's a marathon, not a sprint.

(3:26) A few years ago, I started studying grit in the Chicago public schools. I asked thousands of high school juniors to take grit questionnaires, and then waited around more than a year to see who would graduate. Turns out that grittier kids were significantly more

likely to graduate, even when I matched them on every characteristic I could measure, things like family income, standardized achievement test scores, even how safe kids felt when they were at school. So it's not just at West Point or the National Spelling Bee that grit matters. It's also in school, especially for kids at risk for dropping out. To me, the most shocking thing about grit is how little we know, how little science knows, about building it. Every day, parents and teachers ask me, "How do I build grit in kids? What do I do to teach kids a solid work ethic? How do I keep them motivated for the long run?" The honest answer is, I don't know. (Laughter) What I do know is that talent doesn't make you gritty. Our data show very clearly that there are many talented individuals who simply do not follow through on their commitments. In fact, in our data, grit is usually unrelated or even inversely related to measures of talent.

(4:51) So far, the best idea I've heard about building grit in kids is something called "growth mindset." This is an idea developed at Stanford University by Carol Dweck, and it is the belief that the ability to learn is not fixed, that it can change with your effort. Dr. Dweck has shown that when kids read and learn about the brain and how it changes and grows in response to challenge, they're much more likely to persevere when they fail, because they don't believe that failure is a permanent condition.

(5:27) So growth mindset is a great idea for building grit. But we need more. And that's where I'm going to end my remarks, because that's where we are. That's the work that stands before us. We need to take our best ideas, our strongest intuitions, and we need to test them. We need to measure whether we've been successful, and we have to be willing to fail, to be wrong, to start over again with lessons learned.

(5:54) In other words, we need to be gritty about getting our kids grittier.

(6:01) Thank you.

## **12. Every Kid Needs a Champion**

(0:11) I have spent my entire life either at the schoolhouse, on the way to the schoolhouse, or talking about what happens in the schoolhouse. Both my parents were educators, my maternal grandparents were educators, and for the past 40 years I've done the same thing. And so, needless to say, over those years I've had a chance to look at education reform from a lot of perspectives. Some of those reforms have been good. Some of them have been not so good. And we know why kids drop out. We know why kids don't learn. It's either poverty, low attendance, negative peer influences. We know why. But one of the things that we never discuss or we rarely discuss is the value and importance of human connection, relationships.

(1:07) James Comer says that no significant learning can occur without a significant relationship. George Washington Carver says all learning is understanding relationships. Everyone in this room has been affected by a teacher or an adult. For years, I have watched people teach. I have looked at the best and I've look at some of the worst.

(1:33) A colleague said to me one time, "They don't pay me to like the kids. They pay me to teach a lesson. The kids should learn it. I should teach it. They should learn it. Case closed."

(1:44) Well, I said to her, "You know, kids don't learn from people they don't like."

(1:50) (Laughter) (Applause)

(1:58) She said, "That's just a bunch of hooey."

(2:01) And I said to her, "Well, your year is going to be long and arduous, dear."

(2:07) Needless to say it was. Some people think that you can either have it in you to build a relationship or you don't. I think Stephen Covey had the right idea. He said you ought to just throw in a few simple things, like seeking first to understand as opposed to being understood, simple things like apologizing. You ever thought about that? Tell a kid you're sorry, they're in shock.

(2:32) I taught a lesson once on ratios. I'm not real good with math, but I was working on it. And I got back and looked at that teacher edition. I'd taught the whole lesson wrong. (Laughter)

(2:44) So I came back to class the next day, and I said, "Look, guys, I need to apologize. I taught the whole lesson wrong. I'm so sorry."

(2:53) They said, "That's okay, Ms. Pierson. You were so excited, we just let you go." (Laughter) (Applause)

(3:01) I have had classes that were so low, so academically deficient that I cried. I wondered, how am I going to take this group in nine months from where they are to where they need to be? And it was difficult. It was awfully hard. How do I raise the self-esteem of a child and his academic achievement at the same time?

(3:26) One year I came up with a bright idea. I told all my students, "You were chosen to be in my class because I am the best teacher and you are the best students, they put us all together so we could show everybody else how to do it."

(3:41) One of the students said, "Really?" (Laughter)

(3:46) I said, "Really. We have to show the other classes how to do it, so when we walk down the hall, people will notice us, so you can't make noise. You just have to strut." And I gave them a saying to say: "I am somebody. I was somebody when I came. I'll be a better somebody when I leave. I am powerful, and I am strong. I deserve the education that I get here. I have things to do, people to impress, and places to go."

(4:12) And they said, "Yeah!"

(4:15) You say it long enough, it starts to be a part of you.

(4:20) And so — (Applause) I gave a quiz, 20 questions. A student missed 18. I put a "+2" on his paper and a big smiley face.

(4:38) He said, "Ms. Pierson, is this an F?"

(4:42) I said, "Yes."

(4:44) He said, "Then why'd you put a smiley face?"

(4:48) I said, "Because you're on a roll. You got two right. You didn't miss them all." I said, "And when we review this, won't you do better?"

(4:57) He said, "Yes, ma'am, I can do better."

(5:00) You see, "-18" sucks all the life out of you. "+2" said, "I ain't all bad." (Laughter) (Applause)

(5:11) For years I watched my mother take the time at recess to review, go on home visits in the afternoon, buy combs and brushes and peanut butter and crackers to put in her desk drawer for kids that needed to eat, and a washcloth and some soap for the kids who didn't smell so good. See, it's hard to teach kids who stink. And kids can be cruel. And so she kept those things in her desk, and years later, after she retired, I watched some of those same kids come through and say to her, "You know, Ms. Walker, you made a difference in my life."

You made it work for me. You made me feel like I was somebody, when I knew, at the bottom, I wasn't. And I want you to just see what I've become."

(5:57) And when my mama died two years ago at 92, there were so many former students at her funeral, it brought tears to my eyes, not because she was gone, but because she left a legacy of relationships that could never disappear.

(6:12) Can we stand to have more relationships? Absolutely. Will you like all your children? Of course not. And you know your toughest kids are never absent. (Laughter) Never. You won't like them all, and the tough ones show up for a reason. It's the connection. It's the relationships. And while you won't like them all, the key is, they can never, ever know it. So teachers become great actors and great actresses, and we come to work when we don't feel like it, and we're listening to policy that doesn't make sense, and we teach anyway. We teach anyway, because that's what we do.

(6:59) Teaching and learning should bring joy. How powerful would our world be if we had kids who were not afraid to take risks, who were not afraid to think, and who had a champion? Every child deserves a champion, an adult who will never give up on them, who understands the power of connection, and insists that they become the best that they can possibly be.

(7:23) Is this job tough? You betcha. Oh God, you betcha. But it is not impossible. We can do this. We're educators. We're born to make a difference.

(7:35) Thank you so much.

### **18. Talk Nerdy to Me**

Five years ago, I experienced a bit of what it must have been like to be Alice in Wonderland. Penn State asked me, a communications teacher, to teach a communications class for engineering students. And I was scared. (Laughter) Really scared. Scared of these students with their big brains and their big books and their big, unfamiliar words. But as these conversations unfolded, I experienced what Alice must have when she went down that rabbit hole and saw that door to a whole new world. That's just how I felt as I had those conversations with the students. I was amazed at the ideas that they had, and I wanted others to experience this wonderland as well. And I believe the key to opening that door is great communication.

We desperately need great communication from our scientists and engineers in order to change the world. Our scientists and engineers are the ones that are tackling our grandest challenges, from energy to environment to health care, among others, and if we don't know about it and understand it, then the work isn't done, and I believe it's our responsibility as non-scientists to have these interactions. But these great conversations can't occur if our scientists and engineers don't invite us in to see their wonderland. So scientists and engineers, please, talk nerdy to us.

I want to share a few keys on how you can do that to make sure that we can see that your science is sexy and that your engineering is engaging. First question to answer for us: so what? Tell us why your science is relevant to us. Don't just tell me that you study trabeculae, but tell me that you study trabeculae, which is the mesh-like structure of our bones because it's important to understanding and treating osteoporosis.

And when you're describing your science, beware of jargon. Jargon is a barrier to our understanding of your ideas. Sure, you can say "spatial and temporal," but why not just say

"space and time," which is so much more accessible to us? And making your ideas accessible is not the same as dumbing it down. Instead, as Einstein said, make everything as simple as possible, but no simpler. You can clearly communicate your science without compromising the ideas. A few things to consider are having examples, stories and analogies. Those are ways to engage and excite us about your content. And when presenting your work, drop the bullet points. Have you ever wondered why they're called bullet points? (Laughter) What do bullets do? Bullets kill, and they will kill your presentation. A slide like this is not only boring, but it relies too much on the language area of our brain, and causes us to become overwhelmed. Instead, this example slide by Genevieve Brown is much more effective. It's showing that the special structure of trabeculae are so strong that they actually inspired the unique design of the Eiffel Tower. And the trick here is to use a single, readable sentence that the audience can key into if they get a bit lost, and then provide visuals which appeal to our other senses and create a deeper sense of understanding of what's being described.

So I think these are just a few keys that can help the rest of us to open that door and see the wonderland that is science and engineering. And because the engineers that I've worked with have taught me to become really in touch with my inner nerd, I want to summarize with an equation. (Laughter) Take your science, subtract your bullet points and your jargon, divide by relevance, meaning share what's relevant to the audience, and multiply it by the passion that you have for this incredible work that you're doing, and that is going to equal incredible interactions that are full of understanding. And so, scientists and engineers, when you've solved this equation, by all means, talk nerdy to me. (Laughter) Thank you. (Applause)