



1
00:00:01,000 --> 00:00:07,000
[music playing]

2
00:00:16,600 --> 00:00:18,400
- Thanks very much.
It's great to be here today

3
00:00:18,400 --> 00:00:20,333
and I'm really looking forward
to another talk

4
00:00:20,333 --> 00:00:21,933
in the Summer Series.

5
00:00:21,933 --> 00:00:24,633
A quick show of hands,
how many of you have been

6
00:00:24,633 --> 00:00:27,633
to at least one other
Summer Series talk?

7
00:00:27,633 --> 00:00:28,866
All right.

8
00:00:28,866 --> 00:00:32,166
If you've been to two,
keep them up.

9
00:00:32,166 --> 00:00:34,166
Three?

10
00:00:34,166 --> 00:00:35,233
Oh, we got
some good veterans here.

11
00:00:35,233 --> 00:00:38,033
Okay, let's go up to five.

12

00:00:38,033 --> 00:00:40,133

How about 20?

[laughter]

13

00:00:40,133 --> 00:00:41,966

Here's a clue,

there haven't been 20 talks yet.

14

00:00:41,966 --> 00:00:44,666

So you can't--

anyway, I--I'm really glad

15

00:00:44,666 --> 00:00:46,433

and--and I think those of you

who have been

16

00:00:46,433 --> 00:00:48,433

to several of these

will agree

17

00:00:48,433 --> 00:00:50,233

that these just keep

getting better

18

00:00:50,233 --> 00:00:52,666

and there's a body of knowledge

coming out of these

19

00:00:52,666 --> 00:00:54,733

that's--that's really

interesting and inspiring

20

00:00:54,733 --> 00:00:55,800

to all of us.

21

00:00:55,800 --> 00:00:59,133

And you may know that

here at Ames,

22

00:00:59,133 --> 00:01:03,300

we embrace diversity.

We embrace, um, innovation,

23

00:01:03,300 --> 00:01:06,266

and we are looking for
the subject matter

24

00:01:06,266 --> 00:01:09,233

in these talks and the series
and in the way we do our work

25

00:01:09,233 --> 00:01:11,100

to really inspire that.

26

00:01:11,100 --> 00:01:13,800

And I think that you're, uh,
going to see that we've--

27

00:01:13,800 --> 00:01:16,700

we're going to be exploring
some new territory today

28

00:01:16,700 --> 00:01:21,466

in a fascinating talk
given by Dr. Temple Grandin

29

00:01:21,466 --> 00:01:24,833

um, on the subject of
helping different kinds of minds

30

00:01:24,833 --> 00:01:27,166

solve problems.

31

00:01:27,166 --> 00:01:29,900

Dr. Grandin has
a bachelor's degree

32

00:01:29,900 --> 00:01:35,100

from Franklin Pierce College,

also a master's at Arizona State

33

00:01:35,100 --> 00:01:38,200
and a PhD from
the University of Illinois,

34

00:01:38,200 --> 00:01:40,966
and is currently a professor
of animal science

35

00:01:40,966 --> 00:01:44,533
at Colorado State University.

36

00:01:44,533 --> 00:01:49,866
The, uh, she's also the, uh,
creator of an award-winning film

37

00:01:49,866 --> 00:01:53,966
and is an author that--
of an acclaimed book.

38

00:01:53,966 --> 00:01:57,166
And I think that is available
outside for those of you

39

00:01:57,166 --> 00:01:59,666
interested in--in reading more
about that.

40

00:01:59,666 --> 00:02:03,966
Um, Dr. Grandin will be
describing different methods

41

00:02:03,966 --> 00:02:07,800
of thinking in pursuit of
fostering better communication.

42

00:02:07,800 --> 00:02:10,233
And I'm really looking forward
to this subject,

43

00:02:10,233 --> 00:02:12,466

and I think that
we'll all find it an inspiration

44

00:02:12,466 --> 00:02:16,166

so welcome, again, to all of you
and let's give

45

00:02:16,166 --> 00:02:19,433

a good round of applause and
welcome to Dr. Temple Grandin.

46

00:02:19,433 --> 00:02:22,433

[applause]

47

00:02:28,400 --> 00:02:30,200

- It's really great
to be here today,

48

00:02:30,200 --> 00:02:32,200

got a lot of things
to talk about.

49

00:02:32,200 --> 00:02:34,666

Sorry, I'm just
getting over a cold.

50

00:02:34,666 --> 00:02:37,166

So I hope I don't
get too hoarse.

51

00:02:37,166 --> 00:02:40,266

I'm--think I'll have to give a
little background about myself.

52

00:02:40,266 --> 00:02:43,000

I was one of the kind of kids
that didn't do well in school.

53

00:02:43,000 --> 00:02:46,000

And one of the things
that really turned me around

54

00:02:46,000 --> 00:02:48,700

was a super good
science teacher,

55

00:02:48,700 --> 00:02:51,400

and he actually was
a NASA space scientist

56

00:02:51,400 --> 00:02:54,666

who worked on spacesuits,
a Mr. Bill Carlock.

57

00:02:54,666 --> 00:02:57,400

Um, he was not
an accredited teacher.

58

00:02:57,400 --> 00:02:58,600

You know,
you don't need to do

59

00:02:58,600 --> 00:03:00,966

all the
school bureaucracy stuff.

60

00:03:00,966 --> 00:03:03,233

And he showed me all kinds
of interesting projects

61

00:03:03,233 --> 00:03:05,700

and got me
interested in studying.

62

00:03:05,700 --> 00:03:09,033

I can't emphasize enough
the importance of showing kids

63

00:03:09,033 --> 00:03:11,266

interesting things.

64

00:03:11,266 --> 00:03:13,066

And you do a lot
of interesting things here.

65

00:03:13,066 --> 00:03:15,700

You need to start putting up
a whole bunch of YouTube videos.

66

00:03:15,700 --> 00:03:17,733

Okay, I just talked
to this guy here,

67

00:03:17,733 --> 00:03:20,933

and, um, he, uh,
does computer graphics

68

00:03:20,933 --> 00:03:23,800

over the airplane wing.
That's cool stuff.

69

00:03:23,800 --> 00:03:26,733

Let's make a YouTube video
just out of that

70

00:03:26,733 --> 00:03:29,133

because you got a lot
of cool stuff,

71

00:03:29,133 --> 00:03:30,733

but it's hard to navigate
the webpage.

72

00:03:30,733 --> 00:03:33,566

You know, just put it up
as, um, as YouTube videos,

73

00:03:33,566 --> 00:03:35,966

a lot of key words
so people can find it.

74

00:03:35,966 --> 00:03:38,933

'Cause I travel
all around the country,

75

00:03:38,933 --> 00:03:41,766

and there's a lot of kids
in a lot of different places

76

00:03:41,766 --> 00:03:44,966

that get labeled out
ADHD or autistic or whatever.

77

00:03:44,966 --> 00:03:48,333

Well, you know, the geeks
and the nerds come here.

78

00:03:48,333 --> 00:03:51,800

And the problem we've got with
the autism diagnosis is it goes

79

00:03:51,800 --> 00:03:54,366

all the way from a lot of
scientists here at NASA

80

00:03:54,366 --> 00:03:56,166

and to people at Google
and other companies

81

00:03:56,166 --> 00:03:58,433

to somebody
who can't dress themselves.

82

00:03:58,433 --> 00:04:01,366

All has
the same label.

83

00:04:01,366 --> 00:04:05,066

I just read a recent paper that
a little bit of autism genetics

84

00:04:05,066 --> 00:04:07,700

is linked to intelligence.

85

00:04:07,700 --> 00:04:10,166

You see, things are not
all so simple.

86

00:04:10,166 --> 00:04:12,133

If you got rid
of all the autism genes,

87

00:04:12,133 --> 00:04:14,366

we'd still be in caves,
because who do you think

88

00:04:14,366 --> 00:04:16,066

made the first stone spear?

89

00:04:16,066 --> 00:04:17,533

[laughter]

90

00:04:17,533 --> 00:04:19,700

Now, it's been
very interesting for me

91

00:04:19,700 --> 00:04:22,233

learning how my mind
is different.

92

00:04:22,233 --> 00:04:24,000

When I was young,
I used to think

93

00:04:24,000 --> 00:04:27,300

everybody thought in pictures
the same way I think.

94

00:04:27,300 --> 00:04:30,933

I just assumed that everybody
thinks the same way.

95

00:04:30,933 --> 00:04:32,633

Now if we
have an understanding

96

00:04:32,633 --> 00:04:34,866

of how different kinds
of minds think,

97

00:04:34,866 --> 00:04:37,133

I'm going to show you
how they can work together.

98

00:04:37,133 --> 00:04:39,000

'Cause to have good projects,
you need to have

99

00:04:39,000 --> 00:04:42,400

different ways of thinking.

100

00:04:42,400 --> 00:04:44,500

But the first thing
you have to understand is,

101

00:04:44,500 --> 00:04:45,866

yeah, some people
do think different.

102

00:04:45,866 --> 00:04:49,566

Let's look at some
of the common conflicts.

103

00:04:49,566 --> 00:04:52,266

The techies hate the suits.

[laughter]

104

00:04:52,266 --> 00:04:55,966

Oh, that's a big one,
and I can tell you

105

00:04:55,966 --> 00:04:57,866

I'm not big
on the suits either.

106

00:04:57,866 --> 00:04:59,533

But there is a point
when maybe you do need

107

00:04:59,533 --> 00:05:01,433

a few suits
to keep things organized

108

00:05:01,433 --> 00:05:03,666

'cause maybe the techies
aren't all that organized.

109

00:05:03,666 --> 00:05:06,633

The people in the field
think the academics are stupid.

110

00:05:06,633 --> 00:05:10,133

Well, you need to have both.

111

00:05:10,133 --> 00:05:12,700

Then you get into--
some scientists say if you don't

112

00:05:12,700 --> 00:05:15,833

do a controlled experiment,
you--that's animal science

113

00:05:15,833 --> 00:05:18,400

we're taught if you don't have
a controlled experiment,

114

00:05:18,400 --> 00:05:21,200
you don't have science,
and I used to say

115
00:05:21,200 --> 00:05:23,533
to my professor,
well what's astronomy then?

116
00:05:23,533 --> 00:05:25,000
[laughter]

117
00:05:25,000 --> 00:05:27,600
And then, the artists don't
get along with the accountants.

118
00:05:27,600 --> 00:05:29,066
They can't stand each other.

119
00:05:29,066 --> 00:05:31,766
And then in my field,
you got the ethologists,

120
00:05:31,766 --> 00:05:34,866
who study the animal
in the natural environment,

121
00:05:34,866 --> 00:05:38,166
versus the behaviorists,
put the rat in a Skinner box.

122
00:05:38,166 --> 00:05:40,566
Put him on a variable
reinforcement schedule,

123
00:05:40,566 --> 00:05:42,900
and you've got
a slot machine in Vegas.

124
00:05:42,900 --> 00:05:44,766
That's how those work.

125

00:05:44,766 --> 00:05:46,500

And I don't play slot machines.

I can't think

126

00:05:46,500 --> 00:05:48,966

of something more stupid than

being a rat in a Skinner box.

127

00:05:48,966 --> 00:05:51,466

[laughter]

128

00:05:51,466 --> 00:05:53,233

Not a very smart thing to do.

129

00:05:53,233 --> 00:05:55,833

Okay, some of the conflicts

we have are silly.

130

00:05:55,833 --> 00:05:58,566

If you work for the digital

U.S. Government Digital Service,

131

00:05:58,566 --> 00:06:00,100

do you have to

wear a tie?

132

00:06:00,100 --> 00:06:01,666

No, you don't,

but maybe

133

00:06:01,666 --> 00:06:03,500

a totally ripped up,

um, t-shirt

134

00:06:03,500 --> 00:06:05,666

with a bunch of bad words on it

probably would be

135

00:06:05,666 --> 00:06:08,233

a good idea
not to wear that.

136

00:06:08,233 --> 00:06:10,800

You know, we fight,
what is science?

137

00:06:10,800 --> 00:06:12,733

Well one of the things
that's a big part of science

138

00:06:12,733 --> 00:06:14,400

is observation.

139

00:06:14,400 --> 00:06:18,433

Think of Pluto trip.
You go out there to explore.

140

00:06:18,433 --> 00:06:22,000

Exploring is
a basic human value.

141

00:06:22,000 --> 00:06:24,300

You know, three-year-olds
at the airport explore.

142

00:06:24,300 --> 00:06:26,833

I get lots of time
to watch people in the airports.

143

00:06:26,833 --> 00:06:29,933

I mean, a three-year-old
will find that tensorator rope,

144

00:06:29,933 --> 00:06:33,433

you know, those little posts,
that little tape that goes

145

00:06:33,433 --> 00:06:35,666

between them,
really interesting,

146

00:06:35,666 --> 00:06:37,900

unfasten them,
just pull back and forth.

147

00:06:37,900 --> 00:06:39,233

You know,
a three-year-old will think

148

00:06:39,233 --> 00:06:40,800

that's just wonderful.

149

00:06:40,800 --> 00:06:45,800

That is exploration.
It's a basic thing.

150

00:06:45,800 --> 00:06:49,100

And there's lot of fields
where you have to observe first.

151

00:06:49,100 --> 00:06:50,966

I've often wondered
what's the control

152

00:06:50,966 --> 00:06:52,133

for the Hubble Space Telescope?

153

00:06:52,133 --> 00:06:55,066

Maybe you point it
at the ground?

154

00:06:55,066 --> 00:06:57,033

Maybe it was
a spy satellite originally,

155

00:06:57,033 --> 00:06:59,466

so maybe it has a control.
I don't know.

156

00:06:59,466 --> 00:07:02,400

Okay, I learned my thinking
was different

157

00:07:02,400 --> 00:07:07,266

when I started asking people
about how they think.

158

00:07:07,266 --> 00:07:09,966

And I asked
a speech therapist one time,

159

00:07:09,966 --> 00:07:11,900

"Think about
a church steeple.

160

00:07:11,900 --> 00:07:13,700

How does it come
into your mind?"

161

00:07:13,700 --> 00:07:16,500

And she goes,
"Pointy thing."

162

00:07:16,500 --> 00:07:17,766

I go, "Pointy thing"?

163

00:07:17,766 --> 00:07:20,000

I have no pointy thing
in my mind.

164

00:07:20,000 --> 00:07:23,700

I only have specifics
because my concept

165

00:07:23,700 --> 00:07:26,700

is based on a whole bunch
of different church steeples.

166

00:07:26,700 --> 00:07:30,133

Then I can classify them,
cathedral versus chapels.

167

00:07:30,133 --> 00:07:34,833

Now this is probably the
most important slide I've got.

168

00:07:34,833 --> 00:07:36,000

And I've got to have
a drink of water

169

00:07:36,000 --> 00:07:38,100

before I can
explain this slide.

170

00:07:38,100 --> 00:07:41,833

I am a photo realistic
visual thinker.

171

00:07:41,833 --> 00:07:44,766

Everything I think about
is a picture,

172

00:07:44,766 --> 00:07:47,200

an object visualizer.

173

00:07:47,200 --> 00:07:48,733

Couldn't do algebra.

174

00:07:48,733 --> 00:07:51,166

I'm seeing a lot of smart kids
that can't do algebra,

175

00:07:51,166 --> 00:07:52,800

and the mistake that's
being made is

176

00:07:52,800 --> 00:07:55,800

they're not letting them
go on to geometry and trig.

177

00:07:55,800 --> 00:07:57,333

Because there are students
that can't do algebra

178

00:07:57,333 --> 00:08:00,300

that can do geometry,
trig, and calculus,

179

00:08:00,300 --> 00:08:02,833

that have been in
physics departments,

180

00:08:02,833 --> 00:08:06,200

that have not graduated
from high school.

181

00:08:06,200 --> 00:08:08,200

Then you have
the pattern thinker.

182

00:08:08,200 --> 00:08:11,700

This is your engineers,
the people that figure out

183

00:08:11,700 --> 00:08:14,433

the trajectory of the orbits,
things of this sort.

184

00:08:14,433 --> 00:08:17,266

They think in patterns.

185

00:08:17,266 --> 00:08:20,333

These little kids
often have trouble with reading.

186

00:08:20,333 --> 00:08:22,266

Then you have

the verbal thinker.

187

00:08:22,266 --> 00:08:26,466

Then you have some people that
learn so much better auditory.

188

00:08:26,466 --> 00:08:28,833

You know, they're--they're
auditory thinker.

189

00:08:28,833 --> 00:08:30,933

And these
different kinds of minds

190

00:08:30,933 --> 00:08:32,866

can complement each other.

191

00:08:32,866 --> 00:08:34,433

Now what are some
of the characteristics

192

00:08:34,433 --> 00:08:35,900

of visual thinking?

193

00:08:35,900 --> 00:08:38,533

And even some
of the pattern thinking?

194

00:08:38,533 --> 00:08:41,300

It's bottom up,
not top down.

195

00:08:41,300 --> 00:08:44,100

Concepts are made
of specific examples

196

00:08:44,100 --> 00:08:45,933

put in categories.

197

00:08:45,933 --> 00:08:48,400
That's how I think.

198
00:08:48,400 --> 00:08:52,900
Also, as a visual thinker,
I notice little details.

199
00:08:52,900 --> 00:08:57,133
It's also sensory based.
It's not word based.

200
00:08:57,133 --> 00:08:59,133
Also, a lot of people
that get labeled

201
00:08:59,133 --> 00:09:01,733
with autism and dyslexia,
and other things like this,

202
00:09:01,733 --> 00:09:04,666
it's associative,
not linear.

203
00:09:04,666 --> 00:09:08,133
So it tends to be
very creative kind of thinking.

204
00:09:08,133 --> 00:09:10,833
And in the very first work
I did with with cattle,

205
00:09:10,833 --> 00:09:13,033
I noticed the animals
would be afraid

206
00:09:13,033 --> 00:09:15,033
of a lot
of little visual things.

207
00:09:15,033 --> 00:09:18,333

Like, there'd be a car
parked next to a facility.

208

00:09:18,333 --> 00:09:19,866

There'd be
a little piece of plastic

209

00:09:19,866 --> 00:09:21,033

or a little piece of string.

210

00:09:21,033 --> 00:09:23,566

[coughs]

211

00:09:23,566 --> 00:09:29,400

Some little thing that
most people don't notice,

212

00:09:29,400 --> 00:09:31,133

and you get rid
of those distractions,

213

00:09:31,133 --> 00:09:34,800

then the animals
walk right through the facility,

214

00:09:34,800 --> 00:09:37,033

so looking
at visual detail.

215

00:09:37,033 --> 00:09:40,033

Think about cattle out there
in their natural environment,

216

00:09:40,033 --> 00:09:42,066

back when they
were oryx.

217

00:09:42,066 --> 00:09:44,666

That's the ancestors
of cattle.

218

00:09:44,666 --> 00:09:47,000

Okay, eyes on the side
of their head, they graze.

219

00:09:47,000 --> 00:09:49,066

They can look all around
for something

220

00:09:49,066 --> 00:09:50,666

that might eat them.

221

00:09:50,666 --> 00:09:53,733

So they're very aware
of little visual change.

222

00:09:53,733 --> 00:09:57,300

Okay, how many people here
saw that that animal's

223

00:09:57,300 --> 00:09:59,566

locked onto that sunbeam
like radar?

224

00:09:59,566 --> 00:10:01,933

How many people saw it?

225

00:10:01,933 --> 00:10:04,300

Oh, we're doing horrible here.
[laughter]

226

00:10:04,300 --> 00:10:06,700

You know who
does really well on this?

227

00:10:06,700 --> 00:10:08,333

Children.

228

00:10:08,333 --> 00:10:11,800

I show this slide--
same exact slide to children,

229
00:10:11,800 --> 00:10:14,266
10- and 12-year-olds
in 4-H and FFA, you know,

230
00:10:14,266 --> 00:10:17,533
showing their animals,
and maybe a third of them

231
00:10:17,533 --> 00:10:18,733
will raise their hands.

232
00:10:18,733 --> 00:10:20,700
Children tend
to see it better

233
00:10:20,700 --> 00:10:24,133
because they tend
to be more visual thinkers.

234
00:10:24,133 --> 00:10:25,900
Look at how they--
horse and the zebra

235
00:10:25,900 --> 00:10:27,366
have an ear on each other,

236
00:10:27,366 --> 00:10:29,666
and then the other ear
is pointed at me.

237
00:10:29,666 --> 00:10:33,000
Try to train people.
Be better observers,

238
00:10:33,000 --> 00:10:34,933
observer of detail.

239

00:10:34,933 --> 00:10:38,700

Lots of scientific discoveries
are serendipity.

240

00:10:38,700 --> 00:10:41,333

Did you know that Viagra
was an accidental finding?

241

00:10:41,333 --> 00:10:42,833

[laughter]

242

00:10:42,833 --> 00:10:44,766

And that
major classes of drugs

243

00:10:44,766 --> 00:10:47,200

like antidepressants
and mood stabilizers

244

00:10:47,200 --> 00:10:50,333

were accidental discoveries?

245

00:10:50,333 --> 00:10:53,233

Lithium was originally
a salt substitute.

246

00:10:53,233 --> 00:10:55,366

Then they found out
it had a weird side effect.

247

00:10:55,366 --> 00:10:56,400

[laughter]

248

00:10:56,400 --> 00:10:59,400

That's how
it was discovered.

249

00:10:59,400 --> 00:11:01,666

And how did they figure out

what Viagra did?

250

00:11:01,666 --> 00:11:03,266

Well, the guys didn't
want to give

251

00:11:03,266 --> 00:11:05,866

the experimental
heart medicine back.

252

00:11:05,866 --> 00:11:07,300

And that's how
that was discovered.

253

00:11:07,300 --> 00:11:10,000

I'm serious.
[laughter]

254

00:11:10,000 --> 00:11:15,200

That's serendipity because
a scientist asked a question.

255

00:11:15,200 --> 00:11:18,233

And I always get asked about
getting afraid of slaughter,

256

00:11:18,233 --> 00:11:20,133

and I'm not gonna show
any slaughter pictures.

257

00:11:20,133 --> 00:11:21,700

But if you actually want to
figure out

258

00:11:21,700 --> 00:11:23,900

how some of these things work,
and some things I've designed,

259

00:11:23,900 --> 00:11:25,100

you can go look up

260

00:11:25,100 --> 00:11:28,166

"beef plant video tour
with Temple Grandin."

261

00:11:28,166 --> 00:11:32,766

And NASA needs to be getting
a lot more video lessons

262

00:11:32,766 --> 00:11:36,366

put up online that teachers
like in Louisiana

263

00:11:36,366 --> 00:11:39,933

and other low-income areas
can look up and find

264

00:11:39,933 --> 00:11:43,766

a really interesting thing on
airflow over the airplane wing

265

00:11:43,766 --> 00:11:45,233

from the guy that was told
to get back

266

00:11:45,233 --> 00:11:47,600

in a further back row.

267

00:11:47,600 --> 00:11:50,833

And I said,
"I want to talk to this guy."

268

00:11:50,833 --> 00:11:52,500

He wanted to sit up
closer to me.

269

00:11:52,500 --> 00:11:54,900

Well, I think
he's got something interesting,

270

00:11:54,900 --> 00:11:57,566

and how do we get
through all the bureaucrats

271

00:11:57,566 --> 00:12:00,600

to get these videos up there?

272

00:12:00,600 --> 00:12:02,933

I remember
President Kennedy's speech.

273

00:12:02,933 --> 00:12:06,133

I was really inspired by that.
I'm a child of the '50s.

274

00:12:06,133 --> 00:12:08,466

I worshipped the astronauts.

275

00:12:08,466 --> 00:12:10,233

You know,
and it really upsets me,

276

00:12:10,233 --> 00:12:13,200

you know, things are--
you know, running out of money.

277

00:12:13,200 --> 00:12:16,600

You know,
exploration's really important.

278

00:12:16,600 --> 00:12:18,733

I'm glad the "New York Times"
put, um,

279

00:12:18,733 --> 00:12:21,500

Pluto on the--
on the front page,

280

00:12:21,500 --> 00:12:23,266

but I get
this little science magazine

281
00:12:23,266 --> 00:12:26,300
called "Science News."
It makes me very upset to see

282
00:12:26,300 --> 00:12:28,466
hearing aid ads all over it.

283
00:12:28,466 --> 00:12:31,166
You mean only old people
read "Science News"?

284
00:12:31,166 --> 00:12:32,300
[laughter]

285
00:12:32,300 --> 00:12:33,733
It's a wonderful little
magazine.

286
00:12:33,733 --> 00:12:35,933
It ought to be in every
elementary school library

287
00:12:35,933 --> 00:12:38,333
and high school library.

288
00:12:38,333 --> 00:12:39,533
You know,
we gotta get young people

289
00:12:39,533 --> 00:12:42,366
interested in science.

290
00:12:42,366 --> 00:12:45,200
Now, give you some more
insight into visual thinking.

291

00:12:45,200 --> 00:12:47,466

It's really important
to train cattle

292

00:12:47,466 --> 00:12:49,133

to handle both
to a man on a horse

293

00:12:49,133 --> 00:12:51,866

and a man on foot,
because think about it.

294

00:12:51,866 --> 00:12:54,733

A man on a horse
is a different picture

295

00:12:54,733 --> 00:12:58,600

than a man on foot.

296

00:12:58,600 --> 00:13:01,833

They're very specific
in how they think.

297

00:13:01,833 --> 00:13:04,966

Got to train them
to both.

298

00:13:04,966 --> 00:13:07,300

There's one
of my facilities.

299

00:13:07,300 --> 00:13:10,166

And when--I could
test-run equipment in my head.

300

00:13:10,166 --> 00:13:12,066

I thought everybody
could test-run equipment

301

00:13:12,066 --> 00:13:13,400

in their head.

302

00:13:13,400 --> 00:13:15,133

I had a chance to go
into one of the labs,

303

00:13:15,133 --> 00:13:17,666

and I saw, you know,
mouse cage.

304

00:13:17,666 --> 00:13:19,933

Well, you need both
the engineering kinds of minds

305

00:13:19,933 --> 00:13:21,866

and the visual thinkers.

306

00:13:21,866 --> 00:13:25,066

In fact, years ago
I actually came up with an idea

307

00:13:25,066 --> 00:13:26,500

for a rat cage in space.

308

00:13:26,500 --> 00:13:28,900

Kind of a cylinder
with grids on it.

309

00:13:28,900 --> 00:13:31,666

So the rat could, um,
you know, hold onto it

310

00:13:31,666 --> 00:13:34,500

no matter
what position he's in.

311

00:13:34,500 --> 00:13:37,000

But I thought everybody could
visualize things.

312

00:13:37,000 --> 00:13:40,300

I didn't know that
my thinking was different.

313

00:13:40,300 --> 00:13:43,500

Now I've been working
on some new simpler designs.

314

00:13:43,500 --> 00:13:46,466

I did some of the first research
on cattle temperament,

315

00:13:46,466 --> 00:13:49,500

and I found that calm animals
gain more weight.

316

00:13:49,500 --> 00:13:52,766

So for the last 20 years,
people have been selecting

317

00:13:52,766 --> 00:13:54,766

for calmer and calmer cattle.

318

00:13:54,766 --> 00:13:58,900

So I can handle them
in a more simplified facility.

319

00:13:58,900 --> 00:14:01,033

They're not as wild
as they used to be.

320

00:14:01,033 --> 00:14:04,333

Give me a key word
like "shoes."

321

00:14:04,333 --> 00:14:08,300

Well, and then I see, um--
that's a childhood shoe

322

00:14:08,300 --> 00:14:10,500

right there.

I guess, um--

323

00:14:10,500 --> 00:14:12,000

I had to go

through these slides

324

00:14:12,000 --> 00:14:14,200

for the--to make sure

they didn't violate copyrights.

325

00:14:14,200 --> 00:14:16,833

And I did have a picture

of some little red Mary Janes,

326

00:14:16,833 --> 00:14:18,233

and I used to have

to wear those--

327

00:14:18,233 --> 00:14:21,000

those awful little

scratchy petticoat dresses

328

00:14:21,000 --> 00:14:22,733

that I hated.

329

00:14:22,733 --> 00:14:25,100

Well, that slide, I guess

we couldn't use that slide

330

00:14:25,100 --> 00:14:28,166

so we went right to

the much better memory.

331

00:14:28,166 --> 00:14:30,066

We did not have

those kinds of socks though

332

00:14:30,066 --> 00:14:31,333

in the '50s.

333

00:14:31,333 --> 00:14:34,366

You see,
this is details.

334

00:14:34,366 --> 00:14:36,133

And when I worked
with the HBO movie,

335

00:14:36,133 --> 00:14:38,033

I was really into details.
You got to remember,

336

00:14:38,033 --> 00:14:40,633

'70s there were no backpacks.

337

00:14:40,633 --> 00:14:42,133

And there were
no Nike type shoes.

338

00:14:42,133 --> 00:14:44,533

It was this type of shoes.

339

00:14:44,533 --> 00:14:46,600

Okay, now that's
a nice classic

340

00:14:46,600 --> 00:14:49,233

'50s or '60s picture
right there.

341

00:14:49,233 --> 00:14:51,333

It makes me happy
that young people today are

342

00:14:51,333 --> 00:14:53,966

liking our fashions.

343

00:14:53,966 --> 00:14:56,233

So how did I get
from shoes to mud puddles?

344

00:14:56,233 --> 00:14:58,033

Now I gotta show you
the real thing

345

00:14:58,033 --> 00:14:59,633

'cause I had to take
that slide out

346

00:14:59,633 --> 00:15:03,433

of the Ariat boot,
and I remember I was jumping

347

00:15:03,433 --> 00:15:05,000

through some mud puddles
at a university

348

00:15:05,000 --> 00:15:06,866

where I was giving a talk.
So that's how I got from

349

00:15:06,866 --> 00:15:09,733

this kind of shoe that I'm gonna
just have to show you--

350

00:15:09,733 --> 00:15:13,033

just regular,
and mud puddles.

351

00:15:13,033 --> 00:15:16,033

You see how it is associative.

352

00:15:16,033 --> 00:15:19,100

[coughs]
Really sorry about the coughing,

353

00:15:19,100 --> 00:15:21,600

but I went to the side
so you can edit that out.

354
00:15:21,600 --> 00:15:23,466
[laughter]

355
00:15:23,466 --> 00:15:25,600
Now there's
real scientific evidence

356
00:15:25,600 --> 00:15:27,966
that there are
two different kinds

357
00:15:27,966 --> 00:15:29,333
of visual thinkers.

358
00:15:29,333 --> 00:15:32,100
There's the object visualizer
like me,

359
00:15:32,100 --> 00:15:34,966
and then there is
the pattern thinker.

360
00:15:34,966 --> 00:15:37,600
This Pet Meta-Analysis,
a really interesting study,

361
00:15:37,600 --> 00:15:40,633
and it shows how there's--
different parts of the brain

362
00:15:40,633 --> 00:15:43,933
are involved.
My book, "The Autistic Brain,"

363
00:15:43,933 --> 00:15:48,033
which is available out here,
or you can buy it

364

00:15:48,033 --> 00:15:50,300
on Amazon
or somewhere else--

365

00:15:50,300 --> 00:15:54,333
maybe I'm not supposed to be
talking about commerce.

366

00:15:54,333 --> 00:15:56,400
Yup, I love "Click and Clack,
the Tappet Brothers,"

367

00:15:56,400 --> 00:15:59,300
and they talk about their
shameless commerce department.

368

00:15:59,300 --> 00:16:03,366
But what I'm interested in is
getting information out there.

369

00:16:03,366 --> 00:16:05,333
You do a lot of cool stuff,
all these wind tunnels

370

00:16:05,333 --> 00:16:06,800
and things like this.

371

00:16:06,800 --> 00:16:09,633
You need to be putting that
up on YouTube videos--

372

00:16:09,633 --> 00:16:11,333
individual YouTube videos.

373

00:16:11,333 --> 00:16:14,066
Don't bury them in your
impossible to navigate website.

374

00:16:14,066 --> 00:16:15,500
[laughter]

375
00:16:15,500 --> 00:16:17,700
They need to be put up
as individual videos,

376
00:16:17,700 --> 00:16:19,600
with a lot of the good key words
on there,

377
00:16:19,600 --> 00:16:22,200
and then the social media people
need to just promote them

378
00:16:22,200 --> 00:16:23,466
to the schools.

379
00:16:23,466 --> 00:16:25,266
That's what you need
to be doing.

380
00:16:25,266 --> 00:16:27,966
We got to show kids
interesting stuff.

381
00:16:27,966 --> 00:16:31,266
Now everybody thought
I was a weird, weird geek

382
00:16:31,266 --> 00:16:33,800
when I was in high school,

383
00:16:33,800 --> 00:16:35,566
and when I was in college.

384
00:16:35,566 --> 00:16:38,233
And then I started
showing people my drawings.

385

00:16:38,233 --> 00:16:40,700

Then I got respect,
and they go,

386

00:16:40,700 --> 00:16:44,633

"You drew that?
You weird thing."

387

00:16:44,633 --> 00:16:46,800

I learned
how to sell my work,

388

00:16:46,800 --> 00:16:49,200

but I'm seeing too many kids
get labeled Asperger's

389

00:16:49,200 --> 00:16:51,733

or autistic or ADHD,
and they get

390

00:16:51,733 --> 00:16:54,300

in kind of a handicap
men--mentality.

391

00:16:54,300 --> 00:16:57,000

And they're not learning
work skills.

392

00:16:57,000 --> 00:16:59,700

That needs to start
at around 13.

393

00:16:59,700 --> 00:17:02,133

Maybe walking dogs
for the next door neighbors.

394

00:17:02,133 --> 00:17:04,800

Something really, really simple.

395

00:17:04,800 --> 00:17:07,866
Now I used to joke around that
I had a huge graphics cir--um--

396

00:17:07,866 --> 00:17:11,533
circuit in my head.
Turns out that I do.

397

00:17:11,533 --> 00:17:15,833
It's probably
in the top 25%.

398

00:17:15,833 --> 00:17:18,400
And then I had a lot of fun
with Walter Schneider

399

00:17:18,400 --> 00:17:19,600
at the
University of Pittsburgh,

400

00:17:19,600 --> 00:17:21,466
and I got to thank
our defense department

401

00:17:21,466 --> 00:17:23,066
for funding this research.

402

00:17:23,066 --> 00:17:26,500
Originally it was funded
for head injuries in soldiers,

403

00:17:26,500 --> 00:17:28,700
and I was one
of the first people with autism

404

00:17:28,700 --> 00:17:30,733
to get to try out
the new technology.

405

00:17:30,733 --> 00:17:32,533

This was
strictly scientist playing

406
00:17:32,533 --> 00:17:34,733
with the latest,
new equipment,

407
00:17:34,733 --> 00:17:37,900
and that is a
normal cable bundle

408
00:17:37,900 --> 00:17:39,933
for speak
what you see.

409
00:17:39,933 --> 00:17:42,033
Myelinated fibers
that go from the

410
00:17:42,033 --> 00:17:45,700
la--uh, visual cortex up to
the language part of the brain.

411
00:17:45,700 --> 00:17:47,433
That's a normal one.

412
00:17:47,433 --> 00:17:48,433
That's mine...

413
00:17:48,433 --> 00:17:50,466
Got a lot of extra bushes.

414
00:17:50,466 --> 00:17:53,000
Now if you went out
and you scanned 100 people,

415
00:17:53,000 --> 00:17:56,533
at what point
is an extra branch abnormal?

416

00:17:56,533 --> 00:17:58,666

There's no black and white
dividing line.

417

00:17:58,666 --> 00:18:03,466

It is a continuum.
Now I paid a price for that.

418

00:18:03,466 --> 00:18:06,866

I have less fibers
for speak what you see,

419

00:18:06,866 --> 00:18:09,300

and that probably explains
why I had speech delay.

420

00:18:09,300 --> 00:18:12,600

I was a severely
speech delayed kid.

421

00:18:12,600 --> 00:18:13,766

But then there's
other kids that are

422

00:18:13,766 --> 00:18:16,466

just geeky and nerdy and
socially awkward.

423

00:18:16,466 --> 00:18:18,433

They used to be
labeled Asperger's.

424

00:18:18,433 --> 00:18:20,600

Now in 2013,
they changed the guideline.

425

00:18:20,600 --> 00:18:21,900

They're putting them
all together.

426

00:18:21,900 --> 00:18:25,166

I had lots of fun
spotting Asperger's around here.

427

00:18:25,166 --> 00:18:27,500

I've been to other companies
here in Silicon Valley.

428

00:18:27,500 --> 00:18:30,366

So one geek gets to go
to the fun places,

429

00:18:30,366 --> 00:18:34,066

and another geek is playing
video games on Social Security.

430

00:18:34,066 --> 00:18:35,733

No, that's not--
we need to be getting

431

00:18:35,733 --> 00:18:37,200

these videos out there.
You gotta cut

432

00:18:37,200 --> 00:18:38,800

through the bureaucracy.

433

00:18:38,800 --> 00:18:41,600

I gotta tell you about a sign
that I've got at home.

434

00:18:41,600 --> 00:18:43,533

20 years ago,
when fax machines were

435

00:18:43,533 --> 00:18:46,000

really popular,
I got this fax.

436

00:18:46,000 --> 00:18:48,033

It must have been
in 100 fax machines

437

00:18:48,033 --> 00:18:50,033

'cause it was
all covered with spots.

438

00:18:50,033 --> 00:18:52,466

And it was about
administratium.

439

00:18:52,466 --> 00:18:56,966

And what is the heaviest element
known to the human race

440

00:18:56,966 --> 00:18:59,600

on the periodic table
of the elements?

441

00:18:59,600 --> 00:19:01,966

It's administratium,
and it has

442

00:19:01,966 --> 00:19:05,033

this super astronomical
atomic weight

443

00:19:05,033 --> 00:19:06,766

and it reacts
with absolutely nothing

444

00:19:06,766 --> 00:19:08,800

because it's inert.

445

00:19:08,800 --> 00:19:10,833

[laughter]

446

00:19:10,833 --> 00:19:13,733

That's administratium.

447

00:19:13,733 --> 00:19:17,733

Well, now you're gonna see
the hole in my math department.

448

00:19:17,733 --> 00:19:20,033

You see, a lot of kids
that are kind of different

449

00:19:20,033 --> 00:19:22,200

are good at one thing.
So I've got really good

450

00:19:22,200 --> 00:19:26,833

abilities in visual thinking,
but my left parietal area

451

00:19:26,833 --> 00:19:29,766

is trashed out.
I got very bad working memory.

452

00:19:29,766 --> 00:19:30,933

That's why
I can't do algebra.

453

00:19:30,933 --> 00:19:33,433

I also tried
to take programming, Fortran,

454

00:19:33,433 --> 00:19:35,600

and that was like useless.

455

00:19:35,600 --> 00:19:37,766

And Bill Gates and I
had access

456

00:19:37,766 --> 00:19:40,533

to this exact same computer
when it first came out,

457

00:19:40,533 --> 00:19:43,300

and he could do it,
and I couldn't.

458

00:19:43,300 --> 00:19:44,933

I don't agree
with Malcolm Gladwell.

459

00:19:44,933 --> 00:19:47,100

He doesn't think
innate ability matters.

460

00:19:47,100 --> 00:19:48,966

Yes, you have
to practice.

461

00:19:48,966 --> 00:19:51,266

Yes, abilities have to
be developed.

462

00:19:51,266 --> 00:19:53,866

And you've got to learn how
to do tasks other people want.

463

00:19:53,866 --> 00:19:56,266

And you have to have access
to the services.

464

00:19:56,266 --> 00:19:58,600

Yes, Bill and I
both had that.

465

00:19:58,600 --> 00:20:00,800

He could program.
I couldn't.

466

00:20:00,800 --> 00:20:05,000

I could turn the computer on,
and that was about it.

467

00:20:05,000 --> 00:20:08,100

Now I want to give you a glimpse
into the pattern mind.

468

00:20:08,100 --> 00:20:10,733

This praying mantis
is made out of a single sheet

469

00:20:10,733 --> 00:20:13,100

of folded paper,
and what you see

470

00:20:13,100 --> 00:20:16,900

in the background
is the folding pattern.

471

00:20:16,900 --> 00:20:19,000

And I want to thank you,
Jessica.

472

00:20:19,000 --> 00:20:21,400

You found me better slides
than the one I had.

473

00:20:21,400 --> 00:20:23,300

I'm gonna keep this slide.

474

00:20:23,300 --> 00:20:28,066

You know, this right here is
an example of pattern thinking.

475

00:20:28,066 --> 00:20:30,966

More extreme kind of
paper stuff.

476

00:20:30,966 --> 00:20:33,866

Now when I asked a physicist
who did work

477

00:20:33,866 --> 00:20:36,300
on the Hubble Space Telescope,
"Think about a church steeple,"

478
00:20:36,300 --> 00:20:39,933
he saw motion of people swinging
and singing

479
00:20:39,933 --> 00:20:41,100
and praying.

480
00:20:41,100 --> 00:20:43,033
Now you got two ways
of teaching math.

481
00:20:43,033 --> 00:20:44,500
I can teach it
more verbally,

482
00:20:44,500 --> 00:20:46,333
or teach it
more visually spatially.

483
00:20:46,333 --> 00:20:48,966
Education is really bad
about getting into fads.

484
00:20:48,966 --> 00:20:50,400
Okay, we're going
to teach reading with phonics.

485
00:20:50,400 --> 00:20:52,166
We're going to teach reading
with whole word.

486
00:20:52,166 --> 00:20:54,466
You know what matters
is the outcome.

487
00:20:54,466 --> 00:20:57,000

I spend
20 years supervising

488
00:20:57,000 --> 00:21:01,000
steel and concrete construction
work for my facilities.

489
00:21:01,000 --> 00:21:03,033
I would design a job,
then I'd supervise

490
00:21:03,033 --> 00:21:04,300
its construction.

491
00:21:04,300 --> 00:21:05,900
Then I had to
start it up.

492
00:21:05,900 --> 00:21:07,400
And in education,
we need to be thinking

493
00:21:07,400 --> 00:21:09,633
a lot more
about finishing a job.

494
00:21:09,633 --> 00:21:11,266
I don't want to see
those smart kids

495
00:21:11,266 --> 00:21:14,000
that ought to be here--
getting a job here,

496
00:21:14,000 --> 00:21:15,600
getting a job at Google--
or getting--

497
00:21:15,600 --> 00:21:18,300
get to play with that helicopter

over there that I got to see

498

00:21:18,300 --> 00:21:21,166

that probably was, uh,
flying, you know, by itself.

499

00:21:21,166 --> 00:21:23,933

That's very cool.

500

00:21:23,933 --> 00:21:26,133

And here's more evidence,
a brand new study,

501

00:21:26,133 --> 00:21:28,300

on the different types
of visualizers.

502

00:21:28,300 --> 00:21:31,200

Yes, we need evidence based.

503

00:21:31,200 --> 00:21:33,300

Okay, let's start looking
at different ways

504

00:21:33,300 --> 00:21:34,566

to look at thinking.

505

00:21:34,566 --> 00:21:36,800

You can have
more associational thinking.

506

00:21:36,800 --> 00:21:38,166

It's more like me.

507

00:21:38,166 --> 00:21:39,966

That's how I can get
from an Ariat boot

508

00:21:39,966 --> 00:21:41,433

to a mud puddle.

509

00:21:41,433 --> 00:21:43,800

Now you don't really see
the relationship there,

510

00:21:43,800 --> 00:21:45,366

but when I explain
the relationship,

511

00:21:45,366 --> 00:21:47,800

it's not random.

512

00:21:47,800 --> 00:21:49,433

A word thinker
is more linear.

513

00:21:49,433 --> 00:21:51,700

But you need the word thinkers
to get organization,

514

00:21:51,700 --> 00:21:53,066

to get things done.

515

00:21:53,066 --> 00:21:55,300

And I've read some of the stuff
about tech companies.

516

00:21:55,300 --> 00:21:56,900

They get to be a certain size,
they're gonna have to

517

00:21:56,900 --> 00:21:58,200

get a few suits.

518

00:21:58,200 --> 00:22:01,866

Otherwise they just turn into
a disorganized mess.

519

00:22:01,866 --> 00:22:04,466

Pictures and patterns
versus words.

520

00:22:04,466 --> 00:22:06,700

Bottom up
versus top down.

521

00:22:06,700 --> 00:22:09,700

I'm getting worried about a lot
of young people today

522

00:22:09,700 --> 00:22:13,033

getting too separated from
the world of practical things.

523

00:22:13,033 --> 00:22:15,033

They don't cook, sew,
woodworking.

524

00:22:15,033 --> 00:22:17,000

They don't know how
to fix a lamp.

525

00:22:17,000 --> 00:22:20,333

So everything becomes
totally abstract.

526

00:22:20,333 --> 00:22:23,966

I think that's a worry,
a real, big worry.

527

00:22:23,966 --> 00:22:26,300

You could be social or
more or less social,

528

00:22:26,300 --> 00:22:29,266

more social.
It's a continuum.

529

00:22:29,266 --> 00:22:32,433

You can--and when you do
bottom up thinking,

530

00:22:32,433 --> 00:22:35,000

it takes a lot more time
to get the data,

531

00:22:35,000 --> 00:22:37,200

but when you do too much
top down thinking,

532

00:22:37,200 --> 00:22:39,500

you tend to
grossly overgeneralize.

533

00:22:39,500 --> 00:22:42,133

They go, oh,
my kid's Asperger's,

534

00:22:42,133 --> 00:22:44,033

or my kid has autism.

535

00:22:44,033 --> 00:22:45,800

Well, if he's three years old
and not talking,

536

00:22:45,800 --> 00:22:47,200

I can give you
a standard answer.

537

00:22:47,200 --> 00:22:48,966

20 hours a week
of intensive thera--

538

00:22:48,966 --> 00:22:51,600

20--intensive therapy.

539

00:22:51,600 --> 00:22:53,266

But let's say

the kid's eight years old.

540

00:22:53,266 --> 00:22:55,400

Does he talk?

What does he do?

541

00:22:55,400 --> 00:22:58,666

I've gotta have

a lot more specifics on him.

542

00:22:58,666 --> 00:23:00,633

People tend

to overgeneralize.

543

00:23:00,633 --> 00:23:03,666

Oh, thank you, Jessica.

That's a beautiful mixing board.

544

00:23:03,666 --> 00:23:06,566

I'm gonna add this

to my permanent slides,

545

00:23:06,566 --> 00:23:08,600

because this

really illustrates the idea

546

00:23:08,600 --> 00:23:11,833

of the complex traits,

like how much anxiety you have,

547

00:23:11,833 --> 00:23:14,000

how much visual thinking

you have,

548

00:23:14,000 --> 00:23:16,400

how fearful you are,

a whole lot--

549

00:23:16,400 --> 00:23:17,866

how much

of a mathematician you are.

550

00:23:17,866 --> 00:23:19,866

It's like a mixing board.

551

00:23:19,866 --> 00:23:22,500

It's continuous trait.

552

00:23:22,500 --> 00:23:24,000

All right,
what would happen

553

00:23:24,000 --> 00:23:27,200

to these people today?

How about little Stevie?

554

00:23:27,200 --> 00:23:29,000

Little Stevie was
a weird loner,

555

00:23:29,000 --> 00:23:31,966

brought snakes to school
and turned them loose.

556

00:23:31,966 --> 00:23:33,666

And how about little Albert?

557

00:23:33,666 --> 00:23:37,600

Albert had no language
until age three.

558

00:23:37,600 --> 00:23:40,400

What would happen
to little Albert today?

559

00:23:40,400 --> 00:23:44,400

Especially somewhere
far away from here.

560

00:23:44,400 --> 00:23:46,166

This is where you gotta
broaden your horizon

561

00:23:46,166 --> 00:23:48,600

way outside of here.

562

00:23:48,600 --> 00:23:50,666

You know,
where's Einstein II?

563

00:23:50,666 --> 00:23:52,533

He's probably in the basement
playing video games

564

00:23:52,533 --> 00:23:54,433

on Social Security.

565

00:23:54,433 --> 00:23:57,200

This is the problem.

566

00:23:57,200 --> 00:23:59,900

I'm getting too many smart kids
getting labeled autistic,

567

00:23:59,900 --> 00:24:01,733

dyslexic, or ADHD.

568

00:24:01,733 --> 00:24:03,766

Now the problem you've got
with autism

569

00:24:03,766 --> 00:24:07,266

is maybe about 25% of them
are very severe.

570

00:24:07,266 --> 00:24:09,233

They have difficulty--
they don't talk,

571
00:24:09,233 --> 00:24:11,333
and they have difficulty
with, you know,

572
00:24:11,333 --> 00:24:13,900
just the most basic
daily living skills.

573
00:24:13,900 --> 00:24:15,966
But then there's probably
about 50% of the kids

574
00:24:15,966 --> 00:24:18,100
that are being put
on the label today

575
00:24:18,100 --> 00:24:20,466
where some of them could be
working here or some other

576
00:24:20,466 --> 00:24:23,000
high level kind of job,
but they're not getting

577
00:24:23,000 --> 00:24:26,133
the social skills training
when they're young to do that.

578
00:24:26,133 --> 00:24:28,166
I'm worried that
our educational system is

579
00:24:28,166 --> 00:24:29,966
screening out
too many kids.

580
00:24:29,966 --> 00:24:31,500
You know, every kid
that's hyperactive, you know,

581
00:24:31,500 --> 00:24:33,066
get them loaded up
on drugs.

582
00:24:33,066 --> 00:24:34,700
Mother used to say to me,
"Go outside

583
00:24:34,700 --> 00:24:36,533
and run the energy
out of you."

584
00:24:36,533 --> 00:24:38,900
That's what she
used to say.

585
00:24:38,900 --> 00:24:42,366
Well, "Fortune" magazine
had a great, great, um,

586
00:24:42,366 --> 00:24:47,600
article about ten years ago
on dyslexic CEOs.

587
00:24:47,600 --> 00:24:49,700
You know, a whole bunch
of dyslexic CEOs

588
00:24:49,700 --> 00:24:51,166
because they had
the vision.

589
00:24:51,166 --> 00:24:53,466
And the head of JetBlue
had ADHD.

590
00:24:53,466 --> 00:24:56,500
He's been
real public about it.

591
00:24:56,500 --> 00:25:00,200
And, uh, you know,
very good on selling the idea--

592
00:25:00,200 --> 00:25:01,666
not so good on operations.

593
00:25:01,666 --> 00:25:05,066
Had a real mess at
Kennedy Airport when it snowed.

594
00:25:05,066 --> 00:25:08,466
See this is why you need
the different kinds of minds.

595
00:25:08,466 --> 00:25:13,466
And the head of IKEA
is dyslexic.

596
00:25:13,466 --> 00:25:15,166
And let's look
at some examples

597
00:25:15,166 --> 00:25:17,066
of different kinds of minds
working together

598
00:25:17,066 --> 00:25:18,500
as great teams.

599
00:25:18,500 --> 00:25:20,433
Steve Jobs was an artist.

600
00:25:20,433 --> 00:25:22,366
He didn't do
any programming.

601
00:25:22,366 --> 00:25:24,933
He got infatuated

with calligraphy.

602

00:25:24,933 --> 00:25:26,700

He made the interface
for the iPhones,

603

00:25:26,700 --> 00:25:28,933

so every time you look at
that interface on your iPhone,

604

00:25:28,933 --> 00:25:31,700

that was made
by an artist.

605

00:25:31,700 --> 00:25:34,133

Then the engineers
had to make it work,

606

00:25:34,133 --> 00:25:35,800

and there's
a fascinating article

607

00:25:35,800 --> 00:25:38,900

about the first demonstration
of the iPhone.

608

00:25:38,900 --> 00:25:42,466

And he had to do it just right
or it would freeze and crash.

609

00:25:42,466 --> 00:25:45,700

Then the engineers had
six months to make it work.

610

00:25:45,700 --> 00:25:49,433

How about the Fukushima
Nuclear Power Plant mess?

611

00:25:49,433 --> 00:25:52,833

When I found out

why they had this mess,

612

00:25:52,833 --> 00:25:55,433

I just couldn't believe it.

613

00:25:55,433 --> 00:25:58,266

It was

a visual thinking mistake.

614

00:25:58,266 --> 00:26:02,500

And what I've learned is

the engineers did not see.

615

00:26:02,500 --> 00:26:04,700

Yes, you're next

to the sea,

616

00:26:04,700 --> 00:26:08,033

and you've put

all your emergency generators

617

00:26:08,033 --> 00:26:11,733

and emergency cooling pump

in a non-waterproof basement

618

00:26:11,733 --> 00:26:14,100

with no watertight doors.

619

00:26:14,100 --> 00:26:17,066

And if they had had

simple watertight doors,

620

00:26:17,066 --> 00:26:19,500

it would not

have happened.

621

00:26:19,500 --> 00:26:23,466

That's something that I have

no problem seeing that.

622

00:26:23,466 --> 00:26:25,400

All right,

I want to see how you guys do

623

00:26:25,400 --> 00:26:30,933

on the Texas A&M

engineering ethics question.

624

00:26:30,933 --> 00:26:33,233

I'll tell you,

I'm very proud I passed this.

625

00:26:33,233 --> 00:26:37,266

This is from Karan Watson,

provost at Texas A&M.

626

00:26:37,266 --> 00:26:41,100

You are the manager

of the Boeing Aircraft factory,

627

00:26:41,100 --> 00:26:44,133

and a heavy tool

is dropped on the wing

628

00:26:44,133 --> 00:26:46,366

of a partially built airplane.

629

00:26:46,366 --> 00:26:49,500

It is stressed

close to the critical limit.

630

00:26:49,500 --> 00:26:53,233

What do you do?

631

00:26:53,233 --> 00:26:54,833

All right,

don't over think this one.

632

00:26:54,833 --> 00:26:56,700

I had to answer like that.

633

00:26:56,700 --> 00:26:58,600

What do you do?

634

00:26:58,600 --> 00:27:00,166

You do what?

635

00:27:00,166 --> 00:27:02,800

Replace it.

That's the correct answer.

636

00:27:02,800 --> 00:27:05,333

You replace

all the stressed parts.

637

00:27:05,333 --> 00:27:08,133

Now the worst answer

that I heard

638

00:27:08,133 --> 00:27:10,833

was one government scientist

said you document it.

639

00:27:10,833 --> 00:27:12,433

[laughter]

640

00:27:12,433 --> 00:27:15,500

I am not kidding.

641

00:27:15,500 --> 00:27:19,500

And another worst answer I got

was you prop it up.

642

00:27:19,500 --> 00:27:21,900

And I go,

"Really, you prop it up?"

643

00:27:21,900 --> 00:27:23,433

Now she purposely
didn't say,

644

00:27:23,433 --> 00:27:25,466

"Would you fly
on that airplane?"

645

00:27:25,466 --> 00:27:27,133

She said,
"What would you do?"

646

00:27:27,133 --> 00:27:28,866

It was deliberately left
open-ended.

647

00:27:28,866 --> 00:27:30,566

Good.
You got the answer right.

648

00:27:30,566 --> 00:27:32,966

That's great.
That was wonderful.

649

00:27:32,966 --> 00:27:34,933

I'm worried about kids
getting too separated

650

00:27:34,933 --> 00:27:36,833

from practical things.

651

00:27:36,833 --> 00:27:39,566

And I was recently
at our animal science meetings,

652

00:27:39,566 --> 00:27:43,233

and there was some survey data
given out to consumers

653

00:27:43,233 --> 00:27:45,333

about issues with animals

and stuff like this.

654

00:27:45,333 --> 00:27:49,100

And a lot of
younger consumers today--

655

00:27:49,100 --> 00:27:52,266

factual information's
getting less important.

656

00:27:52,266 --> 00:27:53,566

Well, I don't
think they're getting

657

00:27:53,566 --> 00:27:55,766

enough scientific training
and hands-on training,

658

00:27:55,766 --> 00:27:58,566

and I think that's
one of the reasons why

659

00:27:58,566 --> 00:28:00,866

that's starting to be
a problem.

660

00:28:00,866 --> 00:28:02,133

I think it's a worry.

661

00:28:02,133 --> 00:28:04,333

I think taking skilled trades
out of the schools

662

00:28:04,333 --> 00:28:06,766

is the worst thing
the school ever did.

663

00:28:06,766 --> 00:28:09,866

Hands on stuff,
cooking, sewing, woodworking,

664

00:28:09,866 --> 00:28:14,033

welding, all of those things,
art, making stuff,

665

00:28:14,033 --> 00:28:16,233

teaches practical
problem solving.

666

00:28:16,233 --> 00:28:18,633

Sometimes your project
doesn't work,

667

00:28:18,633 --> 00:28:21,400

and then you have to figure out
how to make it work.

668

00:28:21,400 --> 00:28:23,566

I mean, that's what you did
in these wind tunnels.

669

00:28:23,566 --> 00:28:26,266

You had to figure out
how to make a lot of stuff work.

670

00:28:26,266 --> 00:28:29,133

But if you've never done
practical things as a kid,

671

00:28:29,133 --> 00:28:32,900

you don't understand them.

672

00:28:32,900 --> 00:28:36,866

And here's the things
that saved me as a kid:

673

00:28:36,866 --> 00:28:38,166

hands on classes.

674

00:28:38,166 --> 00:28:40,300

I was bullied and teased
in school.

675

00:28:40,300 --> 00:28:42,966

And the only places
I was not bullied and teased

676

00:28:42,966 --> 00:28:44,666

was things
like horseback riding

677

00:28:44,666 --> 00:28:45,800

and model rockets.

678

00:28:45,800 --> 00:28:48,133

And my science teacher
Mr. Carlock

679

00:28:48,133 --> 00:28:49,666

had the model rockets club.

680

00:28:49,666 --> 00:28:52,066

He also had
an electronics lab.

681

00:28:52,066 --> 00:28:55,000

And these are things
that just absolutely saved me--

682

00:28:55,000 --> 00:28:56,533

specialized things.

683

00:28:56,533 --> 00:28:59,533

Other really great things,
things like, you know,

684

00:28:59,533 --> 00:29:03,166

agriculture classes,
and too many schools are taking

685

00:29:03,166 --> 00:29:05,133

this stuff out.

Now there's a few schools

686

00:29:05,133 --> 00:29:08,233

that are learning

to put this stuff back in.

687

00:29:08,233 --> 00:29:10,433

I get asked all the time,

"How did you

688

00:29:10,433 --> 00:29:12,500

get interested in cattle?"

689

00:29:12,500 --> 00:29:15,100

I was exposed to them

when I was 15.

690

00:29:15,100 --> 00:29:17,733

We've got to be hooking

these teenagers.

691

00:29:17,733 --> 00:29:20,866

We also need to be hooking them

in middle school.

692

00:29:20,866 --> 00:29:23,733

I want to find cool things

I can find online on YouTube.

693

00:29:23,733 --> 00:29:27,200

I don't have to troll through a

impossible to navigate webpage,

694

00:29:27,200 --> 00:29:29,666

where it'll just pop up

on YouTube.

695

00:29:29,666 --> 00:29:32,833

Khan Academy just started out
as a little tutoring thing

696

00:29:32,833 --> 00:29:34,300

for their own kids.

697

00:29:34,300 --> 00:29:37,066

Then they found out
more people were getting on it.

698

00:29:37,066 --> 00:29:41,333

You gotta get
those kind of things going.

699

00:29:41,333 --> 00:29:43,666

Well, I want to give
all the teachers out there--

700

00:29:43,666 --> 00:29:45,700

'cause I've actually done
this talk for businesses.

701

00:29:45,700 --> 00:29:47,700

I've done it for teachers.
You better have a little

702

00:29:47,700 --> 00:29:49,733

respect for the skilled trades
because when you take

703

00:29:49,733 --> 00:29:52,366

the covers off
the jet engine,

704

00:29:52,366 --> 00:29:54,733

it's a
pretty complicated thing.

705

00:29:54,733 --> 00:29:57,300
People don't realize that.

706
00:29:57,300 --> 00:29:58,833
There's a shortage of people
right now

707
00:29:58,833 --> 00:30:02,833
to fix airplane engines
and to fix cars.

708
00:30:02,833 --> 00:30:05,233
You know, young people
are concerned about things,

709
00:30:05,233 --> 00:30:07,966
and young people
do want to improve society.

710
00:30:07,966 --> 00:30:10,166
But they don't really know
how to do it.

711
00:30:10,166 --> 00:30:12,566
They haven't been given
enough tools

712
00:30:12,566 --> 00:30:14,000
just to learn
how to problem solve

713
00:30:14,000 --> 00:30:15,300
in the practical world.

714
00:30:15,300 --> 00:30:17,800
And the practical world
is going to be messy.

715
00:30:17,800 --> 00:30:20,666
It's not gonna fit

all the theories.

716

00:30:20,666 --> 00:30:22,700

And students are getting
further and further away

717

00:30:22,700 --> 00:30:24,400

from the farm.

718

00:30:24,400 --> 00:30:28,100

31% of young students
have never been on a farm.

719

00:30:28,100 --> 00:30:32,133

50% of, uh, young adults
have never been on a farm

720

00:30:32,133 --> 00:30:33,466

that raises animals.

721

00:30:33,466 --> 00:30:34,800

They're getting
totally separated

722

00:30:34,800 --> 00:30:36,733

from where
their food comes from.

723

00:30:36,733 --> 00:30:38,233

You've got
water shortages here.

724

00:30:38,233 --> 00:30:40,133

I heard on the radio
the other day

725

00:30:40,133 --> 00:30:44,300

oil drilling equipment was used
for drilling water wells.

726

00:30:44,300 --> 00:30:46,566

I mean,
we've gotta go that deep?

727

00:30:46,566 --> 00:30:48,033

These are sort of
the little bits and pieces

728

00:30:48,033 --> 00:30:49,900

I put together,
and I go, "Wait a minute.

729

00:30:49,900 --> 00:30:52,733

That's not
a good thing to hear."

730

00:30:52,733 --> 00:30:55,733

Well, here's 50% of young adults
in the U.K. couldn't connect

731

00:30:55,733 --> 00:30:57,500

pigs with bacon.
[laughter]

732

00:30:57,500 --> 00:31:00,333

I go, "Really?"

733

00:31:00,333 --> 00:31:02,800

They don't know
where stuff comes from.

734

00:31:02,800 --> 00:31:04,800

All kinds of stuff.

735

00:31:04,800 --> 00:31:07,200

And there's a great farm
outside of Chicago

736

00:31:07,200 --> 00:31:09,066

where you can go
visit the dairy,

737
00:31:09,066 --> 00:31:11,533
and you can go
visit a real pig farm.

738
00:31:11,533 --> 00:31:13,900
And the most common
weird question they get is,

739
00:31:13,900 --> 00:31:17,833
"Are those actually pigs?"

740
00:31:17,833 --> 00:31:19,866
Yeah, are they Disney
animatronic pigs?

741
00:31:19,866 --> 00:31:23,666
No, they're not.
They're real pigs.

742
00:31:23,666 --> 00:31:25,633
I'm worried
as people get more and more

743
00:31:25,633 --> 00:31:26,966
into the mobile apps,

744
00:31:26,966 --> 00:31:29,633
getting worse and worse
getting to their silos.

745
00:31:29,633 --> 00:31:31,533
I talked
to a young 22-year-old

746
00:31:31,533 --> 00:31:34,133
about two weeks ago
that did not know

747

00:31:34,133 --> 00:31:37,033

what regular google searches are.

748

00:31:37,033 --> 00:31:39,200

I think that's a real problem,

749

00:31:39,200 --> 00:31:41,900

and in a survey that was done by of our, um,

750

00:31:41,900 --> 00:31:45,300

agricultural organizations-- they call it

751

00:31:45,300 --> 00:31:47,433

the tribalization of communication.

752

00:31:47,433 --> 00:31:49,466

I call it getting in the silos,

753

00:31:49,466 --> 00:31:52,600

where you just talk to like-minded people.

754

00:31:52,600 --> 00:31:54,866

You know, our generation, you know, you listen

755

00:31:54,866 --> 00:31:56,966

to the national news and a wide bunch

756

00:31:56,966 --> 00:31:59,100

of different people listen to it.

757

00:31:59,100 --> 00:32:02,366
But I'm worried about, um, kids
where they're getting into

758

00:32:02,366 --> 00:32:05,600
too just a real narrow a thing.

759

00:32:05,600 --> 00:32:07,466
The other big problem
on the Internet is

760

00:32:07,466 --> 00:32:10,133
it magnifies the voices
of radicals

761

00:32:10,133 --> 00:32:11,966
on both sides of an issue.

762

00:32:11,966 --> 00:32:14,633
We got to work
on taking down the silos.

763

00:32:14,633 --> 00:32:17,000
And originally,
I want to just have

764

00:32:17,000 --> 00:32:18,866
a picture of busting up
a silo,

765

00:32:18,866 --> 00:32:21,533
but then I found this picture
of chewing it down.

766

00:32:21,533 --> 00:32:23,133
Even with
a hydraulic chomper,

767

00:32:23,133 --> 00:32:25,766
it's a lot of work
to chew down the silos.

768
00:32:25,766 --> 00:32:28,500
You guys have got to
get out of the silo.

769
00:32:28,500 --> 00:32:30,233
Yeah, you're gonna need it
for funding.

770
00:32:30,233 --> 00:32:31,500
You gotta do it.

771
00:32:31,500 --> 00:32:33,533
You gotta, like, kick a hole
through administratium,

772
00:32:33,533 --> 00:32:36,666
and you gotta just do it.

773
00:32:36,666 --> 00:32:38,433
I got interested
in optical illusions

774
00:32:38,433 --> 00:32:40,933
because, um,
in a science class

775
00:32:40,933 --> 00:32:44,033
I was shown
an old Bell Labs movie,

776
00:32:44,033 --> 00:32:45,433
and in the HBO movie,
they show

777
00:32:45,433 --> 00:32:47,933
the original Bell Labs movie

that I saw.

778

00:32:47,933 --> 00:32:52,700

That was an example of
showing kids interesting stuff.

779

00:32:52,700 --> 00:32:55,233

There's one of my designs
done in SketchUp,

780

00:32:55,233 --> 00:32:58,200

and SketchUp's a free program
you can get online.

781

00:32:58,200 --> 00:33:01,500

There's all kinds
of great free stuff online.

782

00:33:01,500 --> 00:33:04,133

A lot of teachers
just don't know about it.

783

00:33:04,133 --> 00:33:06,600

You know, and then I can
print it out on a 3-D printer.

784

00:33:06,600 --> 00:33:08,166

That would be
pretty cool.

785

00:33:08,166 --> 00:33:10,700

In fact, uh,
the MakerBot, um,

786

00:33:10,700 --> 00:33:13,633

had a sign on it that said,
"Warning: Patience."

787

00:33:13,633 --> 00:33:15,533

I hope this is

a MakerBot printer.

788

00:33:15,533 --> 00:33:19,066

This is one of the
substituted slides.

789

00:33:19,066 --> 00:33:21,100

I had a slide originally
of the MakerBot

790

00:33:21,100 --> 00:33:24,533

from the MakerBot webpage,
and I'm not sure

791

00:33:24,533 --> 00:33:26,933

if that's a MakerBot product
or not.

792

00:33:26,933 --> 00:33:29,566

But the thing
that I really liked

793

00:33:29,566 --> 00:33:31,966

was they talked
about patience.

794

00:33:31,966 --> 00:33:34,466

You got this
little glue gun thing

795

00:33:34,466 --> 00:33:36,666

and the little thing itself
is not electronic.

796

00:33:36,666 --> 00:33:40,633

It's controlled electronically.
It's a mechanical device.

797

00:33:40,633 --> 00:33:43,533

It goes back

to the messy physical world.

798

00:33:43,533 --> 00:33:45,100

Well, that's
the end of my talk,

799

00:33:45,100 --> 00:33:48,133

and what I hope I've done
is I hope it'd make you think.

800

00:33:48,133 --> 00:33:51,333

Now I want to have
some really good questions.

801

00:33:51,333 --> 00:33:54,333

[applause]

802

00:34:02,233 --> 00:34:04,700

- Thank you, Temple,
for an excellent talk.

803

00:34:04,700 --> 00:34:06,266

We have time
for some questions.

804

00:34:06,266 --> 00:34:08,100

If you have a question,
please stand,

805

00:34:08,100 --> 00:34:09,766

go the the aisle
in front of the mic,

806

00:34:09,766 --> 00:34:12,666

and ask one question.
Be succinct,

807

00:34:12,666 --> 00:34:15,966

and we'll get as many answers,
uh, replies.

808

00:34:15,966 --> 00:34:18,800

Thank you.

- Oh, good, we got one already,

809

00:34:18,800 --> 00:34:20,766

and if we don't have any more,
I'll pick somebody.

810

00:34:20,766 --> 00:34:23,233

[laughter]

811

00:34:23,233 --> 00:34:27,866

- Hi, um, earlier in your talk,
you mentioned that, uh

812

00:34:27,866 --> 00:34:33,133

you've observed that kids
more often have visual thinking.

813

00:34:33,133 --> 00:34:34,633

Um--

- Little kids especially.

814

00:34:34,633 --> 00:34:37,166

- Little kids especially?

I was interested in that

815

00:34:37,166 --> 00:34:39,066

because that would seem
to indicate

816

00:34:39,066 --> 00:34:43,100

that modes of thinking change
from childhood to adulthood.

817

00:34:43,100 --> 00:34:44,733

- The tendency, as you go
to adulthood,

818

00:34:44,733 --> 00:34:46,666

you're relying
more and more on language.

819

00:34:46,666 --> 00:34:48,200

- Uh-huh.
- And the thing that was

820

00:34:48,200 --> 00:34:51,466

really shocking for me,
and I discovered this

821

00:34:51,466 --> 00:34:53,300

back when I was doing my book
"Thinking in Pictures"...

822

00:34:53,300 --> 00:34:55,166

That was 20 years ago.

823

00:34:55,166 --> 00:34:56,933

When I asked
this speech therapist,

824

00:34:56,933 --> 00:34:58,666

"Think about a church steeple,"
and she goes,

825

00:34:58,666 --> 00:35:00,933

"Pointy thing,"
like that.

826

00:35:00,933 --> 00:35:03,600

I just see specific pictures.
Now most people,

827

00:35:03,600 --> 00:35:05,933

if I ask them,
"Think about your house or car,"

828

00:35:05,933 --> 00:35:08,800

you can see
your own house or car.

829

00:35:08,800 --> 00:35:11,100

You see--and I'd made
the mistake of asking

830

00:35:11,100 --> 00:35:12,933

something they were
very familiar with.

831

00:35:12,933 --> 00:35:14,400

But when I ask you something
that's out there

832

00:35:14,400 --> 00:35:17,000

in the environment,
everybody sees them.

833

00:35:17,000 --> 00:35:18,800

But they're not quite
so familiar with it.

834

00:35:18,800 --> 00:35:21,100

That's when a lot
of people tend to get

835

00:35:21,100 --> 00:35:23,600

sort of
a vague pointy thing.

836

00:35:23,600 --> 00:35:25,733

And that was
a real sudden bunch

837

00:35:25,733 --> 00:35:29,066

of insight to me that my
thinking was really different

838

00:35:29,066 --> 00:35:31,366

because there is
no pointy thing.

839

00:35:31,366 --> 00:35:35,200

I can fabricate in my mind
a pointy thing.

840

00:35:35,200 --> 00:35:36,833

I have a slide
that I found

841

00:35:36,833 --> 00:35:39,900

from a plastic
church steeple company

842

00:35:39,900 --> 00:35:42,133

of a pointy thing,

843

00:35:42,133 --> 00:35:44,066

but it's something
I have to fabricate.

844

00:35:44,066 --> 00:35:46,166

You know, I tend to see
ones around Fort Collins.

845

00:35:46,166 --> 00:35:48,666

I tend to see
the slides that I use.

846

00:35:48,666 --> 00:35:50,166

Yeah, those slides
gave me a whole pile

847

00:35:50,166 --> 00:35:53,100

of viruses in my computer--

848

00:35:53,100 --> 00:35:55,833

[coughs]

of some specific churches

849

00:35:55,833 --> 00:35:58,400
in Fort Collins.

850

00:35:58,400 --> 00:36:02,166
- Um, so I guess a specific
question that I have is,

851

00:36:02,166 --> 00:36:06,533
how, the plasticity, I guess,
um, for the brains,

852

00:36:06,533 --> 00:36:07,700
and the different
types of thinking

853

00:36:07,700 --> 00:36:10,200
would--would you say that
kids are better

854

00:36:10,200 --> 00:36:12,533
at switching, um, between
different modes of thinking or--

855

00:36:12,533 --> 00:36:15,233
- Little kids
tend to be more visual thinkers,

856

00:36:15,233 --> 00:36:18,500
but it's--you see,
there's a lot of plasticity.

857

00:36:18,500 --> 00:36:21,666
All right, let's sort of
look at the music mixing board.

858

00:36:21,666 --> 00:36:25,233
Uh, maybe there's a screw
put in part of the slot,

859

00:36:25,233 --> 00:36:28,566

and you've got plasticity,
you know, within that range.

860

00:36:28,566 --> 00:36:30,600

And when it comes--
see the reason why

861

00:36:30,600 --> 00:36:33,266

I'm so bad at algebra,
I got no working memory.

862

00:36:33,266 --> 00:36:34,933

I can't--
if I have to--

863

00:36:34,933 --> 00:36:36,966

let's say I had
to take apart

864

00:36:36,966 --> 00:36:39,266

the McDonald's ice cream machine
and clean it.

865

00:36:39,266 --> 00:36:42,266

I'd need to write down
the steps

866

00:36:42,266 --> 00:36:44,166

and then I'd keep it
in a card in my pocket

867

00:36:44,166 --> 00:36:46,366

for maybe two weeks,
and then I'd get it memorized.

868

00:36:46,366 --> 00:36:49,166

And when I worked in a dairy,
they had a little piece of paper

869

00:36:49,166 --> 00:36:51,733

on the wall,
five steps or eight steps

870

00:36:51,733 --> 00:36:53,633

for setting up
the milking equipment.

871

00:36:53,633 --> 00:36:55,766

I would have been in trouble
without that cheat sheet

872

00:36:55,766 --> 00:37:00,066

because I do not remember
more than three sequences.

873

00:37:00,066 --> 00:37:01,966

But if I have my cheat sheet,
then I'm fine

874

00:37:01,966 --> 00:37:03,933

because then it's like
keywords on Google.

875

00:37:03,933 --> 00:37:06,433

Boom.
I'm--and I see the pictures

876

00:37:06,433 --> 00:37:07,966

for that step.
Boom.

877

00:37:07,966 --> 00:37:10,533

I see the pictures
for the next step.

878

00:37:10,533 --> 00:37:12,333

You know, that's how
I can work around that,

879

00:37:12,333 --> 00:37:14,066

but you need
the visual thinkers.

880

00:37:14,066 --> 00:37:16,800

Prevent messes
like Fukushima.

881

00:37:16,800 --> 00:37:18,733

When I found out
why that burned up,

882

00:37:18,733 --> 00:37:20,033

I'm going,
you gotta be kidding.

883

00:37:20,033 --> 00:37:22,666

And then the second mistake
was cultural.

884

00:37:22,666 --> 00:37:24,866

They never
asked for help.

885

00:37:24,866 --> 00:37:27,633

How could you sit there
and watch that thing burn up?

886

00:37:27,633 --> 00:37:30,266

All you had to do
was pick up the phone,

887

00:37:30,266 --> 00:37:31,566

and they didn't do it.

888

00:37:31,566 --> 00:37:34,866

Any piece of equipment you want,
you can have it there.

889

00:37:34,866 --> 00:37:38,066

The world would be there
to help you.

890

00:37:38,066 --> 00:37:41,133

No, that's
sort of beyond me.

891

00:37:41,133 --> 00:37:43,500

No, that point,
nuclear reactor melting down,

892

00:37:43,500 --> 00:37:45,466

you pick up the horn
because you've gotta stop

893

00:37:45,466 --> 00:37:46,733

breaching containment.

894

00:37:46,733 --> 00:37:51,866

That's so horrible,
you can't let it happen.

895

00:37:51,866 --> 00:37:54,166

Okay.
- Hi, I'm currently

896

00:37:54,166 --> 00:37:55,733

a high school teacher
for chemistry,

897

00:37:55,733 --> 00:37:57,866

and I was wondering
if you had any advice

898

00:37:57,866 --> 00:38:00,233

on identifying
students' strengths

899

00:38:00,233 --> 00:38:01,533

in the beginning
of the school year

900

00:38:01,533 --> 00:38:03,166

so that--
'cause I like the idea

901

00:38:03,166 --> 00:38:05,300

of grouping different
types of minds--oh--

902

00:38:05,300 --> 00:38:07,033

to better work together.

903

00:38:07,033 --> 00:38:09,600

- Well, normally
strengths start to show up--

904

00:38:09,600 --> 00:38:12,566

my ability in art,
which was really encouraged,

905

00:38:12,566 --> 00:38:14,700

started to show up
in third and fourth grade.

906

00:38:14,700 --> 00:38:16,900

That's be like seven,
eight years old.

907

00:38:16,900 --> 00:38:19,366

And--and then also
that's the same age

908

00:38:19,366 --> 00:38:22,066

that mathematics ability
often shows up.

909

00:38:22,066 --> 00:38:23,966

And what you want to do
with those kids--

910
00:38:23,966 --> 00:38:26,133
if that eighth grader
can do high school math,

911
00:38:26,133 --> 00:38:27,566
let him
do high school math.

912
00:38:27,566 --> 00:38:30,266
He's gonna need help
in reading.

913
00:38:30,266 --> 00:38:31,666
You know, what--
first thing you find out

914
00:38:31,666 --> 00:38:33,666
is what are they good at.

915
00:38:33,666 --> 00:38:35,733
Now I'm seeing too many kids
totally getting addicted

916
00:38:35,733 --> 00:38:37,033
to video games.

917
00:38:37,033 --> 00:38:40,000
I was really interested to read
that the head of Twitter

918
00:38:40,000 --> 00:38:43,700
severely limits
that sort of activity

919
00:38:43,700 --> 00:38:46,600
'cause he wants his kids, um,
going into something

920

00:38:46,600 --> 00:38:49,366
more worthwhile than playing
video games all day.

921

00:38:49,366 --> 00:38:54,066
But, if the kid gets exposed
to enough different things,

922

00:38:54,066 --> 00:38:55,233
you know, a lot of kids
really are good

923

00:38:55,233 --> 00:38:57,066
at building things
with LEGOs.

924

00:38:57,066 --> 00:39:00,133
It's the only building thing
they get exposed to.

925

00:39:00,133 --> 00:39:01,700
Good at building LEGOs?
Let's expose them

926

00:39:01,700 --> 00:39:03,433
to a lot of other things.

927

00:39:03,433 --> 00:39:07,300
Maybe building organic
chemistry molecules models,

928

00:39:07,300 --> 00:39:09,166
something like that.

929

00:39:09,166 --> 00:39:11,366
Uh, you know,
some kids are

930

00:39:11,366 --> 00:39:13,900

really good at math.

Others are horrible at math.

931

00:39:13,900 --> 00:39:16,266

Visual thinkers--

I had a terrible time

932

00:39:16,266 --> 00:39:19,766

balancing equations,

but doing chemistry experiments

933

00:39:19,766 --> 00:39:21,700

was really interesting

because they don't

934

00:39:21,700 --> 00:39:24,833

always come out perfectly.

935

00:39:24,833 --> 00:39:26,733

That's the real world.

936

00:39:26,733 --> 00:39:28,866

I hope that your school

is still doing

937

00:39:28,866 --> 00:39:31,500

hands-on labs.

Good.

938

00:39:31,500 --> 00:39:34,066

Because there's some people

think you can

939

00:39:34,066 --> 00:39:36,033

do chemistry lab online.

I'm going, "No."

940

00:39:36,033 --> 00:39:37,533

There's some things

you need to do--

941

00:39:37,533 --> 00:39:41,200

you need to actually do
the real thing.

942

00:39:41,200 --> 00:39:46,400

- Thank you.

943

00:39:46,400 --> 00:39:48,333

- Hi, so, um,
I read your book

944

00:39:48,333 --> 00:39:50,400

"Unwritten Rules
of Social Relationships,"

945

00:39:50,400 --> 00:39:52,566

and I thought,
"Wow, that was really useful."

946

00:39:52,566 --> 00:39:55,033

And I went over--
went through it with my son.

947

00:39:55,033 --> 00:39:57,000

I thought it was
very useful for him,

948

00:39:57,000 --> 00:39:59,166

and--and actually--
- How old's your son?

949

00:39:59,166 --> 00:40:01,000

- Um, well, right now
he's 19.

950

00:40:01,000 --> 00:40:02,733

- He's 19?
How's he doing?

951

00:40:02,733 --> 00:40:04,200

- That's a long story.

- Long story.

952

00:40:04,200 --> 00:40:05,466

[laughter]

953

00:40:05,466 --> 00:40:06,933

- But thanks for asking.

954

00:40:06,933 --> 00:40:08,266

We--we can talk offline

if you'd like.

955

00:40:08,266 --> 00:40:09,566

- Okay.

956

00:40:09,566 --> 00:40:11,400

- But I-I really wanted to talk

about something else.

957

00:40:11,400 --> 00:40:16,633

Um--uh, so the--uh, I thought--

I wish I'd had that book around

958

00:40:16,633 --> 00:40:20,266

when I was younger,

and I-I--in fact I wish

959

00:40:20,266 --> 00:40:22,100

I think a lot

of my colleagues would find

960

00:40:22,100 --> 00:40:23,333

a lot of benefit from it.

961

00:40:23,333 --> 00:40:25,100

- Oh, I think there's

a lot of people here

962

00:40:25,100 --> 00:40:26,933

that are on the spectrum
and why are they here?

963

00:40:26,933 --> 00:40:30,833

Because in the '50s they pounded
in the social rules.

964

00:40:30,833 --> 00:40:34,100

'50s and '60s
kids were taught table manners,

965

00:40:34,100 --> 00:40:36,833

taught how to shake hands.
I had to be hostess

966

00:40:36,833 --> 00:40:39,966

at my mother's parties
and learn how to greet guests.

967

00:40:39,966 --> 00:40:42,366

Also they used
teachable moments.

968

00:40:42,366 --> 00:40:44,733

Like if I was, um, gonna
eat the mashed potatoes

969

00:40:44,733 --> 00:40:47,900

with my hand, Mother would say,
"Use the fork."

970

00:40:47,900 --> 00:40:49,700

She didn't scream no.

971

00:40:49,700 --> 00:40:52,800

She would simply give
the instruction.

972

00:40:52,800 --> 00:40:54,800

And the whole social rules thing
was taught in

973

00:40:54,800 --> 00:40:58,133

a much more
structured manner.

974

00:40:58,133 --> 00:41:00,466

So the kid that was just
kinda mildly a little bit

975

00:41:00,466 --> 00:41:03,666

on the autism spectrum, any kind
of Asperger-type of kid,

976

00:41:03,666 --> 00:41:04,966

they learned
enough social skills

977

00:41:04,966 --> 00:41:07,700

so they could get
a great job at NASA.

978

00:41:07,700 --> 00:41:10,100

- So my question
is actually not for you.

979

00:41:10,100 --> 00:41:12,633

My question is
for the management here.

980

00:41:12,633 --> 00:41:14,666

Are--are you aware that

981

00:41:14,666 --> 00:41:16,733

"Unwritten Rules
of Social Relationships"

982

00:41:16,733 --> 00:41:19,666
would really be very beneficial
to most of the population here?

983

00:41:19,666 --> 00:41:21,766
- Put it in your library.
And the other thing I found,

984

00:41:21,766 --> 00:41:25,033
a lot of technical organizations
is there's tons and tons

985

00:41:25,033 --> 00:41:28,000
of autistic grandchildren
and, you know,

986

00:41:28,000 --> 00:41:30,466
it's the music mixing board.
A little bit of the genetics

987

00:41:30,466 --> 00:41:32,366
gives an advantage then you put
two of them together.

988

00:41:32,366 --> 00:41:33,766
You--
- I used to--

989

00:41:33,766 --> 00:41:36,233
- Put more--the little snips,
the little variations

990

00:41:36,233 --> 00:41:39,900
in the genetic code in there,
and I also found

991

00:41:39,900 --> 00:41:41,600
an interesting paper
on Schizophrenia,

992

00:41:41,600 --> 00:41:44,466

where a little tiny bit
of that trait

993

00:41:44,466 --> 00:41:45,933

makes creativity.

994

00:41:45,933 --> 00:41:49,200

That's why these traits
remain in the population

995

00:41:49,200 --> 00:41:51,033

because in the small amounts
of them,

996

00:41:51,033 --> 00:41:53,200

they enable us
to go to the moon

997

00:41:53,200 --> 00:41:54,933

or to do
some great art.

998

00:41:54,933 --> 00:41:56,400

Too much of it?
Yes, then you've got

999

00:41:56,400 --> 00:41:59,000

a gigantic handicap.

1000

00:41:59,000 --> 00:42:00,400

- Well, great,
thank you very much.

1001

00:42:00,400 --> 00:42:05,966

- Okay.

1002

00:42:05,966 --> 00:42:08,800

- Hi, Temple.

As you were describing, um,

1003

00:42:08,800 --> 00:42:11,533

your own experiences,
I felt you're describing my son.

1004

00:42:11,533 --> 00:42:15,466

He's also a visual thinker
and he has autism.

1005

00:42:15,466 --> 00:42:17,933

I guess my question is
how did you overcome

1006

00:42:17,933 --> 00:42:20,966

your, um, limited
language challenge?

1007

00:42:20,966 --> 00:42:24,700

You are f--you said
you had language challenge.

1008

00:42:24,700 --> 00:42:27,200

when you were a kid.
- Well, I-I, um

1009

00:42:27,200 --> 00:42:28,800

got into very good
early intervention.

1010

00:42:28,800 --> 00:42:30,466

And I can't emphasize enough,
you got a three-year-old

1011

00:42:30,466 --> 00:42:32,100

that's not talking,
it's 20 hours a week

1012

00:42:32,100 --> 00:42:33,666

of intense one-on-ones.

1013

00:42:33,666 --> 00:42:36,066

That I can give you
a standard answer.

1014

00:42:36,066 --> 00:42:37,800

Once kids get older,
I've got to know

1015

00:42:37,800 --> 00:42:39,800

a lot more about them
because they've made

1016

00:42:39,800 --> 00:42:42,200

the autism spectrum
so broad now.

1017

00:42:42,200 --> 00:42:45,466

I'm, you know, mainly
you got the--

1018

00:42:45,466 --> 00:42:47,166

well, my elder ones
we need to go back

1019

00:42:47,166 --> 00:42:50,100

to '50s style
teaching social rules,

1020

00:42:50,100 --> 00:42:52,033

and they got to be
just taught.

1021

00:42:52,033 --> 00:42:54,600

I learned a lot
on greeting guests

1022

00:42:54,600 --> 00:42:56,000

at my mother's parties.

1023

00:42:56,000 --> 00:42:58,500

- Yeah, because

what I found was the language--

1024

00:42:58,500 --> 00:43:01,400

um, having limited language

leads to--

1025

00:43:01,400 --> 00:43:03,333

- Can he talk now?

- I'm sorry?

1026

00:43:03,333 --> 00:43:04,433

- Okay--

- He's--he's ten.

1027

00:43:04,433 --> 00:43:06,033

- He's ten.

You see this is where

1028

00:43:06,033 --> 00:43:08,033

when we get further along

on the spectrum,

1029

00:43:08,033 --> 00:43:10,866

I have to have

much more detailed information.

1030

00:43:10,866 --> 00:43:12,766

See, people are grossly

overgeneralizing

1031

00:43:12,766 --> 00:43:14,966

just on the word autism.

The ten-year-old,

1032

00:43:14,966 --> 00:43:17,166

I want to get level of speech,

how's he doing at school--

1033

00:43:17,166 --> 00:43:20,300

[coughs]

There's a lot more things

1034

00:43:20,300 --> 00:43:24,133

that I've got to know

before I can give you an answer.

1035

00:43:24,133 --> 00:43:26,700

I can only give

a standard answer

1036

00:43:26,700 --> 00:43:28,566

when it's a three-year-old

with no speech.

1037

00:43:28,566 --> 00:43:31,133

Then I can give you

a standard answer.

1038

00:43:31,133 --> 00:43:33,200

- Okay.

We'll talk offline.

1039

00:43:33,200 --> 00:43:35,033

But [laughs softly]--

but yeah,

1040

00:43:35,033 --> 00:43:37,066

it's interesting

to see your perspective

1041

00:43:37,066 --> 00:43:40,666

like how you--you're describing

how you were learning things

1042

00:43:40,666 --> 00:43:43,133

or how you were

associating, um--

1043

00:43:43,133 --> 00:43:44,233

- Yeah, you see,
the visual thinker...

1044

00:43:44,233 --> 00:43:45,233

- Yeah.
- Tends to be

1045

00:43:45,233 --> 00:43:47,033

much more associative.
- Yes.

1046

00:43:47,033 --> 00:43:48,433

- You know,
a very verbal thinker

1047

00:43:48,433 --> 00:43:50,733

it's more more linear,
and one of the big problems

1048

00:43:50,733 --> 00:43:53,366

I'm seeing today,
I'm seeing a lot of smart kids

1049

00:43:53,366 --> 00:43:55,033

that ought to be
ending up here

1050

00:43:55,033 --> 00:43:57,300

or ending up on--
I saw that helicopter

1051

00:43:57,300 --> 00:43:59,500

over there that was
probably flying by itself.

1052

00:43:59,500 --> 00:44:03,300

You know,
working on something like that,

1053

00:44:03,300 --> 00:44:04,433

and they're ending up
in the basement

1054

00:44:04,433 --> 00:44:06,100

playing video games.

1055

00:44:06,100 --> 00:44:07,566

You see,
I've made a point

1056

00:44:07,566 --> 00:44:09,700

in my career
to go between the silos.

1057

00:44:09,700 --> 00:44:11,666

Do a certain amount
of tech talks,

1058

00:44:11,666 --> 00:44:15,566

cattle talks,
purely autism talks--

1059

00:44:15,566 --> 00:44:19,033

uh--uh,
talks business people,

1060

00:44:19,033 --> 00:44:21,000

going between
the silos.

1061

00:44:21,000 --> 00:44:23,166

It's not easy
doing that.

1062

00:44:23,166 --> 00:44:25,166

- So you say exposure
is really important--

1063

00:44:25,166 --> 00:44:27,633

- Well you gotta expose kids
to interesting things.

1064

00:44:27,633 --> 00:44:29,066

- But like I said--

- Now, unfortunately

1065

00:44:29,066 --> 00:44:32,000

if you have a child that
maybe is--there's--

1066

00:44:32,000 --> 00:44:34,366

the problem you've got now
with autism label

1067

00:44:34,366 --> 00:44:36,966

is you're going
with a huge variation.

1068

00:44:36,966 --> 00:44:38,800

I wouldn't suggest, uh,
that you've got somebody

1069

00:44:38,800 --> 00:44:42,200

that's nonverbal
that, um, can't read--

1070

00:44:42,200 --> 00:44:44,533

uh, they're not
gonna work at NASA.

1071

00:44:44,533 --> 00:44:46,900

You see what the problem is
is that they've made

1072

00:44:46,900 --> 00:44:48,900

the autism spectrum
so wide.

1073

00:44:48,900 --> 00:44:50,300

You see,
if you get labeled dyslexic,

1074

00:44:50,300 --> 00:44:51,633

you have trouble
with reading.

1075

00:44:51,633 --> 00:44:54,000

ADHD, you have trouble
with attention.

1076

00:44:54,000 --> 00:44:57,433

You see, those labels
are a much narrower label,

1077

00:44:57,433 --> 00:44:59,566

but I'm seeing kids,
that in my generation,

1078

00:44:59,566 --> 00:45:02,300

were just labeled
geeks and nerds.

1079

00:45:02,300 --> 00:45:05,166

Um, and they ought to be
going on in these

1080

00:45:05,166 --> 00:45:06,766

kinds of jobs.

1081

00:45:06,766 --> 00:45:09,033

And there's a tendency
lots of times

1082

00:45:09,033 --> 00:45:11,100

for the parents
to overprotect.

1083

00:45:11,100 --> 00:45:13,166

I was at the airport
the other day,

1084
00:45:13,166 --> 00:45:16,366
and my plane was delayed,
so I got talking

1085
00:45:16,366 --> 00:45:18,333
to a family
that had a teenage kid

1086
00:45:18,333 --> 00:45:20,933
that was very good
at animation.

1087
00:45:20,933 --> 00:45:23,133
And he was just being
in his bedroom.

1088
00:45:23,133 --> 00:45:24,833
And I suggested
that he needs to get out

1089
00:45:24,833 --> 00:45:28,000
and video--do some
other people's video,

1090
00:45:28,000 --> 00:45:30,900
and the mom
didn't want to let go.

1091
00:45:30,900 --> 00:45:32,700
And I said--
and there was an opportunity

1092
00:45:32,700 --> 00:45:34,800
for some video editing
just a mile down the road

1093
00:45:34,800 --> 00:45:36,233

that he could do.

I said,

1094

00:45:36,233 --> 00:45:37,800

"You got to let him go
and work on this--

1095

00:45:37,800 --> 00:45:39,533

on the video editing."
He's got to learn

1096

00:45:39,533 --> 00:45:43,366

how to do video editing
that other people want.

1097

00:45:43,366 --> 00:45:45,800

Biggest problem I'm seeing
with a lot of these

1098

00:45:45,800 --> 00:45:47,333

really smart kids
is they're not learning

1099

00:45:47,333 --> 00:45:49,366

how to work.

1100

00:45:49,366 --> 00:45:51,233

I mean,
the first sign painting job

1101

00:45:51,233 --> 00:45:53,100

I ever sold
was for a beauty shop.

1102

00:45:53,100 --> 00:45:55,033

I had to make a sign
that they wanted.

1103

00:45:55,033 --> 00:45:57,066

Mother arranged

a sewing job for me

1104

00:45:57,066 --> 00:45:59,133

when I was 13,
and when I was 15,

1105

00:45:59,133 --> 00:46:01,133

I was cleaning horse stalls.

1106

00:46:01,133 --> 00:46:03,000

I learned how to work.

1107

00:46:03,000 --> 00:46:06,633

That's another big problem
I see in a lot of kids.

1108

00:46:06,633 --> 00:46:08,466

But before I can make
a recommendation to you,

1109

00:46:08,466 --> 00:46:09,900

I'd have to--
I've got to, like,

1110

00:46:09,900 --> 00:46:12,466

ask you a bunch of questions
to find out exactly,

1111

00:46:12,466 --> 00:46:15,566

you know,
what he's capable of doing.

1112

00:46:15,566 --> 00:46:19,533

And--and I'm--I'm not capable
of doing computer programming.

1113

00:46:19,533 --> 00:46:23,000

I tried it.
I was exposed to it,

1114

00:46:23,000 --> 00:46:26,000

didn't work for me.

It worked for Bill Gates.

1115

00:46:26,000 --> 00:46:27,633

He and I were

on the same computer

1116

00:46:27,633 --> 00:46:31,066

in the same year.

1117

00:46:35,400 --> 00:46:38,066

- So, in an ideal world,

a good teacher will

1118

00:46:38,066 --> 00:46:40,166

be able to cover

all the different types

1119

00:46:40,166 --> 00:46:42,866

of thinkers in a classroom,

but in the real world,

1120

00:46:42,866 --> 00:46:45,366

time and resources

are restricted.

1121

00:46:45,366 --> 00:46:47,200

So I'm wondering

if you could shed some light

1122

00:46:47,200 --> 00:46:52,033

on how you can accommodate

other types of visual thinkers

1123

00:46:52,033 --> 00:46:53,700

to learn successfully

in a classroom

1124

00:46:53,700 --> 00:46:55,533

that is not teaching
their thinking type.

1125

00:46:55,533 --> 00:46:58,200

- Well, I think classrooms
ought to be using more of

1126

00:46:58,200 --> 00:46:59,800

a variety of methods.

1127

00:46:59,800 --> 00:47:01,300

All right,
let's take something simple

1128

00:47:01,300 --> 00:47:03,200

like teaching reading.

1129

00:47:03,200 --> 00:47:05,033

You know, basically
you can teach it with phonics,

1130

00:47:05,033 --> 00:47:06,566

and I was
a phonics learner.

1131

00:47:06,566 --> 00:47:08,733

"Dick and Jane" books
were useless for me.

1132

00:47:08,733 --> 00:47:11,000

Other kids are
a whole word learner.

1133

00:47:11,000 --> 00:47:13,000

So you introduce it
both ways

1134

00:47:13,000 --> 00:47:17,366

because your end result is

I want them to be able to read.

1135

00:47:17,366 --> 00:47:19,433
And as soon as Mother started
teaching me with phonics,

1136

00:47:19,433 --> 00:47:22,100
I went from the th--
third grade--first grade level

1137

00:47:22,100 --> 00:47:23,733
of reading up to
sixth-grade level

1138

00:47:23,733 --> 00:47:26,333
in, like, 2 1/2 months.

1139

00:47:26,333 --> 00:47:28,800
I--your end result
is you want the kid to

1140

00:47:28,800 --> 00:47:30,566
be able to read.
You want the kid to be able to

1141

00:47:30,566 --> 00:47:33,100
find the area of a circle
or whatever thing you want

1142

00:47:33,100 --> 00:47:35,000
to teach.

1143

00:47:35,000 --> 00:47:37,233
You know, you use--
education gets

1144

00:47:37,233 --> 00:47:39,933
really bad
in top down fads.

1145

00:47:39,933 --> 00:47:42,733

So what saved me
on getting through college?

1146

00:47:42,733 --> 00:47:46,366

Because when I went to college,
of--algebra was not

1147

00:47:46,366 --> 00:47:50,133

the national required class.
It was finite math,

1148

00:47:50,133 --> 00:47:52,866

which was matrices,
probability, and statistics.

1149

00:47:52,866 --> 00:47:54,833

And with a whole ton
of tutoring,

1150

00:47:54,833 --> 00:47:57,266

I was able
to do that.

1151

00:47:57,266 --> 00:47:59,933

If it had been algebra,
I would have just been sunk.

1152

00:47:59,933 --> 00:48:01,166

You know,
what I think they need to do

1153

00:48:01,166 --> 00:48:04,533

on this math requirement
is allow substitution

1154

00:48:04,533 --> 00:48:06,533

of maybe algebra
with geometry

1155

00:48:06,533 --> 00:48:08,066

'cause there's a lot--
and I never got a chance

1156

00:48:08,066 --> 00:48:10,700

to take geometry.
That was a gigantic mistake

1157

00:48:10,700 --> 00:48:12,933

in my education.

1158

00:48:12,933 --> 00:48:16,500

Also I understand a lot
better with specific examples.

1159

00:48:16,500 --> 00:48:18,600

When I had to be tutored
in statistics,

1160

00:48:18,600 --> 00:48:22,000

okay, we're gonna do a t-test.
So we'd make up some data

1161

00:48:22,000 --> 00:48:25,600

for a simple experiment, um,
feeding cattle

1162

00:48:25,600 --> 00:48:27,866

two different kinds of feed
and seeing

1163

00:48:27,866 --> 00:48:29,133

if there's differences
in weight.

1164

00:48:29,133 --> 00:48:31,100

That's for a t-test.

1165

00:48:31,100 --> 00:48:33,333

You know, I had to use
a specific example

1166
00:48:33,333 --> 00:48:36,333
of an experiment
I can totally understand

1167
00:48:36,333 --> 00:48:39,700
you know, on how to use
each different statistical test.

1168
00:48:39,700 --> 00:48:40,933
Then understanding
things like

1169
00:48:40,933 --> 00:48:43,333
discreet and continuous
variables.

1170
00:48:43,333 --> 00:48:46,266
I used to love to drive
the statistics teacher crazy.

1171
00:48:46,266 --> 00:48:48,233
I said, "What do you do
with a truck scale that weighs

1172
00:48:48,233 --> 00:48:52,066
in five pound increments?"
That's not continuous.

1173
00:48:52,066 --> 00:48:55,400
Weight's usually
a continuous variable.

1174
00:48:58,833 --> 00:49:00,600
Okay, all right.

1175
00:49:00,600 --> 00:49:04,066
- So please--please join me

in thanking Dr. Temple Grandin

1176

00:49:04,066 --> 00:49:05,533

for an excellent talk.

1177

00:49:05,533 --> 00:49:08,533

[applause]