



1
00:00:06,070 --> 00:00:03,429
uh welcome to the nasa and department of

2
00:00:08,950 --> 00:00:06,080
energy google plus hangout on find your

3
00:00:11,190 --> 00:00:08,960
stem role model i'm katie gallagher and

4
00:00:13,430 --> 00:00:11,200
we're very happy to have you all join us

5
00:00:15,350 --> 00:00:13,440
and like to give a special shout out to

6
00:00:16,950 --> 00:00:15,360
andrew jackson uh middle school in

7
00:00:18,710 --> 00:00:16,960
titusville florida and a thank you to

8
00:00:20,230 --> 00:00:18,720
mrs jones for allowing you guys to

9
00:00:23,349 --> 00:00:20,240
participate

10
00:00:25,029 --> 00:00:23,359
um we have a lot of really interesting

11
00:00:28,950 --> 00:00:25,039
women joining us today

12
00:00:32,310 --> 00:00:28,960
uh we have dr jill foos dr dot harris dr

13
00:00:34,150 --> 00:00:32,320

rebecca kaiser and dr shannon walker so

14

00:00:35,990 --> 00:00:34,160

i'm going to ask each of these ladies to

15

00:00:37,270 --> 00:00:36,000

introduce themselves to you and i'd like

16

00:00:39,430 --> 00:00:37,280

to start with

17

00:00:41,110 --> 00:00:39,440

dr dot harris could you please provide

18

00:00:43,590 --> 00:00:41,120

an introduction and a little bit of

19

00:00:46,310 --> 00:00:43,600

background on yourself

20

00:00:47,430 --> 00:00:46,320

hello everyone my name's don harris i'm

21

00:00:51,510 --> 00:00:47,440

here

22

00:00:53,830 --> 00:00:51,520

dc today i work with the department of

23

00:01:10,149 --> 00:00:53,840

energy i'm the director hey i think we

24

00:01:13,190 --> 00:01:11,109

looks like we're having a little bit of

25

00:01:14,950 --> 00:01:13,200

difficulty with energy here so

26

00:01:19,830 --> 00:01:14,960

should we move on to our next guest

27

00:01:24,870 --> 00:01:22,550

okay so um we're gonna try and get dot

28

00:01:26,390 --> 00:01:24,880

back on the system in the meantime uh dr

29

00:01:28,149 --> 00:01:26,400

rebecca kaiser who's here with me at

30

00:01:30,550 --> 00:01:28,159

nasa headquarters is going to introduce

31

00:01:33,109 --> 00:01:30,560

yourself hi everyone uh and thank you

32

00:01:37,109 --> 00:01:33,119

katie it's really a pleasure to be here

33

00:01:40,149 --> 00:01:37,119

i am at nasa i've been here for 15 years

34

00:01:42,390 --> 00:01:40,159

my title is one of the longest on record

35

00:01:44,789 --> 00:01:42,400

at nasa it's associate deputy

36

00:01:46,310 --> 00:01:44,799

administrator for strategy and policy

37

00:01:48,230 --> 00:01:46,320

and don't worry

38

00:01:49,350 --> 00:01:48,240

kids on the line we won't get tested on

39

00:01:52,550 --> 00:01:49,360

that after

40

00:01:55,030 --> 00:01:52,560

but i'm also the white house council on

41

00:01:57,910 --> 00:01:55,040

women and girls representative for nasa

42

00:01:59,830 --> 00:01:57,920

and so i do a lot with girls and women

43

00:02:01,510 --> 00:01:59,840

in science and technology engineering

44

00:02:03,590 --> 00:02:01,520

and math and it's wonderful to be here

45

00:02:05,270 --> 00:02:03,600

today

46

00:02:06,630 --> 00:02:05,280

thanks rebecca

47

00:02:10,309 --> 00:02:06,640

all right

48

00:02:13,830 --> 00:02:10,319

dr jill foose can you introduce yourself

49

00:02:15,670 --> 00:02:13,840

hi everyone can you hear me

50

00:02:17,110 --> 00:02:15,680

great

51
00:02:18,949 --> 00:02:17,120
good good

52
00:02:21,190 --> 00:02:18,959
so i'm a research scientist here at

53
00:02:24,470 --> 00:02:21,200
lawrence berkeley national laboratory

54
00:02:26,150 --> 00:02:24,480
and i work on uh the

55
00:02:27,750 --> 00:02:26,160
effect of the environment on human

56
00:02:30,070 --> 00:02:27,760
health

57
00:02:32,869 --> 00:02:30,080
i study the molecular machines that

58
00:03:02,790 --> 00:02:32,879
repair sunlight damage to your dna and

59
00:03:06,070 --> 00:03:04,070
all right if we can have astronaut

60
00:03:07,270 --> 00:03:06,080
shannon walker you can give us an

61
00:03:09,509 --> 00:03:07,280
introduction

62
00:03:11,350 --> 00:03:09,519
hello everyone i'm shannon walker i work

63
00:03:12,710 --> 00:03:11,360

at the johnson space center in houston

64

00:03:14,149 --> 00:03:12,720

i've actually worked at the johnson

65

00:03:16,229 --> 00:03:14,159

space center for

66

00:03:17,910 --> 00:03:16,239

a really long time about 27 years but

67

00:03:19,670 --> 00:03:17,920

i've been an astronaut for the last 10

68

00:03:24,390 --> 00:03:19,680

years and i'm really excited to talk

69

00:03:29,670 --> 00:03:25,750

wonderful and then

70

00:03:32,550 --> 00:03:31,589

good afternoon everyone can you hear me

71

00:03:34,309 --> 00:03:32,560

now

72

00:03:36,470 --> 00:03:34,319

yes

73

00:03:38,630 --> 00:03:36,480

all right well listen i'm here in dc and

74

00:03:40,789 --> 00:03:38,640

it's beautiful and sunny today i'm with

75

00:03:42,470 --> 00:03:40,799

the department of energy my position

76

00:03:45,030 --> 00:03:42,480

here i'm the director of the office of

77

00:03:47,030 --> 00:03:45,040

economic impact and diversity i have

78

00:03:48,789 --> 00:03:47,040

been here almost two years i had the

79

00:03:51,750 --> 00:03:48,799

pleasure of being nominated by our

80

00:03:54,070 --> 00:03:51,760

president and um to this role

81

00:03:56,309 --> 00:03:54,080

i'm actually an electrical engineer by

82

00:03:58,949 --> 00:03:56,319

degree i've worked in the private sector

83

00:04:02,390 --> 00:03:58,959

and industry for about 30 some years so

84

00:04:04,070 --> 00:04:02,400

i'm here now helping what do support

85

00:04:06,229 --> 00:04:04,080

girls in stem

86

00:04:09,190 --> 00:04:06,239

students and stem across the country

87

00:04:10,949 --> 00:04:09,200

supporting uh minority businesses as

88

00:04:13,270 --> 00:04:10,959

well as supporting

89

00:04:15,429 --> 00:04:13,280

all of the communities that which many

90

00:04:16,710 --> 00:04:15,439

of you live in across this country i'm

91

00:04:19,189 --> 00:04:16,720

very

92

00:04:21,670 --> 00:04:19,199

passionate about stem education and

93

00:04:23,110 --> 00:04:21,680

helping develop the stem workforce in

94

00:04:32,790 --> 00:04:23,120

this country

95

00:04:37,030 --> 00:04:34,790

okay that's it wonderful thank you all

96

00:04:38,790 --> 00:04:37,040

very much for these introductions uh so

97

00:04:41,030 --> 00:04:38,800

we're gonna go ahead and take our first

98

00:04:45,990 --> 00:04:41,040

question from andrew jackson middle

99

00:04:49,830 --> 00:04:47,189

um

100

00:04:52,150 --> 00:04:49,840

do you guys have anything

101
00:04:54,710 --> 00:04:52,160
how much do you think how much do you

102
00:04:59,110 --> 00:04:57,189
the next one anybody else sounds like we

103
00:05:00,950 --> 00:04:59,120
caught them off guard okay hold on a

104
00:05:02,629 --> 00:05:00,960
second here we're gonna go ahead and

105
00:05:04,230 --> 00:05:02,639
have a discussion about stem and stem

106
00:05:06,230 --> 00:05:04,240
careers here if everybody'd like to talk

107
00:05:08,070 --> 00:05:06,240
a little bit about how you got into the

108
00:05:10,469 --> 00:05:08,080
jobs and roles that you all are in now

109
00:05:12,469 --> 00:05:10,479
and what's exciting about having a stem

110
00:05:16,550 --> 00:05:12,479
career

111
00:05:24,790 --> 00:05:21,350
hi everybody so i i got into biology

112
00:05:26,469 --> 00:05:24,800
when i was in college i actually

113
00:05:28,150 --> 00:05:26,479

i didn't really like science when i was

114

00:05:29,909 --> 00:05:28,160

in high school surprisingly when i went

115

00:05:31,270 --> 00:05:29,919

to college i i wanted to go into

116

00:05:33,990 --> 00:05:31,280

business

117

00:05:36,390 --> 00:05:34,000

but i took a geology class when i was in

118

00:05:37,590 --> 00:05:36,400

college and i i really liked it and then

119

00:05:40,150 --> 00:05:37,600

i had

120

00:05:41,590 --> 00:05:40,160

the opportunity to go work in a lab one

121

00:05:44,790 --> 00:05:41,600

summer and i went and worked at the

122

00:05:47,350 --> 00:05:44,800

national institutes of health and it was

123

00:05:50,830 --> 00:05:47,360

a life-changing experience for me i

124

00:05:53,510 --> 00:05:50,840

loved working in the lab it was it was

125

00:05:55,990 --> 00:05:53,520

great what could i say it i still love

126
00:05:58,390 --> 00:05:56,000
working in the lab and so

127
00:06:00,310 --> 00:05:58,400
i went back to college and i continued

128
00:06:02,710 --> 00:06:00,320
my environmental studies our

129
00:06:05,189 --> 00:06:02,720
environmental science major and learned

130
00:06:07,430 --> 00:06:05,199
about rocks and the environment

131
00:06:12,070 --> 00:06:07,440
but i decided that i wanted to go into

132
00:06:15,990 --> 00:06:14,629
study how the environment affects human

133
00:06:17,590 --> 00:06:16,000
health and that's what i've been working

134
00:06:19,350 --> 00:06:17,600
on ever since

135
00:06:20,390 --> 00:06:19,360
i went to

136
00:06:22,230 --> 00:06:20,400
college at

137
00:06:23,590 --> 00:06:22,240
wesleyan university in connecticut and

138
00:06:26,390 --> 00:06:23,600

then i came

139

00:06:28,469 --> 00:06:26,400

out to california and did my

140

00:06:29,590 --> 00:06:28,479

phd at the university of california

141

00:06:32,230 --> 00:06:29,600

berkeley

142

00:06:34,790 --> 00:06:32,240

and i studied

143

00:06:37,189 --> 00:06:34,800

dna repair and replication when i was

144

00:06:39,350 --> 00:06:37,199

there and then i came up to lawrence

145

00:06:42,309 --> 00:06:39,360

berkeley national lab to do my postdoc

146

00:06:44,550 --> 00:06:42,319

and i went from a cell biology and

147

00:06:48,950 --> 00:06:44,560

enzymology background

148

00:06:51,670 --> 00:06:48,960

during my phd to a structural biology

149

00:06:53,270 --> 00:06:51,680

lab up here at berkeley lab and we

150

00:06:55,590 --> 00:06:53,280

actually try to figure out what

151
00:06:57,990 --> 00:06:55,600
molecules look like it's really exciting

152
00:06:59,589 --> 00:06:58,000
it's it's like going into a molecular

153
00:07:01,029 --> 00:06:59,599
world

154
00:07:03,589 --> 00:07:01,039
and and

155
00:07:05,749 --> 00:07:03,599
you know i i love doing what i do it's

156
00:07:09,189 --> 00:07:05,759
really exciting to to figure out how

157
00:07:10,950 --> 00:07:09,199
these molecular machines work

158
00:07:12,550 --> 00:07:10,960
so that's that's what i

159
00:07:15,110 --> 00:07:12,560
that's how i got here that's what i find

160
00:07:19,430 --> 00:07:16,950
okay uh we're back here at nasa

161
00:07:21,670 --> 00:07:19,440
headquarters um

162
00:07:25,029 --> 00:07:21,680
and i guess uh i'm just gonna catch up

163
00:07:27,350 --> 00:07:25,039

here a little bit so was that uh

164

00:07:28,469 --> 00:07:27,360

dr foose dr harris or dr walker i just

165

00:07:30,390 --> 00:07:28,479

heard

166

00:07:32,390 --> 00:07:30,400

that was me dr foose

167

00:07:33,990 --> 00:07:32,400

okay cool

168

00:07:35,510 --> 00:07:34,000

um

169

00:07:39,029 --> 00:07:35,520

so i'd like to give rebecca the chance

170

00:07:40,550 --> 00:07:39,039

to answer that question here which is uh

171

00:07:42,150 --> 00:07:40,560

how did you get into

172

00:07:44,469 --> 00:07:42,160

your career here

173

00:07:46,309 --> 00:07:44,479

so i probably have a different story

174

00:07:49,270 --> 00:07:46,319

from uh many of our other wonderful

175

00:07:51,909 --> 00:07:49,280

participants on the on the hangout today

176

00:07:54,150 --> 00:07:51,919

my background is international relations

177

00:07:57,029 --> 00:07:54,160

and i have a phd in international

178

00:07:59,909 --> 00:07:57,039

relations and i studied about japan

179

00:08:01,909 --> 00:07:59,919

and as i was doing my studies i received

180

00:08:03,670 --> 00:08:01,919

a fellowship

181

00:08:06,390 --> 00:08:03,680

and middle school students please look

182

00:08:08,950 --> 00:08:06,400

into this because it's great it's called

183

00:08:10,150 --> 00:08:08,960

the national security education program

184

00:08:12,309 --> 00:08:10,160

fellowship

185

00:08:15,430 --> 00:08:12,319

and it provided me with funding to do my

186

00:08:18,950 --> 00:08:15,440

studies in japan for my phd research

187

00:08:21,670 --> 00:08:18,960

in exchange for the funding um i

188

00:08:22,710 --> 00:08:21,680

did a year of service to the government

189

00:08:24,710 --> 00:08:22,720

and

190

00:08:26,469 --> 00:08:24,720

when i was looking around i was looking

191

00:08:29,110 --> 00:08:26,479

at your traditional international

192

00:08:30,790 --> 00:08:29,120

relations types of organizations like

193

00:08:31,830 --> 00:08:30,800

state department

194

00:08:36,790 --> 00:08:31,840

and

195

00:08:38,230 --> 00:08:36,800

department of defense

196

00:08:40,310 --> 00:08:38,240

nasa happened to be looking for

197

00:08:42,389 --> 00:08:40,320

international relations folks at that

198

00:08:45,110 --> 00:08:42,399

time because the international space

199

00:08:47,829 --> 00:08:45,120

station program was really ramping up

200

00:08:50,870 --> 00:08:47,839

and so they called me they interviewed

201
00:08:52,870 --> 00:08:50,880
me and i came to work for nasa in

202
00:08:55,110 --> 00:08:52,880
international relations

203
00:08:57,110 --> 00:08:55,120
i started doing the japan desk and then

204
00:08:58,310 --> 00:08:57,120
i moved into various policy positions

205
00:09:00,790 --> 00:08:58,320
for nasa

206
00:09:02,470 --> 00:09:00,800
that brought me to my position today so

207
00:09:04,470 --> 00:09:02,480
one of my main messages is there are a

208
00:09:06,870 --> 00:09:04,480
lot of different routes to come to work

209
00:09:09,430 --> 00:09:06,880
for a science and technology agency and

210
00:09:11,509 --> 00:09:09,440
a field uh even if you do policy if you

211
00:09:14,949 --> 00:09:11,519
do international relations any of those

212
00:09:16,790 --> 00:09:14,959
things pursue your passion

213
00:09:18,630 --> 00:09:16,800

excellent

214

00:09:20,150 --> 00:09:18,640

all right um

215

00:09:21,990 --> 00:09:20,160

correct me if i'm wrong ladies as i get

216

00:09:23,990 --> 00:09:22,000

caught up here uh

217

00:09:26,150 --> 00:09:24,000

i assume i assume we have now all

218

00:09:28,949 --> 00:09:26,160

answered that question um

219

00:09:30,630 --> 00:09:28,959

and if not let me know

220

00:09:32,550 --> 00:09:30,640

i haven't answered and i'd be happy to

221

00:09:35,750 --> 00:09:32,560

this is

222

00:09:38,470 --> 00:09:35,760

and uh the astronaut and so i started

223

00:09:40,150 --> 00:09:38,480

out i was born and raised in houston and

224

00:09:41,750 --> 00:09:40,160

houston is the home of the human space

225

00:09:43,269 --> 00:09:41,760

flight program and so i was always

226

00:09:44,710 --> 00:09:43,279

intrigued about what we were doing in

227

00:09:47,190 --> 00:09:44,720

space and i just thought it would be a

228

00:09:49,430 --> 00:09:47,200

fantastic thing to pursue

229

00:09:52,230 --> 00:09:49,440

i also really liked science growing up

230

00:09:54,550 --> 00:09:52,240

and so when i got older in high school

231

00:09:55,910 --> 00:09:54,560

and in college i decided i wanted to

232

00:09:58,550 --> 00:09:55,920

learn more about science and so

233

00:10:01,110 --> 00:09:58,560

eventually i ended up studying physics

234

00:10:03,350 --> 00:10:01,120

when i graduated from college i really

235

00:10:04,710 --> 00:10:03,360

wanted to be part of nasa and

236

00:10:07,190 --> 00:10:04,720

particularly the human space flight

237

00:10:09,910 --> 00:10:07,200

program and so i applied for and was

238

00:10:11,990 --> 00:10:09,920

very fortunate to be hired on to work in

239

00:10:13,750 --> 00:10:12,000

the control center here and so i spent

240

00:10:15,670 --> 00:10:13,760

the early part of my career actually

241

00:10:17,350 --> 00:10:15,680

working as an engineer even though my

242

00:10:19,509 --> 00:10:17,360

degree was in physics

243

00:10:20,710 --> 00:10:19,519

but working on part of the shuttle

244

00:10:22,389 --> 00:10:20,720

program

245

00:10:23,670 --> 00:10:22,399

i knew i wanted to keep pursuing being

246

00:10:25,430 --> 00:10:23,680

an astronaut because that was my

247

00:10:27,350 --> 00:10:25,440

ultimate goal so eventually i went back

248

00:10:29,430 --> 00:10:27,360

to school and got more education did

249

00:10:31,430 --> 00:10:29,440

more physics did space physics and then

250

00:10:33,750 --> 00:10:31,440

eventually came back to the johnson

251

00:10:35,269 --> 00:10:33,760

space center and finally finally after

252

00:10:36,710 --> 00:10:35,279

many many years was selected to be an

253

00:10:38,389 --> 00:10:36,720

astronaut and so

254

00:10:40,230 --> 00:10:38,399

as it was just said there's lots of ways

255

00:10:41,670 --> 00:10:40,240

to get into

256

00:10:43,670 --> 00:10:41,680

some of these fields that we work in

257

00:10:45,590 --> 00:10:43,680

there is no one right path and you just

258

00:10:48,470 --> 00:10:45,600

kind of have to follow your passions and

259

00:10:51,110 --> 00:10:48,480

keep after what you want to do

260

00:10:54,069 --> 00:10:51,120

okay and hi this is don harris i i would

261

00:10:56,150 --> 00:10:54,079

like to tell you about my story

262

00:10:57,509 --> 00:10:56,160

and i would love to i think i would love

263

00:10:59,350 --> 00:10:57,519

to frame it around

264

00:11:01,190 --> 00:10:59,360

sitting in the room i see a lot of girls

265

00:11:02,470 --> 00:11:01,200

in the room from the

266

00:11:05,030 --> 00:11:02,480

screenshot

267

00:11:07,350 --> 00:11:05,040

but i tell you i i was on a field trip

268

00:11:09,430 --> 00:11:07,360

in high school i was in the 10th grade

269

00:11:11,430 --> 00:11:09,440

my uh it was a field trip to this random

270

00:11:12,870 --> 00:11:11,440

river laboratories one of actually the

271

00:11:15,269 --> 00:11:12,880

department of energy laboratories

272

00:11:17,829 --> 00:11:15,279

located in aitkin south carolina

273

00:11:19,030 --> 00:11:17,839

i tell you until that i was planning on

274

00:11:21,269 --> 00:11:19,040

being an

275

00:11:23,350 --> 00:11:21,279

english teacher in high school but i

276

00:11:25,509 --> 00:11:23,360

have taken all of the

277

00:11:27,350 --> 00:11:25,519

pre-calculus physics and all the

278

00:11:29,269 --> 00:11:27,360

difficult courses in high school i

279

00:11:30,069 --> 00:11:29,279

actually skipped my senior year because

280

00:11:55,509 --> 00:11:30,079

i

281

00:11:57,590 --> 00:11:55,519

make

282

00:11:59,509 --> 00:11:57,600

the highest paid uh

283

00:12:01,030 --> 00:11:59,519

career coming out of college or still

284

00:12:03,430 --> 00:12:01,040

that of an engineer

285

00:12:05,110 --> 00:12:03,440

uh and so when you were you know if

286

00:12:08,310 --> 00:12:05,120

you're interested in the the money

287

00:12:10,470 --> 00:12:08,320

associated with with experience it also

288

00:12:12,790 --> 00:12:10,480

followed so i was a chemist i was

289

00:12:14,790 --> 00:12:12,800

interested in i went to university south

290

00:12:15,750 --> 00:12:14,800

carolina as electrical engineering

291

00:12:18,310 --> 00:12:15,760

student

292

00:12:20,550 --> 00:12:18,320

i did really well in school and i got

293

00:12:23,829 --> 00:12:20,560

out had 13 job offers so i had a little

294

00:12:25,750 --> 00:12:23,839

fun deciding which job i wanted to take

295

00:12:27,670 --> 00:12:25,760

so that was fascinating i had every

296

00:12:29,670 --> 00:12:27,680

offers everywhere from

297

00:12:31,590 --> 00:12:29,680

working with the space shuttle columbia

298

00:12:33,990 --> 00:12:31,600

team with nasa actually was one of those

299

00:12:36,150 --> 00:12:34,000

13 job offers i received but i decided

300

00:12:37,509 --> 00:12:36,160

to work for westinghouse electric where

301
00:12:39,829 --> 00:12:37,519
i could travel around the world i

302
00:12:41,829 --> 00:12:39,839
traveled to 18 different countries uh

303
00:12:44,310 --> 00:12:41,839
working at nuclear power plants as an

304
00:12:46,550 --> 00:12:44,320
electrical engineer i was a specialist

305
00:12:48,310 --> 00:12:46,560
in instrumentation and controls

306
00:12:49,990 --> 00:12:48,320
so when a power plant would go down

307
00:12:51,430 --> 00:12:50,000
around this country you know they lose

308
00:12:53,509 --> 00:12:51,440
quite a bit of bucks like a million

309
00:12:55,190 --> 00:12:53,519
dollars a day when they're down so i was

310
00:12:57,910 --> 00:12:55,200
that specialist that went and started

311
00:13:00,629 --> 00:12:57,920
these power plants up i worked for in

312
00:13:03,350 --> 00:13:00,639
corporate america got promoted through

313
00:13:06,310 --> 00:13:03,360

wealth i became an officer in a company

314

00:13:08,550 --> 00:13:06,320

abb and worked with general electric so

315

00:13:10,949 --> 00:13:08,560

all those kinds of um

316

00:13:12,629 --> 00:13:10,959

companies that support uh the energy

317

00:13:14,870 --> 00:13:12,639

industry so i have been in the energy

318

00:13:17,430 --> 00:13:14,880

industry my entire career

319

00:13:19,350 --> 00:13:17,440

so i'm so that was more my interest and

320

00:13:21,190 --> 00:13:19,360

how i got it interested and just like

321

00:13:23,509 --> 00:13:21,200

any of you a field trip could change

322

00:13:25,829 --> 00:13:23,519

your life it could really decide help

323

00:13:27,829 --> 00:13:25,839

you get into the stem field which is a

324

00:13:31,269 --> 00:13:27,839

well needed feel so we need all of you

325

00:13:32,550 --> 00:13:31,279

in that room to be part of this stem

326
00:13:34,790 --> 00:13:32,560
workforce

327
00:13:38,870 --> 00:13:34,800
thank you

328
00:13:41,509 --> 00:13:38,880
so that kind of segues into another good

329
00:13:43,910 --> 00:13:41,519
question you talked about the field trip

330
00:13:46,310 --> 00:13:43,920
that inspired you uh did you have any

331
00:13:48,310 --> 00:13:46,320
personal role models who really you know

332
00:13:50,150 --> 00:13:48,320
helped get you hooked and push you

333
00:13:52,870 --> 00:13:50,160
further in uh

334
00:13:54,550 --> 00:13:52,880
science technology and engineering

335
00:13:56,629 --> 00:13:54,560
well you know nicer

336
00:13:58,870 --> 00:13:56,639
yeah i guess my first role model was

337
00:14:00,310 --> 00:13:58,880
this my chemistry teacher miss crumb

338
00:14:02,949 --> 00:14:00,320

i'll never forget her

339

00:14:05,189 --> 00:14:02,959

he's the one that uh encouraged me after

340

00:14:07,670 --> 00:14:05,199

the field trip to get interested in

341

00:14:10,150 --> 00:14:07,680

engineering and then when i went through

342

00:14:12,710 --> 00:14:10,160

college i had a very um wonderful

343

00:14:15,110 --> 00:14:12,720

professor who kept us engaged and a lot

344

00:14:17,350 --> 00:14:15,120

of girls when we go into engineering we

345

00:14:20,069 --> 00:14:17,360

tend to be discouraged actually to

346

00:14:22,949 --> 00:14:20,079

continue to focus on engineering

347

00:14:24,470 --> 00:14:22,959

so i i was able to stay focused in

348

00:14:26,310 --> 00:14:24,480

school and do well

349

00:14:28,230 --> 00:14:26,320

and when i got out into the industry had

350

00:14:30,470 --> 00:14:28,240

some really good role models a lot of

351

00:14:32,389 --> 00:14:30,480

sponsors a lot of mentors

352

00:14:34,230 --> 00:14:32,399

and all of you even at your age in

353

00:14:36,150 --> 00:14:34,240

middle school go ahead and get a mentor

354

00:14:39,110 --> 00:14:36,160

that mentor could be your teacher

355

00:14:41,430 --> 00:14:39,120

someone out in the in the industry or or

356

00:14:43,590 --> 00:14:41,440

an engineer you may know or any any

357

00:14:45,829 --> 00:14:43,600

professional at your

358

00:14:47,509 --> 00:14:45,839

uncle or aunt whatever it may take but

359

00:14:50,069 --> 00:14:47,519

you get a mentor someone that can help

360

00:14:52,230 --> 00:14:50,079

and support you so that my mentors

361

00:14:57,750 --> 00:14:52,240

throughout my career were very critical

362

00:15:02,389 --> 00:14:59,590

excellent um

363

00:15:04,389 --> 00:15:02,399

dr foose or dr walker do you have

364

00:15:07,910 --> 00:15:04,399

anything to add as far as your uh

365

00:15:13,189 --> 00:15:10,949

well i can answer that i i don't i

366

00:15:14,710 --> 00:15:13,199

haven't had one single role model in my

367

00:15:16,629 --> 00:15:14,720

life um

368

00:15:18,629 --> 00:15:16,639

i've had lots of different role models i

369

00:15:21,350 --> 00:15:18,639

i often think it's a it's a tall order

370

00:15:23,829 --> 00:15:21,360

for a role model to fulfill all

371

00:15:25,030 --> 00:15:23,839

different things um that you admire but

372

00:15:27,750 --> 00:15:25,040

you know there have been people along

373

00:15:30,150 --> 00:15:27,760

the way that i've admired for um you

374

00:15:32,790 --> 00:15:30,160

know their creativity in science or how

375

00:15:34,870 --> 00:15:32,800

they ask questions or you know different

376

00:15:38,150 --> 00:15:34,880

skills that that i think they do really

377

00:15:39,990 --> 00:15:38,160

well and i'd like to emulate

378

00:15:41,829 --> 00:15:40,000

and i would agree that's kind of the way

379

00:15:43,670 --> 00:15:41,839

it is for me as well i i wouldn't say

380

00:15:46,150 --> 00:15:43,680

that there was a particular role model

381

00:15:47,670 --> 00:15:46,160

but i did have a lot of teachers uh when

382

00:15:49,509 --> 00:15:47,680

i was in school that shared their

383

00:15:52,470 --> 00:15:49,519

passions with me and that that meant a

384

00:15:54,470 --> 00:15:52,480

lot to me and then um when i got into

385

00:15:56,310 --> 00:15:54,480

the workforce uh

386

00:15:57,990 --> 00:15:56,320

just like dr foo says there's there's a

387

00:15:59,590 --> 00:15:58,000

lot of people that have different skill

388

00:16:00,550 --> 00:15:59,600

sets and you're like okay i want to i

389

00:16:02,230 --> 00:16:00,560

want to

390

00:16:04,230 --> 00:16:02,240

learn how to be like that person because

391

00:16:05,590 --> 00:16:04,240

i admire what they do there and maybe i

392

00:16:07,590 --> 00:16:05,600

want to pick up a different skill from

393

00:16:09,509 --> 00:16:07,600

somebody else so it really is a huge

394

00:16:11,430 --> 00:16:09,519

combination of people and always looking

395

00:16:13,110 --> 00:16:11,440

at everybody around me and seeing what

396

00:16:14,629 --> 00:16:13,120

people have to offer and then

397

00:16:17,829 --> 00:16:14,639

understanding their passions because

398

00:16:20,150 --> 00:16:17,839

their passions help feed my passions

399

00:16:23,670 --> 00:16:20,160

excellent dr kaiser i think

400

00:16:26,550 --> 00:16:23,680

so uh for me it was really the champions

401

00:16:28,870 --> 00:16:26,560

that i had at nasa and

402

00:16:31,030 --> 00:16:28,880

i'm a firm believer in champions

403

00:16:33,670 --> 00:16:31,040

both male and female champions and what

404

00:16:37,110 --> 00:16:33,680

i mean by that is that's those are the

405

00:16:37,990 --> 00:16:37,120

people who will take a chance on you

406

00:16:40,870 --> 00:16:38,000

they'll

407

00:16:42,629 --> 00:16:40,880

offer you up say put rebecca on that

408

00:16:45,030 --> 00:16:42,639

team even though she's only been here

409

00:16:46,949 --> 00:16:45,040

for a year because she can do it and i

410

00:16:49,189 --> 00:16:46,959

want to give her a chance

411

00:16:51,670 --> 00:16:49,199

so i had i was very fortunate here at

412

00:16:54,550 --> 00:16:51,680

nasa to have many champions

413

00:16:56,870 --> 00:16:54,560

my first boss angela diaz who hired me

414

00:17:00,389 --> 00:16:56,880

she took a chance on me to hire me here

415

00:17:02,389 --> 00:17:00,399

at nasa i did not have a space or an

416

00:17:04,150 --> 00:17:02,399

engineering or science background but i

417

00:17:06,870 --> 00:17:04,160

knew international relations i knew

418

00:17:08,549 --> 00:17:06,880

policy and i had a love of space so she

419

00:17:10,390 --> 00:17:08,559

took took a chance on me to bring me

420

00:17:16,470 --> 00:17:10,400

here

421

00:17:19,350 --> 00:17:16,480

the administrator suite

422

00:17:20,470 --> 00:17:19,360

two female deputy administrators shannon

423

00:17:22,789 --> 00:17:20,480

dale

424

00:17:24,710 --> 00:17:22,799

and then lori garver they both took a

425

00:17:25,590 --> 00:17:24,720

chance on me as well

426
00:17:28,470 --> 00:17:25,600
and

427
00:17:30,150 --> 00:17:28,480
when there were times where we had some

428
00:17:33,350 --> 00:17:30,160
quite challenging

429
00:17:36,230 --> 00:17:33,360
issues here at nasa that we had to face

430
00:17:38,230 --> 00:17:36,240
and we needed somebody to come in and

431
00:17:40,950 --> 00:17:38,240
write something really quickly that had

432
00:17:42,710 --> 00:17:40,960
to get out without a lot of review

433
00:17:45,029 --> 00:17:42,720
they said

434
00:17:47,510 --> 00:17:45,039
give rebecca a chance and let her do it

435
00:17:49,990 --> 00:17:47,520
and i appreciate that so much and i want

436
00:17:51,830 --> 00:17:50,000
to pass that on to early career folks

437
00:17:53,830 --> 00:17:51,840
here at nasa i think about that every

438
00:17:57,190 --> 00:17:53,840

day and i try to do that as much as i

439

00:17:59,350 --> 00:17:58,310

that's great

440

00:18:01,909 --> 00:17:59,360

um

441

00:18:03,029 --> 00:18:01,919

so before i ask more questions i know we

442

00:18:05,029 --> 00:18:03,039

have uh

443

00:18:07,270 --> 00:18:05,039

the kids at andrew jackson middle school

444

00:18:09,590 --> 00:18:07,280

online with us and i'd like to know if

445

00:18:12,830 --> 00:18:09,600

you guys have any questions for

446

00:18:16,230 --> 00:18:12,840

our astronauts and scientists and all

447

00:18:17,990 --> 00:18:16,240

um i believe is is mrs jones there with

448

00:18:19,430 --> 00:18:18,000

you do you guys have questions

449

00:18:20,470 --> 00:18:19,440

yes yes

450

00:18:23,990 --> 00:18:20,480

okay

451
00:18:26,070 --> 00:18:24,000
my name is cindy hsn and my question is

452
00:18:29,830 --> 00:18:26,080
what is the job outlook 10 years from

453
00:18:35,029 --> 00:18:31,590
do you want to go sure so this is

454
00:18:37,830 --> 00:18:35,039
rebecca and uh here at nasa

455
00:18:38,950 --> 00:18:37,840
we have so many different opportunities

456
00:18:41,270 --> 00:18:38,960
coming up

457
00:18:43,510 --> 00:18:41,280
we're embarking on this great plan for

458
00:18:46,230 --> 00:18:43,520
space exploration and for scientific

459
00:18:47,990 --> 00:18:46,240
research and technology development

460
00:18:51,270 --> 00:18:48,000
and we need you

461
00:18:53,590 --> 00:18:51,280
so please do look at focusing on science

462
00:18:55,590 --> 00:18:53,600
and technology engineering and math we

463
00:18:58,950 --> 00:18:55,600

have opportunities that will be coming

464

00:19:01,510 --> 00:18:58,960

up for engineers for researchers for

465

00:19:05,510 --> 00:19:01,520

those on the ground who want to test

466

00:19:07,350 --> 00:19:05,520

rockets who want to help develop robots

467

00:19:09,350 --> 00:19:07,360

and so we're looking at a really

468

00:19:10,630 --> 00:19:09,360

positive outlook

469

00:19:12,950 --> 00:19:10,640

at nasa

470

00:19:15,510 --> 00:19:12,960

in science technology engineering and

471

00:19:17,669 --> 00:19:15,520

math i also want to put a plug out to

472

00:19:19,909 --> 00:19:17,679

all of our industry partners

473

00:19:22,549 --> 00:19:19,919

and our commercial partners we work with

474

00:19:24,950 --> 00:19:22,559

we work with a lot of companies

475

00:19:27,350 --> 00:19:24,960

that are partnering with us to fly the

476

00:19:30,150 --> 00:19:27,360

next generation of rockets both to the

477

00:19:31,830 --> 00:19:30,160

space station and deeper into space and

478

00:19:33,350 --> 00:19:31,840

they're looking for wonderful people in

479

00:19:35,750 --> 00:19:33,360

science and technology engineering and

480

00:19:38,150 --> 00:19:35,760

math as well so it's a wonderful thing

481

00:19:40,230 --> 00:19:38,160

we need more american students to go

482

00:19:42,549 --> 00:19:40,240

into science and technology engineering

483

00:19:44,549 --> 00:19:42,559

and math so it's a really growing and

484

00:19:45,990 --> 00:19:44,559

positive field

485

00:19:49,190 --> 00:19:46,000

thank you

486

00:19:52,310 --> 00:19:50,870

if you guys have a question switch these

487

00:19:54,549 --> 00:19:52,320

real

488

00:19:57,750 --> 00:19:54,559

can i answer that last question yes

489

00:20:00,150 --> 00:19:57,760

please do at berkeley lab so i just like

490

00:20:03,270 --> 00:20:00,160

to say that i think you know we're

491

00:20:05,270 --> 00:20:03,280

entering the age of biology there's so

492

00:20:07,669 --> 00:20:05,280

little that we know about how biological

493

00:20:10,549 --> 00:20:07,679

systems work how

494

00:20:11,830 --> 00:20:10,559

the human body works how microbes work

495

00:20:13,669 --> 00:20:11,840

and how they interact with their

496

00:20:15,830 --> 00:20:13,679

environment

497

00:20:17,990 --> 00:20:15,840

that i think you know the technologies

498

00:20:19,590 --> 00:20:18,000

that we have available to us today and

499

00:20:21,830 --> 00:20:19,600

the technologies that are being

500

00:20:23,590 --> 00:20:21,840

developed are going to allow us to

501

00:20:25,909 --> 00:20:23,600

answer

502

00:20:29,029 --> 00:20:25,919

interesting questions lots of new

503

00:20:31,750 --> 00:20:29,039

questions um and there's there's so much

504

00:20:34,070 --> 00:20:31,760

that we don't know about biology

505

00:20:36,789 --> 00:20:34,080

that 10 years from now there will be

506

00:20:41,830 --> 00:20:36,799

still amazing opportunities for doing

507

00:20:46,630 --> 00:20:44,230

my name is brandon becker and i'm into

508

00:20:50,149 --> 00:20:46,640

space exploration

509

00:20:53,909 --> 00:20:50,159

and i was wondering how

510

00:20:57,990 --> 00:20:55,990

are we going to get to mars well there's

511

00:20:59,029 --> 00:20:58,000

the regular conventional way to get to

512

00:21:01,029 --> 00:20:59,039

mars is

513

00:21:02,630 --> 00:21:01,039

get on a rocket and fly to mars and

514

00:21:04,230 --> 00:21:02,640

build a habitat there and then do your

515

00:21:06,470 --> 00:21:04,240

science while you're on mars the

516

00:21:08,470 --> 00:21:06,480

difficulty with that is with our current

517

00:21:11,110 --> 00:21:08,480

technology it takes a really long time

518

00:21:13,510 --> 00:21:11,120

to get to mars it'd be better to spend

519

00:21:16,310 --> 00:21:13,520

uh time on the surface of mars doing

520

00:21:17,990 --> 00:21:16,320

whatever science you need to do there um

521

00:21:19,350 --> 00:21:18,000

during during a particular mission

522

00:21:21,510 --> 00:21:19,360

rather than spending all your time

523

00:21:23,110 --> 00:21:21,520

coming and going and so what i'm hopeful

524

00:21:24,710 --> 00:21:23,120

is that we'll be able to develop new

525

00:21:26,470 --> 00:21:24,720

technologies have different types of

526

00:21:28,470 --> 00:21:26,480

rockets instead of the conventional

527

00:21:30,470 --> 00:21:28,480

rockets that we have now to get us to

528

00:21:32,789 --> 00:21:30,480

mars a whole bunch quicker so we can

529

00:21:34,390 --> 00:21:32,799

spend more time there um exploring the

530

00:21:39,110 --> 00:21:34,400

surface of mars

531

00:21:40,549 --> 00:21:39,120

maybe we can make a space gas station

532

00:21:42,470 --> 00:21:40,559

we will need a space gas station

533

00:21:44,390 --> 00:21:42,480

absolutely because you know you got to

534

00:21:46,390 --> 00:21:44,400

have fuel for your rockets and your uh

535

00:21:49,430 --> 00:21:46,400

all your equipment and so we need some

536

00:21:51,909 --> 00:21:49,440

kind of gas station or solar power or

537

00:21:54,630 --> 00:21:51,919

something to give us the energy to need

538

00:21:57,430 --> 00:21:54,640

to to run our machines absolutely like

539

00:22:00,149 --> 00:21:57,440

instead of making two trip instead of

540

00:22:02,549 --> 00:22:00,159

making one trip maybe we can jump to the

541

00:22:04,070 --> 00:22:02,559

moon and then go to mars

542

00:22:05,510 --> 00:22:04,080

yep you bet and there's all kinds of

543

00:22:07,510 --> 00:22:05,520

ways to get there there's all kinds of

544

00:22:09,270 --> 00:22:07,520

ways to position equipment between here

545

00:22:11,750 --> 00:22:09,280

and there there's all kinds of ways say

546

00:22:13,510 --> 00:22:11,760

do we take one big rocket do we take 16

547

00:22:15,110 --> 00:22:13,520

small rockets how do we do it and that's

548

00:22:17,029 --> 00:22:15,120

part of the puzzle that we're trying to

549

00:22:18,630 --> 00:22:17,039

figure out what's the best way to get to

550

00:22:22,070 --> 00:22:18,640

mars and how do we make the most of it

551
00:22:27,830 --> 00:22:24,710
okay hi i'm christina

552
00:22:29,909 --> 00:22:27,840
um what type of project does

553
00:22:35,190 --> 00:22:29,919
each of

554
00:22:39,270 --> 00:22:37,110
um

555
00:22:41,750 --> 00:22:39,280
it might be for dr fuss to answer yeah i

556
00:22:42,630 --> 00:22:41,760
think dr foose if you could start

557
00:22:46,390 --> 00:22:42,640
sure

558
00:22:48,870 --> 00:22:46,400
so what i study is is how our cells

559
00:22:50,950 --> 00:22:48,880
repair damage to their dna so when you

560
00:22:53,510 --> 00:22:50,960
go out in the sunlight

561
00:22:55,750 --> 00:22:53,520
that sun is actually damaging your dna

562
00:22:58,470 --> 00:22:55,760
and you have all these proteins and

563
00:23:00,870 --> 00:22:58,480

enzymes in your body that

564

00:23:03,510 --> 00:23:00,880

cells that go in and they're little

565

00:23:05,350 --> 00:23:03,520

machines that fix that damage

566

00:23:08,630 --> 00:23:05,360

and it's a really important system

567

00:23:10,390 --> 00:23:08,640

because if you that system isn't working

568

00:23:13,110 --> 00:23:10,400

and there are people

569

00:23:15,350 --> 00:23:13,120

that have mutations in the proteins that

570

00:23:17,909 --> 00:23:15,360

do that work

571

00:23:18,950 --> 00:23:17,919

they get a very high incidence of skin

572

00:23:21,590 --> 00:23:18,960

cancer

573

00:23:25,350 --> 00:23:21,600

so it's really important to understand

574

00:23:27,510 --> 00:23:25,360

how those those systems work

575

00:23:30,230 --> 00:23:27,520

and what i do is i try to figure out

576

00:23:33,110 --> 00:23:30,240

what those little molecular machines

577

00:23:35,430 --> 00:23:33,120

look like how they work how they

578

00:23:36,870 --> 00:23:35,440

sit on the dna

579

00:23:38,870 --> 00:23:36,880

and

580

00:23:41,750 --> 00:23:38,880

one of the proteins that i work on

581

00:23:44,070 --> 00:23:41,760

actually has iron in it

582

00:23:47,029 --> 00:23:44,080

lots of proteins use metals

583

00:23:48,310 --> 00:23:47,039

to do the work that they do or to

584

00:23:52,230 --> 00:23:48,320

organize

585

00:23:55,110 --> 00:23:52,240

their structure and actually behind me

586

00:23:58,470 --> 00:23:55,120

there's this crazy piece of equipment

587

00:24:02,390 --> 00:23:58,480

um that uh is an anaerobic glove box and

588

00:24:04,710 --> 00:24:02,400

so it's there's no oxygen in that box

589

00:24:07,590 --> 00:24:04,720

and that helps us prepare the proteins

590

00:24:09,750 --> 00:24:07,600

that have iron in them because iron is

591

00:24:12,310 --> 00:24:09,760

oxygen sensitive so if you have iron

592

00:24:14,549 --> 00:24:12,320

that's sitting outside it it oxidizes

593

00:24:18,070 --> 00:24:14,559

well the same thing happens to that iron

594

00:24:20,870 --> 00:24:18,080

in the proteins in your cells and so we

595

00:24:22,710 --> 00:24:20,880

have special equipment to allow us to to

596

00:24:24,470 --> 00:24:22,720

look at these proteins and and to

597

00:24:27,029 --> 00:24:24,480

prepare them

598

00:24:29,750 --> 00:24:27,039

and we're able to see what they look

599

00:24:31,669 --> 00:24:29,760

like using this amazing user user

600

00:24:33,510 --> 00:24:31,679

facility here at berkeley lab called the

601
00:24:36,470 --> 00:24:33,520
advanced light source

602
00:24:39,190 --> 00:24:36,480
um so that is that spins electrons

603
00:24:41,110 --> 00:24:39,200
around in a circle really really fast

604
00:24:44,390 --> 00:24:41,120
and then we bend them with magnets and

605
00:24:46,789 --> 00:24:44,400
we're able to send uh x-rays out to uh

606
00:24:48,630 --> 00:24:46,799
protein samples and when those x-rays

607
00:24:50,710 --> 00:24:48,640
hit the protein samples they they

608
00:24:52,789 --> 00:24:50,720
scatter that light

609
00:24:54,950 --> 00:24:52,799
and we're able to figure out what

610
00:24:57,590 --> 00:24:54,960
proteins look like using that pattern

611
00:25:00,470 --> 00:24:57,600
and a lot of math

612
00:25:01,909 --> 00:25:00,480
but we have computers to do the math and

613
00:25:04,549 --> 00:25:01,919

so we're able to see what the proteins

614

00:25:07,029 --> 00:25:04,559

look like and figure out what they do

615

00:25:13,269 --> 00:25:07,039

okay i have a second question

616

00:25:16,549 --> 00:25:15,110

uh who wants to speak on who is an

617

00:25:18,390 --> 00:25:16,559

engineer um

618

00:25:19,269 --> 00:25:18,400

i would love to answer that question all

619

00:25:22,149 --> 00:25:19,279

right

620

00:25:24,549 --> 00:25:22,159

go for it um i'm actually an electrical

621

00:25:26,070 --> 00:25:24,559

engineer and an engineer a little

622

00:25:28,630 --> 00:25:26,080

different than the scientists you know

623

00:25:30,950 --> 00:25:28,640

with the research and and theory but us

624

00:25:32,870 --> 00:25:30,960

engineers are practical kind of boys and

625

00:25:35,350 --> 00:25:32,880

girls we go out and actually build and

626
00:25:36,310 --> 00:25:35,360
design things that actually that you

627
00:25:38,789 --> 00:25:36,320
actually

628
00:25:39,909 --> 00:25:38,799
ride as in a car as a mechanical

629
00:25:41,110 --> 00:25:39,919
engineer

630
00:25:42,950 --> 00:25:41,120
or a

631
00:25:45,029 --> 00:25:42,960
chemical engineer that actually helped

632
00:25:45,830 --> 00:25:45,039
develop some new

633
00:25:48,549 --> 00:25:45,840
new

634
00:25:50,950 --> 00:25:48,559
chemical that actually you can use in in

635
00:25:52,630 --> 00:25:50,960
your everyday life so engineers are more

636
00:25:55,190 --> 00:25:52,640
practical

637
00:25:57,350 --> 00:25:55,200
folks that actually take the technology

638
00:26:00,549 --> 00:25:57,360

and the research that has been developed

639

00:26:02,149 --> 00:26:00,559

and apply it we have applied scientists

640

00:26:04,549 --> 00:26:02,159

engineering is more of an applied

641

00:26:08,230 --> 00:26:04,559

science so we take science and apply it

642

00:26:12,710 --> 00:26:10,310

we always talk here at nasa how we need

643

00:26:15,590 --> 00:26:12,720

both engineers and scientists because

644

00:26:17,269 --> 00:26:15,600

they work together scientists ask lots

645

00:26:20,470 --> 00:26:17,279

and lots of questions and try to do

646

00:26:22,789 --> 00:26:20,480

research to uh to ask even more

647

00:26:24,230 --> 00:26:22,799

questions and then the engineers are at

648

00:26:25,669 --> 00:26:24,240

the other end of the spectrum where

649

00:26:27,110 --> 00:26:25,679

they're trying to solve the problems

650

00:26:29,269 --> 00:26:27,120

that many of the

651
00:26:30,470 --> 00:26:29,279
many of the scientists are raising

652
00:26:31,909 --> 00:26:30,480
okay

653
00:26:34,710 --> 00:26:31,919
um

654
00:26:36,390 --> 00:26:34,720
i'm going to go students they're

655
00:26:37,830 --> 00:26:36,400
the andrew jackson students i'm going to

656
00:26:40,070 --> 00:26:37,840
come back to you in a little bit we have

657
00:26:41,669 --> 00:26:40,080
a couple questions from some other folks

658
00:26:42,789 --> 00:26:41,679
online i believe these came in over

659
00:26:45,430 --> 00:26:42,799
twitter

660
00:26:47,590 --> 00:26:45,440
uh jessica kennedy asked did you face

661
00:26:49,909 --> 00:26:47,600
any challenges unique to female students

662
00:26:51,430 --> 00:26:49,919
in pursuing your stem careers

663
00:26:53,350 --> 00:26:51,440

um

664

00:26:54,630 --> 00:26:53,360

rebecca i see you nodding do you want to

665

00:26:57,430 --> 00:26:54,640

go first

666

00:27:00,390 --> 00:26:57,440

well i was in uh international relations

667

00:27:02,710 --> 00:27:00,400

of course uh but i'll convey a story

668

00:27:04,630 --> 00:27:02,720

that that's laughable and shannon

669

00:27:07,510 --> 00:27:04,640

probably has some more on the ground

670

00:27:08,789 --> 00:27:07,520

kind of experience to share as well

671

00:27:11,590 --> 00:27:08,799

but

672

00:27:15,590 --> 00:27:11,600

just recently even here at nasa

673

00:27:17,350 --> 00:27:15,600

i gave a talk on women in stem

674

00:27:20,149 --> 00:27:17,360

and

675

00:27:22,070 --> 00:27:20,159

a gentleman who's an engineer he happens

676
00:27:24,390 --> 00:27:22,080
to be an engineer

677
00:27:25,830 --> 00:27:24,400
and he came up to me afterwards and said

678
00:27:27,990 --> 00:27:25,840
rebecca

679
00:27:30,070 --> 00:27:28,000
maybe you just have to face the fact

680
00:27:31,669 --> 00:27:30,080
that men's brains and women's brains are

681
00:27:34,230 --> 00:27:31,679
just different

682
00:27:36,310 --> 00:27:34,240
and it's just that women might not have

683
00:27:38,390 --> 00:27:36,320
the brain capacity to go into science

684
00:27:39,830 --> 00:27:38,400
and engineering

685
00:27:42,470 --> 00:27:39,840
so um

686
00:27:44,070 --> 00:27:42,480
my response to him was that that was

687
00:27:46,390 --> 00:27:44,080
very interesting

688
00:27:49,029 --> 00:27:46,400

because if you look at many of the

689

00:27:50,950 --> 00:27:49,039

accomplished scientists and engineers in

690

00:27:52,789 --> 00:27:50,960

the united states and around the world

691

00:27:55,110 --> 00:27:52,799

they're both male and female so it

692

00:27:56,870 --> 00:27:55,120

doesn't seem to make sense to me

693

00:27:58,389 --> 00:27:56,880

and you look at many countries around

694

00:28:02,149 --> 00:27:58,399

the world and they're actually more

695

00:28:04,789 --> 00:28:02,159

women going into science fields than men

696

00:28:06,789 --> 00:28:04,799

so it was really puzzling the way i take

697

00:28:09,110 --> 00:28:06,799

those kinds of comments

698

00:28:11,190 --> 00:28:09,120

is as a learning experience

699

00:28:14,389 --> 00:28:11,200

that we still have a lot more

700

00:28:16,549 --> 00:28:14,399

communication and education to do in

701

00:28:19,750 --> 00:28:16,559

this country and elsewhere

702

00:28:21,750 --> 00:28:19,760

to make everyone understand that science

703

00:28:23,909 --> 00:28:21,760

and technology and engineering and math

704

00:28:26,789 --> 00:28:23,919

are not male or female

705

00:28:29,269 --> 00:28:26,799

they are wonderful exploratory subjects

706

00:28:32,389 --> 00:28:29,279

that anyone can do and the secret is

707

00:28:34,710 --> 00:28:32,399

just being passionate about it and again

708

00:28:37,430 --> 00:28:34,720

getting champions and role models so

709

00:28:39,269 --> 00:28:37,440

that you can follow and understand what

710

00:28:41,669 --> 00:28:39,279

others do in this field it's it's a

711

00:28:43,909 --> 00:28:41,679

wonderful thing to do

712

00:28:45,830 --> 00:28:43,919

and i love the jumping on this one since

713

00:28:47,350 --> 00:28:45,840

i've virtually lived my whole life with

714

00:28:48,950 --> 00:28:47,360

this issue

715

00:28:50,630 --> 00:28:48,960

uh being uh

716

00:28:52,070 --> 00:28:50,640

you know coming out as and i worked in a

717

00:28:53,590 --> 00:28:52,080

nuclear industry so there were only a

718

00:28:56,070 --> 00:28:53,600

handful of women out there in the

719

00:28:57,430 --> 00:28:56,080

nuclear industry uh so not only did we

720

00:28:58,789 --> 00:28:57,440

have to deal with

721

00:29:01,029 --> 00:28:58,799

whether we're

722

00:29:02,710 --> 00:29:01,039

we're technically capable but just being

723

00:29:05,590 --> 00:29:02,720

an environment with not a lot of lots of

724

00:29:08,310 --> 00:29:05,600

women and some of the stats only 24 of

725

00:29:11,430 --> 00:29:08,320

the stem workforce is actually female

726
00:29:13,430 --> 00:29:11,440
whereas over 51 of the workforce overall

727
00:29:15,269 --> 00:29:13,440
is that of a female so we need more

728
00:29:17,269 --> 00:29:15,279
females in the stem

729
00:29:20,070 --> 00:29:17,279
science technology engineering and math

730
00:29:22,310 --> 00:29:20,080
field um we all we have those we run

731
00:29:24,389 --> 00:29:22,320
across those obstacles not even after we

732
00:29:27,269 --> 00:29:24,399
get in in the industry but even going

733
00:29:29,350 --> 00:29:27,279
through college and as young women in

734
00:29:30,789 --> 00:29:29,360
college when you in stem careers you

735
00:29:32,870 --> 00:29:30,799
tend not to be

736
00:29:34,549 --> 00:29:32,880
uh supported as much as we should when

737
00:29:37,110 --> 00:29:34,559
we're even with the professors just

738
00:29:39,269 --> 00:29:37,120

discouraging us to continue in in the

739

00:29:41,990 --> 00:29:39,279

science field so it's something that we

740

00:29:44,389 --> 00:29:42,000

really uh continue to unfortunately in

741

00:29:47,510 --> 00:29:44,399

2014 having some of the same obstacles i

742

00:29:49,830 --> 00:29:47,520

i dealt with 30 some years ago

743

00:29:50,710 --> 00:29:49,840

the number of women in stem we need

744

00:29:52,310 --> 00:29:50,720

women

745

00:29:54,230 --> 00:29:52,320

all across this country all across this

746

00:29:57,029 --> 00:29:54,240

globe to keep us just competitive in

747

00:29:58,870 --> 00:29:57,039

this country and technology will rule

748

00:30:01,110 --> 00:29:58,880

the world going forward i say that every

749

00:30:03,510 --> 00:30:01,120

day so it's important that we need

750

00:30:05,190 --> 00:30:03,520

everyone women minorities all groups

751

00:30:07,590 --> 00:30:05,200

across this globe all the groups across

752

00:30:10,789 --> 00:30:07,600

this country in order to make the impact

753

00:30:11,830 --> 00:30:10,799

that we need in stem

754

00:30:16,630 --> 00:30:11,840

and

755

00:30:18,070 --> 00:30:16,640

well this is uh jill over at brickley

756

00:30:18,870 --> 00:30:18,080

lab so

757

00:30:19,669 --> 00:30:18,880

um

758

00:30:21,669 --> 00:30:19,679

my

759

00:30:24,630 --> 00:30:21,679

i had a really early experience where i

760

00:30:26,549 --> 00:30:24,640

was taking organic chemistry and the we

761

00:30:29,510 --> 00:30:26,559

were getting our exams back and the

762

00:30:30,630 --> 00:30:29,520

professor was handing out exams

763

00:30:33,269 --> 00:30:30,640

and

764

00:30:35,669 --> 00:30:33,279

you know recognized a male student who

765

00:30:37,350 --> 00:30:35,679

had gotten 100 on the exam and it seemed

766

00:30:39,990 --> 00:30:37,360

like he went on for five minutes about

767

00:30:41,909 --> 00:30:40,000

how wonderful this this student was

768

00:30:44,950 --> 00:30:41,919

and then we got our exams back and i got

769

00:30:46,710 --> 00:30:44,960

my back and i had 100 too and i i

770

00:30:47,590 --> 00:30:46,720

thought why didn't he say anything about

771

00:30:51,510 --> 00:30:47,600

me

772

00:30:54,470 --> 00:30:51,520

realized that

773

00:30:57,029 --> 00:30:54,480

i just might not get the recognition um

774

00:30:58,950 --> 00:30:57,039

that other people might get and so i

775

00:31:01,909 --> 00:30:58,960

decided you know that i would just i

776

00:31:04,950 --> 00:31:01,919

would forge ahead um i'm pretty stubborn

777

00:31:07,669 --> 00:31:04,960

i'd start served me pretty well and so i

778

00:31:10,310 --> 00:31:07,679

you know i i just forage on and uh and

779

00:31:13,269 --> 00:31:10,320

do what i love to do um and and that's

780

00:31:15,029 --> 00:31:13,279

doing research in the lab

781

00:31:16,789 --> 00:31:15,039

and this is shannon at the johnson space

782

00:31:19,669 --> 00:31:16,799

center and i would agree a lot with jill

783

00:31:21,750 --> 00:31:19,679

and and um sometimes you have you

784

00:31:22,549 --> 00:31:21,760

encounter people that say silly things

785

00:31:24,149 --> 00:31:22,559

like

786

00:31:26,389 --> 00:31:24,159

women can't you know they don't have the

787

00:31:28,230 --> 00:31:26,399

brains for it and or just just say

788

00:31:29,750 --> 00:31:28,240

inappropriate things and i i just forge

789

00:31:31,190 --> 00:31:29,760

ahead i tend to ignore people that

790

00:31:33,750 --> 00:31:31,200

they're clearly

791

00:31:36,470 --> 00:31:33,760

um well in most cases like this just

792

00:31:38,230 --> 00:31:36,480

talking nonsense and tend to follow my

793

00:31:39,669 --> 00:31:38,240

passions because i know if i'm doing

794

00:31:41,350 --> 00:31:39,679

something that i'm interested in i'm

795

00:31:44,549 --> 00:31:41,360

going to be good at it and then i will

796

00:31:47,029 --> 00:31:44,559

just prove them wrong by my actions and

797

00:31:49,110 --> 00:31:47,039

so i don't tend to engage in in

798

00:31:51,830 --> 00:31:49,120

discussions with them or argue with

799

00:31:54,549 --> 00:31:51,840

people that that say um

800

00:31:57,430 --> 00:31:54,559

say things that are denigrating to women

801
00:31:59,430 --> 00:31:57,440
i just go ahead about my day and and

802
00:32:01,190 --> 00:31:59,440
prove them wrong through my actions

803
00:32:02,789 --> 00:32:01,200
well let me just give you guys a stat

804
00:32:05,269 --> 00:32:02,799
the next time you get someone to tell

805
00:32:07,269 --> 00:32:05,279
you that it has been scientifically

806
00:32:10,230 --> 00:32:07,279
proven that a woman's iq is actually

807
00:32:11,909 --> 00:32:10,240
five points higher than a man

808
00:32:14,230 --> 00:32:11,919
so you can throw that out next time you

809
00:32:17,190 --> 00:32:14,240
get that

810
00:32:18,389 --> 00:32:17,200
i'll remember to tell my brothers that

811
00:32:21,350 --> 00:32:18,399
um

812
00:32:24,310 --> 00:32:21,360
and so you you ladies all touched on uh

813
00:32:26,950 --> 00:32:24,320

times in your uh career where you'd been

814

00:32:28,710 --> 00:32:26,960

discouraged uh based on the fact that

815

00:32:31,430 --> 00:32:28,720

you're a woman uh so this kind of

816

00:32:33,190 --> 00:32:31,440

relates to a question from mark loundy

817

00:32:35,750 --> 00:32:33,200

online i think i've got this right um

818

00:32:38,789 --> 00:32:35,760

and he asks are there special challenges

819

00:32:40,870 --> 00:32:38,799

to inspiring girls as opposed to boys to

820

00:32:42,870 --> 00:32:40,880

work in science techno technology

821

00:32:45,350 --> 00:32:42,880

engineering and mathematics

822

00:32:46,789 --> 00:32:45,360

and dr kaiser sure

823

00:32:53,590 --> 00:32:46,799

so

824

00:32:55,110 --> 00:32:53,600

true that stem is not a male or a female

825

00:32:57,750 --> 00:32:55,120

field

826

00:33:00,149 --> 00:32:57,760

we have a culture however that doesn't

827

00:33:02,710 --> 00:33:00,159

show a lot of women in science and

828

00:33:03,830 --> 00:33:02,720

technology in engineering if you turn on

829

00:33:05,750 --> 00:33:03,840

tv

830

00:33:08,070 --> 00:33:05,760

uh i know here at nasa we were so

831

00:33:10,389 --> 00:33:08,080

excited that there was a great female

832

00:33:13,029 --> 00:33:10,399

character on big bang theory right

833

00:33:15,190 --> 00:33:13,039

because it shows a female right who's

834

00:33:18,549 --> 00:33:15,200

who's in this field

835

00:33:20,630 --> 00:33:18,559

so we need to encourage more girls to go

836

00:33:21,830 --> 00:33:20,640

into it even though we have a culture

837

00:33:25,590 --> 00:33:21,840

that might

838

00:33:28,710 --> 00:33:25,600

say these things aren't cool

839

00:33:30,310 --> 00:33:28,720

and we also have an added barrier

840

00:33:33,750 --> 00:33:30,320

that

841

00:33:36,389 --> 00:33:33,760

right now because as dot said we have

842

00:33:38,389 --> 00:33:36,399

very fewer women who are in science and

843

00:33:40,389 --> 00:33:38,399

technology in the workforce

844

00:33:41,750 --> 00:33:40,399

that means that we have fewer women who

845

00:33:43,430 --> 00:33:41,760

are studying these things at the

846

00:33:44,470 --> 00:33:43,440

university level

847

00:33:46,789 --> 00:33:44,480

and so

848

00:33:48,310 --> 00:33:46,799

in classes and engineering classes in

849

00:33:50,230 --> 00:33:48,320

particular

850

00:33:51,669 --> 00:33:50,240

a female might be the only female in

851
00:33:54,870 --> 00:33:51,679
that whole class

852
00:33:56,470 --> 00:33:54,880
and that does present certain challenges

853
00:33:58,789 --> 00:33:56,480
so what do we need to do we need to

854
00:34:00,630 --> 00:33:58,799
start early on we need to start at

855
00:34:01,990 --> 00:34:00,640
elementary school and middle school we

856
00:34:04,630 --> 00:34:02,000
have to show that these things are

857
00:34:06,870 --> 00:34:04,640
really cool and they are really fun we

858
00:34:08,389 --> 00:34:06,880
have to get more girls to go into these

859
00:34:10,389 --> 00:34:08,399
things in college

860
00:34:12,790 --> 00:34:10,399
and then encourage them through

861
00:34:16,069 --> 00:34:12,800
mentorship and champions to actually go

862
00:34:20,069 --> 00:34:16,079
into the field afterwards

863
00:34:21,030 --> 00:34:20,079

very good uh dr harris

864

00:34:23,510 --> 00:34:21,040

dot

865

00:34:24,710 --> 00:34:23,520

yes i'm here

866

00:34:25,829 --> 00:34:24,720

um

867

00:34:27,510 --> 00:34:25,839

i'll tell you what that's one of the

868

00:34:29,589 --> 00:34:27,520

things we actually focus on here at the

869

00:34:31,750 --> 00:34:29,599

department uh that's part of the mission

870

00:34:32,710 --> 00:34:31,760

of my office and you know when when it

871

00:34:34,550 --> 00:34:32,720

comes to

872

00:34:36,230 --> 00:34:34,560

encouraging girls in stem they need to

873

00:34:38,230 --> 00:34:36,240

see more of us

874

00:34:41,270 --> 00:34:38,240

and really getting girls interested in

875

00:34:42,950 --> 00:34:41,280

stem really starts back at the k-12 it's

876

00:34:44,790 --> 00:34:42,960

really the sixth grade

877

00:34:46,550 --> 00:34:44,800

is where we focus on getting girls

878

00:34:48,389 --> 00:34:46,560

interested in stem

879

00:34:49,109 --> 00:34:48,399

we were just at one of our laboratories

880

00:34:55,589 --> 00:34:49,119

in

881

00:34:57,510 --> 00:34:55,599

about 200 girls there for a stem

882

00:35:00,310 --> 00:34:57,520

girls with beautiful minds it was an

883

00:35:02,870 --> 00:35:00,320

amazing day we had over 200 girls

884

00:35:05,030 --> 00:35:02,880

building cars and competing in race car

885

00:35:06,790 --> 00:35:05,040

competition

886

00:35:09,349 --> 00:35:06,800

had their lab coats and just getting the

887

00:35:11,109 --> 00:35:09,359

girls interested i've spoken to girls

888

00:35:14,390 --> 00:35:11,119

and all across the country

889

00:35:17,910 --> 00:35:14,400

tennessee it was grits girls raising

890

00:35:20,870 --> 00:35:17,920

tennessee um or research uh was very

891

00:35:23,109 --> 00:35:20,880

interested so i go out and i'll be in

892

00:35:26,230 --> 00:35:23,119

in california in inglewood for example

893

00:35:28,950 --> 00:35:26,240

where unfortunately um 50 of girls and

894

00:35:31,109 --> 00:35:28,960

of african-american and latino

895

00:35:33,270 --> 00:35:31,119

racers are 50 are dropping out of high

896

00:35:35,589 --> 00:35:33,280

school so we're really just getting into

897

00:35:38,710 --> 00:35:35,599

these goals and the program i support

898

00:35:39,510 --> 00:35:38,720

here at the office works very closely

899

00:35:41,109 --> 00:35:39,520

with

900

00:35:42,870 --> 00:35:41,119

women and girls across this country

901
00:35:44,630 --> 00:35:42,880
getting them interested in stem and

902
00:35:47,349 --> 00:35:44,640
particularly those that are in rural

903
00:35:49,510 --> 00:35:47,359
areas or in urban areas where we don't

904
00:35:52,310 --> 00:35:49,520
have as much we haven't placed as much

905
00:35:54,150 --> 00:35:52,320
attention so it's very passionate for me

906
00:35:56,790 --> 00:35:54,160
for my office here at the department of

907
00:35:58,550 --> 00:35:56,800
energy to focus on and just getting out

908
00:36:02,550 --> 00:35:58,560
and getting engaged and being role

909
00:36:07,829 --> 00:36:05,990
can i can i jump in please do so

910
00:36:10,390 --> 00:36:07,839
you know i wanted to make two points one

911
00:36:12,310 --> 00:36:10,400
is that you know as a culture

912
00:36:14,150 --> 00:36:12,320
science really has an image problem so i

913
00:36:15,430 --> 00:36:14,160

think when people bring up an image of a

914

00:36:18,630 --> 00:36:15,440

scientist

915

00:36:21,190 --> 00:36:18,640

in a lab it's it's a man and that man is

916

00:36:24,230 --> 00:36:21,200

working alone in the science in the lab

917

00:36:26,710 --> 00:36:24,240

and you know often the word that's most

918

00:36:28,550 --> 00:36:26,720

associated with scientists is mad mad

919

00:36:31,030 --> 00:36:28,560

scientist

920

00:36:32,950 --> 00:36:31,040

when you know in reality

921

00:36:35,829 --> 00:36:32,960

no research is

922

00:36:40,310 --> 00:36:35,839

done alone uh you know

923

00:36:42,150 --> 00:36:40,320

all of our research papers and teams are

924

00:36:44,390 --> 00:36:42,160

multiple people

925

00:36:46,710 --> 00:36:44,400

and the best labs are these diverse

926
00:36:48,470 --> 00:36:46,720
groups of people working on

927
00:36:50,069 --> 00:36:48,480
different questions or working towards a

928
00:36:51,750 --> 00:36:50,079
single goal

929
00:36:54,950 --> 00:36:51,760
and bringing different perspectives to

930
00:36:56,950 --> 00:36:54,960
the research and so i think

931
00:37:00,310 --> 00:36:56,960
you know we really our culture needs to

932
00:37:02,470 --> 00:37:00,320
have uh more positive images of science

933
00:37:03,670 --> 00:37:02,480
scientists and more realistic images of

934
00:37:05,589 --> 00:37:03,680
scientists

935
00:37:07,349 --> 00:37:05,599
and the other thing is that i think

936
00:37:11,109 --> 00:37:07,359
women and

937
00:37:13,430 --> 00:37:11,119
uh underrepresented minorities um ask

938
00:37:15,190 --> 00:37:13,440

different questions in science and i

939

00:37:16,790 --> 00:37:15,200

think a lot of the you know i would like

940

00:37:19,349 --> 00:37:16,800

to see more

941

00:37:22,390 --> 00:37:19,359

uh funding mechanisms where it's more

942

00:37:23,589 --> 00:37:22,400

grassroots or bottom up where people can

943

00:37:26,150 --> 00:37:23,599

ask

944

00:37:29,589 --> 00:37:26,160

the questions that interest them

945

00:37:31,670 --> 00:37:29,599

in basic science and to figure out you

946

00:37:33,430 --> 00:37:31,680

know their passions

947

00:37:36,390 --> 00:37:33,440

a lot of the times

948

00:37:40,150 --> 00:37:36,400

we have we you know answer

949

00:37:41,750 --> 00:37:40,160

calls um where uh for specific projects

950

00:37:42,950 --> 00:37:41,760

to work on and

951
00:37:45,270 --> 00:37:42,960
and i think

952
00:37:50,950 --> 00:37:45,280
women or underrepresented minorities

953
00:37:50,960 --> 00:37:55,190
okay

954
00:37:58,790 --> 00:37:56,790
all right i'd like to give the students

955
00:37:59,910 --> 00:37:58,800
a chance to ask another question i

956
00:38:01,670 --> 00:37:59,920
understand there's more questions there

957
00:38:02,470 --> 00:38:01,680
at the middle school

958
00:38:04,390 --> 00:38:02,480
um

959
00:38:05,910 --> 00:38:04,400
yes we have more questions and we're

960
00:38:08,550 --> 00:38:05,920
actually going to ask our students to

961
00:38:10,950 --> 00:38:08,560
hold them because we are very grateful

962
00:38:13,589 --> 00:38:10,960
and thankful for you allowing us to be a

963
00:38:16,710 --> 00:38:13,599

part of your live chat but our students

964

00:38:18,550 --> 00:38:16,720

are on a bell and a rotation schedule so

965

00:38:21,349 --> 00:38:18,560

our bell is actually getting ready to

966

00:38:23,190 --> 00:38:21,359

ring in looks like four minutes

967

00:38:25,589 --> 00:38:23,200

so we're going to allow them to ask

968

00:38:26,950 --> 00:38:25,599

questions up until that point um and

969

00:38:29,270 --> 00:38:26,960

then you'll see

970

00:38:31,589 --> 00:38:29,280

what middle schools do best get up in

971

00:38:33,510 --> 00:38:31,599

chaos as they exit out but we want to

972

00:38:36,470 --> 00:38:33,520

allow them to ask as many questions as

973

00:38:39,030 --> 00:38:36,480

possible up until our bell rings that's

974

00:38:40,630 --> 00:38:39,040

perfect we'd like that very much and and

975

00:38:42,470 --> 00:38:40,640

in case i don't get to thank you later

976

00:38:43,990 --> 00:38:42,480

thank you very much for joining us we're

977

00:38:46,550 --> 00:38:44,000

very excited to talk to you middle

978

00:38:49,349 --> 00:38:46,560

school students okay so uh

979

00:38:52,550 --> 00:38:49,359

please go ahead with your question

980

00:38:56,230 --> 00:38:52,560

um my name is kaitlyn and my question is

981

00:39:00,310 --> 00:38:59,109

what is a phd

982

00:39:02,150 --> 00:39:00,320

is shannon a phd

983

00:39:04,150 --> 00:39:02,160

is an advanced degree so you go to

984

00:39:06,230 --> 00:39:04,160

college and you did get a degree at a

985

00:39:08,470 --> 00:39:06,240

university and then you go back to

986

00:39:10,630 --> 00:39:08,480

school to graduate school and you get

987

00:39:12,550 --> 00:39:10,640

more degrees and so the next one after

988

00:39:14,230 --> 00:39:12,560

you get your your

989

00:39:16,150 --> 00:39:14,240

degree from university is called a

990

00:39:18,470 --> 00:39:16,160

master's degree it'll be a masters of

991

00:39:20,870 --> 00:39:18,480

science or masters of art and then a phd

992

00:39:24,150 --> 00:39:20,880

is the next level so it just shows

993

00:39:24,160 --> 00:39:33,430

okay thank you

994

00:39:36,950 --> 00:39:35,270

and my question is

995

00:39:38,230 --> 00:39:36,960

what do you have to what do you what

996

00:39:41,670 --> 00:39:38,240

classes do you have to take because of

997

00:39:45,190 --> 00:39:42,870

what classes do you have to take to be

998

00:39:47,030 --> 00:39:45,200

an aerospace engineer well really all

999

00:39:49,270 --> 00:39:47,040

comes down to the basics you need to

1000

00:39:51,510 --> 00:39:49,280

take a bunch of math because engineering

1001
00:39:53,589 --> 00:39:51,520
uses a lot of math and then once you get

1002
00:39:55,270 --> 00:39:53,599
into university you'll start taking

1003
00:39:56,790 --> 00:39:55,280
engineering classes and so you'll take

1004
00:39:58,390 --> 00:39:56,800
all kinds of engineering classes for

1005
00:40:00,150 --> 00:39:58,400
aerospace engineering you'll take

1006
00:40:02,550 --> 00:40:00,160
electrical engineering classes how are

1007
00:40:04,230 --> 00:40:02,560
things wired how do you how do you get

1008
00:40:05,670 --> 00:40:04,240
electricity to flow from one place to

1009
00:40:07,109 --> 00:40:05,680
the next you'll take mechanical

1010
00:40:08,950 --> 00:40:07,119
engineering classes this is the

1011
00:40:11,190 --> 00:40:08,960
structures how do you actually build

1012
00:40:12,310 --> 00:40:11,200
things how do you build an airplane

1013
00:40:14,470 --> 00:40:12,320

and there's all kinds of other

1014

00:40:17,030 --> 00:40:14,480

engineering classes you take so really

1015

00:40:18,230 --> 00:40:17,040

to be an aerospace engineer lots of math

1016

00:40:20,390 --> 00:40:18,240

and then you'll get into engineering

1017

00:40:22,790 --> 00:40:20,400

classes in university

1018

00:40:24,230 --> 00:40:22,800

thanks and can we expand that what do

1019

00:40:25,510 --> 00:40:24,240

they need to take since these are middle

1020

00:40:27,190 --> 00:40:25,520

schoolers when they're going into high

1021

00:40:30,710 --> 00:40:27,200

school what should they be thinking

1022

00:40:33,589 --> 00:40:30,720

about for classes to take at high school

1023

00:40:37,030 --> 00:40:35,510

math and science i mean that's really

1024

00:40:39,109 --> 00:40:37,040

good for everything math science and

1025

00:40:40,790 --> 00:40:39,119

computers know how to program a computer

1026

00:40:42,790 --> 00:40:40,800

and know how to do your your math

1027

00:40:43,990 --> 00:40:42,800

equations and then understand science

1028

00:40:45,750 --> 00:40:44,000

and that that'll get you just about

1029

00:40:46,950 --> 00:40:45,760

anywhere you want to go whatever field

1030

00:40:49,510 --> 00:40:46,960

you want to go in

1031

00:40:54,310 --> 00:40:49,520

well that's chemistry and geometry and

1032

00:40:54,320 --> 00:40:57,349

thank you

1033

00:41:01,670 --> 00:40:59,270

we have another question

1034

00:41:07,190 --> 00:41:01,680

because i'm josh and in what ways do you

1035

00:41:11,990 --> 00:41:09,990

well i i i'll say that i use algebra

1036

00:41:14,390 --> 00:41:12,000

absolutely every day in the lab to

1037

00:41:16,069 --> 00:41:14,400

figure out how to make my solutions

1038

00:41:20,870 --> 00:41:16,079

so i use

1039

00:41:31,670 --> 00:41:22,550

thank you thanks for watching guys

1040

00:41:37,109 --> 00:41:34,470

okay i guess we're still on so sure

1041

00:41:39,190 --> 00:41:37,119

do you want so on math um one of the

1042

00:41:40,470 --> 00:41:39,200

wonderful things that i use even in

1043

00:41:43,190 --> 00:41:40,480

policy is

1044

00:41:45,349 --> 00:41:43,200

math is a lot like another language and

1045

00:41:47,510 --> 00:41:45,359

it really teaches you reasoning and

1046

00:41:50,230 --> 00:41:47,520

logic and how to figure things out and

1047

00:41:51,829 --> 00:41:50,240

put things together and i used that kind

1048

00:41:54,230 --> 00:41:51,839

of brain

1049

00:41:56,309 --> 00:41:54,240

activity that i learned in math of how

1050

00:41:58,470 --> 00:41:56,319

to connect things that really might not

1051
00:42:01,030 --> 00:41:58,480
seem to fit together

1052
00:42:02,630 --> 00:42:01,040
but they do and come up with new and

1053
00:42:05,109 --> 00:42:02,640
innovative ideas

1054
00:42:06,950 --> 00:42:05,119
they've actually linked this a lot those

1055
00:42:09,510 --> 00:42:06,960
who are good in math are usually really

1056
00:42:11,990 --> 00:42:09,520
creative people those who study math are

1057
00:42:14,069 --> 00:42:12,000
usually incredibly innovative

1058
00:42:16,710 --> 00:42:14,079
and it's because it teaches you to link

1059
00:42:19,510 --> 00:42:16,720
all these different things that don't

1060
00:42:21,750 --> 00:42:19,520
seem to really fit and make some kind of

1061
00:42:24,870 --> 00:42:21,760
sense out of them so that's what i do

1062
00:42:26,550 --> 00:42:24,880
even in policy i try to communicate out

1063
00:42:29,990 --> 00:42:26,560

very clearly

1064

00:42:33,109 --> 00:42:30,000

that we have a very logical plan and

1065

00:42:34,870 --> 00:42:33,119

sometimes in washington it becomes a

1066

00:42:36,630 --> 00:42:34,880

little bit puzzling of how all the

1067

00:42:38,870 --> 00:42:36,640

different pieces of the government fit

1068

00:42:41,190 --> 00:42:38,880

together and how to communicate things

1069

00:42:42,309 --> 00:42:41,200

in a very clear way to different people

1070

00:42:44,630 --> 00:42:42,319

here

1071

00:42:48,390 --> 00:42:44,640

different messages for for the congress

1072

00:42:51,349 --> 00:42:48,400

and for the public and for other folks

1073

00:42:52,870 --> 00:42:51,359

who follow nasa and so i learned how to

1074

00:42:54,790 --> 00:42:52,880

communicate and put these pieces

1075

00:42:56,309 --> 00:42:54,800

together in a clear coherent way and a

1076

00:42:59,510 --> 00:42:56,319

lot of that training believe it or not

1077

00:43:01,910 --> 00:42:59,520

came from math

1078

00:43:04,550 --> 00:43:01,920

all right very good um i got a note here

1079

00:43:06,470 --> 00:43:04,560

that we have ryan bisson's fourth grade

1080

00:43:07,589 --> 00:43:06,480

class from maple grove minnesota

1081

00:43:09,109 --> 00:43:07,599

listening

1082

00:43:10,550 --> 00:43:09,119

um and so

1083

00:43:13,190 --> 00:43:10,560

since we have fourth graders online i'd

1084

00:43:14,550 --> 00:43:13,200

like to ask our panel if what advice

1085

00:43:16,950 --> 00:43:14,560

they would give to

1086

00:43:18,790 --> 00:43:16,960

these very young students um who are

1087

00:43:20,069 --> 00:43:18,800

maybe thinking about studying math and

1088

00:43:22,309 --> 00:43:20,079

science

1089

00:43:25,030 --> 00:43:22,319

do you guys have any advice for them

1090

00:43:27,030 --> 00:43:25,040

yes we have advice in minnesota i was

1091

00:43:30,710 --> 00:43:27,040

just seeing saint cloud minnesota

1092

00:43:32,790 --> 00:43:30,720

speaking to 1500 students in your state

1093

00:43:35,670 --> 00:43:32,800

matter of fact your governor declared

1094

00:43:37,109 --> 00:43:35,680

that day the official stem day for

1095

00:43:40,870 --> 00:43:37,119

minnesota

1096

00:43:43,190 --> 00:43:40,880

um so i it was it was about 15 degrees

1097

00:43:45,270 --> 00:43:43,200

below but i was still happy

1098

00:43:48,710 --> 00:43:45,280

but for fourth graders

1099

00:43:50,950 --> 00:43:48,720

start with your your basic math classes

1100

00:43:52,710 --> 00:43:50,960

i think they call one two three at that

1101
00:43:54,470 --> 00:43:52,720
age um

1102
00:43:56,950 --> 00:43:54,480
science classes

1103
00:43:58,950 --> 00:43:56,960
and just any any of your classes that

1104
00:44:00,390 --> 00:43:58,960
require you to do um

1105
00:44:02,230 --> 00:44:00,400
building block building things

1106
00:44:04,630 --> 00:44:02,240
mechanical classes i think they have

1107
00:44:06,550 --> 00:44:04,640
around you know then so

1108
00:44:09,109 --> 00:44:06,560
just do anything that just will just

1109
00:44:12,630 --> 00:44:09,119
feed on innovation and creativity in the

1110
00:44:17,829 --> 00:44:15,030
and i'd like to say uh you know do the

1111
00:44:19,910 --> 00:44:17,839
science fair uh i actually got my start

1112
00:44:21,190 --> 00:44:19,920
in science doing science fair projects

1113
00:44:23,430 --> 00:44:21,200

um

1114

00:44:24,870 --> 00:44:23,440

and i i used to think it was just

1115

00:44:28,150 --> 00:44:24,880

something that students do but it's

1116

00:44:30,710 --> 00:44:28,160

actually what we do as as scientists uh

1117

00:44:32,950 --> 00:44:30,720

we present posters at conferences um

1118

00:44:35,109 --> 00:44:32,960

that's just like a science fair people

1119

00:44:37,109 --> 00:44:35,119

come around to our posters and listen to

1120

00:44:37,990 --> 00:44:37,119

what our projects are about

1121

00:44:43,990 --> 00:44:38,000

and

1122

00:44:45,670 --> 00:44:44,000

science fair is a is great practice

1123

00:44:47,589 --> 00:44:45,680

and one other piece of advice something

1124

00:44:49,349 --> 00:44:47,599

that may be a little bit different but i

1125

00:44:52,630 --> 00:44:49,359

think you need to read i mean we're

1126
00:44:54,150 --> 00:44:52,640
talking about sim um education here but

1127
00:44:55,349 --> 00:44:54,160
reading uh

1128
00:44:57,430 --> 00:44:55,359
to coin a phrase they're reading is

1129
00:44:59,750 --> 00:44:57,440
fundamental and and if you can read

1130
00:45:02,550 --> 00:44:59,760
books about how things work how the

1131
00:45:04,309 --> 00:45:02,560
world works um you'll have a better

1132
00:45:06,870 --> 00:45:04,319
understanding of what's going on in your

1133
00:45:08,630 --> 00:45:06,880
science classes and so yes take the

1134
00:45:09,990 --> 00:45:08,640
classes do the science fair projects but

1135
00:45:11,030 --> 00:45:10,000
also go out there and read about the

1136
00:45:13,670 --> 00:45:11,040
world because there are so many

1137
00:45:15,109 --> 00:45:13,680
fascinating things to learn

1138
00:45:17,510 --> 00:45:15,119

i always think i agree with you

1139

00:45:19,109 --> 00:45:17,520

completely shannon and my thoughts are

1140

00:45:21,349 --> 00:45:19,119

exactly the same

1141

00:45:22,950 --> 00:45:21,359

don't think about each subject as a

1142

00:45:25,270 --> 00:45:22,960

separate thing

1143

00:45:27,109 --> 00:45:25,280

that you have to do math and that's very

1144

00:45:29,510 --> 00:45:27,119

separate from what you do when you're

1145

00:45:31,750 --> 00:45:29,520

reading or what you do in social studies

1146

00:45:32,870 --> 00:45:31,760

or history they're all related to each

1147

00:45:34,710 --> 00:45:32,880

other

1148

00:45:36,150 --> 00:45:34,720

so when you're studying social studies

1149

00:45:37,990 --> 00:45:36,160

think about what you've learned in

1150

00:45:39,990 --> 00:45:38,000

science and how it relates to what

1151

00:45:41,910 --> 00:45:40,000

you're learning in social studies and

1152

00:45:44,309 --> 00:45:41,920

when you're reading think about all the

1153

00:45:46,309 --> 00:45:44,319

different things and the stories that

1154

00:45:48,870 --> 00:45:46,319

are being told and how they relate to

1155

00:45:50,470 --> 00:45:48,880

science they're all connected to each

1156

00:45:52,390 --> 00:45:50,480

other and

1157

00:45:56,630 --> 00:45:52,400

when you do that i think it makes a lot

1158

00:46:00,870 --> 00:45:58,230

all right very good

1159

00:46:02,790 --> 00:46:00,880

um i have a question here for dot can

1160

00:46:06,870 --> 00:46:02,800

you tell us about the council on women

1161

00:46:08,710 --> 00:46:06,880

and girls uh stem speakers bureau

1162

00:46:10,870 --> 00:46:08,720

yes absolutely

1163

00:46:12,950 --> 00:46:10,880

uh the um

1164

00:46:14,870 --> 00:46:12,960

the white house has a council the

1165

00:46:17,109 --> 00:46:14,880

president of the united states president

1166

00:46:18,230 --> 00:46:17,119

barack obama has really been focusing on

1167

00:46:19,430 --> 00:46:18,240

stem

1168

00:46:22,069 --> 00:46:19,440

and you guys have heard it when you

1169

00:46:23,430 --> 00:46:22,079

watch tv uh across the country uh

1170

00:46:25,750 --> 00:46:23,440

focusing on

1171

00:46:28,630 --> 00:46:25,760

uh the council on for women and girls in

1172

00:46:30,950 --> 00:46:28,640

stem the speakers borough we've done

1173

00:46:32,150 --> 00:46:30,960

quite a bit across the country in that

1174

00:46:33,510 --> 00:46:32,160

regard

1175

00:46:34,790 --> 00:46:33,520

i'm actually

1176

00:46:36,470 --> 00:46:34,800

as rebecca mentioned she's a

1177

00:46:37,510 --> 00:46:36,480

representative for nasa for the council

1178

00:46:38,870 --> 00:46:37,520

for women and girls i'm the

1179

00:46:39,750 --> 00:46:38,880

representative from the department of

1180

00:46:42,710 --> 00:46:39,760

energy

1181

00:46:44,870 --> 00:46:42,720

for the council for women and girls we

1182

00:46:46,870 --> 00:46:44,880

chose to focus on the stem portion of

1183

00:46:48,150 --> 00:46:46,880

that as part of our speaker's bureau

1184

00:46:49,829 --> 00:46:48,160

activity

1185

00:46:52,710 --> 00:46:49,839

and we've been like i mentioned earlier

1186

00:46:54,950 --> 00:46:52,720

across the country speaking to girls and

1187

00:46:56,950 --> 00:46:54,960

women on on stem we were at john hopkins

1188

00:46:58,630 --> 00:46:56,960

university for example

1189

00:47:01,589 --> 00:46:58,640

as i mentioned in minnesota we were just

1190

00:47:04,309 --> 00:47:01,599

there with an amazing 1500 students high

1191

00:47:06,630 --> 00:47:04,319

school students across minnesota talking

1192

00:47:08,710 --> 00:47:06,640

encouraged them to go into science and

1193

00:47:10,470 --> 00:47:08,720

stem and some of the things we actually

1194

00:47:12,390 --> 00:47:10,480

do here at the department

1195

00:47:15,190 --> 00:47:12,400

in addition to those kinds of programs

1196

00:47:16,790 --> 00:47:15,200

we have a number of internships that we

1197

00:47:18,390 --> 00:47:16,800

get students high school students

1198

00:47:20,950 --> 00:47:18,400

college students here

1199

00:47:22,710 --> 00:47:20,960

and we promote a national science bowl

1200

00:47:24,470 --> 00:47:22,720

that this department has been doing for

1201
00:47:26,309 --> 00:47:24,480
a number of years and we have middle

1202
00:47:28,950 --> 00:47:26,319
school science bowls and high school

1203
00:47:30,069 --> 00:47:28,960
science bowls we just supported the dc

1204
00:47:31,589 --> 00:47:30,079
base

1205
00:47:33,589 --> 00:47:31,599
steins bowl for middle school and high

1206
00:47:34,950 --> 00:47:33,599
school in just the past few weeks so

1207
00:47:37,430 --> 00:47:34,960
getting involved in

1208
00:47:38,950 --> 00:47:37,440
our national science bowl check that out

1209
00:47:41,349 --> 00:47:38,960
and see your schools will also

1210
00:47:43,670 --> 00:47:41,359
participate so just a number of um

1211
00:47:46,069 --> 00:47:43,680
competitions like the solar decathlon

1212
00:47:47,589 --> 00:47:46,079
the national clean energy

1213
00:47:50,470 --> 00:47:47,599

bowls and

1214

00:47:52,630 --> 00:47:50,480

uh wind technology com competition so a

1215

00:47:54,390 --> 00:47:52,640

lot of those kinds of things that you

1216

00:47:56,550 --> 00:47:54,400

could just look all those who are

1217

00:47:57,910 --> 00:47:56,560

viewing just look into your area and see

1218

00:47:59,270 --> 00:47:57,920

some of the things that

1219

00:48:01,910 --> 00:47:59,280

we're doing here with at the department

1220

00:48:06,630 --> 00:48:03,910

all right and i'd actually uh like to

1221

00:48:08,470 --> 00:48:06,640

ask rebecca a similar question

1222

00:48:10,230 --> 00:48:08,480

both about the nasa speakers bureau and

1223

00:48:12,710 --> 00:48:10,240

also can you tell us about what nasa

1224

00:48:15,190 --> 00:48:12,720

offers similar to department of energy

1225

00:48:18,150 --> 00:48:15,200

to engage students sure so we have a

1226
00:48:21,430 --> 00:48:18,160
nasa speakers bureau and it's made up of

1227
00:48:24,230 --> 00:48:21,440
volunteers from across nasa we have

1228
00:48:26,870 --> 00:48:24,240
wonderful scientists engineers

1229
00:48:28,790 --> 00:48:26,880
policy people like me all sorts of

1230
00:48:30,870 --> 00:48:28,800
people from different backgrounds who do

1231
00:48:33,990 --> 00:48:30,880
different jobs here at nasa

1232
00:48:36,150 --> 00:48:34,000
and so for those who are interested in

1233
00:48:38,549 --> 00:48:36,160
having someone from nasa come and speak

1234
00:48:39,990 --> 00:48:38,559
they can contact the speakers bureau

1235
00:48:42,790 --> 00:48:40,000
for a school

1236
00:48:44,549 --> 00:48:42,800
for a public event for a social media

1237
00:48:46,950 --> 00:48:44,559
type of activity like we're doing today

1238
00:48:48,950 --> 00:48:46,960

for the google plus hangout hangout and

1239

00:48:51,589 --> 00:48:48,960

our wonderful communication folks look

1240

00:48:53,990 --> 00:48:51,599

at this database of folks who are part

1241

00:48:55,910 --> 00:48:54,000

of the speakers bureau and they match up

1242

00:48:57,430 --> 00:48:55,920

the appropriate person

1243

00:48:59,910 --> 00:48:57,440

for that event

1244

00:49:02,150 --> 00:48:59,920

so we do and we consider it a big part

1245

00:49:05,510 --> 00:49:02,160

of our mission it's been part of us

1246

00:49:07,990 --> 00:49:05,520

since our formation in 1958 to reach out

1247

00:49:09,990 --> 00:49:08,000

to the public and get information out as

1248

00:49:12,069 --> 00:49:10,000

much as possible and we take that very

1249

00:49:14,150 --> 00:49:12,079

seriously that's what we do through the

1250

00:49:16,309 --> 00:49:14,160

speakers bureau we have many other

1251
00:49:18,309 --> 00:49:16,319
programs that are aimed at students and

1252
00:49:20,230 --> 00:49:18,319
young people as well

1253
00:49:22,309 --> 00:49:20,240
one of them i know will talk about women

1254
00:49:23,750 --> 00:49:22,319
and energy and women at nasa but i do

1255
00:49:25,109 --> 00:49:23,760
encourage you to check out these

1256
00:49:28,390 --> 00:49:25,119
websites

1257
00:49:30,870 --> 00:49:28,400
we have stories of real women who work

1258
00:49:34,549 --> 00:49:30,880
at nasa and work at energy

1259
00:49:36,470 --> 00:49:34,559
and we find that telling stories and

1260
00:49:39,430 --> 00:49:36,480
giving people examples

1261
00:49:41,670 --> 00:49:39,440
of these great different diversity of

1262
00:49:43,270 --> 00:49:41,680
backgrounds that we have here at nasa

1263
00:49:45,829 --> 00:49:43,280

and the different pathways people have

1264

00:49:47,750 --> 00:49:45,839

taken to come work here is really really

1265

00:49:49,910 --> 00:49:47,760

impactful

1266

00:49:52,549 --> 00:49:49,920

we also have a wonderful education

1267

00:49:54,470 --> 00:49:52,559

website and a nasa website check it out

1268

00:49:56,950 --> 00:49:54,480

it's changing all the time we have

1269

00:49:58,790 --> 00:49:56,960

interactive activities you can follow

1270

00:49:59,910 --> 00:49:58,800

missions real time

1271

00:50:05,430 --> 00:49:59,920

and

1272

00:50:07,190 --> 00:50:05,440

events as much as possible through our

1273

00:50:10,069 --> 00:50:07,200

local activities

1274

00:50:12,390 --> 00:50:10,079

we have a presence in every state

1275

00:50:14,309 --> 00:50:12,400

through something called the space grant

1276

00:50:18,069 --> 00:50:14,319

and those uh

1277

00:50:20,150 --> 00:50:18,079

those entities send every send folks out

1278

00:50:22,150 --> 00:50:20,160

and develop activities in every state in

1279

00:50:25,510 --> 00:50:22,160

the united states related to science and

1280

00:50:26,950 --> 00:50:25,520

technology and space

1281

00:50:27,910 --> 00:50:26,960

all right very good

1282

00:50:29,190 --> 00:50:27,920

um

1283

00:50:31,750 --> 00:50:29,200

i'd like to ask you guys we have another

1284

00:50:33,430 --> 00:50:31,760

question uh from donna

1285

00:50:36,150 --> 00:50:33,440

uh i'm probably going to butcher this

1286

00:50:37,349 --> 00:50:36,160

name i think it's critical

1287

00:50:39,589 --> 00:50:37,359

uh

1288

00:50:41,190 --> 00:50:39,599

she asks how can federal research labs

1289

00:50:42,790 --> 00:50:41,200

support more women in diversity in the

1290

00:50:45,589 --> 00:50:42,800

workforce we touched on this a little

1291

00:50:48,630 --> 00:50:45,599

bit earlier but um if you guys had some

1292

00:50:49,589 --> 00:50:48,640

specific recommendations in that area

1293

00:50:52,630 --> 00:50:49,599

um

1294

00:50:55,670 --> 00:50:52,640

would you like to start start uh dot

1295

00:50:57,270 --> 00:50:55,680

yes we have uh 17 national labs across

1296

00:51:00,710 --> 00:50:57,280

this country one's probably in

1297

00:51:02,309 --> 00:51:00,720

everyone's backyard or close to it um we

1298

00:51:04,790 --> 00:51:02,319

have like we mentioned earlier we have

1299

00:51:06,030 --> 00:51:04,800

the women in energy series we have a

1300

00:51:09,190 --> 00:51:06,040

almost over

1301
00:51:12,150 --> 00:51:09,200
170 women already that have signed up as

1302
00:51:14,309 --> 00:51:12,160
as mentors and sponsors as part of that

1303
00:51:15,990 --> 00:51:14,319
and you can and what it does it profiles

1304
00:51:17,589 --> 00:51:16,000
women across the country and help can

1305
00:51:19,670 --> 00:51:17,599
show girls and

1306
00:51:22,470 --> 00:51:19,680
and young kids on how to start a career

1307
00:51:25,349 --> 00:51:22,480
in spam how to find stem resources

1308
00:51:28,230 --> 00:51:25,359
these labs conduct a lot of um

1309
00:51:30,549 --> 00:51:28,240
weekend activities sometimes to promote

1310
00:51:32,230 --> 00:51:30,559
to encourage the students as well as

1311
00:51:34,549 --> 00:51:32,240
have their parents participate their

1312
00:51:36,230 --> 00:51:34,559
community-based activities

1313
00:51:38,630 --> 00:51:36,240

in oak ridge tennessee for example where

1314

00:51:40,150 --> 00:51:38,640

one of our labs are they have a stem

1315

00:51:43,030 --> 00:51:40,160

weekend and they've had it for a number

1316

00:51:45,670 --> 00:51:43,040

of years and they attract over 800 to a

1317

00:51:48,230 --> 00:51:45,680

thousand participants um throughout the

1318

00:51:50,549 --> 00:51:48,240

day so just a series of things that we

1319

00:51:52,549 --> 00:51:50,559

can get engaged with our labs

1320

00:51:54,470 --> 00:51:52,559

the labs are always open

1321

00:51:56,630 --> 00:51:54,480

you can contact those labs they set up

1322

00:51:57,990 --> 00:51:56,640

tours they can set up activities working

1323

00:51:59,349 --> 00:51:58,000

with the students like i said the

1324

00:52:01,270 --> 00:51:59,359

schools

1325

00:52:03,349 --> 00:52:01,280

are community-based activities so we

1326

00:52:04,470 --> 00:52:03,359

would love to have you

1327

00:52:06,309 --> 00:52:04,480

thank you

1328

00:52:08,390 --> 00:52:06,319

so here at berkeley lab we have a

1329

00:52:10,390 --> 00:52:08,400

workforce development and education

1330

00:52:13,349 --> 00:52:10,400

office and they run a number of great

1331

00:52:15,270 --> 00:52:13,359

summer internship programs and programs

1332

00:52:17,430 --> 00:52:15,280

during the school year

1333

00:52:18,790 --> 00:52:17,440

and i would really encourage

1334

00:52:20,950 --> 00:52:18,800

girls who are interested in doing

1335

00:52:23,349 --> 00:52:20,960

research to check out those programs and

1336

00:52:25,109 --> 00:52:23,359

really get into a lab and have a

1337

00:52:26,309 --> 00:52:25,119

hands-on experience because i think it's

1338

00:52:29,589 --> 00:52:26,319

really different

1339

00:52:32,069 --> 00:52:29,599

from maybe your your classes at school

1340

00:52:34,549 --> 00:52:32,079

it's a different experience to to work

1341

00:52:36,950 --> 00:52:34,559

in a lab so i'd encourage you to do that

1342

00:52:39,349 --> 00:52:36,960

and then you know if you can't do that

1343

00:52:41,190 --> 00:52:39,359

you can follow us on on facebook or

1344

00:52:42,870 --> 00:52:41,200

twitter and and just learn about the

1345

00:52:45,670 --> 00:52:42,880

research that we do

1346

00:52:47,589 --> 00:52:45,680

and just get involved and uh

1347

00:52:49,030 --> 00:52:47,599

and you know open up your your

1348

00:52:51,589 --> 00:52:49,040

possibilities

1349

00:52:55,589 --> 00:52:53,670

something that uh we've been focusing on

1350

00:52:57,349 --> 00:52:55,599

we have a

1351
00:52:59,589 --> 00:52:57,359
something similar to a national lab here

1352
00:53:02,630 --> 00:52:59,599
at nasa the jet propulsion laboratory

1353
00:53:03,670 --> 00:53:02,640
and then we have eight other centers as

1354
00:53:05,030 --> 00:53:03,680
well

1355
00:53:07,589 --> 00:53:05,040
and

1356
00:53:10,549 --> 00:53:07,599
we really encourage each center to reach

1357
00:53:13,589 --> 00:53:10,559
out to its local community and encourage

1358
00:53:16,230 --> 00:53:13,599
students as well as those in college and

1359
00:53:18,470 --> 00:53:16,240
postdocs to come and do all sorts of

1360
00:53:20,790 --> 00:53:18,480
research at the center we have a

1361
00:53:22,790 --> 00:53:20,800
diversity of different programs

1362
00:53:25,270 --> 00:53:22,800
something that we're trying to do even

1363
00:53:27,430 --> 00:53:25,280

more is reach out to those who might not

1364

00:53:29,109 --> 00:53:27,440

be part of that local area

1365

00:53:32,309 --> 00:53:29,119

and that's something where our social

1366

00:53:34,870 --> 00:53:32,319

media is increa is doing a great deal

1367

00:53:38,470 --> 00:53:34,880

it's amazing

1368

00:53:40,549 --> 00:53:38,480

we have a wonderful twitter program we

1369

00:53:42,790 --> 00:53:40,559

have folks all over the agency who tweet

1370

00:53:44,549 --> 00:53:42,800

all the time and then we have a special

1371

00:53:48,150 --> 00:53:44,559

program that's actually aimed at middle

1372

00:53:50,230 --> 00:53:48,160

schoolers and one is called nasa girls

1373

00:53:52,549 --> 00:53:50,240

and one is called nasa boys and these

1374

00:53:55,270 --> 00:53:52,559

are online mentoring programs

1375

00:53:58,069 --> 00:53:55,280

so we'll be sending announcements out

1376

00:54:01,270 --> 00:53:58,079

soon for the next round of that and all

1377

00:54:03,109 --> 00:54:01,280

you need is access to a computer to do

1378

00:54:06,150 --> 00:54:03,119

online mentoring through that program

1379

00:54:08,309 --> 00:54:06,160

either your library or at home

1380

00:54:10,710 --> 00:54:08,319

where you again are connected with a

1381

00:54:13,829 --> 00:54:10,720

nasa scientist or engineer

1382

00:54:16,230 --> 00:54:13,839

for different sessions where you talk as

1383

00:54:18,390 --> 00:54:16,240

well as you do a really cool fun project

1384

00:54:19,990 --> 00:54:18,400

using science and math so look out for

1385

00:54:21,829 --> 00:54:20,000

that as well

1386

00:54:23,910 --> 00:54:21,839

oh that sounds interesting

1387

00:54:25,510 --> 00:54:23,920

so uh we're getting close to the end of

1388

00:54:28,150 --> 00:54:25,520

our time here but i have a really good

1389

00:54:30,069 --> 00:54:28,160

question from carrie martin who's online

1390

00:54:32,630 --> 00:54:30,079

she says her daughter is looking at stem

1391

00:54:34,390 --> 00:54:32,640

careers what can she do to help and

1392

00:54:35,990 --> 00:54:34,400

encourage her daughter

1393

00:54:37,430 --> 00:54:36,000

um and i think some of you guys are

1394

00:54:39,109 --> 00:54:37,440

mothers here so you may have some extra

1395

00:54:41,829 --> 00:54:39,119

good advice here

1396

00:54:45,589 --> 00:54:41,839

yes i'm a mom i have a second grade girl

1397

00:54:49,430 --> 00:54:45,599

and i have a boy who's in kindergarten

1398

00:54:51,270 --> 00:54:49,440

and what i do is two different things

1399

00:54:54,230 --> 00:54:51,280

most of us talked about following your

1400

00:54:56,950 --> 00:54:54,240

passion and so a lot of it is being

1401

00:54:59,750 --> 00:54:56,960

encouraging to your children to be

1402

00:55:02,230 --> 00:54:59,760

inquisitive to be interested to see the

1403

00:55:04,549 --> 00:55:02,240

connectedness between different things

1404

00:55:07,349 --> 00:55:04,559

and i think that helps a lot

1405

00:55:09,109 --> 00:55:07,359

when my daughter is studying math i'm

1406

00:55:11,510 --> 00:55:09,119

always asking her questions about how

1407

00:55:13,589 --> 00:55:11,520

again she can use math and other areas

1408

00:55:16,470 --> 00:55:13,599

besides doing the math calculation on

1409

00:55:19,109 --> 00:55:16,480

her worksheet using math and cooking for

1410

00:55:21,030 --> 00:55:19,119

instance using math to measure the depth

1411

00:55:22,870 --> 00:55:21,040

of the snow outside since we've had a

1412

00:55:25,829 --> 00:55:22,880

big snowstorm here

1413

00:55:28,950 --> 00:55:25,839

in the d.c area so again we can see that

1414

00:55:31,349 --> 00:55:28,960

this is a fun wonderful thing same with

1415

00:55:33,510 --> 00:55:31,359

science and that it's not something

1416

00:55:34,390 --> 00:55:33,520

that's separate from what everyone else

1417

00:55:35,990 --> 00:55:34,400

does

1418

00:55:38,230 --> 00:55:36,000

i think that helps with what we're

1419

00:55:40,710 --> 00:55:38,240

talking about with this cultural stigma

1420

00:55:42,630 --> 00:55:40,720

um that somehow science and

1421

00:55:44,230 --> 00:55:42,640

math and engineering are not cool i

1422

00:55:46,069 --> 00:55:44,240

don't believe that at all they're really

1423

00:55:50,150 --> 00:55:46,079

cool and they're really fun we just have

1424

00:55:53,990 --> 00:55:52,150

uh do any of our other panel members

1425

00:55:56,309 --> 00:55:54,000

have something to add to that one

1426

00:55:57,670 --> 00:55:56,319

yeah i would like to add i know for um

1427

00:55:59,910 --> 00:55:57,680

we have um

1428

00:56:02,470 --> 00:55:59,920

you know like with with science you know

1429

00:56:04,150 --> 00:56:02,480

girls you know love nail polish and to

1430

00:56:07,190 --> 00:56:04,160

know that it could be a chemist that

1431

00:56:09,349 --> 00:56:07,200

helped to develop that polish we had

1432

00:56:11,670 --> 00:56:09,359

this one young girl in atlanta that

1433

00:56:13,750 --> 00:56:11,680

actually wanted to come up with a better

1434

00:56:15,030 --> 00:56:13,760

conditioner for her hair and and was

1435

00:56:17,109 --> 00:56:15,040

having problems with the current

1436

00:56:18,630 --> 00:56:17,119

products on the market and her mother

1437

00:56:21,270 --> 00:56:18,640

encouraged her to

1438

00:56:23,670 --> 00:56:21,280

uh develop this new product and she

1439

00:56:25,750 --> 00:56:23,680

sells it in walmart and she's she her

1440

00:56:27,670 --> 00:56:25,760

mother works for her now

1441

00:56:29,670 --> 00:56:27,680

so she has like a multi-million dollar

1442

00:56:31,829 --> 00:56:29,680

company because she was interested in

1443

00:56:33,750 --> 00:56:31,839

doing something uh applying her and she

1444

00:56:36,069 --> 00:56:33,760

was a stem student uh and she was just

1445

00:56:39,030 --> 00:56:36,079

in high school 15 years old so there are

1446

00:56:40,710 --> 00:56:39,040

lots of ways that our girls do you got

1447

00:56:43,109 --> 00:56:40,720

to make it interesting and exciting i

1448

00:56:44,789 --> 00:56:43,119

mean when it comes to if you love music

1449

00:56:47,030 --> 00:56:44,799

you know there's there's engineering and

1450

00:56:49,750 --> 00:56:47,040

science behind music if you love the

1451
00:56:51,910 --> 00:56:49,760
dance you know the routines that the

1452
00:56:54,150 --> 00:56:51,920
dancers use that the technology so

1453
00:56:56,230 --> 00:56:54,160
technology and science is in everything

1454
00:56:58,390 --> 00:56:56,240
you love the iphones all it's just so

1455
00:57:00,150 --> 00:56:58,400
much that we just want to make our kids

1456
00:57:01,430 --> 00:57:00,160
more aware of the day-to-day things that

1457
00:57:03,910 --> 00:57:01,440
they love

1458
00:57:06,309 --> 00:57:03,920
uh involves science it's it's not some

1459
00:57:07,670 --> 00:57:06,319
foreign thing and and i always say like

1460
00:57:09,829 --> 00:57:07,680
at the department of energy three of the

1461
00:57:11,670 --> 00:57:09,839
world's largest super computers are at

1462
00:57:13,910 --> 00:57:11,680
the department of energy for example the

1463
00:57:14,870 --> 00:57:13,920

world's largest laser at one of these

1464

00:57:17,670 --> 00:57:14,880

labs

1465

00:57:19,990 --> 00:57:17,680

and so cool i know the star trek if you

1466

00:57:22,150 --> 00:57:20,000

guys saw the last star trek movie it was

1467

00:57:24,549 --> 00:57:22,160

filmed big portions of one of our labs

1468

00:57:26,789 --> 00:57:24,559

in california so just some really cool

1469

00:57:28,630 --> 00:57:26,799

things and my last note

1470

00:57:31,349 --> 00:57:28,640

if you look at the periodic table

1471

00:57:33,910 --> 00:57:31,359

element 116 livermorium was was

1472

00:57:36,390 --> 00:57:33,920

developed at one of our labs 16 and so

1473

00:57:38,309 --> 00:57:36,400

if you imagine it's the periodic table

1474

00:57:40,470 --> 00:57:38,319

you look at that your students every day

1475

00:57:42,150 --> 00:57:40,480

that stuff's being developed in places

1476

00:57:44,069 --> 00:57:42,160

like nassar our department of energy

1477

00:57:46,630 --> 00:57:44,079

that we we touch this stuff and

1478

00:57:48,630 --> 00:57:46,640

something kids can just relate to so you

1479

00:57:50,870 --> 00:57:48,640

want to make it relatable and and part

1480

00:57:56,069 --> 00:57:50,880

of their everyday life and they will get

1481

00:58:00,069 --> 00:57:57,109

very good

1482

00:58:01,990 --> 00:58:00,079

uh jill or shannon

1483

00:58:03,589 --> 00:58:02,000

um well i don't have any kids myself but

1484

00:58:05,109 --> 00:58:03,599

i do have lots of nieces and nephews and

1485

00:58:06,470 --> 00:58:05,119

i think one of the most important things

1486

00:58:09,030 --> 00:58:06,480

is one that has already been mentioned

1487

00:58:10,950 --> 00:58:09,040

you have to encourage your child uh in

1488

00:58:12,870 --> 00:58:10,960

this case a girl

1489

00:58:14,309 --> 00:58:12,880

don't don't stifle the questions you

1490

00:58:15,990 --> 00:58:14,319

know go out and encourage them to be

1491

00:58:17,990 --> 00:58:16,000

inquisitive and then the other thing

1492

00:58:20,150 --> 00:58:18,000

that i think is important to do

1493

00:58:21,829 --> 00:58:20,160

is provide opportunities to see a

1494

00:58:23,349 --> 00:58:21,839

variety of experiences because you

1495

00:58:26,230 --> 00:58:23,359

really never know what might spark

1496

00:58:27,990 --> 00:58:26,240

somebody's interest and so if you go do

1497

00:58:30,069 --> 00:58:28,000

a lot of different things and see a lot

1498

00:58:32,069 --> 00:58:30,079

of different things that will help

1499

00:58:33,109 --> 00:58:32,079

develop the interest in whatever field

1500

00:58:37,430 --> 00:58:33,119

she might be

1501
00:58:41,750 --> 00:58:39,589
and i'll just say that uh

1502
00:58:44,789 --> 00:58:41,760
you know i think i have a kindergarten

1503
00:58:47,430 --> 00:58:44,799
girl and um i just you know what

1504
00:58:49,349 --> 00:58:47,440
everyone said so far has been very

1505
00:58:51,589 --> 00:58:49,359
true for me i have a

1506
00:58:54,230 --> 00:58:51,599
the opposite problem in that i try not

1507
00:58:56,069 --> 00:58:54,240
to push science too much for fear of

1508
00:58:58,309 --> 00:58:56,079
turning my daughter

1509
00:59:00,470 --> 00:58:58,319
off of it because that's what i do

1510
00:59:03,270 --> 00:59:00,480
but um i do try to make sure that she

1511
00:59:04,950 --> 00:59:03,280
understands um you know that math and

1512
00:59:06,390 --> 00:59:04,960
science are everywhere in life and we

1513
00:59:08,150 --> 00:59:06,400

try to just see

1514

00:59:10,309 --> 00:59:08,160

um you know pointing out things and

1515

00:59:13,030 --> 00:59:10,319

being observing different things and we

1516

00:59:15,190 --> 00:59:13,040

talk about what what her guesses are

1517

00:59:17,430 --> 00:59:15,200

sometimes i say what's your your guess

1518

00:59:20,069 --> 00:59:17,440

or your hypothesis about how that works

1519

00:59:22,150 --> 00:59:20,079

and we just work through those

1520

00:59:26,069 --> 00:59:22,160

how to work through questions that you

1521

00:59:29,109 --> 00:59:27,349

very good

1522

00:59:30,789 --> 00:59:29,119

um

1523

00:59:33,270 --> 00:59:30,799

okay i have another question here it

1524

00:59:35,589 --> 00:59:33,280

says uh what factors most contributed to

1525

00:59:36,950 --> 00:59:35,599

your current success

1526

00:59:38,069 --> 00:59:36,960

um

1527

00:59:39,270 --> 00:59:38,079

shannon would you like to start with

1528

00:59:41,349 --> 00:59:39,280

that one

1529

00:59:44,309 --> 00:59:41,359

i would say persistence is probably the

1530

00:59:47,910 --> 00:59:44,319

one that got me the farthest um being an

1531

00:59:48,789 --> 00:59:47,920

astronaut is a is a very competitive job

1532

00:59:50,710 --> 00:59:48,799

and

1533

00:59:53,670 --> 00:59:50,720

not just within the job to be to be able

1534

00:59:56,549 --> 00:59:53,680

to become an astronaut and so it took me

1535

00:59:57,910 --> 00:59:56,559

um many many years applying many many

1536

00:59:59,829 --> 00:59:57,920

times to

1537

01:00:01,270 --> 00:59:59,839

finally be accepted into this position

1538

01:00:03,270 --> 01:00:01,280

and so it was my persistence and it was

1539

01:00:05,430 --> 01:00:03,280

my persistence getting through school

1540

01:00:07,030 --> 01:00:05,440

physics is not an easy subject and you

1541

01:00:09,270 --> 01:00:07,040

know biology and chemistry those are not

1542

01:00:11,270 --> 01:00:09,280

easy subjects but if you're persistent

1543

01:00:12,950 --> 01:00:11,280

you can get through them and and then

1544

01:00:14,390 --> 01:00:12,960

when you're at the end and you're

1545

01:00:15,670 --> 01:00:14,400

graduating you realize how much

1546

01:00:18,150 --> 01:00:15,680

knowledge and understanding you have

1547

01:00:19,589 --> 01:00:18,160

it's very satisfying so being persistent

1548

01:00:21,750 --> 01:00:19,599

in what you're doing will get you very

1549

01:00:26,470 --> 01:00:21,760

far in life

1550

01:00:30,150 --> 01:00:28,390

so i was just going to say you know

1551

01:00:32,870 --> 01:00:30,160

stubbornness i i

1552

01:00:35,510 --> 01:00:32,880

so i would echo shannon's comment um

1553

01:00:37,109 --> 01:00:35,520

about persistence it does really help um

1554

01:00:39,270 --> 01:00:37,119

the other thing is that i just really

1555

01:00:41,910 --> 01:00:39,280

like figuring out a puzzle you know it

1556

01:00:43,750 --> 01:00:41,920

helps me troubleshoot experiments

1557

01:00:45,910 --> 01:00:43,760

work through problems

1558

01:00:47,190 --> 01:00:45,920

i like i'm very curious i like asking

1559

01:00:49,109 --> 01:00:47,200

questions

1560

01:00:51,270 --> 01:00:49,119

i want to see how things work i think

1561

01:00:53,270 --> 01:00:51,280

that's why i got into molecular biology

1562

01:00:54,829 --> 01:00:53,280

because if you keep asking why you

1563

01:00:57,190 --> 01:00:54,839

eventually get down to

1564

01:00:59,349 --> 01:00:57,200

molecules um and so

1565

01:01:02,309 --> 01:00:59,359

yeah that i think

1566

01:01:03,030 --> 01:01:02,319

that that's been the main uh driver for

1567

01:01:06,470 --> 01:01:03,040

me

1568

01:01:07,670 --> 01:01:06,480

stubbornness and curiosity

1569

01:01:09,109 --> 01:01:07,680

very good

1570

01:01:11,990 --> 01:01:09,119

dot

1571

01:01:14,230 --> 01:01:12,000

oh just living by the the failure is not

1572

01:01:16,069 --> 01:01:14,240

an option i mean i when someone tells me

1573

01:01:18,470 --> 01:01:16,079

i couldn't do something or when i failed

1574

01:01:20,069 --> 01:01:18,480

that first math class in college and the

1575

01:01:21,510 --> 01:01:20,079

professor told me to go over to the

1576

01:01:23,510 --> 01:01:21,520

social sciences

1577

01:01:25,589 --> 01:01:23,520

science classes and forget about

1578

01:01:27,589 --> 01:01:25,599

engineering it was that you know

1579

01:01:29,910 --> 01:01:27,599

just not accepting failure and knowing

1580

01:01:34,069 --> 01:01:29,920

that you can be the best of what you are

1581

01:01:36,549 --> 01:01:34,079

and and us girls we make it happen

1582

01:01:40,549 --> 01:01:36,559

all right very good and rebecca well for

1583

01:01:41,990 --> 01:01:40,559

me it's creativity and not being afraid

1584

01:01:43,750 --> 01:01:42,000

to ask

1585

01:01:46,150 --> 01:01:43,760

so um

1586

01:01:47,030 --> 01:01:46,160

almost every job i've had here at nasa

1587

01:01:50,870 --> 01:01:47,040

i've

1588

01:01:52,870 --> 01:01:50,880

created myself and i saw a need and i

1589

01:01:55,990 --> 01:01:52,880

said well i could do that

1590

01:01:57,190 --> 01:01:56,000

and i proposed it up to my champions

1591

01:01:59,190 --> 01:01:57,200

so

1592

01:02:02,069 --> 01:01:59,200

often as women

1593

01:02:04,390 --> 01:02:02,079

we're trained and socialized not to ask

1594

01:02:07,829 --> 01:02:04,400

for what we want and not to convey what

1595

01:02:09,750 --> 01:02:07,839

we think we're good at and we need to

1596

01:02:11,670 --> 01:02:09,760

learn how to do that we have to do it

1597

01:02:14,150 --> 01:02:11,680

diplomatically of course like anyone

1598

01:02:16,630 --> 01:02:14,160

else but don't be afraid to ask and

1599

01:02:18,230 --> 01:02:16,640

don't be afraid to be proud and convey

1600

01:02:20,390 --> 01:02:18,240

what you know are your strengths and

1601

01:02:21,430 --> 01:02:20,400

what you're good at doing

1602

01:02:23,589 --> 01:02:21,440

thank you

1603

01:02:26,150 --> 01:02:23,599

well uh that's all about all the time we

1604

01:02:29,109 --> 01:02:26,160

have for today i'd like to thank our

1605

01:02:32,230 --> 01:02:29,119

panelists dr jill foose dr dot harris dr

1606

01:02:34,470 --> 01:02:32,240

rebecca kaiser and dr shannon walker

1607

01:02:36,150 --> 01:02:34,480

and for you folks online if you have

1608

01:02:38,069 --> 01:02:36,160

interest in more of the information like

1609

01:02:40,150 --> 01:02:38,079

this please check out our websites at

1610

01:02:42,630 --> 01:02:40,160

women at energy and women at nasa if you