



1  
00:00:05,190 --> 00:00:03,429  
good afternoon and welcome back to

2  
00:00:07,349 --> 00:00:05,200  
today's nasa future forum here at the

3  
00:00:09,750 --> 00:00:07,359  
university of maryland college park in

4  
00:00:11,509 --> 00:00:09,760  
the riggs alumni center

5  
00:00:14,310 --> 00:00:11,519  
for our final panel this afternoon we

6  
00:00:17,990 --> 00:00:14,320  
have one of perhaps the best of all day

7  
00:00:21,109 --> 00:00:18,000  
we have our panel on inspiration and

8  
00:00:23,990 --> 00:00:21,119  
education building idea factories for

9  
00:00:26,150 --> 00:00:24,000  
the future our panel leader today is

10  
00:00:29,429 --> 00:00:26,160  
michael locke from the u.s department of

11  
00:00:33,910 --> 00:00:31,509  
thank you good afternoon everyone um

12  
00:00:35,590 --> 00:00:33,920  
great to be here

13  
00:00:37,990 --> 00:00:35,600

it's exciting to be part of this i

14

00:00:39,990 --> 00:00:38,000

always get a kick out of um whenever i

15

00:00:43,190 --> 00:00:40,000

get to do anything

16

00:00:45,190 --> 00:00:43,200

that's even remotely related to nasa

17

00:00:48,310 --> 00:00:45,200

you guys have all the cool toys and all

18

00:00:50,630 --> 00:00:48,320

the all the fun things um so it's it's

19

00:00:53,029 --> 00:00:50,640

great to be here

20

00:00:54,630 --> 00:00:53,039

i come i come from this as the

21

00:00:56,790 --> 00:00:54,640

special assistant to

22

00:00:58,389 --> 00:00:56,800

secretary duncan focusing on stem

23

00:01:00,630 --> 00:00:58,399

education issues in the department of

24

00:01:03,189 --> 00:01:00,640

education and prior to that i was a

25

00:01:06,310 --> 00:01:03,199

classroom teacher i taught for

26  
00:01:09,109 --> 00:01:06,320  
almost 10 years in new orleans new york

27  
00:01:10,550 --> 00:01:09,119  
city and chicago

28  
00:01:12,310 --> 00:01:10,560  
and then sold out and became a

29  
00:01:13,190 --> 00:01:12,320  
bureaucrat

30  
00:01:14,710 --> 00:01:13,200  
leading

31  
00:01:16,230 --> 00:01:14,720  
curriculum instruction the chicago

32  
00:01:17,910 --> 00:01:16,240  
public schools for arne and then i came

33  
00:01:18,950 --> 00:01:17,920  
with him when he came out out here to

34  
00:01:20,710 --> 00:01:18,960  
d.c

35  
00:01:23,510 --> 00:01:20,720  
but it's great to be here you're going

36  
00:01:25,510 --> 00:01:23,520  
to hear from some really exceptional

37  
00:01:26,710 --> 00:01:25,520  
people talking about

38  
00:01:28,950 --> 00:01:26,720

how

39

00:01:31,030 --> 00:01:28,960

inspiration and education are really

40

00:01:32,550 --> 00:01:31,040

tightly linked and important pieces of

41

00:01:35,270 --> 00:01:32,560

the whole problem you're going to hear

42

00:01:38,550 --> 00:01:35,280

about it from all different levels

43

00:01:41,590 --> 00:01:38,560

we've got two university folks here

44

00:01:43,429 --> 00:01:41,600

mary bowden and muhammad italiab who

45

00:01:45,350 --> 00:01:43,439

both have engineering backgrounds and

46

00:01:48,710 --> 00:01:45,360

will speak to

47

00:01:51,830 --> 00:01:48,720

some of the higher ed perspective

48

00:01:53,590 --> 00:01:51,840

susan barhonigan is a elementary school

49

00:01:55,350 --> 00:01:53,600

teacher and also the

50

00:01:57,429 --> 00:01:55,360

regional director of the virginia

51  
00:02:00,149 --> 00:01:57,439  
science teachers association

52  
00:02:02,149 --> 00:02:00,159  
and leland melvin leads nasa's education

53  
00:02:04,069 --> 00:02:02,159  
effort and has been a tremendous partner

54  
00:02:05,670 --> 00:02:04,079  
in all this work across the federal

55  
00:02:07,190 --> 00:02:05,680  
government moving forward

56  
00:02:09,270 --> 00:02:07,200  
but you don't want to hear from me let's

57  
00:02:12,710 --> 00:02:09,280  
hear from them so um why don't we start

58  
00:02:14,470 --> 00:02:12,720  
with you mary tell a little bit about um

59  
00:02:16,869 --> 00:02:14,480  
where you're coming from and the the

60  
00:02:18,630 --> 00:02:16,879  
expertise you provide here and maybe it

61  
00:02:20,630 --> 00:02:18,640  
would be helpful to since we're talking

62  
00:02:22,949 --> 00:02:20,640  
about inspiration talk a little bit

63  
00:02:25,670 --> 00:02:22,959

about how you decided to become a

64

00:02:27,110 --> 00:02:25,680

scientist what inspired you

65

00:02:28,790 --> 00:02:27,120

okay

66

00:02:29,990 --> 00:02:28,800

well first let me introduce myself a

67

00:02:32,470 --> 00:02:30,000

little further

68

00:02:34,390 --> 00:02:32,480

i'm actually a part-time faculty here at

69

00:02:36,869 --> 00:02:34,400

the university of maryland

70

00:02:38,710 --> 00:02:36,879

in the aerospace engineering department

71

00:02:40,790 --> 00:02:38,720

and i'm also associated with the space

72

00:02:43,350 --> 00:02:40,800

systems lab

73

00:02:45,350 --> 00:02:43,360

and i'd like to point out that we have a

74

00:02:47,190 --> 00:02:45,360

number of displays out in the hallway of

75

00:02:48,949 --> 00:02:47,200

some of the undergraduate projects that

76

00:02:50,949 --> 00:02:48,959

are going on currently going on in the

77

00:02:52,869 --> 00:02:50,959

space systems lab

78

00:02:57,190 --> 00:02:52,879

and i'd encourage everybody to look at

79

00:03:01,110 --> 00:02:58,869

i think what i'd really like to start

80

00:03:03,589 --> 00:03:01,120

with is

81

00:03:05,990 --> 00:03:03,599

just to kind of put in perspective what

82

00:03:07,509 --> 00:03:06,000

my current passion is

83

00:03:09,589 --> 00:03:07,519

i am

84

00:03:12,070 --> 00:03:09,599

involved in a number of undergraduate

85

00:03:15,270 --> 00:03:12,080

projects

86

00:03:16,869 --> 00:03:15,280

that have been ongoing through the years

87

00:03:18,710 --> 00:03:16,879

and

88

00:03:21,589 --> 00:03:18,720

i'll get to the part of what actually

89

00:03:23,750 --> 00:03:21,599

inspired me originally

90

00:03:27,670 --> 00:03:23,760

afterwards but um i think what's so

91

00:03:30,149 --> 00:03:27,680

important is that these projects um

92

00:03:33,030 --> 00:03:30,159

i have come to realize without any

93

00:03:35,589 --> 00:03:33,040

question in my mind the projects at the

94

00:03:38,309 --> 00:03:35,599

freshman and sophomore level tend to

95

00:03:39,350 --> 00:03:38,319

keep engineers in engineering because we

96

00:03:41,430 --> 00:03:39,360

lose some

97

00:03:43,430 --> 00:03:41,440

and that's always sad

98

00:03:45,830 --> 00:03:43,440

they choose to go to other

99

00:03:47,509 --> 00:03:45,840

disciplines and that's okay but we want

100

00:03:48,550 --> 00:03:47,519

to keep them in engineering as much as

101  
00:03:51,509 --> 00:03:48,560  
possible

102  
00:03:53,750 --> 00:03:51,519  
and the projects at the upper level in

103  
00:03:56,789 --> 00:03:53,760  
the sophomore and the junior and senior

104  
00:03:59,190 --> 00:03:56,799  
years are also extremely effective and

105  
00:04:02,229 --> 00:03:59,200  
important because they're

106  
00:04:04,390 --> 00:04:02,239  
teaching engineers how to be more

107  
00:04:06,630 --> 00:04:04,400  
effective engineers

108  
00:04:08,869 --> 00:04:06,640  
real world experience

109  
00:04:10,309 --> 00:04:08,879  
by doing hands-on engineering is

110  
00:04:12,309 --> 00:04:10,319  
essential and

111  
00:04:14,070 --> 00:04:12,319  
just developing confidence in their own

112  
00:04:16,310 --> 00:04:14,080  
ability to think and to work through

113  
00:04:17,990 --> 00:04:16,320

problems is also essential and i think

114

00:04:20,949 --> 00:04:18,000

that is what has gained

115

00:04:23,110 --> 00:04:20,959

so much more from these projects than

116

00:04:26,070 --> 00:04:23,120

perhaps from sitting in a classroom

117

00:04:27,909 --> 00:04:26,080

listening to someone talk

118

00:04:31,909 --> 00:04:27,919

so the projects are essential the one

119

00:04:34,390 --> 00:04:31,919

i'd like to emphasize the most is a

120

00:04:36,870 --> 00:04:34,400

project that we have actually um that

121

00:04:39,189 --> 00:04:36,880

spans all four years for our

122

00:04:41,270 --> 00:04:39,199

undergraduates and that's our balloon

123

00:04:44,070 --> 00:04:41,280

payload program

124

00:04:46,870 --> 00:04:44,080

this is a program that was

125

00:04:48,950 --> 00:04:46,880

initiated in in our department

126  
00:04:51,110 --> 00:04:48,960  
over seven years ago

127  
00:04:53,110 --> 00:04:51,120  
and i have to say i want to give full

128  
00:04:55,749 --> 00:04:53,120  
credit to the maryland space grant

129  
00:04:56,790 --> 00:04:55,759  
organization for initiating this project

130  
00:04:58,950 --> 00:04:56,800  
because

131  
00:05:01,110 --> 00:04:58,960  
they sent me i had no clue what was

132  
00:05:02,950 --> 00:05:01,120  
going on with this program and they sent

133  
00:05:04,550 --> 00:05:02,960  
me to colorado to learn how to build

134  
00:05:06,230 --> 00:05:04,560  
balloon payloads

135  
00:05:08,550 --> 00:05:06,240  
next thing i knew i was expected to

136  
00:05:11,189 --> 00:05:08,560  
start a program a very similar nature at

137  
00:05:13,990 --> 00:05:11,199  
our university so i did

138  
00:05:15,749 --> 00:05:14,000

and we are now seven years into it with

139

00:05:20,150 --> 00:05:15,759

um hundreds of students who have built

140

00:05:22,310 --> 00:05:20,160

payloads um we've launched 32 flights

141

00:05:23,430 --> 00:05:22,320

getting ready to launch our 33rd flight

142

00:05:25,749 --> 00:05:23,440

tomorrow

143

00:05:27,909 --> 00:05:25,759

and um it has been a wonderful

144

00:05:30,790 --> 00:05:27,919

experience for the students to really

145

00:05:33,670 --> 00:05:30,800

get a feeling for what it is to build

146

00:05:35,029 --> 00:05:33,680

space okay near space hardware

147

00:05:36,070 --> 00:05:35,039

launch it

148

00:05:38,390 --> 00:05:36,080

fly it

149

00:05:40,390 --> 00:05:38,400

get it back see the results analyze the

150

00:05:43,189 --> 00:05:40,400

data and it's it's i think it's a it's a

151  
00:05:44,790 --> 00:05:43,199  
wonderful sort of microcosm of a real

152  
00:05:46,150 --> 00:05:44,800  
launch experience

153  
00:05:51,350 --> 00:05:46,160  
um

154  
00:05:54,310 --> 00:05:51,360  
actually one that is spread over all 50

155  
00:05:56,790 --> 00:05:54,320  
states and the district of columbia and

156  
00:06:00,469 --> 00:05:56,800  
puerto rico and is just a tremendous

157  
00:06:05,189 --> 00:06:00,479  
network of universities and colleges

158  
00:06:10,629 --> 00:06:05,199  
where the the primary purpose is to

159  
00:06:16,550 --> 00:06:14,070  
engineering and science education and

160  
00:06:18,950 --> 00:06:16,560  
research and outreach and it's just been

161  
00:06:21,110 --> 00:06:18,960  
a wonderful in fact an enabling

162  
00:06:23,189 --> 00:06:21,120  
organization for us to do not just this

163  
00:06:24,150 --> 00:06:23,199

balloon payload project but but many

164

00:06:25,430 --> 00:06:24,160

others

165

00:06:27,990 --> 00:06:25,440

um

166

00:06:30,309 --> 00:06:28,000

i i think the the

167

00:06:32,150 --> 00:06:30,319

you know the conclusion that i have come

168

00:06:34,790 --> 00:06:32,160

to is that the

169

00:06:36,629 --> 00:06:34,800

students who get the hands-on experience

170

00:06:38,629 --> 00:06:36,639

not just with the balloon payloads but

171

00:06:39,749 --> 00:06:38,639

we have as you'll see in the hall we

172

00:06:47,909 --> 00:06:39,759

have

173

00:06:49,510 --> 00:06:47,919

rovers and underwater submersibles many

174

00:06:51,430 --> 00:06:49,520

many projects some of them are

175

00:06:53,990 --> 00:06:51,440

competitions and some are not

176  
00:06:56,230 --> 00:06:54,000  
um all of these projects have been

177  
00:06:58,150 --> 00:06:56,240  
inspiring and educational

178  
00:06:59,990 --> 00:06:58,160  
and um you know truly building

179  
00:07:02,629 --> 00:07:00,000  
confidence in our students

180  
00:07:04,710 --> 00:07:02,639  
um i i would like to

181  
00:07:06,710 --> 00:07:04,720  
say though that not everything is is is

182  
00:07:09,189 --> 00:07:06,720  
perfect this is not a perfect world and

183  
00:07:10,309 --> 00:07:09,199  
one of my big concerns i'll just voice

184  
00:07:11,670 --> 00:07:10,319  
it right now

185  
00:07:14,150 --> 00:07:11,680  
is that

186  
00:07:16,870 --> 00:07:14,160  
many of these projects would not be

187  
00:07:19,029 --> 00:07:16,880  
feasible would not be as successful

188  
00:07:21,350 --> 00:07:19,039

certainly as they are without a

189

00:07:23,270 --> 00:07:21,360

laboratory in this case it's the space

190

00:07:25,589 --> 00:07:23,280

systems lab but there are many many labs

191

00:07:29,430 --> 00:07:25,599

like this across the country

192

00:07:30,469 --> 00:07:29,440

a lab that is doing cutting-edge vibrant

193

00:07:31,909 --> 00:07:30,479

active

194

00:07:33,670 --> 00:07:31,919

let's be honest

195

00:07:35,110 --> 00:07:33,680

funded research

196

00:07:38,390 --> 00:07:35,120

and if that

197

00:07:41,029 --> 00:07:38,400

if if the lab cannot continue doesn't

198

00:07:43,189 --> 00:07:41,039

continue to have funding

199

00:07:45,430 --> 00:07:43,199

you know not only do we lose all of the

200

00:07:47,510 --> 00:07:45,440

output of the graduate

201  
00:07:49,110 --> 00:07:47,520  
students working in the lab

202  
00:07:51,270 --> 00:07:49,120  
but these opportunities for

203  
00:07:53,990 --> 00:07:51,280  
undergraduates will go away as well it's

204  
00:07:56,309 --> 00:07:54,000  
so essential to keep

205  
00:07:59,110 --> 00:07:56,319  
the university

206  
00:08:02,390 --> 00:07:59,120  
research uh going at a high level

207  
00:08:05,589 --> 00:08:02,400  
and um and and basically allowing

208  
00:08:07,990 --> 00:08:05,599  
um the the labs to inspire and and

209  
00:08:09,830 --> 00:08:08,000  
educate the undergraduates

210  
00:08:11,189 --> 00:08:09,840  
um i think i should just say in closing

211  
00:08:13,029 --> 00:08:11,199  
i've probably run out of time more than

212  
00:08:14,230 --> 00:08:13,039  
run out of time but let me just say that

213  
00:08:16,070 --> 00:08:14,240

um

214

00:08:17,510 --> 00:08:16,080

i'm a little bit embarrassed to say this

215

00:08:20,070 --> 00:08:17,520

but when i was

216

00:08:21,110 --> 00:08:20,080

showing my age when i was a

217

00:08:23,589 --> 00:08:21,120

freshman

218

00:08:26,070 --> 00:08:23,599

in college i honestly did not know what

219

00:08:28,550 --> 00:08:26,080

engineering was i thought that engineers

220

00:08:31,350 --> 00:08:28,560

drove trains okay so engineers do drive

221

00:08:33,750 --> 00:08:31,360

trains but it's so much more than that

222

00:08:35,589 --> 00:08:33,760

and it wasn't until i had a roommate my

223

00:08:38,469 --> 00:08:35,599

sophomore year who happened to be an

224

00:08:40,790 --> 00:08:38,479

engineer that i realized this is really

225

00:08:42,230 --> 00:08:40,800

neat and you know what got me i i'm

226

00:08:44,230 --> 00:08:42,240

again a little embarrassed here because

227

00:08:47,509 --> 00:08:44,240

this is a sign what got me where the

228

00:08:50,470 --> 00:08:47,519

textbooks were so cool they had pictures

229

00:08:53,350 --> 00:08:50,480

of real systems and real real real world

230

00:08:56,070 --> 00:08:53,360

problems and i have um

231

00:08:58,470 --> 00:08:56,080

you know i i i i can almost say the rest

232

00:09:00,630 --> 00:08:58,480

is history from the time i saw

233

00:09:03,509 --> 00:09:00,640

the types of problems and the types of

234

00:09:05,190 --> 00:09:03,519

applications that you could study

235

00:09:06,070 --> 00:09:05,200

with engineering

236

00:09:09,269 --> 00:09:06,080

i mean

237

00:09:12,230 --> 00:09:09,279

it's it's um to me it's you know it's

238

00:09:13,990 --> 00:09:12,240

it's an infinite um opportunity there's

239

00:09:15,030 --> 00:09:14,000

so many things we can be doing and we

240

00:09:17,670 --> 00:09:15,040

will do

241

00:09:19,269 --> 00:09:17,680

um i think that's that's all i really

242

00:09:20,870 --> 00:09:19,279

had had to say

243

00:09:22,550 --> 00:09:20,880

mohammed

244

00:09:24,790 --> 00:09:22,560

thank you very much i'm really very

245

00:09:27,190 --> 00:09:24,800

honored to be here today and this panel

246

00:09:29,509 --> 00:09:27,200

to discuss with these 10 people about

247

00:09:30,949 --> 00:09:29,519

stem education and how to inspire and

248

00:09:33,110 --> 00:09:30,959

motivate the

249

00:09:34,870 --> 00:09:33,120

students the next generation

250

00:09:36,710 --> 00:09:34,880

into the fields of sciences and

251  
00:09:38,550 --> 00:09:36,720  
technologies and advanced technologies

252  
00:09:40,389 --> 00:09:38,560  
especially

253  
00:09:42,470 --> 00:09:40,399  
i also hope to share some lights on some

254  
00:09:43,990 --> 00:09:42,480  
of the troubles and the challenges and

255  
00:09:46,150 --> 00:09:44,000  
the problems that

256  
00:09:49,030 --> 00:09:46,160  
we will be facing in trying to provide

257  
00:09:50,470 --> 00:09:49,040  
the factories of the future in trying to

258  
00:09:52,949 --> 00:09:50,480  
provide

259  
00:09:54,550 --> 00:09:52,959  
the next generation innovators the next

260  
00:09:56,389 --> 00:09:54,560  
generation

261  
00:09:59,990 --> 00:09:56,399  
explorers

262  
00:10:02,389 --> 00:10:00,000  
i come from an academic arena

263  
00:10:05,190 --> 00:10:02,399

i do work for frostburg state university

264

00:10:08,470 --> 00:10:05,200

as a faculty member in addition to my

265

00:10:10,949 --> 00:10:08,480

involvement in teaching and

266

00:10:13,430 --> 00:10:10,959

research to some extent i have also

267

00:10:14,230 --> 00:10:13,440

developed a special interest

268

00:10:17,430 --> 00:10:14,240

in

269

00:10:18,949 --> 00:10:17,440

stem education

270

00:10:20,470 --> 00:10:18,959

for

271

00:10:22,790 --> 00:10:20,480

k-12

272

00:10:25,590 --> 00:10:22,800

students

273

00:10:27,030 --> 00:10:25,600

i do direct the program

274

00:10:29,590 --> 00:10:27,040

at frostburg state university it's

275

00:10:31,269 --> 00:10:29,600

called the center for future engineers

276

00:10:33,190 --> 00:10:31,279

this is a very brief beautiful and

277

00:10:35,350 --> 00:10:33,200

wonderful program because it's directed

278

00:10:36,949 --> 00:10:35,360

towards the gifted and talented students

279

00:10:39,190 --> 00:10:36,959

in the state of maryland we've just

280

00:10:41,190 --> 00:10:39,200

recently opened up for the

281

00:10:43,590 --> 00:10:41,200

neighboring states in west virginia and

282

00:10:46,470 --> 00:10:43,600

virginia and pennsylvania

283

00:10:48,710 --> 00:10:46,480

we tried to recruit students at an early

284

00:10:51,829 --> 00:10:48,720

age probably at

285

00:10:53,990 --> 00:10:51,839

grade 6 through 12

286

00:10:56,310 --> 00:10:54,000

into some activities

287

00:10:58,790 --> 00:10:56,320

experiential learning activities

288

00:11:00,550 --> 00:10:58,800

experiments

289

00:11:02,630 --> 00:11:00,560

challenging problems and challenging

290

00:11:04,949 --> 00:11:02,640

programs because we believe that the

291

00:11:07,350 --> 00:11:04,959

best way to inspire

292

00:11:13,110 --> 00:11:07,360

a gifted and talented student is

293

00:11:16,310 --> 00:11:14,870

that being said i would like to also

294

00:11:18,389 --> 00:11:16,320

mention that

295

00:11:21,350 --> 00:11:18,399

although recent

296

00:11:24,230 --> 00:11:21,360

indicators and recent concerns about the

297

00:11:26,069 --> 00:11:24,240

nation's ability to produce

298

00:11:27,829 --> 00:11:26,079

the next generation innovative

299

00:11:30,230 --> 00:11:27,839

innovators in the next generation

300

00:11:31,990 --> 00:11:30,240

academicians and the next generation

301  
00:11:33,670 --> 00:11:32,000  
explorers

302  
00:11:36,630 --> 00:11:33,680  
in the science and technology and

303  
00:11:40,550 --> 00:11:38,550  
these concerns led to

304  
00:11:42,550 --> 00:11:40,560  
a great investment

305  
00:11:44,069 --> 00:11:42,560  
in stem education

306  
00:11:46,150 --> 00:11:44,079  
at college level

307  
00:11:49,829 --> 00:11:46,160  
and beyond

308  
00:11:52,790 --> 00:11:49,839  
but unfortunately did not focus on

309  
00:11:55,110 --> 00:11:52,800  
trying to reach out for the brightest

310  
00:11:57,269 --> 00:11:55,120  
kids

311  
00:11:59,829 --> 00:11:57,279  
the misconception here is that the

312  
00:12:00,949 --> 00:11:59,839  
brightest student would make it on their

313  
00:12:03,030 --> 00:12:00,959

own

314

00:12:04,949 --> 00:12:03,040

well actually they will not unless we

315

00:12:06,710 --> 00:12:04,959

provide really challenging problems and

316

00:12:08,949 --> 00:12:06,720

difficult problems for them to keep them

317

00:12:10,949 --> 00:12:08,959

inspired and motivated

318

00:12:13,110 --> 00:12:10,959

this is what we do at the center for

319

00:12:15,190 --> 00:12:13,120

future engineers we reach out for the

320

00:12:17,910 --> 00:12:15,200

gifted and talented students

321

00:12:19,829 --> 00:12:17,920

we try to focus on providing challenging

322

00:12:23,030 --> 00:12:19,839

problems

323

00:12:25,430 --> 00:12:23,040

nasa of course is one of our vehicles

324

00:12:28,550 --> 00:12:25,440

the tools that we use

325

00:12:29,350 --> 00:12:28,560

because we real excuse me we realized

326

00:12:31,030 --> 00:12:29,360

that

327

00:12:34,389 --> 00:12:31,040

as soon as we mentioned about space

328

00:12:36,870 --> 00:12:34,399

missions for example this year for

329

00:12:40,150 --> 00:12:36,880

summer center which is part of our

330

00:12:41,829 --> 00:12:40,160

center for future engineers activity

331

00:12:42,949 --> 00:12:41,839

we developed a program we called

332

00:12:45,110 --> 00:12:42,959

robotics

333

00:12:47,190 --> 00:12:45,120

on the surface of the moon

334

00:12:48,310 --> 00:12:47,200

so we realized that robotics is a cool

335

00:12:52,230 --> 00:12:48,320

thing

336

00:12:54,550 --> 00:12:52,240

join them together robotics on the

337

00:12:57,190 --> 00:12:54,560

surface of the moon is one wonderful

338

00:13:01,509 --> 00:12:57,200

great thing too it's like putting peanut

339

00:13:06,550 --> 00:13:04,069

and it was actually a great success it

340

00:13:08,069 --> 00:13:06,560

was very very very cool program

341

00:13:10,230 --> 00:13:08,079

everybody liked it

342

00:13:11,590 --> 00:13:10,240

we added a little bit of technical

343

00:13:13,430 --> 00:13:11,600

challenge because we wanted these

344

00:13:16,629 --> 00:13:13,440

robotics to be networked that they can

345

00:13:18,629 --> 00:13:16,639

communicate and search for some kind of

346

00:13:20,470 --> 00:13:18,639

a mystery substance under the rockets of

347

00:13:22,629 --> 00:13:20,480

the moons

348

00:13:25,509 --> 00:13:22,639

students in that program were

349

00:13:27,590 --> 00:13:25,519

entering grade 9 through 12.

350

00:13:28,389 --> 00:13:27,600

quite challenging some of these programs

351  
00:13:30,470 --> 00:13:28,399  
were

352  
00:13:33,509 --> 00:13:30,480  
initially developed for college students

353  
00:13:36,069 --> 00:13:33,519  
at their senior and junior level

354  
00:13:38,069 --> 00:13:36,079  
in three weeks we noticed that because

355  
00:13:41,189 --> 00:13:38,079  
of the inspiration the amount of

356  
00:13:44,310 --> 00:13:41,199  
inspiration the amount of motivation

357  
00:13:47,670 --> 00:13:44,320  
the amount of realism in those kids they

358  
00:13:49,350 --> 00:13:47,680  
were able to program develop build

359  
00:13:52,150 --> 00:13:49,360  
construct

360  
00:13:54,710 --> 00:13:52,160  
robotic systems that were able to

361  
00:13:56,389 --> 00:13:54,720  
complete the mission

362  
00:13:57,189 --> 00:13:56,399  
well the trick here is before we did

363  
00:13:59,590 --> 00:13:57,199

that

364

00:14:03,829 --> 00:13:59,600

we showed a little documentary and a

365

00:14:06,629 --> 00:14:03,839

movie about the early apollo missions

366

00:14:08,710 --> 00:14:06,639

and we showed them how engineers

367

00:14:10,710 --> 00:14:08,720

did really great cool things and how

368

00:14:13,590 --> 00:14:10,720

they reached their goals

369

00:14:17,990 --> 00:14:13,600

when the time was it was very very early

370

00:14:19,590 --> 00:14:18,000

stages of a state of space programs

371

00:14:21,030 --> 00:14:19,600

i kind of cheated a little bit because

372

00:14:23,269 --> 00:14:21,040

this is how i got myself into

373

00:14:25,350 --> 00:14:23,279

engineering and science

374

00:14:27,350 --> 00:14:25,360

when i was little rowan

375

00:14:29,030 --> 00:14:27,360

this is how i

376

00:14:31,430 --> 00:14:29,040

realized that engineering is cool

377

00:14:33,110 --> 00:14:31,440

because i watch the documentary i watch

378

00:14:35,189 --> 00:14:33,120

the movies about the early apollo

379

00:14:37,430 --> 00:14:35,199

missions

380

00:14:39,670 --> 00:14:37,440

nasa history

381

00:14:42,710 --> 00:14:39,680

and historical missions

382

00:14:46,870 --> 00:14:44,949

programs and current missions

383

00:14:50,470 --> 00:14:46,880

can be used

384

00:14:53,189 --> 00:14:50,480

as a great tool to inspire those kids

385

00:14:54,790 --> 00:14:53,199

especially in these programs

386

00:14:56,310 --> 00:14:54,800

now some of the problems and the

387

00:14:57,990 --> 00:14:56,320

challenges and like

388

00:14:59,430 --> 00:14:58,000

my friend mary here said that the world

389

00:15:01,910 --> 00:14:59,440

is not perfect

390

00:15:04,150 --> 00:15:01,920

is of course funding these programs are

391

00:15:05,509 --> 00:15:04,160

actually dying because of the lack of

392

00:15:07,990 --> 00:15:05,519

funding

393

00:15:09,910 --> 00:15:08,000

why do we want to target specifically we

394

00:15:11,030 --> 00:15:09,920

want to target all students and try to

395

00:15:13,110 --> 00:15:11,040

create

396

00:15:14,790 --> 00:15:13,120

the numbers that we want the numbers

397

00:15:16,470 --> 00:15:14,800

that this country needs

398

00:15:18,389 --> 00:15:16,480

to cover

399

00:15:20,790 --> 00:15:18,399

the needs in

400

00:15:22,470 --> 00:15:20,800

fueling the economic and security needs

401  
00:15:24,310 --> 00:15:22,480  
in engineering

402  
00:15:26,870 --> 00:15:24,320  
but we also want to focus on the gifted

403  
00:15:29,590 --> 00:15:26,880  
and talented students they are also

404  
00:15:31,430 --> 00:15:29,600  
gifted and talented in other fields

405  
00:15:32,949 --> 00:15:31,440  
and if we don't care for them

406  
00:15:37,910 --> 00:15:32,959  
they would just simply go and find

407  
00:15:42,949 --> 00:15:40,550  
i just was very surprised to learn

408  
00:15:44,949 --> 00:15:42,959  
that there's only eight million dollars

409  
00:15:47,430 --> 00:15:44,959  
in the federal budget for gifted and

410  
00:15:48,949 --> 00:15:47,440  
talented students in the united states

411  
00:15:51,430 --> 00:15:48,959  
remember that these are the

412  
00:15:53,509 --> 00:15:51,440  
the kids that are going to participate

413  
00:15:56,230 --> 00:15:53,519

in nasa great missions of the future the

414

00:15:58,389 --> 00:15:56,240

gifted and talented ones

415

00:16:00,870 --> 00:15:58,399

there's no money unfortunately earmarked

416

00:16:02,710 --> 00:16:00,880

for gifted and talented students

417

00:16:05,110 --> 00:16:02,720

in the state of maryland where we

418

00:16:06,629 --> 00:16:05,120

actually operate

419

00:16:08,629 --> 00:16:06,639

with that

420

00:16:10,870 --> 00:16:08,639

we are considered to be

421

00:16:12,389 --> 00:16:10,880

one of the few lucky centers in the

422

00:16:14,629 --> 00:16:12,399

state of maryland that are still

423

00:16:16,870 --> 00:16:14,639

surviving because of some corporate

424

00:16:18,790 --> 00:16:16,880

sponsorship and we don't know actually

425

00:16:20,470 --> 00:16:18,800

what would be the future

426  
00:16:22,629 --> 00:16:20,480  
for the center

427  
00:16:24,389 --> 00:16:22,639  
in conclusion i would like to reiterate

428  
00:16:26,069 --> 00:16:24,399  
that nasa

429  
00:16:29,430 --> 00:16:26,079  
past achievements and current

430  
00:16:32,150 --> 00:16:29,440  
achievements is a great are a great

431  
00:16:35,430 --> 00:16:32,160  
tool and vehicle to inspire and motivate

432  
00:16:37,350 --> 00:16:35,440  
the future of our engineers

433  
00:16:39,910 --> 00:16:37,360  
through funds from nasa and other

434  
00:16:41,829 --> 00:16:39,920  
corporate corporations we were able to

435  
00:16:43,509 --> 00:16:41,839  
generate these programs

436  
00:16:45,189 --> 00:16:43,519  
when we challenge the gifted and

437  
00:16:47,350 --> 00:16:45,199  
talented students

438  
00:16:49,110 --> 00:16:47,360

beyond their capacity

439

00:16:51,030 --> 00:16:49,120

we are not actually challenging them

440

00:16:54,470 --> 00:16:51,040

beyond their capacity we are pushing the

441

00:16:57,189 --> 00:16:54,480

limit and when we do so we are preparing

442

00:16:59,350 --> 00:16:57,199

the great engineers of the future

443

00:17:01,590 --> 00:16:59,360

with that i would like to

444

00:17:02,629 --> 00:17:01,600

let's go to let's go to susan

445

00:17:04,630 --> 00:17:02,639

hey

446

00:17:09,510 --> 00:17:04,640

good afternoon my name is susan

447

00:17:11,909 --> 00:17:09,520

bardenhagen i am a classroom educator

448

00:17:13,029 --> 00:17:11,919

i am the oldest of four

449

00:17:14,230 --> 00:17:13,039

daughters

450

00:17:16,549 --> 00:17:14,240

and

451  
00:17:17,429 --> 00:17:16,559  
i in looking at the careers that we all

452  
00:17:19,909 --> 00:17:17,439  
took

453  
00:17:22,470 --> 00:17:19,919  
being the oldest i went into the

454  
00:17:24,309 --> 00:17:22,480  
traditional role that someone

455  
00:17:25,270 --> 00:17:24,319  
involved in stem education would be

456  
00:17:28,549 --> 00:17:25,280  
involved

457  
00:17:29,990 --> 00:17:28,559  
with and that is being a teacher

458  
00:17:31,830 --> 00:17:30,000  
my next sister

459  
00:17:33,669 --> 00:17:31,840  
is a physical therapist assistant the

460  
00:17:36,070 --> 00:17:33,679  
medical profession is another place

461  
00:17:37,830 --> 00:17:36,080  
where you find a lot of females

462  
00:17:40,789 --> 00:17:37,840  
my third sister really wanted to be a

463  
00:17:43,110 --> 00:17:40,799

veterinarian but she has her own horse

464

00:17:45,110 --> 00:17:43,120

farm and um

465

00:17:46,549 --> 00:17:45,120

is an entrepreneur with everything that

466

00:17:48,549 --> 00:17:46,559

she does

467

00:17:51,990 --> 00:17:48,559

and my youngest sister

468

00:17:54,310 --> 00:17:52,000

is a chemical engineer

469

00:17:56,630 --> 00:17:54,320

she also went back to school and got her

470

00:17:59,430 --> 00:17:56,640

degree in financial

471

00:18:01,590 --> 00:17:59,440

becoming a financial analyst so

472

00:18:03,909 --> 00:18:01,600

she can take on both roles first when

473

00:18:05,430 --> 00:18:03,919

she worked for arco oil company

474

00:18:07,110 --> 00:18:05,440

she not only could

475

00:18:09,510 --> 00:18:07,120

do the chemical engineering but she was

476

00:18:11,029 --> 00:18:09,520

able to do the financial analyst and

477

00:18:14,230 --> 00:18:11,039

know what she was talking about in that

478

00:18:16,630 --> 00:18:14,240

particular role she's now working i'm

479

00:18:17,830 --> 00:18:16,640

proud to say with alternative energy

480

00:18:20,150 --> 00:18:17,840

forces

481

00:18:21,990 --> 00:18:20,160

and um

482

00:18:23,350 --> 00:18:22,000

actually came to talk to my students

483

00:18:25,830 --> 00:18:23,360

about the new book that she was a

484

00:18:29,190 --> 00:18:25,840

contributing edit editor for on wind

485

00:18:31,110 --> 00:18:29,200

energy so that's pretty cool

486

00:18:32,870 --> 00:18:31,120

yeah we're for four daughters but we

487

00:18:35,029 --> 00:18:32,880

didn't know that there was anything

488

00:18:36,630 --> 00:18:35,039

unusual about us being girls that were

489

00:18:38,549 --> 00:18:36,640

interested in doing stuff until we each

490

00:18:40,630 --> 00:18:38,559

went to college armed with our

491

00:18:42,390 --> 00:18:40,640

flat-bladed and phillips head

492

00:18:44,630 --> 00:18:42,400

screwdrivers and everybody knew that if

493

00:18:46,150 --> 00:18:44,640

they needed anything fixed or

494

00:18:48,310 --> 00:18:46,160

that we could do it we didn't think that

495

00:18:51,510 --> 00:18:48,320

was unusual and it was just the way that

496

00:18:54,470 --> 00:18:51,520

my mom and dad brought us up and um

497

00:18:57,190 --> 00:18:54,480

i mean i remember mary was talking about

498

00:18:59,110 --> 00:18:57,200

the engineer i thought an engineer too

499

00:19:00,470 --> 00:18:59,120

when i was in high school and college

500

00:19:02,390 --> 00:19:00,480

was someone who

501  
00:19:03,510 --> 00:19:02,400  
was the engineer for the train

502  
00:19:07,590 --> 00:19:03,520  
um

503  
00:19:09,110 --> 00:19:07,600  
air force base on long island and we

504  
00:19:11,669 --> 00:19:09,120  
were always wondering what those things

505  
00:19:14,150 --> 00:19:11,679  
were and

506  
00:19:16,870 --> 00:19:14,160  
kind of being afraid but

507  
00:19:18,950 --> 00:19:16,880  
thinking they were interesting but the

508  
00:19:21,590 --> 00:19:18,960  
the defining moment for me as far as

509  
00:19:25,270 --> 00:19:21,600  
interest in space came in 62 when john

510  
00:19:27,669 --> 00:19:25,280  
glenn did his three orbits and they

511  
00:19:29,430 --> 00:19:27,679  
at the time

512  
00:19:31,590 --> 00:19:29,440  
in school they

513  
00:19:33,270 --> 00:19:31,600

broadcasted on the pa system there were

514

00:19:36,789 --> 00:19:33,280

no televisions in the classroom i mean

515

00:19:39,270 --> 00:19:36,799

we were still watching black and white

516

00:19:41,350 --> 00:19:39,280

and i remember being so interested in

517

00:19:42,710 --> 00:19:41,360

that and telling my mom that i wanted to

518

00:19:44,549 --> 00:19:42,720

cut out all the

519

00:19:45,590 --> 00:19:44,559

articles and everything and she actually

520

00:19:47,909 --> 00:19:45,600

gave up

521

00:19:50,310 --> 00:19:47,919

her treasured scrapbook that her big

522

00:19:52,230 --> 00:19:50,320

brother had brought back and let me put

523

00:19:54,630 --> 00:19:52,240

some pictures in hers and because it's

524

00:19:56,150 --> 00:19:54,640

so little you can see it just

525

00:19:58,470 --> 00:19:56,160

i have this little thing of the ticker

526

00:20:00,150 --> 00:19:58,480

tape parade and i saved it

527

00:20:01,669 --> 00:20:00,160

and then i started collecting bigger

528

00:20:04,149 --> 00:20:01,679

things and putting them on poster board

529

00:20:05,669 --> 00:20:04,159

so i have gordon cooper and a few others

530

00:20:08,070 --> 00:20:05,679

and

531

00:20:10,870 --> 00:20:08,080

that kept my interest in space but i

532

00:20:13,110 --> 00:20:10,880

never aspired to become an astronaut

533

00:20:14,149 --> 00:20:13,120

until i became a teacher

534

00:20:16,630 --> 00:20:14,159

and

535

00:20:18,470 --> 00:20:16,640

i still tell my students that when i

536

00:20:20,230 --> 00:20:18,480

grow up i want to be an astronaut and

537

00:20:23,190 --> 00:20:20,240

because i teach elementary school they

538

00:20:25,990 --> 00:20:23,200

look at me and say well you are grown up

539

00:20:29,110 --> 00:20:26,000

and that brings me to to what

540

00:20:31,190 --> 00:20:29,120

i think has me sitting here

541

00:20:33,590 --> 00:20:31,200

today and the fact that

542

00:20:35,590 --> 00:20:33,600

i am still so excited about everything

543

00:20:37,510 --> 00:20:35,600

that's out there to learn

544

00:20:39,590 --> 00:20:37,520

i relate to the students what it was

545

00:20:41,110 --> 00:20:39,600

like when i was their age so that they

546

00:20:42,950 --> 00:20:41,120

can get in a

547

00:20:45,430 --> 00:20:42,960

it's very difficult and abstract for

548

00:20:48,149 --> 00:20:45,440

them to understand how much technology

549

00:20:49,990 --> 00:20:48,159

has grown just in the 58 years that i've

550

00:20:52,470 --> 00:20:50,000

been on the planet and

551  
00:20:54,390 --> 00:20:52,480  
for them to understand that

552  
00:20:56,070 --> 00:20:54,400  
there were no black and white television

553  
00:20:59,029 --> 00:20:56,080  
i mean there were only black and white

554  
00:21:00,789 --> 00:20:59,039  
televisions that at 12 midnight the

555  
00:21:02,630 --> 00:21:00,799  
the signal came on and there wasn't

556  
00:21:05,669 --> 00:21:02,640  
anything on after that

557  
00:21:07,029 --> 00:21:05,679  
um no cell phones the dial

558  
00:21:13,590 --> 00:21:07,039  
and

559  
00:21:15,750 --> 00:21:13,600  
i took some notes as to what kinds of

560  
00:21:17,430 --> 00:21:15,760  
things i remember from my teaching

561  
00:21:19,590 --> 00:21:17,440  
from being taught

562  
00:21:21,590 --> 00:21:19,600  
as a student i remember doing a science

563  
00:21:24,230 --> 00:21:21,600

project on brine shrimp whether or not

564

00:21:26,230 --> 00:21:24,240

they preferred certain colored lights

565

00:21:27,669 --> 00:21:26,240

and so i took over my dad's workshop in

566

00:21:29,669 --> 00:21:27,679

the basement and had all these different

567

00:21:30,789 --> 00:21:29,679

colored lights set up

568

00:21:32,789 --> 00:21:30,799

and

569

00:21:34,630 --> 00:21:32,799

i remember doing that project i remember

570

00:21:36,390 --> 00:21:34,640

my fifth grade teacher requiring us to

571

00:21:39,190 --> 00:21:36,400

keep a nature lock

572

00:21:41,270 --> 00:21:39,200

and go out and find this particular spot

573

00:21:42,950 --> 00:21:41,280

that we'd have to go visit at least once

574

00:21:45,590 --> 00:21:42,960

a week maybe longer for the whole school

575

00:21:47,669 --> 00:21:45,600

year through all four seasons and record

576

00:21:49,990 --> 00:21:47,679

information and data about the flora and

577

00:21:52,230 --> 00:21:50,000

fauna and everything that was going on

578

00:21:54,470 --> 00:21:52,240

and somewhere packed in a box somewhere

579

00:21:57,029 --> 00:21:54,480

i still have the leaves

580

00:21:58,710 --> 00:21:57,039

in these little what they were then the

581

00:22:01,669 --> 00:21:58,720

plastic sleeves that you could keep

582

00:22:04,149 --> 00:22:01,679

protect things in and i still have my

583

00:22:06,549 --> 00:22:04,159

students do that i've had my third

584

00:22:08,149 --> 00:22:06,559

through my eighth graders keep nature

585

00:22:09,990 --> 00:22:08,159

locks and

586

00:22:12,390 --> 00:22:10,000

do the observations

587

00:22:14,070 --> 00:22:12,400

um

588

00:22:16,070 --> 00:22:14,080

when i look at

589

00:22:17,430 --> 00:22:16,080

the things with which i've become

590

00:22:19,430 --> 00:22:17,440

involved

591

00:22:22,549 --> 00:22:19,440

i think it's because of all the things

592

00:22:25,110 --> 00:22:22,559

that nasa has had out there noah has had

593

00:22:28,310 --> 00:22:25,120

out there and the fact that i am still a

594

00:22:30,070 --> 00:22:28,320

big kid that loves learning i mean

595

00:22:32,870 --> 00:22:30,080

when i was approached to be part of the

596

00:22:34,950 --> 00:22:32,880

panel today it was because i don't know

597

00:22:37,669 --> 00:22:34,960

if i'm the only but i'm one of the few

598

00:22:38,630 --> 00:22:37,679

classroom teachers who signed up for the

599

00:22:41,190 --> 00:22:38,640

to be

600

00:22:42,070 --> 00:22:41,200

part of this today and

601  
00:22:45,110 --> 00:22:42,080  
then

602  
00:22:47,110 --> 00:22:45,120  
the you know the rest is history um to

603  
00:22:48,470 --> 00:22:47,120  
just let you know a few of the things

604  
00:22:52,549 --> 00:22:48,480  
that

605  
00:22:54,549 --> 00:22:52,559  
um

606  
00:22:57,110 --> 00:22:54,559  
there's the an organization called the

607  
00:22:58,950 --> 00:22:57,120  
federation of galaxy explorers there's

608  
00:22:59,990 --> 00:22:58,960  
there are two displays outside for you

609  
00:23:01,190 --> 00:23:00,000  
to look at

610  
00:23:04,630 --> 00:23:01,200  
um

611  
00:23:05,669 --> 00:23:04,640  
it was started in 2002 by an engineer a

612  
00:23:11,830 --> 00:23:05,679  
space

613  
00:23:13,669 --> 00:23:11,840

across and inspire kids

614

00:23:15,830 --> 00:23:13,679

and i've been a mission team leader

615

00:23:18,149 --> 00:23:15,840

since 2003

616

00:23:19,190 --> 00:23:18,159

and one of the most exciting things is

617

00:23:21,669 --> 00:23:19,200

to see

618

00:23:23,590 --> 00:23:21,679

young third fourth and fifth graders who

619

00:23:24,870 --> 00:23:23,600

have so many questions that we don't get

620

00:23:27,110 --> 00:23:24,880

to a lot of the stuff that's on the

621

00:23:29,190 --> 00:23:27,120

meeting because they just want to know

622

00:23:31,270 --> 00:23:29,200

and if we don't know the answers we find

623

00:23:32,789 --> 00:23:31,280

it out and they investigate and they see

624

00:23:33,590 --> 00:23:32,799

me at school and they'll come back and

625

00:23:36,549 --> 00:23:33,600

say

626  
00:23:38,310 --> 00:23:36,559  
the awe that's in their face is probably

627  
00:23:39,510 --> 00:23:38,320  
when i was sitting there in

628  
00:23:46,230 --> 00:23:39,520  
in

629  
00:23:48,870 --> 00:23:46,240  
galaxy explorers is a great way we have

630  
00:23:50,870 --> 00:23:48,880  
moon based teams we've updated to the

631  
00:23:51,750 --> 00:23:50,880  
fact now where they have simulations

632  
00:23:54,149 --> 00:23:51,760  
where

633  
00:23:56,630 --> 00:23:54,159  
we have suits that were created by the

634  
00:23:58,390 --> 00:23:56,640  
same company that does nasa so the kids

635  
00:24:01,269 --> 00:23:58,400  
get to dress up in their

636  
00:24:03,750 --> 00:24:01,279  
little helmets and their white suits and

637  
00:24:05,510 --> 00:24:03,760  
we made gloves for them and

638  
00:24:07,909 --> 00:24:05,520

spongy boots so that they can feel what

639

00:24:09,830 --> 00:24:07,919

they're doing and they actually do a

640

00:24:12,470 --> 00:24:09,840

moon base where they look for meteorites

641

00:24:15,269 --> 00:24:12,480

and possibly

642

00:24:16,630 --> 00:24:15,279

have a solar solar flare and they have

643

00:24:18,470 --> 00:24:16,640

to go in and

644

00:24:20,149 --> 00:24:18,480

protect each other and be

645

00:24:21,830 --> 00:24:20,159

it's a team thing and it's just so

646

00:24:24,149 --> 00:24:21,840

exciting to have it involved and that's

647

00:24:25,909 --> 00:24:24,159

one of the things that

648

00:24:28,789 --> 00:24:25,919

that i work with that

649

00:24:30,870 --> 00:24:28,799

specifically rated related to space

650

00:24:32,390 --> 00:24:30,880

there's another program that i just got

651  
00:24:34,230 --> 00:24:32,400  
involved with this year called the real

652  
00:24:37,430 --> 00:24:34,240  
world design challenge

653  
00:24:39,990 --> 00:24:37,440  
and that takes high school students

654  
00:24:41,590 --> 00:24:40,000  
and gives them a project to solve

655  
00:24:43,990 --> 00:24:41,600  
a problem they have to work together as

656  
00:24:46,630 --> 00:24:44,000  
a team it's totally

657  
00:24:48,070 --> 00:24:46,640  
funded by outside sources the people

658  
00:24:49,830 --> 00:24:48,080  
that put it together

659  
00:24:52,070 --> 00:24:49,840  
it's unbelievable what these kids would

660  
00:24:53,669 --> 00:24:52,080  
do and the the cha the final challenge

661  
00:24:56,630 --> 00:24:53,679  
where they compete

662  
00:24:58,390 --> 00:24:56,640  
is in washington dc and it's held at the

663  
00:25:00,549 --> 00:24:58,400

air and space museum when they're done

664

00:25:01,669 --> 00:25:00,559

we have a reception and to see these

665

00:25:02,870 --> 00:25:01,679

young kids

666

00:25:05,110 --> 00:25:02,880

many of whom are going to go into

667

00:25:07,990 --> 00:25:05,120

stem-related fields

668

00:25:10,149 --> 00:25:08,000

working together on high-powered

669

00:25:12,390 --> 00:25:10,159

physics and engineering and coming up

670

00:25:15,190 --> 00:25:12,400

with everything they need to do it's

671

00:25:16,950 --> 00:25:15,200

phenomenal the lieutenant governors

672

00:25:19,110 --> 00:25:16,960

a bill was passed and

673

00:25:20,390 --> 00:25:19,120

a resolution that

674

00:25:22,230 --> 00:25:20,400

all of the states are going to

675

00:25:24,789 --> 00:25:22,240

participate and it's it's run through

676

00:25:26,390 --> 00:25:24,799

the lieutenant governor's office

677

00:25:27,350 --> 00:25:26,400

that'll be coming up starting in the

678

00:25:29,909 --> 00:25:27,360

fall

679

00:25:32,870 --> 00:25:29,919

another thing that i'm actively involved

680

00:25:35,590 --> 00:25:32,880

in has to do with the female and the

681

00:25:37,750 --> 00:25:35,600

gender side of of

682

00:25:39,350 --> 00:25:37,760

where i came to be and that is

683

00:25:41,350 --> 00:25:39,360

through a conference called girls plus

684

00:25:45,110 --> 00:25:41,360

math plus science equals success it was

685

00:25:47,590 --> 00:25:45,120

started on the west coast in 1990

686

00:25:49,669 --> 00:25:47,600

on the east coast they have a lot of

687

00:25:52,310 --> 00:25:49,679

conferences called girls excelling at

688

00:25:55,029 --> 00:25:52,320

math and science so it's gems again it's

689

00:25:58,549 --> 00:25:55,039

math and science based from the early

690

00:26:01,029 --> 00:25:58,559

90s as opposed to stem but we've now

691

00:26:02,789 --> 00:26:01,039

updated it so include stem and it's a

692

00:26:04,950 --> 00:26:02,799

career conference for

693

00:26:07,269 --> 00:26:04,960

for the young people grades five through

694

00:26:09,029 --> 00:26:07,279

high school to see

695

00:26:11,190 --> 00:26:09,039

role models

696

00:26:12,789 --> 00:26:11,200

if i were to say the two biggest things

697

00:26:14,789 --> 00:26:12,799

that i would

698

00:26:17,350 --> 00:26:14,799

think educators need to do is they need

699

00:26:19,430 --> 00:26:17,360

to provide role models with whether it's

700

00:26:20,789 --> 00:26:19,440

the teacher themselves or the people

701  
00:26:24,470 --> 00:26:20,799  
that they bring into the classroom

702  
00:26:27,190 --> 00:26:24,480  
through careers or conferences that kids

703  
00:26:28,630 --> 00:26:27,200  
actually get to see other people

704  
00:26:31,269 --> 00:26:28,640  
like themselves

705  
00:26:33,110 --> 00:26:31,279  
whether it be minorities females people

706  
00:26:35,669 --> 00:26:33,120  
with handicapping conditions people of

707  
00:26:38,070 --> 00:26:35,679  
different ethnicities and that

708  
00:26:40,870 --> 00:26:38,080  
that empowers them to say oh i can do

709  
00:26:44,070 --> 00:26:41,830  
and

710  
00:26:46,710 --> 00:26:44,080  
the conference is co-sponsored by the

711  
00:26:48,710 --> 00:26:46,720  
american association of university women

712  
00:26:51,029 --> 00:26:48,720  
and i can say when i first heard about

713  
00:26:52,710 --> 00:26:51,039

it's kind of a similar story to mary

714

00:26:54,470 --> 00:26:52,720

i thought the american association of

715

00:26:55,909 --> 00:26:54,480

university women

716

00:26:57,990 --> 00:26:55,919

okay

717

00:27:00,870 --> 00:26:58,000

were the wives of professors

718

00:27:02,149 --> 00:27:00,880

when i first heard about it 25 years ago

719

00:27:03,990 --> 00:27:02,159

and why

720

00:27:06,390 --> 00:27:04,000

there was nothing else to make me think

721

00:27:09,029 --> 00:27:06,400

anything different and so

722

00:27:10,710 --> 00:27:09,039

come a long way

723

00:27:13,590 --> 00:27:10,720

the first year that conference happened

724

00:27:16,390 --> 00:27:13,600

i i couldn't be a presenter because they

725

00:27:19,590 --> 00:27:16,400

only wanted non-traditional roles

726

00:27:21,990 --> 00:27:19,600

uh for women so a teacher was not one my

727

00:27:24,470 --> 00:27:22,000

sister working in the physical therapy

728

00:27:28,149 --> 00:27:24,480

field no not really but my youngest

729

00:27:30,070 --> 00:27:28,159

sister the chemical engineer in 1991

730

00:27:31,350 --> 00:27:30,080

her presentation was called hard hat and

731

00:27:32,950 --> 00:27:31,360

a dress

732

00:27:35,190 --> 00:27:32,960

because when she first got her job

733

00:27:36,950 --> 00:27:35,200

working for the utility company it was

734

00:27:39,430 --> 00:27:36,960

business dress they didn't know what to

735

00:27:41,430 --> 00:27:39,440

do with a female so they made her wear a

736

00:27:43,909 --> 00:27:41,440

dress but she had to wear steel-toed

737

00:27:45,510 --> 00:27:43,919

shoes shoes and a hard hat until they

738

00:27:47,029 --> 00:27:45,520

figured out what was what was

739

00:27:48,549 --> 00:27:47,039

appropriate and

740

00:27:52,230 --> 00:27:48,559

gosh that's only

741

00:27:56,149 --> 00:27:53,110

okay

742

00:27:59,269 --> 00:27:56,159

1991 i made a mistake

743

00:28:03,190 --> 00:27:59,279

the other thing that's coming up

744

00:28:04,789 --> 00:28:03,200

is the the 2012 united states of america

745

00:28:06,070 --> 00:28:04,799

science and engineering conference many

746

00:28:07,750 --> 00:28:06,080

of you have already talked to me about

747

00:28:09,029 --> 00:28:07,760

it today because you saw the flyers

748

00:28:11,510 --> 00:28:09,039

outside

749

00:28:13,430 --> 00:28:11,520

last year it was on 10 10 10.

750

00:28:15,909 --> 00:28:13,440

they even had some music that was

751  
00:28:17,590 --> 00:28:15,919  
created which is another part near and

752  
00:28:19,350 --> 00:28:17,600  
dear to my heart because i play violin

753  
00:28:20,950 --> 00:28:19,360  
in a symphony orchestra

754  
00:28:23,350 --> 00:28:20,960  
um

755  
00:28:26,070 --> 00:28:23,360  
the bringing of all the stem and across

756  
00:28:28,230 --> 00:28:26,080  
the country i encourage you to check it

757  
00:28:30,310 --> 00:28:28,240  
out and see what's going on there are

758  
00:28:32,470 --> 00:28:30,320  
packets banded out on the table i saw

759  
00:28:34,070 --> 00:28:32,480  
many of you just pulling out one or two

760  
00:28:36,549 --> 00:28:34,080  
there are three more boxes of those

761  
00:28:39,269 --> 00:28:36,559  
those are called save the date things

762  
00:28:40,950 --> 00:28:39,279  
um to get people involved all across the

763  
00:28:42,630 --> 00:28:40,960

country just because it's the final

764

00:28:44,230 --> 00:28:42,640

thing is going to happen in dc doesn't

765

00:28:46,070 --> 00:28:44,240

mean there aren't all of these things

766

00:28:47,669 --> 00:28:46,080

we've been talking about today

767

00:28:48,950 --> 00:28:47,679

partnering with

768

00:28:51,430 --> 00:28:48,960

businesses

769

00:28:53,510 --> 00:28:51,440

bringing mentors in bringing scientists

770

00:28:56,789 --> 00:28:53,520

into the classroom having kids

771

00:28:58,710 --> 00:28:56,799

email questions to different scientists

772

00:28:59,990 --> 00:28:58,720

field trips and just getting everybody

773

00:29:02,230 --> 00:29:00,000

involved

774

00:29:04,710 --> 00:29:02,240

and the reason i'm here today is because

775

00:29:06,710 --> 00:29:04,720

of aiaa the american institute of

776

00:29:08,950 --> 00:29:06,720

aeronautics and astronautics i am an

777

00:29:11,029 --> 00:29:08,960

educator associate

778

00:29:13,510 --> 00:29:11,039

it's free and they invite me to all

779

00:29:18,789 --> 00:29:13,520

these different things i got to have

780

00:29:23,909 --> 00:29:21,990

the royal aeronautics society

781

00:29:25,669 --> 00:29:23,919

to talk about things that were happening

782

00:29:28,310 --> 00:29:25,679

and it's just there's just so many

783

00:29:31,510 --> 00:29:28,320

things out there that don't cost

784

00:29:33,110 --> 00:29:31,520

money for me per se as much as

785

00:29:34,789 --> 00:29:33,120

it's an investment thinking about the

786

00:29:36,549 --> 00:29:34,799

last panel

787

00:29:38,950 --> 00:29:36,559

yes it's an investment for the different

788

00:29:41,029 --> 00:29:38,960

organizations to get together but then

789

00:29:43,190 --> 00:29:41,039

to provide that for teachers so that we

790

00:29:45,590 --> 00:29:43,200

can then be excited and go back to the

791

00:29:48,310 --> 00:29:45,600

classroom and get kids excited and try

792

00:29:49,669 --> 00:29:48,320

to get other teachers involved is is oh

793

00:29:51,990 --> 00:29:49,679

so important

794

00:29:54,950 --> 00:29:52,000

and that brings me to the final thing

795

00:29:57,190 --> 00:29:54,960

that i want to say is my concern is that

796

00:29:59,909 --> 00:29:57,200

especially at the

797

00:30:03,029 --> 00:29:59,919

elementary level of having people who

798

00:30:03,909 --> 00:30:03,039

are knowledgeable about the content

799

00:30:06,149 --> 00:30:03,919

and

800

00:30:08,310 --> 00:30:06,159

if they're not knowledgeable

801  
00:30:10,070 --> 00:30:08,320  
still teaching it and finding out how to

802  
00:30:12,470 --> 00:30:10,080  
make the kids interested and learning

803  
00:30:16,070 --> 00:30:12,480  
with the kids to do the research

804  
00:30:18,470 --> 00:30:16,080  
i worry that we don't

805  
00:30:20,630 --> 00:30:18,480  
get the kids started enough

806  
00:30:23,269 --> 00:30:20,640  
early enough because we've become so

807  
00:30:25,029 --> 00:30:23,279  
focused on testing and

808  
00:30:26,230 --> 00:30:25,039  
that language arts and math are in the

809  
00:30:29,029 --> 00:30:26,240  
forefront and that's what you're going

810  
00:30:31,350 --> 00:30:29,039  
to be judged at so

811  
00:30:34,070 --> 00:30:31,360  
with that i will pass it on to an

812  
00:30:35,990 --> 00:30:34,080  
education person with nasa to michael

813  
00:30:38,149 --> 00:30:36,000

Ieland um why don't you give a little

814

00:30:39,269 --> 00:30:38,159

bit of background um but i think folks

815

00:30:40,389 --> 00:30:39,279

have already heard a little bit about

816

00:30:42,789 --> 00:30:40,399

you and then we'll dive into some

817

00:30:45,350 --> 00:30:42,799

questions okay um

818

00:30:47,590 --> 00:30:45,360

middle school parents inspired me

819

00:30:50,549 --> 00:30:47,600

gave me tools to help me

820

00:30:51,430 --> 00:30:50,559

create things that fueled my curiosity

821

00:30:53,510 --> 00:30:51,440

and

822

00:30:55,029 --> 00:30:53,520

that allowed me to become an astronaut

823

00:30:56,230 --> 00:30:55,039

eventually flew in space a couple of

824

00:30:57,430 --> 00:30:56,240

times

825

00:31:00,389 --> 00:30:57,440

and

826  
00:31:01,750 --> 00:31:00,399  
my second flight i realized how

827  
00:31:03,350 --> 00:31:01,760  
impactful

828  
00:31:05,430 --> 00:31:03,360  
talking to kids from the international

829  
00:31:07,830 --> 00:31:05,440  
space station was because we did a

830  
00:31:09,669 --> 00:31:07,840  
radio show on the tom joyner show which

831  
00:31:11,590 --> 00:31:09,679  
the market is about 7 million people in

832  
00:31:12,470 --> 00:31:11,600  
the african-american community

833  
00:31:14,389 --> 00:31:12,480  
and

834  
00:31:15,430 --> 00:31:14,399  
when i got back from space

835  
00:31:17,509 --> 00:31:15,440  
there were

836  
00:31:19,590 --> 00:31:17,519  
mothers and fathers that were emailing

837  
00:31:21,269 --> 00:31:19,600  
me and writing me to tell me

838  
00:31:22,789 --> 00:31:21,279

when they were driving their kids to

839

00:31:24,950 --> 00:31:22,799

work that morning there were two

840

00:31:27,269 --> 00:31:24,960

african-american astronauts in space who

841

00:31:29,669 --> 00:31:27,279

were calling down and talking to tom

842

00:31:31,669 --> 00:31:29,679

joyner and their kid wanted to become an

843

00:31:32,950 --> 00:31:31,679

astronaut instantly on that day they had

844

00:31:35,509 --> 00:31:32,960

never been interested in science and

845

00:31:39,350 --> 00:31:35,519

math but they heard this show and they

846

00:31:41,430 --> 00:31:39,360

were so inspired so over my 12 years as

847

00:31:43,110 --> 00:31:41,440

being an astronaut now the associate

848

00:31:44,630 --> 00:31:43,120

administrator for education i've

849

00:31:47,909 --> 00:31:44,640

probably talked to close to half a

850

00:31:50,789 --> 00:31:47,919

million students and we have to find the

851  
00:31:52,870 --> 00:31:50,799  
ways to reach all students we talk about

852  
00:31:54,870 --> 00:31:52,880  
diversity and access we've got to figure

853  
00:31:57,029 --> 00:31:54,880  
out a way that every student has an

854  
00:31:59,029 --> 00:31:57,039  
opportunity to make that choice

855  
00:32:00,389 --> 00:31:59,039  
and so that's something that michael

856  
00:32:01,830 --> 00:32:00,399  
that we we've been trying to do with

857  
00:32:03,509 --> 00:32:01,840  
programs like summer of innovation and

858  
00:32:04,870 --> 00:32:03,519  
21 century learning

859  
00:32:07,029 --> 00:32:04,880  
um

860  
00:32:09,190 --> 00:32:07,039  
all the assets that nasa has at its

861  
00:32:11,269 --> 00:32:09,200  
disposal to help inspire and motivate

862  
00:32:13,269 --> 00:32:11,279  
everyone so

863  
00:32:15,350 --> 00:32:13,279

great thank you all so we're starting to

864

00:32:17,350 --> 00:32:15,360

get some questions in um

865

00:32:18,870 --> 00:32:17,360

from our twitter feed and um i think

866

00:32:20,789 --> 00:32:18,880

there'll be some questions from the

867

00:32:23,669 --> 00:32:20,799

audience please keep those coming i'm

868

00:32:25,190 --> 00:32:23,679

going to begin with this one um

869

00:32:27,669 --> 00:32:25,200

which gets it something susan i think

870

00:32:30,630 --> 00:32:27,679

you touched on a little bit

871

00:32:32,630 --> 00:32:30,640

how does today's focus on grades and

872

00:32:35,110 --> 00:32:32,640

test scores and

873

00:32:38,310 --> 00:32:35,120

ten-year rules um

874

00:32:41,190 --> 00:32:38,320

i editorialized both at the k-12 level

875

00:32:43,350 --> 00:32:41,200

and at the um at the higher ed level

876

00:32:45,029 --> 00:32:43,360

impact how students are prepared for

877

00:32:47,669 --> 00:32:45,039

college and interested in careers in

878

00:32:47,679 --> 00:32:52,789

go ahead and others chime in eluded um

879

00:32:59,430 --> 00:32:56,950

there is so much pressure on test scores

880

00:33:02,230 --> 00:32:59,440

that oftentimes

881

00:33:03,669 --> 00:33:02,240

especially teachers just coming

882

00:33:05,190 --> 00:33:03,679

out of college

883

00:33:08,230 --> 00:33:05,200

they are told well you've got to make

884

00:33:10,870 --> 00:33:08,240

sure that your students perform and

885

00:33:13,350 --> 00:33:10,880

because if the the emphasis is so much

886

00:33:14,870 --> 00:33:13,360

on language arts and math and yes math

887

00:33:17,269 --> 00:33:14,880

is part of stem

888

00:33:18,870 --> 00:33:17,279

but it's it's more for taking the test

889

00:33:20,310 --> 00:33:18,880

multiple choice and things like that

890

00:33:21,750 --> 00:33:20,320

it's not getting into the critical

891

00:33:22,950 --> 00:33:21,760

thinking and all the kinds of things

892

00:33:25,509 --> 00:33:22,960

that we know

893

00:33:28,070 --> 00:33:25,519

math needs to have in order to

894

00:33:29,350 --> 00:33:28,080

to support science and to support a good

895

00:33:31,269 --> 00:33:29,360

healthy student

896

00:33:32,789 --> 00:33:31,279

and it's very hard

897

00:33:34,070 --> 00:33:32,799

you can see from the program how long

898

00:33:36,630 --> 00:33:34,080

i've been teaching

899

00:33:38,630 --> 00:33:36,640

i still encounter people who have a hard

900

00:33:40,470 --> 00:33:38,640

time with the fact that

901  
00:33:41,750 --> 00:33:40,480  
i'm integrating and talking about all

902  
00:33:42,950 --> 00:33:41,760  
different kinds of things while i'm

903  
00:33:45,190 --> 00:33:42,960  
teaching

904  
00:33:47,029 --> 00:33:45,200  
and bringing in hands-on and having the

905  
00:33:49,110 --> 00:33:47,039  
kids discover instead of taking the

906  
00:33:50,950 --> 00:33:49,120  
teacher's guide that says this is what

907  
00:33:53,430 --> 00:33:50,960  
the lesson is today

908  
00:33:55,669 --> 00:33:53,440  
i gave my kids a box of wires and light

909  
00:33:56,870 --> 00:33:55,679  
bulbs and batteries and

910  
00:33:59,110 --> 00:33:56,880  
said okay

911  
00:34:02,230 --> 00:33:59,120  
make them light see what you can do

912  
00:34:04,310 --> 00:34:02,240  
and within 10 minutes not only did they

913  
00:34:06,389 --> 00:34:04,320

have them lit but the ones who didn't

914

00:34:07,830 --> 00:34:06,399

were showing the other kids why theirs

915

00:34:09,909 --> 00:34:07,840

wasn't lighting up because they would

916

00:34:11,109 --> 00:34:09,919

all come tell me the batteries were dead

917

00:34:13,510 --> 00:34:11,119

they didn't know

918

00:34:15,109 --> 00:34:13,520

about having positive and negative and

919

00:34:16,629 --> 00:34:15,119

but they discovered it on their own and

920

00:34:18,629 --> 00:34:16,639

then they could teach the other ones and

921

00:34:19,589 --> 00:34:18,639

then they wanted to go on from there

922

00:34:21,589 --> 00:34:19,599

and

923

00:34:23,589 --> 00:34:21,599

people are afraid that if you don't

924

00:34:25,190 --> 00:34:23,599

teach exactly what's there oh i'm not

925

00:34:26,950 --> 00:34:25,200

going to be okay

926

00:34:28,550 --> 00:34:26,960

so i still have to prove myself every

927

00:34:30,069 --> 00:34:28,560

year my kids do really well on their

928

00:34:31,990 --> 00:34:30,079

test scores

929

00:34:34,550 --> 00:34:32,000

and on other things as well not just

930

00:34:37,349 --> 00:34:34,560

that but that's the hard thing right now

931

00:34:39,430 --> 00:34:37,359

they're so concerned and justifiably so

932

00:34:41,270 --> 00:34:39,440

in a lot of states you are held

933

00:34:42,869 --> 00:34:41,280

accountable for how well your kids do on

934

00:34:45,669 --> 00:34:42,879

test scores

935

00:34:49,430 --> 00:34:47,270

you know yeah go ahead of course just

936

00:34:51,750 --> 00:34:49,440

chime in i think the there's an

937

00:34:53,510 --> 00:34:51,760

equivalent sort of phenomenon that goes

938

00:34:56,710 --> 00:34:53,520

on at the university level which is that

939

00:34:59,190 --> 00:34:56,720

we have a cadre of honors students who

940

00:35:02,310 --> 00:34:59,200

are very concerned about gpa

941

00:35:04,310 --> 00:35:02,320

and doing as well as possible on all

942

00:35:05,670 --> 00:35:04,320

their exams of course which is a

943

00:35:07,510 --> 00:35:05,680

wonderful thing

944

00:35:10,310 --> 00:35:07,520

and um

945

00:35:12,790 --> 00:35:10,320

there are times when these absolute

946

00:35:14,310 --> 00:35:12,800

top-notch students are basically getting

947

00:35:16,790 --> 00:35:14,320

the message that doesn't matter if you

948

00:35:18,550 --> 00:35:16,800

do any hands-on stuff for an engineering

949

00:35:21,109 --> 00:35:18,560

undergraduate curriculum what what

950

00:35:22,870 --> 00:35:21,119

matters is doing well on the exams

951  
00:35:24,069 --> 00:35:22,880  
getting a's in your courses

952  
00:35:26,230 --> 00:35:24,079  
and

953  
00:35:28,630 --> 00:35:26,240  
fortunately that is

954  
00:35:30,630 --> 00:35:28,640  
taken care of somewhat by

955  
00:35:33,910 --> 00:35:30,640  
most engineering programs certainly ours

956  
00:35:34,710 --> 00:35:33,920  
has a capstone design requirement

957  
00:35:37,829 --> 00:35:34,720  
where

958  
00:35:40,950 --> 00:35:37,839  
in in our case we usually try to do some

959  
00:35:42,710 --> 00:35:40,960  
hands-on engineering but it is perfectly

960  
00:35:44,390 --> 00:35:42,720  
possible in fact it used to be the case

961  
00:35:45,670 --> 00:35:44,400  
especially in space

962  
00:35:47,349 --> 00:35:45,680  
on the space side of aerospace

963  
00:35:48,950 --> 00:35:47,359

engineering that we would

964

00:35:50,470 --> 00:35:48,960

have students go through an entire

965

00:35:51,670 --> 00:35:50,480

four-year program

966

00:35:53,990 --> 00:35:51,680

and

967

00:35:56,310 --> 00:35:54,000

truly never use a wrench

968

00:35:59,750 --> 00:35:56,320

never get their hands dirty

969

00:36:03,430 --> 00:35:59,760

the senior design effort was um analysis

970

00:36:06,390 --> 00:36:03,440

and theoretical and paper studies and i

971

00:36:09,510 --> 00:36:06,400

i think it's unfortunate um

972

00:36:11,990 --> 00:36:09,520

this has resulted in a um

973

00:36:13,190 --> 00:36:12,000

a a rule that my husband who happens to

974

00:36:16,230 --> 00:36:13,200

be a

975

00:36:18,230 --> 00:36:16,240

professor here at the university as well

976  
00:36:21,349 --> 00:36:18,240  
when he's looking for graduate students

977  
00:36:23,910 --> 00:36:21,359  
he does not want the 4.0 he doesn't

978  
00:36:26,990 --> 00:36:23,920  
necessarily want students who have the

979  
00:36:30,710 --> 00:36:27,000  
top gpa he wants the students with

980  
00:36:33,349 --> 00:36:30,720  
3.5 to 3.8 who have the experience with

981  
00:36:34,950 --> 00:36:33,359  
projects and um

982  
00:36:37,030 --> 00:36:34,960  
i what i'm seeing more and more is

983  
00:36:39,190 --> 00:36:37,040  
companies are ha ha sort of have the

984  
00:36:42,150 --> 00:36:39,200  
same attitude everybody

985  
00:36:43,910 --> 00:36:42,160  
will love a person with a 4.0 gpa don't

986  
00:36:45,750 --> 00:36:43,920  
don't get me wrong but

987  
00:36:47,750 --> 00:36:45,760  
the ones that have maybe a slightly

988  
00:36:49,430 --> 00:36:47,760

lower gpa but have experience with

989

00:36:54,069 --> 00:36:49,440

hands-on projects that's what we want to

990

00:36:57,349 --> 00:36:55,910

just want to add one thing the problem

991

00:36:59,190 --> 00:36:57,359

here is

992

00:37:02,230 --> 00:36:59,200

in my in my uh

993

00:37:03,910 --> 00:37:02,240

opinion is not just the uh uh

994

00:37:05,670 --> 00:37:03,920

trying to reach the highest grade

995

00:37:08,310 --> 00:37:05,680

possible because that may be a

996

00:37:09,910 --> 00:37:08,320

motivational thing for for some students

997

00:37:11,750 --> 00:37:09,920

is the problem when this becomes the

998

00:37:13,990 --> 00:37:11,760

goal and the objective

999

00:37:17,190 --> 00:37:14,000

from the learning procedure or the

1000

00:37:19,270 --> 00:37:17,200

learning process itself

1001

00:37:21,190 --> 00:37:19,280

there's part that is considered to be

1002

00:37:22,470 --> 00:37:21,200

principles and theory in this part that

1003

00:37:23,990 --> 00:37:22,480

is practical

1004

00:37:25,910 --> 00:37:24,000

and everybody

1005

00:37:28,710 --> 00:37:25,920

ought to be doing well and probably

1006

00:37:30,150 --> 00:37:28,720

grading is the one of the ways

1007

00:37:32,790 --> 00:37:30,160

to assess how

1008

00:37:34,870 --> 00:37:32,800

at least up to this point i i didn't see

1009

00:37:37,510 --> 00:37:34,880

anything that works better than that to

1010

00:37:40,470 --> 00:37:37,520

assess how how the students are are

1011

00:37:44,150 --> 00:37:42,390

but the problem is when

1012

00:37:46,390 --> 00:37:44,160

they put their goal

1013

00:37:49,109 --> 00:37:46,400

on to getting the highest grade not

1014

00:37:50,710 --> 00:37:49,119

learning and then finding out what

1015

00:37:55,670 --> 00:37:50,720

the effect of their learning on their

1016

00:37:58,870 --> 00:37:57,510

i want to um

1017

00:38:00,710 --> 00:37:58,880

sort of

1018

00:38:01,910 --> 00:38:00,720

shift a little bit we heard each of the

1019

00:38:04,310 --> 00:38:01,920

panels talk

1020

00:38:06,150 --> 00:38:04,320

a bit about how they got inspired and

1021

00:38:07,829 --> 00:38:06,160

your story about the tom joyner show

1022

00:38:10,150 --> 00:38:07,839

that's a

1023

00:38:13,430 --> 00:38:10,160

pretty exciting story

1024

00:38:15,910 --> 00:38:13,440

can you all now talk a little bit about

1025

00:38:17,829 --> 00:38:15,920

after that moment of inspiration what do

1026  
00:38:19,750 --> 00:38:17,839  
we have to do to keep kids engaged

1027  
00:38:20,950 --> 00:38:19,760  
because a single moment a single radio

1028  
00:38:21,750 --> 00:38:20,960  
show is great

1029  
00:38:23,349 --> 00:38:21,760  
but

1030  
00:38:24,870 --> 00:38:23,359  
what do we have to do to keep those kids

1031  
00:38:26,390 --> 00:38:24,880  
engaged

1032  
00:38:27,829 --> 00:38:26,400  
you know over the course of their

1033  
00:38:29,030 --> 00:38:27,839  
educational experience what works and

1034  
00:38:31,510 --> 00:38:29,040  
what doesn't work

1035  
00:38:33,109 --> 00:38:31,520  
i think one of the things that that nasa

1036  
00:38:35,589 --> 00:38:33,119  
can do you know we've

1037  
00:38:37,829 --> 00:38:35,599  
been charged to in look at the entire

1038  
00:38:40,550 --> 00:38:37,839

pipeline from k to gray

1039

00:38:42,550 --> 00:38:40,560

but you know i don't think you know with

1040

00:38:44,069 --> 00:38:42,560

budgetary constraints and so forth that

1041

00:38:46,230 --> 00:38:44,079

we can cover

1042

00:38:47,910 --> 00:38:46,240

the entire pipeline and take that to

1043

00:38:49,670 --> 00:38:47,920

scale at the same time

1044

00:38:51,430 --> 00:38:49,680

so it's it's very important as i

1045

00:38:54,230 --> 00:38:51,440

mentioned earlier that we have strategic

1046

00:38:56,630 --> 00:38:54,240

partners that we partner with that say

1047

00:38:57,990 --> 00:38:56,640

take a portion of that pipeline and we

1048

00:38:59,510 --> 00:38:58,000

all work together to make sure that

1049

00:39:00,470 --> 00:38:59,520

those kids are getting the fundamentals

1050

00:39:02,470 --> 00:39:00,480

they need

1051

00:39:04,390 --> 00:39:02,480

but also it's the teachers you know in

1052

00:39:06,069 --> 00:39:04,400

the in the earlier grades that aren't

1053

00:39:08,310 --> 00:39:06,079

necessarily trained

1054

00:39:10,470 --> 00:39:08,320

to be scientists or engineers but

1055

00:39:13,190 --> 00:39:10,480

they're teaching science so how does

1056

00:39:15,109 --> 00:39:13,200

nasa engage these maybe middle school

1057

00:39:18,069 --> 00:39:15,119

teachers because if they're not as

1058

00:39:20,230 --> 00:39:18,079

motivated to say you susan they there's

1059

00:39:21,589 --> 00:39:20,240

a there's a deficit there for them maybe

1060

00:39:23,829 --> 00:39:21,599

understanding some of the things that

1061

00:39:26,550 --> 00:39:23,839

the kids need to learn to turn them on

1062

00:39:28,710 --> 00:39:26,560

to be scientists and engineers so if we

1063

00:39:30,950 --> 00:39:28,720

can use the you know the federal space

1064

00:39:34,310 --> 00:39:30,960

to help maybe some of those teachers

1065

00:39:36,390 --> 00:39:34,320

and like i said we flew this um we had

1066

00:39:38,310 --> 00:39:36,400

teachers flying on this uh

1067

00:39:39,430 --> 00:39:38,320

this microgravity plane a couple of

1068

00:39:41,750 --> 00:39:39,440

weeks ago

1069

00:39:44,230 --> 00:39:41,760

and they were doing experiments and

1070

00:39:46,470 --> 00:39:44,240

learning you know experiential hands-on

1071

00:39:48,710 --> 00:39:46,480

things that they probably didn't do in a

1072

00:39:51,589 --> 00:39:48,720

classroom before before this

1073

00:39:53,829 --> 00:39:51,599

and the the re-engagement of the

1074

00:39:55,430 --> 00:39:53,839

teachers and the students and then

1075

00:39:56,390 --> 00:39:55,440

keeping them engaged throughout the nasa

1076  
00:39:58,310 --> 00:39:56,400  
pipeline

1077  
00:39:59,190 --> 00:39:58,320  
dr mabel matthews has set up something

1078  
00:40:01,270 --> 00:39:59,200  
called

1079  
00:40:03,670 --> 00:40:01,280  
one stop shopping initiative

1080  
00:40:06,710 --> 00:40:03,680  
where if you go to [intern.nasa.gov](http://intern.nasa.gov)

1081  
00:40:08,790 --> 00:40:06,720  
a student can get into the nasa pipeline

1082  
00:40:10,790 --> 00:40:08,800  
and see what opportunities are available

1083  
00:40:13,270 --> 00:40:10,800  
right now it's for high school and

1084  
00:40:15,510 --> 00:40:13,280  
college students but if we extended this

1085  
00:40:17,990 --> 00:40:15,520  
extended this down into the

1086  
00:40:19,990 --> 00:40:18,000  
middle school and elementary school

1087  
00:40:22,069 --> 00:40:20,000  
then we could attach and we have to get

1088  
00:40:24,069 --> 00:40:22,079

parental consent but attach

1089

00:40:26,069 --> 00:40:24,079

an id to a student and be able to blast

1090

00:40:28,230 --> 00:40:26,079

them out all the opportunities

1091

00:40:30,309 --> 00:40:28,240

throughout their career throughout their

1092

00:40:31,670 --> 00:40:30,319

pipeline and then they could see all the

1093

00:40:33,990 --> 00:40:31,680

nasa type

1094

00:40:35,910 --> 00:40:34,000

related activities that they could do

1095

00:40:38,309 --> 00:40:35,920

and to keep them re-engaged into

1096

00:40:39,589 --> 00:40:38,319

missions that are going up juno grail

1097

00:40:41,750 --> 00:40:39,599

all the things that are happening with

1098

00:40:43,190 --> 00:40:41,760

nasa the really cool stuff then they can

1099

00:40:45,829 --> 00:40:43,200

find out about it throughout their

1100

00:40:48,150 --> 00:40:45,839

entire pipeline and also the resources

1101  
00:40:51,990 --> 00:40:48,160  
for you know graduate school and and

1102  
00:40:56,069 --> 00:40:53,589  
anyone else

1103  
00:40:58,790 --> 00:40:56,079  
i think keeping them involved

1104  
00:41:00,470 --> 00:40:58,800  
once you've realized that spark i found

1105  
00:41:02,630 --> 00:41:00,480  
it effective

1106  
00:41:04,710 --> 00:41:02,640  
that you find out from kids at the

1107  
00:41:07,030 --> 00:41:04,720  
beginning of the school year

1108  
00:41:08,710 --> 00:41:07,040  
the things in which they're interested

1109  
00:41:10,230 --> 00:41:08,720  
no matter what it is

1110  
00:41:12,950 --> 00:41:10,240  
even if it's favorite colors at the

1111  
00:41:14,150 --> 00:41:12,960  
youngest level and who their icons are

1112  
00:41:16,150 --> 00:41:14,160  
that was a

1113  
00:41:18,470 --> 00:41:16,160

an eye-opening experience as well i

1114

00:41:20,630 --> 00:41:18,480

remember doing that

1115

00:41:23,030 --> 00:41:20,640

and then once you find that there's that

1116

00:41:24,630 --> 00:41:23,040

spark then you can

1117

00:41:27,030 --> 00:41:24,640

put them into different places there

1118

00:41:28,950 --> 00:41:27,040

have been lots of programs that support

1119

00:41:31,589 --> 00:41:28,960

kids in what they're interested a lot of

1120

00:41:33,670 --> 00:41:31,599

it has to do with the grants and

1121

00:41:37,190 --> 00:41:33,680

i i got a grant through the virginia

1122

00:41:39,750 --> 00:41:37,200

space grant consortium um and it it

1123

00:41:41,910 --> 00:41:39,760

program it was how to

1124

00:41:44,710 --> 00:41:41,920

do better with the gender

1125

00:41:47,510 --> 00:41:44,720

based programs for stem in schools and

1126

00:41:49,349 --> 00:41:47,520

it was amazing to see the teachers who

1127

00:41:50,630 --> 00:41:49,359

would sit there and

1128

00:41:52,470 --> 00:41:50,640

talk about

1129

00:41:54,870 --> 00:41:52,480

something that was obvious but it it

1130

00:41:57,349 --> 00:41:54,880

didn't until they got to brainstorm

1131

00:42:00,630 --> 00:41:57,359

together the synergistic approach

1132

00:42:02,630 --> 00:42:00,640

just was was amazing i

1133

00:42:04,150 --> 00:42:02,640

i had an apprentice program for third

1134

00:42:05,510 --> 00:42:04,160

through fifth graders once we knew that

1135

00:42:07,109 --> 00:42:05,520

they were interested in stuff more than

1136

00:42:09,349 --> 00:42:07,119

just a career day they actually got to

1137

00:42:12,069 --> 00:42:09,359

sit down and work with scientists

1138

00:42:14,069 --> 00:42:12,079

working with peers um or just a little

1139

00:42:15,750 --> 00:42:14,079

bit older when the robotics team comes

1140

00:42:18,790 --> 00:42:15,760

in from the high school or middle school

1141

00:42:20,150 --> 00:42:18,800

to the elementary school these kids

1142

00:42:22,230 --> 00:42:20,160

you can't stop

1143

00:42:24,150 --> 00:42:22,240

you know they that would maintain it

1144

00:42:26,630 --> 00:42:24,160

because they see that it's out there and

1145

00:42:28,069 --> 00:42:26,640

it's attainable and it's closer to them

1146

00:42:30,309 --> 00:42:28,079

as opposed to

1147

00:42:31,109 --> 00:42:30,319

somebody that may be 25 years older than

1148

00:42:31,990 --> 00:42:31,119

them

1149

00:42:34,390 --> 00:42:32,000

um

1150

00:42:37,670 --> 00:42:34,400

they have somebody that's just

1151

00:42:39,030 --> 00:42:37,680

to them one of their peers so

1152

00:42:40,230 --> 00:42:39,040

mary did you want to chime in and then

1153

00:42:41,990 --> 00:42:40,240

we've got a couple of questions the

1154

00:42:43,030 --> 00:42:42,000

audience too i think i'd just like to

1155

00:42:45,030 --> 00:42:43,040

add that

1156

00:42:47,670 --> 00:42:45,040

i i have a little bit of a concern that

1157

00:42:49,589 --> 00:42:47,680

students in the um grade school do

1158

00:42:51,109 --> 00:42:49,599

projects and they they find out that

1159

00:42:52,790 --> 00:42:51,119

engineering is fun and that's wonderful

1160

00:42:55,349 --> 00:42:52,800

but they also think sometimes that

1161

00:42:58,470 --> 00:42:55,359

engineering is just fun and that it's

1162

00:43:00,630 --> 00:42:58,480

easy maybe too easy and

1163

00:43:02,390 --> 00:43:00,640

some of these students will come into a

1164

00:43:03,990 --> 00:43:02,400

freshman year in an engineering program

1165

00:43:05,349 --> 00:43:04,000

and suddenly they find that engineering

1166

00:43:07,190 --> 00:43:05,359

is hard

1167

00:43:10,150 --> 00:43:07,200

it's very difficult there's a lot of

1168

00:43:12,230 --> 00:43:10,160

work to it and i make a point at the

1169

00:43:14,230 --> 00:43:12,240

beginning of every freshman course that

1170

00:43:16,950 --> 00:43:14,240

i teach to say yes

1171

00:43:18,870 --> 00:43:16,960

engineering is very hard engineering is

1172

00:43:21,190 --> 00:43:18,880

tremendously difficult work hard

1173

00:43:22,150 --> 00:43:21,200

everybody would be doing it and

1174

00:43:23,510 --> 00:43:22,160

but

1175

00:43:26,309 --> 00:43:23,520

there's another part to this message

1176

00:43:27,670 --> 00:43:26,319

which is that anyone i believe can be an

1177

00:43:29,990 --> 00:43:27,680

engineer

1178

00:43:32,069 --> 00:43:30,000

if you work hard enough and what we

1179

00:43:34,870 --> 00:43:32,079

provide we try to provide and i think

1180

00:43:36,870 --> 00:43:34,880

one of the the um important things is

1181

00:43:38,950 --> 00:43:36,880

when students get into stem

1182

00:43:41,190 --> 00:43:38,960

it's not just getting in they have to

1183

00:43:42,309 --> 00:43:41,200

have the support when they're struggling

1184

00:43:44,309 --> 00:43:42,319

and when they're working hard and

1185

00:43:46,790 --> 00:43:44,319

they're not figuring things out

1186

00:43:49,270 --> 00:43:46,800

it's it's very important to i mean i'm

1187

00:43:50,950 --> 00:43:49,280

talking at the university level to have

1188

00:43:52,710 --> 00:43:50,960

these students have a whole support

1189

00:43:54,390 --> 00:43:52,720

system of their peers

1190

00:43:56,150 --> 00:43:54,400

and a teaching assistants and the

1191

00:43:57,430 --> 00:43:56,160

faculty who are there to answer

1192

00:44:00,390 --> 00:43:57,440

questions and help them through the

1193

00:44:02,870 --> 00:44:00,400

process the support system is essential

1194

00:44:07,510 --> 00:44:02,880

once they're in and inspired and ready

1195

00:44:10,710 --> 00:44:09,349

how about uh the gentleman the back

1196

00:44:13,349 --> 00:44:10,720

there standing up the microphone you

1197

00:44:14,630 --> 00:44:13,359

have a question for us yeah um again

1198

00:44:16,950 --> 00:44:14,640

greg shuckman from the university of

1199

00:44:17,670 --> 00:44:16,960

central florida before i was at ucf i

1200

00:44:19,109 --> 00:44:17,680

was

1201

00:44:21,030 --> 00:44:19,119

uh with the american association of

1202

00:44:23,349 --> 00:44:21,040

engineering societies and so i spent a

1203

00:44:25,750 --> 00:44:23,359

lot of time looking at the workforce

1204

00:44:27,349 --> 00:44:25,760

issues and

1205

00:44:29,430 --> 00:44:27,359

we also had the engineering workforce

1206

00:44:31,670 --> 00:44:29,440

commission which had longitudinal data

1207

00:44:33,349 --> 00:44:31,680

going back to the 50s in terms of

1208

00:44:34,309 --> 00:44:33,359

degrees and enrollments

1209

00:44:37,349 --> 00:44:34,319

so

1210

00:44:39,030 --> 00:44:37,359

i'd looked at 86 to 96 was at aes and

1211

00:44:40,870 --> 00:44:39,040

then when i went to ucf i said you know

1212

00:44:43,430 --> 00:44:40,880

let me look at how things have gone

1213

00:44:45,190 --> 00:44:43,440

since from 2006.

1214

00:44:46,470 --> 00:44:45,200

what was interesting is that over those

1215

00:44:47,829 --> 00:44:46,480

20 years

1216

00:44:49,670 --> 00:44:47,839

the number of students who had earned

1217

00:44:51,910 --> 00:44:49,680

baccalaureate degrees in all fields had

1218

00:44:53,349 --> 00:44:51,920

gone up over 50 percent

1219

00:44:54,710 --> 00:44:53,359

in the u.s

1220

00:44:56,069 --> 00:44:54,720

the number of students who had earned

1221

00:44:58,150 --> 00:44:56,079

baccalaureate degrees in engineering

1222

00:44:59,910 --> 00:44:58,160

over that same period went down almost 3

1223

00:45:01,270 --> 00:44:59,920

percent

1224

00:45:02,790 --> 00:45:01,280

and i looked at it state by state

1225

00:45:06,630 --> 00:45:02,800

maryland happens to be one of the

1226  
00:45:07,510 --> 00:45:06,640  
winners we went up 37 during that time

1227  
00:45:09,349 --> 00:45:07,520  
but

1228  
00:45:11,270 --> 00:45:09,359  
in getting to your point leland when you

1229  
00:45:13,750 --> 00:45:11,280  
look at the representation

1230  
00:45:15,589 --> 00:45:13,760  
of the engineering workforce and the

1231  
00:45:18,309 --> 00:45:15,599  
engineering students

1232  
00:45:19,750 --> 00:45:18,319  
57 percent of the undergraduates today

1233  
00:45:22,470 --> 00:45:19,760  
are women

1234  
00:45:24,630 --> 00:45:22,480  
and we struggle to hit that 20 mark for

1235  
00:45:27,270 --> 00:45:24,640  
women in engineering programs

1236  
00:45:29,750 --> 00:45:27,280  
it's even worse for for um

1237  
00:45:31,670 --> 00:45:29,760  
underrepresented students in

1238  
00:45:35,270 --> 00:45:31,680

african americans and hispanics when you

1239

00:45:37,670 --> 00:45:35,280

go up to graduate level it becomes worse

1240

00:45:39,829 --> 00:45:37,680

so the question is

1241

00:45:41,910 --> 00:45:39,839

how do you reach out

1242

00:45:44,950 --> 00:45:41,920

getting to your point about

1243

00:45:46,950 --> 00:45:44,960

really digging down into the grades

1244

00:45:48,710 --> 00:45:46,960

not even middle school but elementary

1245

00:45:50,710 --> 00:45:48,720

school i remember a study from the

1246

00:45:52,390 --> 00:45:50,720

national science foundation years ago

1247

00:45:54,390 --> 00:45:52,400

and they looked at when

1248

00:45:57,030 --> 00:45:54,400

girls made the choice

1249

00:45:59,670 --> 00:45:57,040

of whether to go to a stem-oriented

1250

00:46:02,550 --> 00:45:59,680

career or non-stem-oriented career

1251  
00:46:04,390 --> 00:46:02,560  
and it was 12 years old it was a sixth

1252  
00:46:05,910 --> 00:46:04,400  
grade so basically if you didn't get

1253  
00:46:07,190 --> 00:46:05,920  
them by that point

1254  
00:46:09,670 --> 00:46:07,200  
they're already going to be off the

1255  
00:46:11,109 --> 00:46:09,680  
rails in terms of having the coursework

1256  
00:46:13,910 --> 00:46:11,119  
and the preparation they needed to to

1257  
00:46:16,230 --> 00:46:13,920  
succeed in a very rigorous stem career

1258  
00:46:17,670 --> 00:46:16,240  
so when you talk about all these

1259  
00:46:18,710 --> 00:46:17,680  
different outreach and the strategic

1260  
00:46:21,510 --> 00:46:18,720  
partners

1261  
00:46:24,470 --> 00:46:21,520  
nasa is probably the most exciting

1262  
00:46:26,630 --> 00:46:24,480  
federal agency

1263  
00:46:29,589 --> 00:46:26,640

program

1264

00:46:32,470 --> 00:46:29,599

of any i mean what's more exciting than

1265

00:46:33,510 --> 00:46:32,480

than being able to go beyond

1266

00:46:36,150 --> 00:46:33,520

and so

1267

00:46:37,829 --> 00:46:36,160

i guess my question is

1268

00:46:39,990 --> 00:46:37,839

informal science education is taking a

1269

00:46:41,589 --> 00:46:40,000

real hit in the budget and so we do need

1270

00:46:43,190 --> 00:46:41,599

to rely on these partnerships more and

1271

00:46:45,750 --> 00:46:43,200

more between government industry and

1272

00:46:47,670 --> 00:46:45,760

academe and in the media

1273

00:46:49,510 --> 00:46:47,680

do you have a plan

1274

00:46:50,470 --> 00:46:49,520

for reaching out especially to those

1275

00:46:51,750 --> 00:46:50,480

younger

1276

00:46:52,870 --> 00:46:51,760

students

1277

00:46:54,550 --> 00:46:52,880

and the parents of those younger

1278

00:46:56,230 --> 00:46:54,560

students to help them

1279

00:46:58,309 --> 00:46:56,240

become more engaged in the stem career

1280

00:47:00,230 --> 00:46:58,319

particularly for women and minorities

1281

00:47:01,829 --> 00:47:00,240

yeah nasa currently has a program called

1282

00:47:03,430 --> 00:47:01,839

sema which

1283

00:47:04,870 --> 00:47:03,440

actually it's for underrepresented

1284

00:47:06,630 --> 00:47:04,880

underserved students

1285

00:47:10,150 --> 00:47:06,640

that reaches out not only to the

1286

00:47:12,390 --> 00:47:10,160

students in in the the younger ages but

1287

00:47:14,870 --> 00:47:12,400

also to their parents to bring the

1288

00:47:16,790 --> 00:47:14,880

parents to a sema session to let the

1289

00:47:18,790 --> 00:47:16,800

parents know that you don't have to be

1290

00:47:21,430 --> 00:47:18,800

an engineer to raise an engineer and i

1291

00:47:22,630 --> 00:47:21,440

think a lot of times our our parents or

1292

00:47:24,790 --> 00:47:22,640

the adults

1293

00:47:27,589 --> 00:47:24,800

are the worst

1294

00:47:29,109 --> 00:47:27,599

advocate for stem education because

1295

00:47:30,390 --> 00:47:29,119

first of all they already think it's

1296

00:47:32,150 --> 00:47:30,400

hard they can't do it i don't know math

1297

00:47:33,670 --> 00:47:32,160

i don't know science so if i don't know

1298

00:47:35,430 --> 00:47:33,680

it then you're not going to know it and

1299

00:47:38,470 --> 00:47:35,440

the kids get turned off to it so they

1300

00:47:40,230 --> 00:47:38,480

need people that are able to you know

1301  
00:47:42,309 --> 00:47:40,240  
you know spread that message that even

1302  
00:47:44,309 --> 00:47:42,319  
look like them because i've talked to so

1303  
00:47:45,990 --> 00:47:44,319  
many kids that say well how did you

1304  
00:47:47,430 --> 00:47:46,000  
become an astronaut you know you don't

1305  
00:47:49,349 --> 00:47:47,440  
have a military crew cut so they first

1306  
00:47:51,910 --> 00:47:49,359  
have to be a military person but then

1307  
00:47:53,349 --> 00:47:51,920  
they see the other side and oh well i

1308  
00:47:55,829 --> 00:47:53,359  
don't see many black astronauts i don't

1309  
00:47:57,750 --> 00:47:55,839  
see many female astronauts and that part

1310  
00:47:59,589 --> 00:47:57,760  
of it you have to really drill down and

1311  
00:48:02,230 --> 00:47:59,599  
let the kids see someone that looks like

1312  
00:48:04,230 --> 00:48:02,240  
them so that's media that's partnering

1313  
00:48:06,309 --> 00:48:04,240

with entertainment

1314

00:48:08,870 --> 00:48:06,319

industry council that's partnering with

1315

00:48:10,309 --> 00:48:08,880

you know your your your entertainers and

1316

00:48:12,950 --> 00:48:10,319

your ball players because those are the

1317

00:48:15,109 --> 00:48:12,960

people that are visible so the sema

1318

00:48:16,950 --> 00:48:15,119

program we have you know other programs

1319

00:48:18,630 --> 00:48:16,960

which summer of innovation reaching

1320

00:48:20,390 --> 00:48:18,640

underrepresented underserved but you

1321

00:48:22,150 --> 00:48:20,400

just got to keep that exposure you got

1322

00:48:23,750 --> 00:48:22,160

to keep going at it and it's in the

1323

00:48:25,750 --> 00:48:23,760

partnership pieces is so critical

1324

00:48:27,670 --> 00:48:25,760

because you need mentors also that as

1325

00:48:29,430 --> 00:48:27,680

you get through the pipeline you're

1326

00:48:31,109 --> 00:48:29,440

you're you know if you're not engaged

1327

00:48:32,950 --> 00:48:31,119

with the programs and you need someone's

1328

00:48:34,870 --> 00:48:32,960

going to keep at them i mean even in

1329

00:48:36,710 --> 00:48:34,880

college and undergraduate and graduate

1330

00:48:38,390 --> 00:48:36,720

and having a mentor that's just telling

1331

00:48:39,670 --> 00:48:38,400

to help you show the ropes so i think

1332

00:48:41,589 --> 00:48:39,680

those are some of the things that can

1333

00:48:44,230 --> 00:48:41,599

help great thank you how about this

1334

00:48:45,829 --> 00:48:44,240

gentleman up in the front here

1335

00:48:52,390 --> 00:48:45,839

my name is

1336

00:48:54,630 --> 00:48:52,400

two positions one i currently

1337

00:48:56,710 --> 00:48:54,640

the title is called member at large in

1338

00:48:58,950 --> 00:48:56,720

metro washington men say yeah i know a

1339

00:49:01,190 --> 00:48:58,960

lot about gifted and talented and i'm

1340

00:49:03,589 --> 00:49:01,200

learning more all the time a few years

1341

00:49:05,589 --> 00:49:03,599

back i was leading a committee as part

1342

00:49:09,109 --> 00:49:05,599

of the governor's workforce investment

1343

00:49:11,190 --> 00:49:09,119

board here on aerospace initiative and

1344

00:49:14,710 --> 00:49:11,200

industry collaboration

1345

00:49:17,990 --> 00:49:14,720

uh one of the things that uh we talk

1346

00:49:21,030 --> 00:49:18,000

about in our circles is the need for

1347

00:49:23,750 --> 00:49:21,040

various kinds of reform like a few years

1348

00:49:26,390 --> 00:49:23,760

back i found out that 4 000 students are

1349

00:49:28,549 --> 00:49:26,400

being home schooled in montgomery county

1350

00:49:30,630 --> 00:49:28,559

because they don't look at the parents

1351

00:49:32,950 --> 00:49:30,640

of bright students don't like what

1352

00:49:35,270 --> 00:49:32,960

they're seeing happening to their bright

1353

00:49:36,950 --> 00:49:35,280

students in school with

1354

00:49:39,670 --> 00:49:36,960

everything ranging from

1355

00:49:42,390 --> 00:49:39,680

poor teachers to abusive bullying in the

1356

00:49:45,109 --> 00:49:42,400

schools and one of the real issues in

1357

00:49:48,390 --> 00:49:45,119

stem fields in general seems to be in

1358

00:49:50,870 --> 00:49:48,400

a growingly worse a work-life balance do

1359

00:49:54,390 --> 00:49:50,880

any of you people talk about needs for

1360

00:50:00,950 --> 00:49:54,400

various reforms in either education or

1361

00:50:04,470 --> 00:50:02,870

i mean i can assure you it's something

1362

00:50:06,309 --> 00:50:04,480

we spend a lot of time thinking about at

1363

00:50:08,870 --> 00:50:06,319

the department of education

1364

00:50:10,470 --> 00:50:08,880

and um would argue that our

1365

00:50:13,190 --> 00:50:10,480

you know the initiatives that we have

1366

00:50:19,109 --> 00:50:15,510

are really designed to

1367

00:50:22,069 --> 00:50:19,119

to change the whole system

1368

00:50:24,309 --> 00:50:22,079

so they are long-term plays they are not

1369

00:50:27,190 --> 00:50:24,319

the sort of things that will change in

1370

00:50:29,750 --> 00:50:27,200

two years or one term

1371

00:50:34,390 --> 00:50:32,470

raising standards for all kids

1372

00:50:36,150 --> 00:50:34,400

recruiting preparing and supporting

1373

00:50:37,270 --> 00:50:36,160

great teachers and leaders all over the

1374

00:50:39,990 --> 00:50:37,280

place

1375

00:50:41,270 --> 00:50:40,000

better data throughout the whole system

1376

00:50:43,910 --> 00:50:41,280

so

1377

00:50:47,270 --> 00:50:43,920

decisions can be made at scale with

1378

00:50:49,349 --> 00:50:47,280

confidence at all levels of the system

1379

00:50:51,270 --> 00:50:49,359

and then

1380

00:50:53,589 --> 00:50:51,280

really from moral issues

1381

00:50:54,870 --> 00:50:53,599

finally

1382

00:50:57,190 --> 00:50:54,880

paying attention you know paying

1383

00:50:58,870 --> 00:50:57,200

attention to and making changes um in

1384

00:50:59,990 --> 00:50:58,880

the places that need it most the schools

1385

00:51:02,710 --> 00:51:00,000

that have been

1386

00:51:03,510 --> 00:51:02,720

um failing kids for years and years and

1387

00:51:05,030 --> 00:51:03,520

years

1388

00:51:06,710 --> 00:51:05,040

were finally saying hey we need to do

1389

00:51:11,670 --> 00:51:06,720

something about that it's not okay to

1390

00:51:15,030 --> 00:51:13,430

i agree i agree with that

1391

00:51:17,030 --> 00:51:15,040

little

1392

00:51:20,150 --> 00:51:17,040

sentence that you mentioned about reform

1393

00:51:22,630 --> 00:51:20,160

and i i would like to also add that

1394

00:51:24,390 --> 00:51:22,640

the reform should also include reforming

1395

00:51:25,829 --> 00:51:24,400

curriculum

1396

00:51:28,069 --> 00:51:25,839

as well

1397

00:51:30,390 --> 00:51:28,079

because right now

1398

00:51:32,710 --> 00:51:30,400

what we see is when

1399

00:51:34,549 --> 00:51:32,720

when we receive those students at a

1400

00:51:36,790 --> 00:51:34,559

college level

1401

00:51:39,109 --> 00:51:36,800

many of them actually do come

1402

00:51:41,190 --> 00:51:39,119

with a level

1403

00:51:43,510 --> 00:51:41,200

in stem field

1404

00:51:45,109 --> 00:51:43,520

material that is less than adequate for

1405

00:51:47,829 --> 00:51:45,119

them to even

1406

00:51:50,230 --> 00:51:47,839

pursue a serious career in that field

1407

00:51:51,430 --> 00:51:50,240

and we struggle with that

1408

00:51:53,510 --> 00:51:51,440

they come in

1409

00:51:56,390 --> 00:51:53,520

with the notion uh

1410

00:51:58,470 --> 00:51:56,400

of the that the field is is quite

1411

00:51:59,990 --> 00:51:58,480

exciting and easy and it's it's not a

1412

00:52:02,470 --> 00:52:00,000

big problem because there's so much

1413

00:52:03,510 --> 00:52:02,480

emphasis on

1414

00:52:06,790 --> 00:52:03,520

just the

1415

00:52:07,910 --> 00:52:06,800

fun part of it and not on the actual

1416

00:52:10,630 --> 00:52:07,920

uh

1417

00:52:12,549 --> 00:52:10,640

strong educational component

1418

00:52:13,829 --> 00:52:12,559

that comes with it i mean everybody

1419

00:52:15,190 --> 00:52:13,839

knows that

1420

00:52:17,270 --> 00:52:15,200

any subject

1421

00:52:19,670 --> 00:52:17,280

whether it is a scientific subject or

1422

00:52:21,750 --> 00:52:19,680

even a sport needs a lot of practice and

1423

00:52:24,549 --> 00:52:21,760

a lot of work and a lot of

1424

00:52:26,549 --> 00:52:24,559

sweat and and and and

1425

00:52:29,109 --> 00:52:26,559

and we have to

1426

00:52:30,950 --> 00:52:29,119

implant that at that level

1427

00:52:32,549 --> 00:52:30,960

so the reform should be in that and also

1428

00:52:33,990 --> 00:52:32,559

the training of the teachers and many of

1429

00:52:36,710 --> 00:52:34,000

these things that are

1430

00:52:39,750 --> 00:52:36,720

probably very well covered

1431

00:52:41,829 --> 00:52:39,760

uh i'll follow up with one observation a

1432

00:52:45,270 --> 00:52:41,839

lot of some of us are starting to

1433

00:52:47,430 --> 00:52:45,280

complain a lot particularly in it fields

1434

00:52:49,190 --> 00:52:47,440

you can't do hard work if you're only

1435

00:52:51,109 --> 00:52:49,200

getting four hours of sleep at night and

1436

00:52:53,990 --> 00:52:51,119

that's what some places are trying to

1437

00:52:59,589 --> 00:52:56,069

we have time for one more question here

1438

00:53:01,109 --> 00:52:59,599

before we wrap up here in the back sir

1439

00:53:03,270 --> 00:53:01,119

thank you my name is stephen peterson i

1440

00:53:04,309 --> 00:53:03,280

teach exploring space to juniors in high

1441

00:53:06,069 --> 00:53:04,319

school

1442

00:53:07,670 --> 00:53:06,079

last month i had a golden opportunity to

1443

00:53:09,670 --> 00:53:07,680

go to a teachers and space workshop

1444

00:53:11,030 --> 00:53:09,680

which opened up a world of new

1445

00:53:12,230 --> 00:53:11,040

information

1446

00:53:14,069 --> 00:53:12,240

last year when i was teaching this

1447

00:53:15,990 --> 00:53:14,079

course i discovered the students really

1448

00:53:17,750 --> 00:53:16,000

opened up when we taught them the little

1449

00:53:19,349 --> 00:53:17,760

stuff for instance i would walk them

1450

00:53:21,190 --> 00:53:19,359

through the space shuttle launch from

1451  
00:53:22,870 --> 00:53:21,200  
the two hours before to the time they

1452  
00:53:25,750 --> 00:53:22,880  
reach orbit

1453  
00:53:28,790 --> 00:53:25,760  
coming from the workshop

1454  
00:53:29,910 --> 00:53:28,800  
what i really could use from nasa and

1455  
00:53:31,670 --> 00:53:29,920  
throughout the day they said tell us

1456  
00:53:32,710 --> 00:53:31,680  
what we can help you with is the little

1457  
00:53:36,710 --> 00:53:32,720  
stuff

1458  
00:53:38,870 --> 00:53:36,720  
okay that's good when you start talking

1459  
00:53:41,030 --> 00:53:38,880  
about that little stuff they get excited

1460  
00:53:42,630 --> 00:53:41,040  
let me give you an example it'd be nice

1461  
00:53:45,990 --> 00:53:42,640  
for me to tell them

1462  
00:53:47,109 --> 00:53:46,000  
how a astronaut preps from the time

1463  
00:53:48,069 --> 00:53:47,119

pre-brief

1464

00:53:49,030 --> 00:53:48,079

to

1465

00:53:50,549 --> 00:53:49,040

uh

1466

00:53:51,990 --> 00:53:50,559

purging his body i don't know all the

1467

00:53:54,069 --> 00:53:52,000

details i've heard it but i can't

1468

00:53:55,270 --> 00:53:54,079

remember to doing the eva and coming

1469

00:53:56,870 --> 00:53:55,280

back in again

1470

00:53:58,950 --> 00:53:56,880

it's those little things they really get

1471

00:54:00,870 --> 00:53:58,960

excited about because they had no clue

1472

00:54:03,270 --> 00:54:00,880

all that little stuff went on

1473

00:54:04,710 --> 00:54:03,280

so how do i get that information so i

1474

00:54:07,589 --> 00:54:04,720

can present it to the students to get

1475

00:54:07,599 --> 00:54:11,030

call me

1476  
00:54:15,829 --> 00:54:13,030  
we have we have quite a quite a bit of

1477  
00:54:17,349 --> 00:54:15,839  
information on i know the jsc johnson

1478  
00:54:19,430 --> 00:54:17,359  
space center

1479  
00:54:21,910 --> 00:54:19,440  
homepage about some of those little

1480  
00:54:23,670 --> 00:54:21,920  
pieces of how you go to the bathroom in

1481  
00:54:25,430 --> 00:54:23,680  
space how do you do different things

1482  
00:54:29,030 --> 00:54:25,440  
there are there are websites the nasa

1483  
00:54:31,349 --> 00:54:29,040  
website nasa.gov education has little

1484  
00:54:34,549 --> 00:54:31,359  
stories but they're not all in

1485  
00:54:36,230 --> 00:54:34,559  
uh centrify you know central location so

1486  
00:54:38,309 --> 00:54:36,240  
that's something that we're also trying

1487  
00:54:39,589 --> 00:54:38,319  
to get more of an infrastructure for

1488  
00:54:43,910 --> 00:54:39,599

selecting

1489

00:54:46,549 --> 00:54:43,920

these types of things the little stuff

1490

00:54:49,109 --> 00:54:46,559

so that kids can see what's going on to

1491

00:54:51,750 --> 00:54:49,119

you know take them from you know

1492

00:54:53,990 --> 00:54:51,760

three two one liftoff to coming home

1493

00:54:55,910 --> 00:54:54,000

that whole cycle but

1494

00:54:59,910 --> 00:54:55,920

i'll give you my card when we're done

1495

00:55:05,829 --> 00:55:03,109

but i want to make a comment uh on

1496

00:55:08,230 --> 00:55:05,839

in the uh the women in aerospace are

1497

00:55:11,109 --> 00:55:08,240

planning a stem event here at the

1498

00:55:13,349 --> 00:55:11,119

university of maryland uh the last week

1499

00:55:16,230 --> 00:55:13,359

in uh november or the first week in

1500

00:55:17,670 --> 00:55:16,240

december and i and i don't know exactly

1501

00:55:19,190 --> 00:55:17,680

what all's on the agenda i know there

1502

00:55:20,789 --> 00:55:19,200

will be panels there will be a career

1503

00:55:23,109 --> 00:55:20,799

fair and this sort of thing

1504

00:55:25,430 --> 00:55:23,119

and it's being sponsored jointly too by

1505

00:55:28,230 --> 00:55:25,440

the maryland space business roundtable

1506

00:55:29,750 --> 00:55:28,240

and the aiaa and maybe some others and i

1507

00:55:31,589 --> 00:55:29,760

thought some of you might be interested

1508

00:55:33,910 --> 00:55:31,599

in attending but i'm not sure how

1509

00:55:35,670 --> 00:55:33,920

they're going to get the word out yet

1510

00:55:38,390 --> 00:55:35,680

thank you very much any other concluding

1511

00:55:40,870 --> 00:55:38,400

uh comments from our panel

1512

00:55:42,630 --> 00:55:40,880

can i say one thing that just follow up

1513

00:55:45,190 --> 00:55:42,640

this um

1514

00:55:47,109 --> 00:55:45,200

this question or this comment about how

1515

00:55:49,750 --> 00:55:47,119

interested students can get in learning

1516

00:55:52,390 --> 00:55:49,760

the real you know details of doing

1517

00:55:54,390 --> 00:55:52,400

something like a space walk

1518

00:55:56,309 --> 00:55:54,400

we actually teach a graduate course that

1519

00:55:57,910 --> 00:55:56,319

goes into the details and it is

1520

00:56:00,630 --> 00:55:57,920

tremendously complicated the sort of

1521

00:56:02,549 --> 00:56:00,640

body chemistry uh effects that that have

1522

00:56:03,430 --> 00:56:02,559

to be dealt with

1523

00:56:04,870 --> 00:56:03,440

but

1524

00:56:06,549 --> 00:56:04,880

i think

1525

00:56:08,630 --> 00:56:06,559

you don't have to go to that level to be

1526  
00:56:10,950 --> 00:56:08,640  
really psyched but what you do need to

1527  
00:56:12,789 --> 00:56:10,960  
have is humans in space

1528  
00:56:14,870 --> 00:56:12,799  
and i you know i

1529  
00:56:17,829 --> 00:56:14,880  
i don't really know where where our

1530  
00:56:21,030 --> 00:56:17,839  
future in space is but i personally and

1531  
00:56:23,109 --> 00:56:21,040  
i think i hear this from so many kids um

1532  
00:56:25,430 --> 00:56:23,119  
we've got to have humans out there we've

1533  
00:56:27,430 --> 00:56:25,440  
got to have humans in space to really

1534  
00:56:30,789 --> 00:56:27,440  
inspire and to really

1535  
00:56:32,789 --> 00:56:30,799  
you know give give students

1536  
00:56:34,630 --> 00:56:32,799  
i i'm glad you agreed

1537  
00:56:37,270 --> 00:56:34,640  
that's apparently not everybody agrees

1538  
00:56:40,150 --> 00:56:37,280

but that's okay um but i feel like

1539

00:56:41,670 --> 00:56:40,160

that's the that's the crux of the matter

1540

00:56:45,670 --> 00:56:41,680

and mary that is the plan to continue

1541

00:56:50,630 --> 00:56:48,069

okay thank you very much uh

1542

00:56:53,430 --> 00:56:50,640

for your wonderful thoughts

1543

00:56:55,510 --> 00:56:53,440

that concludes our panel discussion we

1544

00:56:57,109 --> 00:56:55,520

have some closing remarks from dr

1545

00:56:59,270 --> 00:56:57,119

michael gazarick

1546

00:57:09,510 --> 00:56:59,280

mike is our deputy chief technologist at

1547

00:57:13,349 --> 00:57:11,910

well good afternoon i hope you've had a

1548

00:57:14,630 --> 00:57:13,359

great day here

1549

00:57:16,549 --> 00:57:14,640

um i've been

1550

00:57:18,390 --> 00:57:16,559

back at the headquarters in dc while you

1551  
00:57:19,910 --> 00:57:18,400  
guys have been having this fun and i but

1552  
00:57:21,190 --> 00:57:19,920  
i've watched most of it you know on the

1553  
00:57:23,990 --> 00:57:21,200  
web stream

1554  
00:57:25,750 --> 00:57:24,000  
and it's been awesome it's been awesome

1555  
00:57:28,390 --> 00:57:25,760  
but i will say on the way on the way in

1556  
00:57:31,589 --> 00:57:28,400  
here uh as i passed a parking attendant

1557  
00:57:32,710 --> 00:57:31,599  
um i was told to fear the turtle so i

1558  
00:57:34,150 --> 00:57:32,720  
don't know what that means but maybe

1559  
00:57:36,390 --> 00:57:34,160  
some students can kind of help me out

1560  
00:57:37,990 --> 00:57:36,400  
with what what that means uh

1561  
00:57:40,950 --> 00:57:38,000  
being here live apparently there's

1562  
00:57:42,390 --> 00:57:40,960  
something to be careful about i think we

1563  
00:57:44,230 --> 00:57:42,400

heard many interesting points of view

1564

00:57:45,990 --> 00:57:44,240

today and and really as you know that's

1565

00:57:47,670 --> 00:57:46,000

the point of this right it's it's it's

1566

00:57:49,589 --> 00:57:47,680

really for us to listen and to have a

1567

00:57:52,069 --> 00:57:49,599

dialogue about the kinds of things that

1568

00:57:53,910 --> 00:57:52,079

we nasa are are doing and you know we

1569

00:57:55,910 --> 00:57:53,920

greatly value your input and that that's

1570

00:57:57,910 --> 00:57:55,920

one of the reasons why we wanted to have

1571

00:57:59,990 --> 00:57:57,920

a forum such as this

1572

00:58:02,150 --> 00:58:00,000

uh we want to thank a number of people

1573

00:58:04,870 --> 00:58:02,160

uh for today first of which would be the

1574

00:58:08,309 --> 00:58:04,880

panelists for taking time and energy uh

1575

00:58:10,309 --> 00:58:08,319

and coming down today to participate

1576  
00:58:11,750 --> 00:58:10,319  
we want to thank especially the students

1577  
00:58:13,670 --> 00:58:11,760  
from the university of maryland for in

1578  
00:58:15,510 --> 00:58:13,680  
robotics and engineering for many of you

1579  
00:58:16,390 --> 00:58:15,520  
who have seen uh the displays out in the

1580  
00:58:18,470 --> 00:58:16,400  
hallway

1581  
00:58:19,829 --> 00:58:18,480  
fantastic and great stuff

1582  
00:58:21,430 --> 00:58:19,839  
we want to thank charlie bolden for

1583  
00:58:23,030 --> 00:58:21,440  
kicking us off he starts a lot of things

1584  
00:58:24,470 --> 00:58:23,040  
and i think he started off this whole

1585  
00:58:26,470 --> 00:58:24,480  
forum today

1586  
00:58:28,950 --> 00:58:26,480  
listening to it on the stream

1587  
00:58:31,190 --> 00:58:28,960  
was was a great way to get a day like

1588  
00:58:32,470 --> 00:58:31,200

today started

1589

00:58:34,470 --> 00:58:32,480

in addition i want we want to thank

1590

00:58:36,069 --> 00:58:34,480

congressman edwards

1591

00:58:37,990 --> 00:58:36,079

her remarks i thought were were

1592

00:58:39,910 --> 00:58:38,000

incredible and uh her stories that she

1593

00:58:41,910 --> 00:58:39,920

brought um really kind of set the

1594

00:58:44,230 --> 00:58:41,920

foundation for the day i i really

1595

00:58:45,589 --> 00:58:44,240

enjoyed that and and her uh you know for

1596

00:58:47,589 --> 00:58:45,599

me personally her mentioning of the

1597

00:58:49,670 --> 00:58:47,599

infrared camera or the use of for that

1598

00:58:51,349 --> 00:58:49,680

for energy efficiency that really hit

1599

00:58:54,390 --> 00:58:51,359

home uh for me

1600

00:58:56,230 --> 00:58:54,400

and and uh working uh with uh melvin on

1601  
00:58:57,349 --> 00:58:56,240  
i worked on an infrared camera that is

1602  
00:58:59,109 --> 00:58:57,359  
now used

1603  
00:59:01,030 --> 00:58:59,119  
by astronauts on the international space

1604  
00:59:02,309 --> 00:59:01,040  
station it's a handheld device and as a

1605  
00:59:04,230 --> 00:59:02,319  
matter of fact i was at a conference

1606  
00:59:06,549 --> 00:59:04,240  
years ago presenting on that on the use

1607  
00:59:08,390 --> 00:59:06,559  
of this infrared technology for the use

1608  
00:59:10,390 --> 00:59:08,400  
on the international space station and

1609  
00:59:12,630 --> 00:59:10,400  
it was a conference that were uh that

1610  
00:59:14,069 --> 00:59:12,640  
was mainly for people that she mentioned

1611  
00:59:16,390 --> 00:59:14,079  
people in the industry for energy

1612  
00:59:18,630 --> 00:59:16,400  
efficiency they were just i was just as

1613  
00:59:20,309 --> 00:59:18,640

fascinated as their use of it for

1614

00:59:21,990 --> 00:59:20,319

understanding energy efficiency in my

1615

00:59:23,270 --> 00:59:22,000

home as they were about learning how

1616

00:59:27,190 --> 00:59:23,280

infrared cameras and the things that

1617

00:59:31,670 --> 00:59:29,190

finally i want to thank you really you

1618

00:59:33,750 --> 00:59:31,680

uh everyone here for taking the time and

1619

00:59:35,109 --> 00:59:33,760

the energy and staying with us for a

1620

00:59:36,630 --> 00:59:35,119

very long day

1621

00:59:38,150 --> 00:59:36,640

i want to thank

1622

00:59:39,829 --> 00:59:38,160

you know thank you for your interest and

1623

00:59:40,549 --> 00:59:39,839

your passion

1624

00:59:43,589 --> 00:59:40,559

and

1625

00:59:45,030 --> 00:59:43,599

your caring for what we do at nasa

1626  
00:59:47,430 --> 00:59:45,040  
i also want to thank for those that are

1627  
00:59:48,870 --> 00:59:47,440  
on tv and from the stream like i was

1628  
00:59:52,390 --> 00:59:48,880  
being able to

1629  
00:59:53,910 --> 00:59:52,400  
to listen and to learn from home

1630  
00:59:55,910 --> 00:59:53,920  
we're going to have another one our next

1631  
00:59:59,430 --> 00:59:55,920  
event the next forum is planned for

1632  
01:00:00,950 --> 00:59:59,440  
october 21st that's a tentative date

1633  
01:00:01,990 --> 01:00:00,960  
and that won't have anything to do with

1634  
01:00:04,309 --> 01:00:02,000  
turtles

1635  
01:00:05,829 --> 01:00:04,319  
in fact it will be the ohio state

1636  
01:00:07,589 --> 01:00:05,839  
university

1637  
01:00:12,549 --> 01:00:07,599  
in the land of the buckeyes you can

1638  
01:00:17,510 --> 01:00:15,109

oct for further information on that

1639

01:00:22,789 --> 01:00:19,510

so let me just close with a couple key

1640

01:00:24,309 --> 01:00:22,799

messages you know that we heard today um

1641

01:00:25,270 --> 01:00:24,319

first of all i want to say that we heard

1642

01:00:27,030 --> 01:00:25,280

you

1643

01:00:29,030 --> 01:00:27,040

we have a whole series of messages and

1644

01:00:30,470 --> 01:00:29,040

notes that we heard and you certainly i

1645

01:00:32,710 --> 01:00:30,480

can say i think for most of the

1646

01:00:34,470 --> 01:00:32,720

panelists you have made us think

1647

01:00:36,950 --> 01:00:34,480

and you made us pause about what we're

1648

01:00:38,710 --> 01:00:36,960

doing and how we're doing it and and we

1649

01:00:41,349 --> 01:00:38,720

we need doubt some time to go reflect on

1650

01:00:43,430 --> 01:00:41,359

that and turn that into action

1651  
01:00:45,670 --> 01:00:43,440  
one of the things we heard is that nasa

1652  
01:00:47,510 --> 01:00:45,680  
we don't promote ourselves very well

1653  
01:00:49,109 --> 01:00:47,520  
i suppose many of you heard the joke

1654  
01:00:51,190 --> 01:00:49,119  
about the engineers

1655  
01:00:53,670 --> 01:00:51,200  
and the difference about looking down at

1656  
01:00:55,109 --> 01:00:53,680  
their shoes versus your shoes so i think

1657  
01:00:56,950 --> 01:00:55,119  
a lot of us suffer for that we're really

1658  
01:00:58,710 --> 01:00:56,960  
good engineers but not so much perhaps

1659  
01:01:01,349 --> 01:00:58,720  
about promoting and marketing so we hear

1660  
01:01:03,349 --> 01:01:01,359  
that and we have more work to do in that

1661  
01:01:04,870 --> 01:01:03,359  
arena

1662  
01:01:07,349 --> 01:01:04,880  
we learned i think we do a lot of good

1663  
01:01:08,789 --> 01:01:07,359

work but no one knows

1664

01:01:10,470 --> 01:01:08,799

and so

1665

01:01:12,470 --> 01:01:10,480

telling our story and telling about a

1666

01:01:14,549 --> 01:01:12,480

lot of the great things that we do um in

1667

01:01:15,990 --> 01:01:14,559

addition to just what you see you know

1668

01:01:17,750 --> 01:01:16,000

in human space flight and with

1669

01:01:20,230 --> 01:01:17,760

astronauts in addition to that within

1670

01:01:22,630 --> 01:01:20,240

science with engineering and technology

1671

01:01:25,910 --> 01:01:22,640

across the fronts uh we have a lot to

1672

01:01:28,069 --> 01:01:25,920

tell and we'll continue to work on that

1673

01:01:29,430 --> 01:01:28,079

so in short i'm going to borrow a little

1674

01:01:31,190 --> 01:01:29,440

bit from hank green

1675

01:01:33,190 --> 01:01:31,200

you know today you helped us increase

1676

01:01:35,030 --> 01:01:33,200

the awesome of nasa and for that we

1677

01:01:37,109 --> 01:01:35,040

thank you

1678

01:01:38,549 --> 01:01:37,119

i want to close by just repeating i

1679

01:01:39,910 --> 01:01:38,559

thought was a great line for congress

1680

01:01:41,430 --> 01:01:39,920

from edwards

1681

01:01:43,109 --> 01:01:41,440

and that's one that really kind of stuck

1682

01:01:44,069 --> 01:01:43,119

with me as i listened to it on the

1683

01:01:46,309 --> 01:01:44,079

stream

1684

01:01:48,630 --> 01:01:46,319

and that is a nation is only as strong