



National Aeronautics and
Space Administration



National
Engineers
Week

February 22nd is
Introduce a Girl to Engineering Day!
Hosted by Kennedy Space Center

Tune in to see female scientists and engineers from NASA tell you about their careers and research. For more information, contact Bethanne.hull@nasa.gov.

Watch any expert speak at: <http://bit.ly/NASASpeakersBureau>
Tweet questions using #NASADEEP or use the chat window next to the video player.

- 9:00 am Janet Petro, Deputy Director, Kennedy Space Center
- 10:00 am Dr. Gioia Massa, Life Science Project Scientist, KSC
- 11:00 am NASA STARS en español with Janet Gobaira, Flight Systems Engineer, KSC
- 12:00 pm Krista Shaffer, Senior Field Manager - EM1 Mobile Launcher GSE Install, KSC
- 1:00 pm Stephanie Vivod, Research Chemical Engineer, GRC
- 2:00 pm Shideh Naderi, Research & Development Electrical/Software Engineer, AFRC
- 3:00 pm Breanna Johnson, Aerospace Engineer, JSC
- 4:00 pm Keri Bean, Mission Operations Engineer, JPL

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1
00:00:05,480 --> 00:00:02,570
we do I think so I didn't turn it off

2
00:00:09,410 --> 00:00:05,490
can you hear me it's gonna be delayed

3
00:00:13,129 --> 00:00:09,420
we're about 45 seconds out so welcome to

4
00:00:14,120 --> 00:00:13,139
our live 360 broadcasts from the Vehicle

5
00:00:16,550 --> 00:00:14,130
Assembly Building

6
00:00:19,040 --> 00:00:16,560
I am NASA education specialist Rachel

7
00:00:20,510 --> 00:00:19,050
power and I have here with me Krista

8
00:00:22,429 --> 00:00:20,520
Schaeffer hi girls

9
00:00:26,300 --> 00:00:22,439
we're so excited to get to talk to you

10
00:00:29,150 --> 00:00:26,310
today live in 360 if you're tuned in

11
00:00:31,609 --> 00:00:29,160
from a web browser you can actually use

12
00:00:33,590 --> 00:00:31,619
your mouse or your trackpad to pan

13
00:00:35,720 --> 00:00:33,600

around you can look left right all

14

00:00:37,700 --> 00:00:35,730

around up or down basically see almost

15

00:00:39,560 --> 00:00:37,710

everything we can see if you're using

16

00:00:41,810 --> 00:00:39,570

your mobile device you can just

17

00:00:44,299 --> 00:00:41,820

physically turn and look just like if

18

00:00:46,369 --> 00:00:44,309

you're looking at a 360 video online but

19

00:00:47,840 --> 00:00:46,379

we're doing it live right so we're here

20

00:00:51,170 --> 00:00:47,850

actually right now in the Vehicle

21

00:00:52,939 --> 00:00:51,180

Assembly Building and we are hoping that

22

00:00:53,450 --> 00:00:52,949

you have lots of questions for us right

23

00:00:56,389 --> 00:00:53,460

Chrissa

24

00:00:59,569 --> 00:00:56,399

right yes absolutely ask away you can

25

00:01:05,539 --> 00:00:59,579

tweet them to us using hashtag NASA deep

26
00:01:06,980 --> 00:01:05,549
that's na si de EP or you can send them

27
00:01:09,350 --> 00:01:06,990
through the chat window you'll see those

28
00:01:11,450 --> 00:01:09,360
next to the video player on the browser

29
00:01:13,460 --> 00:01:11,460
so we'll take questions that's you

30
00:01:15,050 --> 00:01:13,470
notice me on my phone I'm not looking at

31
00:01:16,340 --> 00:01:15,060
my social media I'm scrolling through

32
00:01:20,120 --> 00:01:16,350
you're looking at your questions so I

33
00:01:22,280 --> 00:01:20,130
can relay them to to Krista here I also

34
00:01:23,840 --> 00:01:22,290
wanted just to make note that if you do

35
00:01:26,810 --> 00:01:23,850
look around you may see some other

36
00:01:29,539 --> 00:01:26,820
people here on the platform with us we

37
00:01:31,069 --> 00:01:29,549
got Rob he's over on the computer so if

38
00:01:32,690 --> 00:01:31,079

you turn around the other direction over

39

00:01:35,179 --> 00:01:32,700

there there's Rob waving to you right

40

00:01:37,069 --> 00:01:35,189

now thank you rob

41

00:01:39,200 --> 00:01:37,079

all right and if you just look a little

42

00:01:41,450 --> 00:01:39,210

bit over from Rob you'll see John John

43

00:01:43,190 --> 00:01:41,460

is basically he's going to be censoring

44

00:01:44,960 --> 00:01:43,200

us today might unplug the camera if we

45

00:01:46,850 --> 00:01:44,970

say something non kidding Johnny might

46

00:01:49,010 --> 00:01:46,860

come up actually on camera and talk to

47

00:01:51,260 --> 00:01:49,020

us a little bit about the vab of course

48

00:01:52,850 --> 00:01:51,270

we got Glenn he's taking pictures of us

49

00:01:54,620 --> 00:01:52,860

for the press site he's going to be

50

00:01:56,569 --> 00:01:54,630

putting some of these on line for us

51
00:01:59,030 --> 00:01:56,579
later and then over there we have

52
00:02:00,740 --> 00:01:59,040
Bethany Bethany is the project

53
00:02:02,810 --> 00:02:00,750
coordinator for NASA speakers bureau and

54
00:02:06,560 --> 00:02:02,820
help get this whole event going so it's

55
00:02:09,169 --> 00:02:06,570
really exciting now Krista we sent out a

56
00:02:11,800 --> 00:02:09,179
PDF showing everybody the speakers that

57
00:02:13,960 --> 00:02:11,810
we had today and we had you

58
00:02:15,910 --> 00:02:13,970
job title listen it was pretty long a

59
00:02:18,699 --> 00:02:15,920
little bit complicated so I want you to

60
00:02:20,920 --> 00:02:18,709
help explain it so you are the senior

61
00:02:23,770 --> 00:02:20,930
field manager for exploration mission-1

62
00:02:26,350 --> 00:02:23,780
for the mobile launcher correct what

63
00:02:27,910 --> 00:02:26,360

exactly does that mean okay so I'm going

64

00:02:29,830 --> 00:02:27,920

to show you guys a picture of the mobile

65

00:02:31,990 --> 00:02:29,840

launcher it's actually going to be

66

00:02:34,449 --> 00:02:32,000

parked in this huge building and if you

67

00:02:36,460 --> 00:02:34,459

guys look around you can try and get an

68

00:02:39,280 --> 00:02:36,470

idea of how big it is this is probably

69

00:02:41,620 --> 00:02:39,290

the biggest building volume-wise that

70

00:02:43,059 --> 00:02:41,630

has ever been built in the US it's not

71

00:02:45,310 --> 00:02:43,069

the tallest but it is the biggest

72

00:02:47,170 --> 00:02:45,320

there's four Bay's exactly like this

73

00:02:48,820 --> 00:02:47,180

they used to use it to process the

74

00:02:50,800 --> 00:02:48,830

Saturn vehicle and then the shuttle if

75

00:02:53,890 --> 00:02:50,810

you guys don't remember the shuttle so

76

00:02:55,990 --> 00:02:53,900

we're going to walk over here this is

77

00:02:57,280 --> 00:02:56,000

the mobile launch platform so what we're

78

00:02:59,320 --> 00:02:57,290

doing right now is we're actually

79

00:03:01,660 --> 00:02:59,330

building this we're building this so

80

00:03:04,630 --> 00:03:01,670

that when they bring the vehicle to KSC

81

00:03:07,270 --> 00:03:04,640

it's got something to stand on this

82

00:03:10,150 --> 00:03:07,280

thing will be the whole structure will

83

00:03:11,380 --> 00:03:10,160

be picked up taken to the pad and then

84

00:03:14,800 --> 00:03:11,390

that's where we're going to launch it

85

00:03:16,150 --> 00:03:14,810

but what happens in this building we're

86

00:03:19,930 --> 00:03:16,160

going to show you guys another picture

87

00:03:22,390 --> 00:03:19,940

is the whole mobile launcher comes into

88

00:03:24,039 --> 00:03:22,400

this building and all these platforms

89

00:03:26,229 --> 00:03:24,049

that you see if you guys look up and

90

00:03:28,930 --> 00:03:26,239

then if you can look down a little bit

91

00:03:32,289 --> 00:03:28,940

all these platforms surround the SOS

92

00:03:35,830 --> 00:03:32,299

vehicle so that we can work on it and

93

00:03:36,970 --> 00:03:35,840

and fuel it and do check it out make

94

00:03:39,370 --> 00:03:36,980

sure it's ready for launch

95

00:03:42,270 --> 00:03:39,380

before it goes out to the pad so I know

96

00:03:44,920 --> 00:03:42,280

we're on platform F so which one is that

97

00:03:47,740 --> 00:03:44,930

here in the shoulders

98

00:03:49,840 --> 00:03:47,750

okay so we're the fifth one up right and

99

00:03:52,900 --> 00:03:49,850

it's hard to see from the picture how

100

00:03:54,610 --> 00:03:52,910

big this thing actually is but this is a

101
00:03:58,630 --> 00:03:54,620
hundred and twenty feet up in the air

102
00:04:00,580 --> 00:03:58,640
when you get to the top it's the top of

103
00:04:04,539 --> 00:04:00,590
the vehicle is actually four hundred

104
00:04:08,319 --> 00:04:04,549
feet tall so imagine a normal like one

105
00:04:12,069 --> 00:04:08,329
story building is ten feet tall 400 feet

106
00:04:15,460 --> 00:04:12,079
man you multiply that 40:47 yeah you're

107
00:04:20,259 --> 00:04:15,470
way up there so if you get to the edge

108
00:04:21,690 --> 00:04:20,269
over here and look down let me tell you

109
00:04:23,760 --> 00:04:21,700
it's a long

110
00:04:25,860 --> 00:04:23,770
so that's why you see it this is a

111
00:04:27,960 --> 00:04:25,870
working facility and we've got our hard

112
00:04:29,520 --> 00:04:27,970
hats on because you might notice even as

113
00:04:31,170 --> 00:04:29,530

we're talking today there may be some

114

00:04:32,550 --> 00:04:31,180

construction going on you might notice

115

00:04:34,920 --> 00:04:32,560

other people walking around with hard

116

00:04:37,320 --> 00:04:34,930

hats because right now they are doing

117

00:04:39,090 --> 00:04:37,330

construction and working on this for our

118

00:04:40,680 --> 00:04:39,100

future launch vehicle right and that

119

00:04:42,720 --> 00:04:40,690

gets into a little bit more about what I

120

00:04:45,510 --> 00:04:42,730

do so as I mentioned they're actually

121

00:04:47,730 --> 00:04:45,520

building the mobile launcher we brought

122

00:04:49,620 --> 00:04:47,740

all the steel together what we're doing

123

00:04:51,750 --> 00:04:49,630

right now is we have the tower in place

124

00:04:53,100 --> 00:04:51,760

we have the base everything's ready for

125

00:04:55,140 --> 00:04:53,110

the rocket and now we're putting all

126

00:04:57,570 --> 00:04:55,150

that equipment on that that the rocket

127

00:05:01,500 --> 00:04:57,580

needs to launch so there's all kinds of

128

00:05:07,860 --> 00:05:01,510

fluid systems there's electrical systems

129

00:05:09,870 --> 00:05:07,870

there's can't remember what else well we

130

00:05:13,830 --> 00:05:09,880

got okay so you got all the different

131

00:05:16,320 --> 00:05:13,840

systems basically to make the launch

132

00:05:18,570 --> 00:05:16,330

vehicle be able to function while it's

133

00:05:20,340 --> 00:05:18,580

on the launch pad right and so if you

134

00:05:24,720 --> 00:05:20,350

guys bring the mobile launcher picture

135

00:05:25,920 --> 00:05:24,730

up again when I talk about systems some

136

00:05:28,320 --> 00:05:25,930

of the things that we're putting on

137

00:05:31,890 --> 00:05:28,330

right now are what we call arms so these

138

00:05:34,080 --> 00:05:31,900

arms provide fluids and electrical and

139

00:05:36,330 --> 00:05:34,090

commodity and controls to the vehicle

140

00:05:38,160 --> 00:05:36,340

before it launches when it launches

141

00:05:40,320 --> 00:05:38,170

those arms are actually movable they

142

00:05:43,050 --> 00:05:40,330

move away so they're very complex mini

143

00:05:46,140 --> 00:05:43,060

systems within this whole giant complex

144

00:05:48,240 --> 00:05:46,150

structure and this top arm I recently

145

00:05:51,780 --> 00:05:48,250

saw this sitting outside of this

146

00:05:53,910 --> 00:05:51,790

building what is the white room for so

147

00:05:58,310 --> 00:05:53,920

we haven't put this one on yet we call

148

00:06:00,480 --> 00:05:58,320

this the crew access arm so that one

149

00:06:01,380 --> 00:06:00,490

trying to move forward okay we're going

150

00:06:06,060 --> 00:06:01,390

to move up a little bit

151
00:06:07,590 --> 00:06:06,070
so when the second mission goes off not

152
00:06:09,930 --> 00:06:07,600
the first one the first one's going to

153
00:06:12,030 --> 00:06:09,940
be an unmanned mission it's going to be

154
00:06:13,770 --> 00:06:12,040
a proving ground a test mission the

155
00:06:15,750 --> 00:06:13,780
second one though astronauts will

156
00:06:17,220 --> 00:06:15,760
actually come up the tower they'll walk

157
00:06:20,100 --> 00:06:17,230
out on this platform and the white room

158
00:06:23,580 --> 00:06:20,110
is like a clean room and it's it sucks

159
00:06:26,760 --> 00:06:23,590
up against the access door to the Orion

160
00:06:28,800 --> 00:06:26,770
spacecraft vehicle so when you see the

161
00:06:29,879 --> 00:06:28,810
pictures on TV of astronauts walking out

162
00:06:31,770 --> 00:06:29,889
walking into the

163
00:06:33,809 --> 00:06:31,780

like we used to be the shuttle now it'll

164

00:06:37,409 --> 00:06:33,819

be SLS that'll be the white room that

165

00:06:40,740 --> 00:06:37,419

you see so this entire structure is

166

00:06:42,600 --> 00:06:40,750

going to come in to this building yeah

167

00:06:44,580 --> 00:06:42,610

and this rocket is going to be assembled

168

00:06:46,529 --> 00:06:44,590

on top of it in here

169

00:06:48,839 --> 00:06:46,539

correct it's like a building inside a

170

00:06:51,409 --> 00:06:48,849

building so the a platform we're

171

00:06:55,709 --> 00:06:51,419

standing on right now will be used for

172

00:06:58,080 --> 00:06:55,719

workers so basically helped do different

173

00:07:00,869 --> 00:06:58,090

things on the rocket as it being

174

00:07:02,610 --> 00:07:00,879

assembled in here yes it's so people so

175

00:07:04,740 --> 00:07:02,620

that people can get access to the rocket

176
00:07:07,860 --> 00:07:04,750
if you guys pan around one thing you can

177
00:07:09,360 --> 00:07:07,870
look for look up on the top of the VAB

178
00:07:11,939 --> 00:07:09,370
you'll see something bright yellow

179
00:07:14,790 --> 00:07:11,949
that's one of the big overhead cranes

180
00:07:16,860 --> 00:07:14,800
they come out open that way up it's over

181
00:07:19,320 --> 00:07:16,870
that way and it's used to pick up the

182
00:07:20,939 --> 00:07:19,330
pieces of the rocket from what we call

183
00:07:23,879 --> 00:07:20,949
the transfer aisle which is the middle

184
00:07:25,439 --> 00:07:23,889
of the VAB and you stack them on to the

185
00:07:27,629 --> 00:07:25,449
mobile launch platform and that's how we

186
00:07:30,779 --> 00:07:27,639
sequentially build the rocket up in this

187
00:07:33,209 --> 00:07:30,789
building so the parts come in on the

188
00:07:34,860 --> 00:07:33,219

floor the crane lifts them up and then

189

00:07:37,769 --> 00:07:34,870

brings them into here this is called the

190

00:07:40,050 --> 00:07:37,779

high bay right and if they pan around

191

00:07:42,540 --> 00:07:40,060

the other direction you can actually see

192

00:07:45,480 --> 00:07:42,550

some of the doors that open up to allow

193

00:07:47,300 --> 00:07:45,490

the vehicle and mobile launcher to come

194

00:07:50,339 --> 00:07:47,310

in and out of that this high bay right

195

00:07:53,909 --> 00:07:50,349

if you guys remember some shuttle days

196

00:07:55,619 --> 00:07:53,919

the big vehicle that we used to pick up

197

00:07:58,769 --> 00:07:55,629

this entire structure is called a

198

00:08:01,050 --> 00:07:58,779

crawler-transporter it runs on tracks it

199

00:08:03,390 --> 00:08:01,060

actually pulls up under the mobile

200

00:08:05,999 --> 00:08:03,400

launch platform picks it up and drives

201
00:08:07,709 --> 00:08:06,009
it into the Vav set sit down on posts

202
00:08:09,689 --> 00:08:07,719
and then when it's ready to go out to

203
00:08:11,879 --> 00:08:09,699
the pad comes back in picks it up and

204
00:08:13,589 --> 00:08:11,889
drives it out to the launch pad I read

205
00:08:15,749 --> 00:08:13,599
an interesting fact online these doors

206
00:08:18,779 --> 00:08:15,759
that you see on the other side here

207
00:08:22,140 --> 00:08:18,789
there they are the largest doors in the

208
00:08:24,089 --> 00:08:22,150
world yeah they're 456 feet tall you

209
00:08:26,640 --> 00:08:24,099
know they have to be that large to open

210
00:08:29,450 --> 00:08:26,650
up to allow this amazing huge structure

211
00:08:31,960 --> 00:08:29,460
in and out which is just phenomenal

212
00:08:34,880 --> 00:08:31,970
and actually the next the next

213
00:08:36,680 --> 00:08:34,890

progression of the vehicle the SLS

214

00:08:37,910 --> 00:08:36,690

vehicle is going to be 60 feet taller

215

00:08:39,650 --> 00:08:37,920

Wow

216

00:08:42,290 --> 00:08:39,660

so are they gonna have to add more

217

00:08:44,180 --> 00:08:42,300

platforms yes I think we got 10 now so

218

00:08:45,770 --> 00:08:44,190

we're gonna need an additional one yep

219

00:08:47,450 --> 00:08:45,780

to make up for the added weight and some

220

00:08:48,950 --> 00:08:47,460

of these arms are gonna be going away

221

00:08:50,570 --> 00:08:48,960

and we're gonna have different arms

222

00:08:53,210 --> 00:08:50,580

coming in so they'll have to adjust the

223

00:08:56,180 --> 00:08:53,220

platform is 4 that is are the arms I

224

00:08:57,590 --> 00:08:56,190

don't if you guys look the platform's

225

00:08:59,960 --> 00:08:57,600

are actually you can see there are some

226

00:09:03,350 --> 00:08:59,970

of them are up there on hinges so after

227

00:09:05,240 --> 00:09:03,360

the the vehicle comes in it surrounds it

228

00:09:08,870 --> 00:09:05,250

and then the platform's lift up and down

229

00:09:11,150 --> 00:09:08,880

another huge engineering feat that that

230

00:09:14,630 --> 00:09:11,160

NASA's right to make it movable so it

231

00:09:17,120 --> 00:09:14,640

can actually be used for different sizes

232

00:09:19,280 --> 00:09:17,130

of rockets like if faith were to bring

233

00:09:20,780 --> 00:09:19,290

in another rocket could the same

234

00:09:23,780 --> 00:09:20,790

platform work I believe they are

235

00:09:28,600 --> 00:09:23,790

somewhat adjustable this way and I'm not

236

00:09:33,050 --> 00:09:28,610

sure up and down maybe John here looking

237

00:09:46,699 --> 00:09:33,060

will mic up John over here it's on

238

00:09:46,709 --> 00:09:50,889

give

239

00:09:56,949 --> 00:09:53,949

excellent all right so what I'm curious

240

00:09:59,439 --> 00:09:56,959

about to Krista is I mean today we're

241

00:10:01,629 --> 00:09:59,449

celebrating engineer specifically women

242

00:10:03,790 --> 00:10:01,639

in engineering and I'm curious like how

243

00:10:06,400 --> 00:10:03,800

did you get to a to do a job like this

244

00:10:08,410 --> 00:10:06,410

to be you know the field senior field

245

00:10:09,699 --> 00:10:08,420

manager for this particular project how

246

00:10:11,739 --> 00:10:09,709

did you even get to NASA in the first

247

00:10:14,980 --> 00:10:11,749

place yeah it was kind of a roundabout

248

00:10:17,739 --> 00:10:14,990

story actually when I was in school I

249

00:10:19,150 --> 00:10:17,749

knew that I liked science and math I

250

00:10:23,499 --> 00:10:19,160

wasn't sure I wasn't even sure what

251
00:10:26,019 --> 00:10:23,509
engineering was but NASA advertised a

252
00:10:28,660 --> 00:10:26,029
scholarship a co-op scholarship where

253
00:10:30,280 --> 00:10:28,670
they said hey you know come work you

254
00:10:33,639 --> 00:10:30,290
know work for us for the summer and then

255
00:10:34,960 --> 00:10:33,649
we will send you to college and in order

256
00:10:36,280 --> 00:10:34,970
to do that you had to be an engineer and

257
00:10:37,869 --> 00:10:36,290
I'm like okay well I know it has

258
00:10:38,410 --> 00:10:37,879
something to do with math I'll give it a

259
00:10:41,650 --> 00:10:38,420
try

260
00:10:43,720 --> 00:10:41,660
so I did and turns out when I went to

261
00:10:46,079 --> 00:10:43,730
school I kind of gravitated towards

262
00:10:49,239 --> 00:10:46,089
civil engineering and structures and and

263
00:10:50,949 --> 00:10:49,249

ended up liking it and it was so like

264

00:10:53,710 --> 00:10:50,959

fascinated with what was going on here

265

00:10:55,660 --> 00:10:53,720

at NASA stayed through the whole my

266

00:10:59,139 --> 00:10:55,670

whole schooling and got hired on and I

267

00:11:00,579 --> 00:10:59,149

was when I graduated so and is that

268

00:11:04,389 --> 00:11:00,589

that's one thing that I wanted to tell

269

00:11:07,569 --> 00:11:04,399

you girls when you get to college level

270

00:11:09,970 --> 00:11:07,579

the biggest thing is go out find an

271

00:11:11,619 --> 00:11:09,980

internship it doesn't even have to be

272

00:11:13,419 --> 00:11:11,629

something that you think you want to do

273

00:11:14,919 --> 00:11:13,429

for the rest of your life but it's going

274

00:11:17,110 --> 00:11:14,929

to give you experience and how the

275

00:11:19,809 --> 00:11:17,120

business world really works interacting

276

00:11:22,360 --> 00:11:19,819

with people being able to communicate so

277

00:11:25,299 --> 00:11:22,370

things like that yeah do you have any

278

00:11:27,549 --> 00:11:25,309

other recommendations for for them if

279

00:11:28,480 --> 00:11:27,559

they want to become engineers you know

280

00:11:32,590 --> 00:11:28,490

what are some things you've learned

281

00:11:34,720 --> 00:11:32,600

along the way okay basically just some

282

00:11:36,369 --> 00:11:34,730

of these not necessarily engineering but

283

00:11:38,860 --> 00:11:36,379

for anybody who goes out in the working

284

00:11:41,199 --> 00:11:38,870

world whatever you guys choose to do I

285

00:11:43,600 --> 00:11:41,209

wrote down a few things that I've

286

00:11:45,689 --> 00:11:43,610

learned over my lifetime you know I have

287

00:11:47,789 --> 00:11:45,699

kids myself and I hear them

288

00:11:50,129 --> 00:11:47,799

the times I was too embarrassed to ask a

289

00:11:52,099 --> 00:11:50,139

question don't be afraid to ask

290

00:11:55,829 --> 00:11:52,109

questions the smart people ask questions

291

00:11:57,629 --> 00:11:55,839

if you know people will respect you they

292

00:11:59,609 --> 00:11:57,639

also want to teach you know when you

293

00:12:01,769 --> 00:11:59,619

find that hey you're interested in

294

00:12:04,169 --> 00:12:01,779

something somebody's gonna tell you how

295

00:12:06,509 --> 00:12:04,179

to do it so it's the people that don't

296

00:12:07,889 --> 00:12:06,519

ask the questions that are the dumb ones

297

00:12:11,099 --> 00:12:07,899

not the ones that ask the questions

298

00:12:13,559 --> 00:12:11,109

right I'm an educator so I am also a fan

299

00:12:14,699 --> 00:12:13,569

like you know the more you ask the more

300

00:12:17,249 --> 00:12:14,709

curious you are the more you're gonna

301
00:12:18,720 --> 00:12:17,259
learn so there's no such thing as a bad

302
00:12:20,879 --> 00:12:18,730
question right and then don't be

303
00:12:22,769 --> 00:12:20,889
embarrassed to ask I ask anything I even

304
00:12:23,249 --> 00:12:22,779
say hey I don't care if this is a stupid

305
00:12:24,989 --> 00:12:23,259
question

306
00:12:27,409 --> 00:12:24,999
I don't know this tell me how to do it

307
00:12:28,949 --> 00:12:27,419
nobody expects you to know everything

308
00:12:32,460 --> 00:12:28,959
making mistakes

309
00:12:34,409 --> 00:12:32,470
I am 50 years old I've been working for

310
00:12:37,439 --> 00:12:34,419
NASA for 30 years I'm gonna still make

311
00:12:39,539 --> 00:12:37,449
mistakes but I realize that I'm not

312
00:12:41,549 --> 00:12:39,549
perfect and when it happens I just say

313
00:12:43,739 --> 00:12:41,559

hey you know I'm sorry I made a mistake

314

00:12:46,619 --> 00:12:43,749

you know don't pretend to know something

315

00:12:49,499 --> 00:12:46,629

that you don't know you're gonna

316

00:12:51,150 --> 00:12:49,509

actually get respect if you admit hey I

317

00:12:55,279 --> 00:12:51,160

made a mistake I'll do it better next

318

00:12:58,650 --> 00:12:55,289

time okay so and then the other thing is

319

00:13:00,960 --> 00:12:58,660

as far as respect treat everybody with

320

00:13:04,799 --> 00:13:00,970

respect treat everyone like you want to

321

00:13:06,210 --> 00:13:04,809

be treated you know just because I'm an

322

00:13:08,489 --> 00:13:06,220

engineer I don't go out to the job site

323

00:13:10,859 --> 00:13:08,499

and say hey I know everything right you

324

00:13:14,659 --> 00:13:10,869

know if there's a if there's a guy you

325

00:13:17,639 --> 00:13:14,669

know laying rebar or welding you know

326

00:13:21,029 --> 00:13:17,649

everybody knows their job as well as you

327

00:13:23,609 --> 00:13:21,039

know your job so you know respect

328

00:13:27,670 --> 00:13:23,619

everybody and learn from that and then

329

00:13:32,320 --> 00:13:27,680

the last thing if you are an engineer

330

00:13:34,829 --> 00:13:32,330

your designer actually go out and see

331

00:13:37,510 --> 00:13:34,839

your thing being done if you're an

332

00:13:39,310 --> 00:13:37,520

air-conditioner mechanic see how that

333

00:13:42,970 --> 00:13:39,320

air conditioner works see how things are

334

00:13:44,620 --> 00:13:42,980

built in the field so many times if you

335

00:13:46,449 --> 00:13:44,630

don't ever get out away from your office

336

00:13:48,639 --> 00:13:46,459

you're looking at a set of plans and

337

00:13:50,110 --> 00:13:48,649

you're like you can't understand why

338

00:13:52,269 --> 00:13:50,120

this can't be built in the field until

339

00:13:53,980 --> 00:13:52,279

you go out there and you realize oh my

340

00:13:56,650 --> 00:13:53,990

gosh the tool that they use to put this

341

00:13:58,120 --> 00:13:56,660

bolt together is this big and I'm trying

342

00:14:01,150 --> 00:13:58,130

to get you guys to get it into a space

343

00:14:03,010 --> 00:14:01,160

this big right so that is the biggest

344

00:14:05,530 --> 00:14:03,020

lesson that I've learned being out in

345

00:14:07,329 --> 00:14:05,540

the field is that you actually have to

346

00:14:10,090 --> 00:14:07,339

see things put together to be a really

347

00:14:12,639 --> 00:14:10,100

good engineer and I'm curious I wish we

348

00:14:13,780 --> 00:14:12,649

could see some of our audience and like

349

00:14:16,150 --> 00:14:13,790

if you're in a classroom right now

350

00:14:17,740 --> 00:14:16,160

listening just arrange them and even

351
00:14:20,230 --> 00:14:17,750
though we can't see we can imagine out

352
00:14:21,970 --> 00:14:20,240
there how many of you love to just build

353
00:14:24,970 --> 00:14:21,980
things and take things apart whether

354
00:14:27,060 --> 00:14:24,980
it's Legos or robotic things you know if

355
00:14:31,570 --> 00:14:27,070
that's something you're passionate about

356
00:14:32,769 --> 00:14:31,580
around as well then that might be a hint

357
00:14:35,410 --> 00:14:32,779
to you right that you might be

358
00:14:36,790 --> 00:14:35,420
interested in this field yeah I never I

359
00:14:38,800 --> 00:14:36,800
never thought that I would end up in the

360
00:14:41,949 --> 00:14:38,810
construction field until I came to work

361
00:14:43,720 --> 00:14:41,959
for NASA and got exposed to it and

362
00:14:45,610 --> 00:14:43,730
thought wow that's really cool you get

363
00:14:47,440 --> 00:14:45,620

to be outside you still get to do

364

00:14:49,990 --> 00:14:47,450

engineering and you get to actually see

365

00:14:51,340 --> 00:14:50,000

things being built great and there's so

366

00:14:53,170 --> 00:14:51,350

many different types of construction

367

00:14:56,199 --> 00:14:53,180

like people think of construction maybe

368

00:14:59,470 --> 00:14:56,209

with infrastructure and they're like

369

00:15:01,750 --> 00:14:59,480

homes or buildings or houses or roads

370

00:15:03,400 --> 00:15:01,760

whatever but look at the infrastructure

371

00:15:05,380 --> 00:15:03,410

here that's being constructed it's just

372

00:15:07,060 --> 00:15:05,390

yeah what are the purpose of launching a

373

00:15:09,610 --> 00:15:07,070

rocket to space is kind of a really cool

374

00:15:12,010 --> 00:15:09,620

and goal to write and even down to the

375

00:15:13,420 --> 00:15:12,020

the pieces of electrical equipment that

376

00:15:15,130 --> 00:15:13,430

we have on the

377

00:15:16,870 --> 00:15:15,140

there's people here at NASA that are

378

00:15:18,519 --> 00:15:16,880

building the little circuit boards that

379

00:15:20,740 --> 00:15:18,529

go into they build the you know the

380

00:15:22,840 --> 00:15:20,750

valves that go into the panels yeah so

381

00:15:25,660 --> 00:15:22,850

it's not just the big heavy industrial

382

00:15:27,820 --> 00:15:25,670

work it's it's down to the small pieces

383

00:15:29,560 --> 00:15:27,830

and parts all right we look like we

384

00:15:31,690 --> 00:15:29,570

already are getting some questions in

385

00:15:34,389 --> 00:15:31,700

are you game for taking a few filter

386

00:15:36,880 --> 00:15:34,399

questions out all right so one of the

387

00:15:39,759 --> 00:15:36,890

questions that came in via Ustream is

388

00:15:41,920 --> 00:15:39,769

what is the purpose or the goal of this

389

00:15:45,670 --> 00:15:41,930

vehicle and when is it expected to

390

00:15:48,009 --> 00:15:45,680

launch okay so I mentioned before that

391

00:15:51,370 --> 00:15:48,019

it's the proving ground so you never

392

00:15:53,500 --> 00:15:51,380

want to put live astronauts on a rocket

393

00:15:55,240 --> 00:15:53,510

that you haven't tested before so the

394

00:15:57,990 --> 00:15:55,250

goal of this is actually to test out the

395

00:16:01,750 --> 00:15:58,000

vehicle it's going to launch in late

396

00:16:05,259 --> 00:16:01,760

2019 and the mission goes up into space

397

00:16:09,639 --> 00:16:05,269

past the moon it's about a I think it's

398

00:16:10,960 --> 00:16:09,649

about a three week mission and then the

399

00:16:12,579 --> 00:16:10,970

reusable parts actually after it

400

00:16:14,590 --> 00:16:12,589

launches comes back but this it's

401
00:16:17,380 --> 00:16:14,600
basically to test out the vehicle before

402
00:16:18,760 --> 00:16:17,390
we put people on it all right but so I

403
00:16:20,260 --> 00:16:18,770
want to walk over here a little bit just

404
00:16:22,990 --> 00:16:20,270
to kind of get a different perspective

405
00:16:23,980 --> 00:16:23,000
of things because hey young man this is

406
00:16:25,930 --> 00:16:23,990
six right you're right

407
00:16:29,440 --> 00:16:25,940
you can look already building all around

408
00:16:32,530 --> 00:16:29,450
so from here standing near the edge I

409
00:16:36,310 --> 00:16:32,540
can see all the way down and see that

410
00:16:38,650 --> 00:16:36,320
the sections of the platforms are very

411
00:16:40,780 --> 00:16:38,660
sizes as we look up they get narrower

412
00:16:42,460 --> 00:16:40,790
and narrower and that's because of the

413
00:16:44,139 --> 00:16:42,470

shape of the vehicle right right gonna

414

00:16:45,340 --> 00:16:44,149

be going in here right so can you

415

00:16:47,050 --> 00:16:45,350

explain a little bit about the very top

416

00:16:48,940 --> 00:16:47,060

part it seems to get very very narrow at

417

00:16:50,980 --> 00:16:48,950

the top okay well for that we have to go

418

00:16:55,780 --> 00:16:50,990

back Bethany that bring it over this way

419

00:16:55,790 --> 00:17:00,210

Oh actually the Vav one would be better

420

00:17:05,320 --> 00:17:02,890

so we're gonna get you guys a picture to

421

00:17:07,810 --> 00:17:05,330

help explain that a little bit so as you

422

00:17:09,850 --> 00:17:07,820

can see the vehicles fatter on the

423

00:17:11,560 --> 00:17:09,860

bottom than it is on the top here's

424

00:17:15,160 --> 00:17:11,570

where the crew capsule is and this is

425

00:17:17,290 --> 00:17:15,170

the the launch escape mechanism but but

426

00:17:19,390 --> 00:17:17,300

as it goes up it gets skinnier so that's

427

00:17:20,860 --> 00:17:19,400

why when you're looking up the holes and

428

00:17:24,310 --> 00:17:20,870

the platform's get narrower and narrower

429

00:17:26,410 --> 00:17:24,320

and like I said that's for people to get

430

00:17:27,910 --> 00:17:26,420

close enough to the vehicle to access it

431

00:17:31,140 --> 00:17:27,920

to work on it to make it get it ready

432

00:17:33,760 --> 00:17:31,150

for launch okay we got more questions

433

00:17:35,650 --> 00:17:33,770

somebody says they they've always wanted

434

00:17:37,600 --> 00:17:35,660

to work at NASA is it true that you have

435

00:17:40,570 --> 00:17:37,610

to go to the best schools and be

436

00:17:42,070 --> 00:17:40,580

extremely smart and is this especially

437

00:17:44,170 --> 00:17:42,080

true for girls that's a great question

438

00:17:46,840 --> 00:17:44,180

I'm glad you guys asked because I always

439

00:17:51,040 --> 00:17:46,850

tell people I wasn't the smartest kid I

440

00:17:53,650 --> 00:17:51,050

was a navy student pretty average but I

441

00:17:55,060 --> 00:17:53,660

did have a drive and motivation I wanted

442

00:17:57,280 --> 00:17:55,070

to work hard and I really had a passion

443

00:17:58,750 --> 00:17:57,290

for you know doing something in the

444

00:18:00,760 --> 00:17:58,760

engineering field so I think that's the

445

00:18:02,350 --> 00:18:00,770

biggest thing is just you have you have

446

00:18:04,180 --> 00:18:02,360

to show that you're motivated you have

447

00:18:06,280 --> 00:18:04,190

to show that you're willing you know

448

00:18:08,440 --> 00:18:06,290

you're good at working with people and

449

00:18:11,620 --> 00:18:08,450

you're good at communicating excellent

450

00:18:13,270 --> 00:18:11,630

so another question that just came in

451
00:18:15,430 --> 00:18:13,280
and I just wanted to remind everybody

452
00:18:16,750 --> 00:18:15,440
who's watching if you didn't hear

453
00:18:18,490 --> 00:18:16,760
earlier and you want to send in a

454
00:18:20,140 --> 00:18:18,500
question there's a couple ways you can

455
00:18:24,850 --> 00:18:20,150
do it you can send them via twitter

456
00:18:26,740 --> 00:18:24,860
using hashtag nasa deep dep and you can

457
00:18:28,390 --> 00:18:26,750
send them through the chat window that

458
00:18:30,340 --> 00:18:28,400
you see next to the video player and

459
00:18:31,840 --> 00:18:30,350
don't forget to look around you can pan

460
00:18:34,000 --> 00:18:31,850
around and see up or down if you're

461
00:18:36,280 --> 00:18:34,010
using a tablet or a mobile device you

462
00:18:38,770 --> 00:18:36,290
can actually physically move your device

463
00:18:41,350 --> 00:18:38,780

to see in different directions this next

464

00:18:43,700 --> 00:18:41,360

question came in from Cheltenham

465

00:18:46,160 --> 00:18:43,710

elementary school and they

466

00:18:48,980 --> 00:18:46,170

- no how many Rockets are in the

467

00:18:51,020 --> 00:18:48,990

facility at this time or at a time how

468

00:18:53,930 --> 00:18:51,030

many could be America we're going to be

469

00:18:56,570 --> 00:18:53,940

just processing one at a time okay but

470

00:18:59,300 --> 00:18:56,580

we have there's four high base right

471

00:19:01,370 --> 00:18:59,310

yeah okay we could have four so it's got

472

00:19:04,640 --> 00:19:01,380

capacity for more than one but the plan

473

00:19:06,920 --> 00:19:04,650

is for one right the next question I

474

00:19:08,750 --> 00:19:06,930

love this question because every person

475

00:19:10,100 --> 00:19:08,760

I ask no matter I could ask everybody

476

00:19:12,230 --> 00:19:10,110

here this question would have different

477

00:19:14,030 --> 00:19:12,240

answers so curious about your answer

478

00:19:17,570 --> 00:19:14,040

what is the best thing about working for

479

00:19:22,040 --> 00:19:17,580

NASA oh my gosh I think it's just what

480

00:19:23,780 --> 00:19:22,050

we do here you know sometimes when

481

00:19:26,510 --> 00:19:23,790

you're working a job every day you get

482

00:19:28,340 --> 00:19:26,520

you get bogged down and just you know

483

00:19:31,370 --> 00:19:28,350

being overwhelmed

484

00:19:33,530 --> 00:19:31,380

lots of workload but then I go outside

485

00:19:35,450 --> 00:19:33,540

and I look at Wow

486

00:19:37,730 --> 00:19:35,460

there's the Vav there's the mobile

487

00:19:39,380 --> 00:19:37,740

launcher there's the crawler I got to

488

00:19:41,060 --> 00:19:39,390

drive the caller transporter one time

489

00:19:42,680 --> 00:19:41,070

and it's like I'll never forget that so

490

00:19:46,220 --> 00:19:42,690

explain what is the crawler transporter

491

00:19:48,890 --> 00:19:46,230

so it's a it's like a big giant movable

492

00:19:51,290 --> 00:19:48,900

platform and that's the thing that comes

493

00:19:54,080 --> 00:19:51,300

up underneath the mobile launcher okay

494

00:19:55,580 --> 00:19:54,090

makes it mobile so it picks it up takes

495

00:19:57,140 --> 00:19:55,590

it yeah wherever it got this out it's a

496

00:19:58,880 --> 00:19:57,150

big giant track the vehicle it's the

497

00:20:01,760 --> 00:19:58,890

same one they use for shuttle they

498

00:20:04,140 --> 00:20:01,770

upgraded it and it picks up the mobile

499

00:20:06,780 --> 00:20:04,150

launcher and then drives it into the V

500

00:20:09,270 --> 00:20:06,790

and out to the head so it kind of looks

501
00:20:12,500 --> 00:20:09,280
like a like a big tank but without the

502
00:20:16,530 --> 00:20:12,510
military stuff just exactly like VA wide

503
00:20:19,350 --> 00:20:16,540
squatly tank with a flat top okay so

504
00:20:21,480 --> 00:20:19,360
that itself must be pretty massive and

505
00:20:23,550 --> 00:20:21,490
then on top of it you have that platform

506
00:20:25,320 --> 00:20:23,560
the mobile launcher and then you've got

507
00:20:29,010 --> 00:20:25,330
a rocket stacked on top of that I

508
00:20:31,890 --> 00:20:29,020
imagine it's not exactly moving fast to

509
00:20:34,440 --> 00:20:31,900
the launcher when they moved the shuttle

510
00:20:37,230 --> 00:20:34,450
it was a top speed of 0.8 miles per hour

511
00:20:40,470 --> 00:20:37,240
point 8 yes and I think that caller can

512
00:20:42,630 --> 00:20:40,480
go like a little over 1 mile an hour so

513
00:20:45,930 --> 00:20:42,640

people could probably walk faster than

514

00:20:49,140 --> 00:20:45,940

yeah not had a name yeah yep caller put

515

00:20:50,550 --> 00:20:49,150

a dollar makes sense right okay let's

516

00:20:54,090 --> 00:20:50,560

see if I got another question coming in

517

00:20:57,090 --> 00:20:54,100

yep here we go our rockets in this

518

00:20:59,790 --> 00:20:57,100

building currently no we don't have any

519

00:21:02,010 --> 00:20:59,800

yet but you build them in here I guess

520

00:21:03,870 --> 00:21:02,020

they want to know really they're built

521

00:21:06,150 --> 00:21:03,880

off-site but they get assembled in here

522

00:21:08,520 --> 00:21:06,160

so you guys assembled means we put the

523

00:21:10,230 --> 00:21:08,530

pieces together so I like Legos like if

524

00:21:12,240 --> 00:21:10,240

the parts come independently and then

525

00:21:14,400 --> 00:21:12,250

you stack them up and yes the rocket

526

00:21:16,380 --> 00:21:14,410

preferences and then we put it together

527

00:21:18,390 --> 00:21:16,390

like we described before where it comes

528

00:21:20,910 --> 00:21:18,400

into the center of the building and then

529

00:21:23,070 --> 00:21:20,920

it's stacked piece by piece onto the

530

00:21:26,970 --> 00:21:23,080

mobile launcher and we hope to have a

531

00:21:31,820 --> 00:21:26,980

rocket in here by spring or fall of 19

532

00:21:34,440 --> 00:21:31,830

okay so it takes then I would guess a

533

00:21:36,000 --> 00:21:34,450

couple months to three months to process

534

00:21:38,520 --> 00:21:36,010

it so yeah it ready yeah I launched

535

00:21:40,890 --> 00:21:38,530

several months to stack it to test it

536

00:21:43,770 --> 00:21:40,900

out before they're ready for long and

537

00:21:45,450 --> 00:21:43,780

are you going to what would be your role

538

00:21:47,610 --> 00:21:45,460

during the time of the launch will you

539

00:21:49,530 --> 00:21:47,620

be a spectator and join it yeah or your

540

00:21:52,200 --> 00:21:49,540

spectator or my job will be done by that

541

00:21:54,510 --> 00:21:52,210

time my hope is that I am getting to do

542

00:21:56,490 --> 00:21:54,520

something like this maybe a live 360

543

00:21:57,330 --> 00:21:56,500

launch cats for that that would be my

544

00:21:59,400 --> 00:21:57,340

hope

545

00:22:01,110 --> 00:21:59,410

that would I would if you ever get an

546

00:22:02,970 --> 00:22:01,120

opportunity to come out to the Space

547

00:22:05,250 --> 00:22:02,980

Center to see a launch live I would

548

00:22:06,870 --> 00:22:05,260

highly recommend it and you know you've

549

00:22:07,560 --> 00:22:06,880

probably seen quite a few throughout

550

00:22:09,150 --> 00:22:07,570

your career

551
00:22:11,250 --> 00:22:09,160
what does the experience like to see a

552
00:22:13,260 --> 00:22:11,260
launch it never gets old

553
00:22:16,950 --> 00:22:13,270
you know I I missing the shuttle

554
00:22:19,590 --> 00:22:16,960
launches just feeling the the vibration

555
00:22:21,810 --> 00:22:19,600
from the launch blast and just you know

556
00:22:23,880 --> 00:22:21,820
knowing what it took to get that thing

557
00:22:26,430 --> 00:22:23,890
up in the air it's amazing yeah I

558
00:22:30,510 --> 00:22:26,440
remember the first launch that I saw in

559
00:22:33,390 --> 00:22:30,520
person I was you know surprised by the

560
00:22:35,670 --> 00:22:33,400
amount of vibration you could feel from

561
00:22:37,710 --> 00:22:35,680
the sound waves you know you see it

562
00:22:39,450 --> 00:22:37,720
launch and then there's a delay because

563
00:22:42,390 --> 00:22:39,460

of course light travels faster than

564

00:22:44,220 --> 00:22:42,400

sound so a short while later you start

565

00:22:46,110 --> 00:22:44,230

to feel the vibrations and the rumbling

566

00:22:49,110 --> 00:22:46,120

in the ground it just shakes everything

567

00:22:50,790 --> 00:22:49,120

around here - that's really cool the

568

00:22:53,040 --> 00:22:50,800

next question that has come in is how

569

00:22:55,770 --> 00:22:53,050

long has it taken you to build the

570

00:22:57,240 --> 00:22:55,780

vehicle so far do we do we have parts

571

00:22:59,190 --> 00:22:57,250

that are already being built you know

572

00:23:02,010 --> 00:22:59,200

the rocket itself or the mobile launcher

573

00:23:03,810 --> 00:23:02,020

they've been this vehicle so I'm not

574

00:23:05,040 --> 00:23:03,820

sure let's let's start with the mobile

575

00:23:07,890 --> 00:23:05,050

launcher because that's your area of

576

00:23:10,800 --> 00:23:07,900

expertise okay the mobile launch are all

577

00:23:13,440 --> 00:23:10,810

in part probably it was it's been a

578

00:23:16,140 --> 00:23:13,450

start-stop because we modified one that

579

00:23:19,140 --> 00:23:16,150

we built for constellation but I want to

580

00:23:21,180 --> 00:23:19,150

say probably three years okay you know

581

00:23:24,090 --> 00:23:21,190

from start to finish if we went straight

582

00:23:26,610 --> 00:23:24,100

through the vehicle itself I want to say

583

00:23:33,120 --> 00:23:26,620

that's been in work for at least three

584

00:23:35,370 --> 00:23:33,130

years okay oh I am a fan of this

585

00:23:37,380 --> 00:23:35,380

question because I'm a math educator and

586

00:23:39,410 --> 00:23:37,390

so the question these are from students

587

00:23:42,240 --> 00:23:39,420

that are learning statistics right now

588

00:23:46,670 --> 00:23:42,250

stats they want to know how much of a

589

00:23:54,600 --> 00:23:46,680

role do statistics play in your job my

590

00:23:55,880 --> 00:23:54,610

personally none Oh probably indirectly

591

00:23:57,980 --> 00:23:55,890

they do

592

00:24:00,080 --> 00:23:57,990

but you yourself aren't a number

593

00:24:04,480 --> 00:24:00,090

cruncher you're not running any stats no

594

00:24:07,570 --> 00:24:04,490

no I run numbers for math calculations

595

00:24:12,500 --> 00:24:07,580

engineering calculations I run a lot of

596

00:24:15,590 --> 00:24:12,510

cross numbers you know and but but not

597

00:24:17,510 --> 00:24:15,600

necessarily statistics okay next

598

00:24:23,210 --> 00:24:17,520

question what I'm not my favorite

599

00:24:24,710 --> 00:24:23,220

classes now well it isn't necessarily

600

00:24:27,170 --> 00:24:24,720

for everybody and that's why we have

601
00:24:29,330 --> 00:24:27,180
jobs that some are engineers some are

602
00:24:31,610 --> 00:24:29,340
mathematicians but hopefully some of you

603
00:24:33,530 --> 00:24:31,620
that are in that class and are loving it

604
00:24:36,770 --> 00:24:33,540
we need you here at NASA too so we need

605
00:24:40,190 --> 00:24:36,780
lots of that assistance to work here the

606
00:24:42,680 --> 00:24:40,200
next question that we got is related

607
00:24:43,910 --> 00:24:42,690
again to rockets and I'm not sure if

608
00:24:44,750 --> 00:24:43,920
this is an insert something you can

609
00:24:49,400 --> 00:24:44,760
answer it but they want to know what

610
00:24:50,930 --> 00:24:49,410
kind of fuel does a rocket use you know

611
00:24:53,330 --> 00:24:50,940
that one's kind of man me it's

612
00:24:58,340 --> 00:24:53,340
definitely not what fuel you put in your

613
00:25:00,560 --> 00:24:58,350

car no the boosters are solid it's a

614

00:25:03,620 --> 00:25:00,570

solid it almost looks like a like a hard

615

00:25:05,810 --> 00:25:03,630

gel yeah well I usually describe it

616

00:25:07,970 --> 00:25:05,820

because this is familiar to kids like

617

00:25:10,130 --> 00:25:07,980

it's almost like a rubbery material like

618

00:25:13,460 --> 00:25:10,140

an actual eraser yep kind of consistency

619

00:25:15,830 --> 00:25:13,470

and the actual Orion I think has

620

00:25:18,650 --> 00:25:15,840

hydrazine in it and maybe John Kenneth

621

00:25:22,700 --> 00:25:18,660

the liquid is a liquid for the fourth

622

00:25:24,350 --> 00:25:22,710

stage you'll flip flip okay hydrogen and

623

00:25:27,130 --> 00:25:24,360

oxygen okay so if you're same as the

624

00:25:30,560 --> 00:25:27,140

Space Shuttle uses liquid fuel and

625

00:25:34,940 --> 00:25:30,570

liquid hydrogen is extremely cold yeah

626

00:25:36,740 --> 00:25:34,950

it's a negative 420 degrees below zero

627

00:25:38,660 --> 00:25:36,750

so something that's really really cool

628

00:25:42,110 --> 00:25:38,670

the same thing with liquid oxygen it's

629

00:25:43,850 --> 00:25:42,120

well below zero and they come together

630

00:25:46,850 --> 00:25:43,860

when they come together they are

631

00:25:50,870 --> 00:25:46,860

explosive and they rocket fuel

632

00:25:52,850 --> 00:25:50,880

so you do not fuel it wallets in here no

633

00:25:54,919 --> 00:25:52,860

no that gets done out of the launchpad

634

00:25:56,210 --> 00:25:54,929

right there's big spherical tank you

635

00:25:58,310 --> 00:25:56,220

might have seen them if you've ever seen

636

00:25:59,870 --> 00:25:58,320

pictures of the launchpad these large

637

00:26:02,149 --> 00:25:59,880

spherical tanks that are filled with

638

00:26:03,980 --> 00:26:02,159

liquid hydrogen we keep getting

639

00:26:05,360 --> 00:26:03,990

questions in so let's keep going we got

640

00:26:07,279 --> 00:26:05,370

it's just a few more minutes left so

641

00:26:09,620 --> 00:26:07,289

what kind of classes should we take in

642

00:26:12,710 --> 00:26:09,630

school if we want to be an engineer like

643

00:26:16,130 --> 00:26:12,720

you or any engineer ago before you get

644

00:26:17,960 --> 00:26:16,140

to college yeah I think we kind of build

645

00:26:20,960 --> 00:26:17,970

maybe you start with high school and

646

00:26:23,480 --> 00:26:20,970

then we can talk about maybe some enjoy

647

00:26:27,289 --> 00:26:23,490

college courses yeah of course math and

648

00:26:30,889 --> 00:26:27,299

science not so much the biology courses

649

00:26:35,720 --> 00:26:30,899

but physics you know any of your math

650

00:26:36,919 --> 00:26:35,730

classes algebra calculus sometimes you

651
00:26:40,370 --> 00:26:36,929
know when you're getting your to your

652
00:26:42,769 --> 00:26:40,380
career you end up not meaning to crunch

653
00:26:44,480 --> 00:26:42,779
those kind of numbers it's more of a you

654
00:26:46,190 --> 00:26:44,490
know there's a lot of computer programs

655
00:26:48,500 --> 00:26:46,200
that we use nowadays AI do some of that

656
00:26:50,210 --> 00:26:48,510
stuff but then when you get into college

657
00:26:52,909 --> 00:26:50,220
it's it kind of follows the same course

658
00:26:56,210 --> 00:26:52,919
but then they get into more statics and

659
00:26:59,870 --> 00:26:56,220
dynamics and you know looking at how

660
00:27:01,549 --> 00:26:59,880
materials work and plus of the actual

661
00:27:03,440 --> 00:27:01,559
mechanics and material is kind of stuff

662
00:27:05,870 --> 00:27:03,450
and you do get additional kind of

663
00:27:07,789 --> 00:27:05,880

training as you go I mean once you you

664

00:27:09,320 --> 00:27:07,799

know get a job here at now say your

665

00:27:10,700 --> 00:27:09,330

training isn't really done right you're

666

00:27:13,009 --> 00:27:10,710

not oh and that's what you're learning

667

00:27:15,710 --> 00:27:13,019

yeah you're your schooling just gives

668

00:27:17,629 --> 00:27:15,720

you a basis for starting your job but

669

00:27:19,940 --> 00:27:17,639

when I started my job I was like wow

670

00:27:21,470 --> 00:27:19,950

they don't teach you this in college you

671

00:27:24,080 --> 00:27:21,480

actually have to learn it when you

672

00:27:26,600 --> 00:27:24,090

here and John smiling because he knows

673

00:27:28,340 --> 00:27:26,610

the same thing yeah it's it's just the

674

00:27:29,990 --> 00:27:28,350

foundation to kind of build off of for

675

00:27:31,880 --> 00:27:30,000

everything else that you're gonna do you

676
00:27:34,130 --> 00:27:31,890
need that background to know whether you

677
00:27:37,280 --> 00:27:34,140
know hey that looks writer that looks

678
00:27:40,520 --> 00:27:37,290
wrong but you learn after you get into

679
00:27:42,590 --> 00:27:40,530
your job sure yep so let's just do one

680
00:27:44,630 --> 00:27:42,600
less foot kind of general overview where

681
00:27:46,130 --> 00:27:44,640
we are so just in case you missed the

682
00:27:48,980 --> 00:27:46,140
beginning we are in the Vehicle Assembly

683
00:27:52,610 --> 00:27:48,990
Building yep standing on platform F

684
00:27:55,190 --> 00:27:52,620
which is the fifth platform up out of

685
00:27:58,280 --> 00:27:55,200
ten currently that are in this high bay

686
00:28:00,830 --> 00:27:58,290
high bay 3 and this is where the SLS

687
00:28:05,600 --> 00:28:00,840
vehicle will be built in sometime in

688
00:28:07,909 --> 00:28:05,610

2019 correct and the vehicle itself will

689

00:28:11,960 --> 00:28:07,919

be built on top of a mobile launcher

690

00:28:13,549 --> 00:28:11,970

which you are helping to construct and

691

00:28:16,370 --> 00:28:13,559

then in the air to help design and build

692

00:28:17,630 --> 00:28:16,380

it yes that is so cool I wanted to just

693

00:28:21,799 --> 00:28:17,640

if we have our few minutes left to ask

694

00:28:24,470 --> 00:28:21,809

you if you have any just final words of

695

00:28:25,760 --> 00:28:24,480

advice or wisdom or encouragement you'd

696

00:28:28,100 --> 00:28:25,770

like to give for the girls out there

697

00:28:29,720 --> 00:28:28,110

maybe that are in school like you might

698

00:28:31,940 --> 00:28:29,730

be struggling maybe they're not maybe

699

00:28:34,520 --> 00:28:31,950

they love it but whatever you want to do

700

00:28:36,350 --> 00:28:34,530

to encourage them in their education in

701
00:28:38,780 --> 00:28:36,360
their studies yeah I would say girls do

702
00:28:40,310 --> 00:28:38,790
what you want don't let anybody talk you

703
00:28:44,299 --> 00:28:40,320
into not doing anything because oh

704
00:28:47,150 --> 00:28:44,309
that's normally a boy does that when I

705
00:28:49,549 --> 00:28:47,160
went to school it was primarily boys but

706
00:28:51,320 --> 00:28:49,559
you know you can do whatever you want

707
00:28:54,500 --> 00:28:51,330
you know and being out in the

708
00:28:56,240 --> 00:28:54,510
construction site you know there's not a

709
00:28:58,340 --> 00:28:56,250
lot of n that work out there but there

710
00:28:59,870 --> 00:28:58,350
are a few women and I you know I like

711
00:29:03,169 --> 00:28:59,880
that women are starting to get out and

712
00:29:05,270 --> 00:29:03,179
just do things that are you know have

713
00:29:08,180 --> 00:29:05,280

been primarily you know a guy's world

714

00:29:11,290 --> 00:29:08,190

right so find some and find something

715

00:29:13,060 --> 00:29:11,300

you love you know if you like math you

716

00:29:14,620 --> 00:29:13,070

if you like sighing I like how you look

717

00:29:17,560 --> 00:29:14,630

at me like that yeah if you like rap

718

00:29:19,510 --> 00:29:17,570

yeah but you know you're gonna have to

719

00:29:21,400 --> 00:29:19,520

do this job for the rest of your life

720

00:29:23,290 --> 00:29:21,410

so it has to be based on something you

721

00:29:25,270 --> 00:29:23,300

love to do absolutely home

722

00:29:27,340 --> 00:29:25,280

I agree no matter what that job ends up

723

00:29:30,250 --> 00:29:27,350

being something else I didn't go into

724

00:29:32,049 --> 00:29:30,260

statistics cuz I didn't like that but if

725

00:29:34,900 --> 00:29:32,059

you love that that's where you need to

726

00:29:37,660 --> 00:29:34,910

go alright I just wanted to before we

727

00:29:39,340 --> 00:29:37,670

wrap up ask Rob over there to wave

728

00:29:41,740 --> 00:29:39,350

goodbye John thank you

729

00:29:44,110 --> 00:29:41,750

bye ball that's an ear and off camera so

730

00:29:46,570 --> 00:29:44,120

show hopped away from afar but thank you

731

00:29:48,040 --> 00:29:46,580

all for tuning in Crysta thank you for

732

00:29:50,260 --> 00:29:48,050

joining me today and for being a role

733

00:29:52,450 --> 00:29:50,270

model for our next generation is the

734

00:29:54,970 --> 00:29:52,460

ring Kennedy Space Center alright don't

735

00:29:56,590 --> 00:29:54,980

forget to tune in at one o'clock eastern

736

00:29:59,680 --> 00:29:56,600

time we'll be coming to you live from

737

00:30:01,330 --> 00:29:59,690

the Glenn Research Center and we'll be

738

00:30:05,500 --> 00:30:01,340

alive again at two three and four