
PAO
Forest Lake Elementary
A TECHNOLOGY
MAGNET SCHOOL

1
00:00:05,430 --> 00:00:03,350
we'd like to welcome all you guys at

2
00:00:06,550 --> 00:00:05,440
forest lake technology magnet school

3
00:00:08,710 --> 00:00:06,560
that's

4
00:00:10,790 --> 00:00:08,720
in columbia south carolina so understand

5
00:00:12,470 --> 00:00:10,800
that's the hometown of our nasa

6
00:00:14,390 --> 00:00:12,480
administrator

7
00:00:16,470 --> 00:00:14,400
general charlie bolden so we're pretty

8
00:00:18,470 --> 00:00:16,480
excited to have you guys here

9
00:00:21,189 --> 00:00:18,480
and as michael said i'm sitting with

10
00:00:22,470 --> 00:00:21,199
veteran flight director chris edelen and

11
00:00:24,230 --> 00:00:22,480
chris knows

12
00:00:25,910 --> 00:00:24,240
quite a bit a lot about what happens in

13
00:00:28,470 --> 00:00:25,920

this room and also what happens up on

14
00:00:30,790 --> 00:00:28,480
the international space station this is

15
00:00:33,430 --> 00:00:30,800
the nerve center for human space flight

16
00:00:35,030 --> 00:00:33,440
for nasa the mission control center so

17
00:00:37,110 --> 00:00:35,040
we're very excited to have you guys here

18
00:00:39,910 --> 00:00:37,120
chris and i and uh and we're ready to

19
00:00:42,790 --> 00:00:39,920
take y'all's questions

20
00:00:44,869 --> 00:00:42,800
hi my name is sophia and my question is

21
00:00:46,150 --> 00:00:44,879
what is the primary job of a flight

22
00:00:47,990 --> 00:00:46,160
director

23
00:00:50,389 --> 00:00:48,000
okay well thank you sophia and let me

24
00:00:52,950 --> 00:00:50,399
first also say uh welcome to mission

25
00:00:54,869 --> 00:00:52,960
control to force lake uh elementary and

26
00:00:56,150 --> 00:00:54,879
uh i'll be glad to talk to you a little

27
00:00:57,510 --> 00:00:56,160
bit about what it's like to work here in

28
00:00:59,910 --> 00:00:57,520
mission control and also some of the

29
00:01:01,990 --> 00:00:59,920
other exciting things that nasa is doing

30
00:01:03,430 --> 00:01:02,000
in space but first we'll talk about the

31
00:01:04,710 --> 00:01:03,440
flight director job

32
00:01:07,510 --> 00:01:04,720
essentially the flight director is

33
00:01:08,789 --> 00:01:07,520
responsible for uh for two things one

34
00:01:10,870 --> 00:01:08,799
keeping the astronauts safe while

35
00:01:12,950 --> 00:01:10,880
they're in space and number two ensuring

36
00:01:14,469 --> 00:01:12,960
the success of the mission so uh we

37
00:01:16,310 --> 00:01:14,479
don't do this by ourselves obviously we

38
00:01:17,910 --> 00:01:16,320

have a we have a team of people that uh

39
00:01:19,590 --> 00:01:17,920
that help us in this job and uh that's

40
00:01:21,990 --> 00:01:19,600
the room that we're in right now we're

41
00:01:23,910 --> 00:01:22,000
in uh mission control and right now the

42
00:01:25,830 --> 00:01:23,920
people in this room are controlling the

43
00:01:28,390 --> 00:01:25,840
international space station the space

44
00:01:30,789 --> 00:01:28,400
station's uh 250 miles up in space in

45
00:01:32,550 --> 00:01:30,799
orbit around the earth there are six

46
00:01:34,710 --> 00:01:32,560
cosmonauts and astronauts on board the

47
00:01:37,749 --> 00:01:34,720
space station right now and so in this

48
00:01:39,510 --> 00:01:37,759
room there are about 15 people each

49
00:01:41,830 --> 00:01:39,520
their flight controllers each one is

50
00:01:43,429 --> 00:01:41,840
responsible for a particular system on

51
00:01:45,910 --> 00:01:43,439
board the space station for example the

52
00:01:48,469 --> 00:01:45,920
uh the life support system the uh the

53
00:01:50,710 --> 00:01:48,479
communication gear uh the power systems

54
00:01:52,230 --> 00:01:50,720
and uh of course we picked a bad time to

55
00:01:54,469 --> 00:01:52,240
to show the entire room because uh right

56
00:01:55,910 --> 00:01:54,479
now is uh evidently a bit of a break in

57
00:01:57,990 --> 00:01:55,920
the communication so some of the folks

58
00:02:00,149 --> 00:01:58,000
have stepped off uh stepped off console

59
00:02:01,910 --> 00:02:00,159
but you see the people here are are

60
00:02:03,670 --> 00:02:01,920
monitoring the onboard systems on the

61
00:02:05,830 --> 00:02:03,680
space station they're planning the

62
00:02:07,030 --> 00:02:05,840
cruise activities and uh in the middle

63
00:02:08,790 --> 00:02:07,040

of the room there on the left of your

64
00:02:10,869 --> 00:02:08,800
screen is bob dempsey that's the flight

65
00:02:13,110 --> 00:02:10,879
director he's in charge right now so he

66
00:02:15,270 --> 00:02:13,120
takes all the recommendations all the

67
00:02:17,190 --> 00:02:15,280
inputs from these flight controllers and

68
00:02:18,309 --> 00:02:17,200
he makes the final decision about what

69
00:02:20,630 --> 00:02:18,319
plan they're going to execute what

70
00:02:22,630 --> 00:02:20,640
they're going to do and if anything goes

71
00:02:24,790 --> 00:02:22,640
wrong then it's up to the specialists at

72
00:02:26,470 --> 00:02:24,800
their computers here to monitor the data

73
00:02:28,309 --> 00:02:26,480
from the space station to figure out

74
00:02:30,390 --> 00:02:28,319
what we should do to fix the problem

75
00:02:31,830 --> 00:02:30,400
then they'll tell the flight director

76
00:02:33,270 --> 00:02:31,840
and he'll make the final decision what

77
00:02:34,949 --> 00:02:33,280
course of action will take to fix the

78
00:02:36,630 --> 00:02:34,959
problem of course we work very closely

79
00:02:38,150 --> 00:02:36,640
with the astronauts and and we uh

80
00:02:40,390 --> 00:02:38,160
communicate with them to tell them what

81
00:02:42,470 --> 00:02:40,400
they need to do as well to to stay safe

82
00:02:44,710 --> 00:02:42,480
and to keep the mission successful and

83
00:02:46,470 --> 00:02:44,720
of course that's that's your seat that's

84
00:02:47,990 --> 00:02:46,480
chris's seat where you saw him showing

85
00:02:50,150 --> 00:02:48,000
you where bob sits so chris doesn't

86
00:02:52,309 --> 00:02:50,160
normally sit here but he's here helping

87
00:02:54,710 --> 00:02:52,319
me answer y'all's questions because he

88
00:02:56,869 --> 00:02:54,720

knows all the he's the expert on

89
00:03:00,470 --> 00:02:56,879
on a human space flight next question

90
00:03:05,830 --> 00:03:02,949
um my name is isabelle and my question

91
00:03:07,190 --> 00:03:05,840
is what is the scariest moment you've

92
00:03:09,670 --> 00:03:07,200
experienced in

93
00:03:11,990 --> 00:03:09,680
mission control

94
00:03:14,790 --> 00:03:12,000
well probably the scariest moment was

95
00:03:16,949 --> 00:03:14,800
back in 2010 when i was flight director

96
00:03:19,110 --> 00:03:16,959
for the international space station on a

97
00:03:20,550 --> 00:03:19,120
quiet saturday shift towards the end of

98
00:03:21,589 --> 00:03:20,560
the shift the crew was getting ready to

99
00:03:23,670 --> 00:03:21,599
go to bed

100
00:03:25,750 --> 00:03:23,680
and then just like in a hollywood movie

101
00:03:28,550 --> 00:03:25,760
all the alarms started going off so our

102
00:03:30,550 --> 00:03:28,560
caution warning display goes yellow and

103
00:03:33,350 --> 00:03:30,560
red and there's tones going off and it

104
00:03:36,390 --> 00:03:33,360
was a failure of one of our two external

105
00:03:38,149 --> 00:03:36,400
cooling pumps so these pumps move liquid

106
00:03:40,149 --> 00:03:38,159
ammonia around the outside of the space

107
00:03:41,990 --> 00:03:40,159
station to keep that you know to keep

108
00:03:44,309 --> 00:03:42,000
the the modules that the astronauts live

109
00:03:46,390 --> 00:03:44,319
in cool and cool off our electronics so

110
00:03:47,910 --> 00:03:46,400
they don't overheat so one of those two

111
00:03:49,910 --> 00:03:47,920
pumps failed it had never happened

112
00:03:51,830 --> 00:03:49,920
before but it was something that we had

113
00:03:53,830 --> 00:03:51,840

practiced before in simulation so

114
00:03:55,670 --> 00:03:53,840
suddenly i found myself with the with a

115
00:03:56,789 --> 00:03:55,680
small team on the weekend having to deal

116
00:03:58,710 --> 00:03:56,799
with that problem so over the next

117
00:04:00,070 --> 00:03:58,720
several hours we we saved all the

118
00:04:02,550 --> 00:04:00,080
systems and made sure that the space

119
00:04:05,190 --> 00:04:02,560
station could could handle that that you

120
00:04:07,110 --> 00:04:05,200
know loss of 50 of our cooling and then

121
00:04:08,630 --> 00:04:07,120
over the next few weeks uh additional

122
00:04:10,630 --> 00:04:08,640
teams and other flight directors helped

123
00:04:12,470 --> 00:04:10,640
out and we uh the astronauts actually

124
00:04:15,910 --> 00:04:12,480
had to do three spacewalks to replace

125
00:04:17,909 --> 00:04:15,920
that failed pump and it one one thing to

126
00:04:20,229 --> 00:04:17,919
take note of what chris just said uh if

127
00:04:24,150 --> 00:04:20,239
you didn't catch that that happened on a

128
00:04:26,390 --> 00:04:24,160
saturday um just to remind you the folks

129
00:04:29,110 --> 00:04:26,400
in this room are here on three shifts

130
00:04:31,270 --> 00:04:29,120
around the clock every day

131
00:04:33,110 --> 00:04:31,280
every day of the year so

132
00:04:34,550 --> 00:04:33,120
it's important to know that the the the

133
00:04:37,990 --> 00:04:34,560
crew up on the international space

134
00:04:41,270 --> 00:04:38,000
station is being watched over 24 hours a

135
00:04:46,710 --> 00:04:41,280
day seven days a week 365 days a year

136
00:04:51,270 --> 00:04:49,670
hello my name is jackson my question is

137
00:04:55,030 --> 00:04:51,280
what do you worry about most during

138
00:04:57,350 --> 00:04:55,040

takeoff or re-entry of a space vehicle

139
00:04:59,510 --> 00:04:57,360
yeah that's a great question as well um

140
00:05:01,430 --> 00:04:59,520
i think for myself as a flight director

141
00:05:03,029 --> 00:05:01,440
or frankly any you know an astronaut or

142
00:05:05,909 --> 00:05:03,039
any flight controller here the thing we

143
00:05:07,590 --> 00:05:05,919
worry about uh during launch is are the

144
00:05:09,590 --> 00:05:07,600
engines going to work

145
00:05:11,430 --> 00:05:09,600
uh and on landing is the heat shield

146
00:05:13,350 --> 00:05:11,440
going to work so on landing the

147
00:05:16,230 --> 00:05:13,360
temperatures can get up to 3000 degrees

148
00:05:18,870 --> 00:05:16,240
as the spacecraft slows from traveling

149
00:05:20,870 --> 00:05:18,880
five miles a second down to to zero

150
00:05:22,830 --> 00:05:20,880
velocity within about an hour so you're

151
00:05:24,150 --> 00:05:22,840
talking uh

152
00:05:25,909 --> 00:05:24,160
extreme uh

153
00:05:27,670 --> 00:05:25,919
release of energy and that's in the form

154
00:05:29,590 --> 00:05:27,680
of heat so the heat shield has to work

155
00:05:31,270 --> 00:05:29,600
for landing uh

156
00:05:33,670 --> 00:05:31,280
the astronauts nowadays come back on

157
00:05:35,510 --> 00:05:33,680
russian soyuz capsules they land under

158
00:05:37,029 --> 00:05:35,520
parachutes so that's another thing we

159
00:05:38,550 --> 00:05:37,039
worry about are the parachutes going to

160
00:05:40,550 --> 00:05:38,560
work but uh space flight is very

161
00:05:42,550 --> 00:05:40,560
dangerous there's lots to worry about we

162
00:05:44,710 --> 00:05:42,560
have no shortage of of things to keep

163
00:05:46,629 --> 00:05:44,720

track of here so that's why we we really

164
00:05:48,310 --> 00:05:46,639
emphasize our preparation and training

165
00:05:49,670 --> 00:05:48,320
to make sure that we're ready uh no

166
00:05:53,830 --> 00:05:49,680
matter what happens that we're ready to

167
00:05:57,909 --> 00:05:56,150
hello my name is cyrus and my question

168
00:06:01,270 --> 00:05:57,919
is what place

169
00:06:02,230 --> 00:06:01,280
what shuttle mission have you supported

170
00:06:03,670 --> 00:06:02,240
okay

171
00:06:06,230 --> 00:06:03,680
thank you for that question as well i've

172
00:06:07,350 --> 00:06:06,240
been here for 25 years i've supported

173
00:06:09,749 --> 00:06:07,360
over

174
00:06:13,189 --> 00:06:09,759
40 shuttle missions and uh i'm up to

175
00:06:14,150 --> 00:06:13,199
about 24 space station missions so far

176
00:06:15,430 --> 00:06:14,160
and

177
00:06:17,270 --> 00:06:15,440
they've all been you know they've all

178
00:06:19,110 --> 00:06:17,280
had their own unique challenges and

179
00:06:21,390 --> 00:06:19,120
rewards the one that probably stands out

180
00:06:24,230 --> 00:06:21,400
in my mind the most would be

181
00:06:26,550 --> 00:06:24,240
sts-99 which was the shuttle radar

182
00:06:27,510 --> 00:06:26,560
topography mission and uh that's that's

183
00:06:30,550 --> 00:06:27,520
a lot of big words but it was

184
00:06:33,270 --> 00:06:30,560
essentially a radar mapping mission uh

185
00:06:35,189 --> 00:06:33,280
we helped to to to make a map of the

186
00:06:37,670 --> 00:06:35,199
entire world and what was special about

187
00:06:39,270 --> 00:06:37,680
this map was that it included elevation

188
00:06:41,749 --> 00:06:39,280

data that's what the radar gave us was

189
00:06:44,469 --> 00:06:41,759
the height information that uh that

190
00:06:46,950 --> 00:06:44,479
could be used uh for maps and so this

191
00:06:48,070 --> 00:06:46,960
mission took place back in the year 2000

192
00:06:49,990 --> 00:06:48,080
but

193
00:06:52,469 --> 00:06:50,000
my role was not as flight director back

194
00:06:54,309 --> 00:06:52,479
then i was a flight dynamics officer so

195
00:06:56,550 --> 00:06:54,319
i was in charge of the trajectory or

196
00:06:58,469 --> 00:06:56,560
flight path of that mission so it took

197
00:07:00,230 --> 00:06:58,479
about three years to plan

198
00:07:02,309 --> 00:07:00,240
how we would direct the flight path of

199
00:07:04,230 --> 00:07:02,319
the shuttle such that the uh the radar

200
00:07:06,550 --> 00:07:04,240
data would would allow this highly

201
00:07:08,150 --> 00:07:06,560
accurate map and then and what was

202
00:07:10,150 --> 00:07:08,160
rewarding about it was to to plan

203
00:07:11,830 --> 00:07:10,160
something for years and then to actually

204
00:07:13,990 --> 00:07:11,840
go and execute it and make it happen and

205
00:07:16,150 --> 00:07:14,000
it was extremely successful that mapping

206
00:07:18,550 --> 00:07:16,160
data is used for uh for geology for

207
00:07:20,230 --> 00:07:18,560
aerial navigation for uh

208
00:07:21,510 --> 00:07:20,240
even for things such as situating cell

209
00:07:23,589 --> 00:07:21,520
phone towers and figuring out what the

210
00:07:25,589 --> 00:07:23,599
coverage is going to be based on the

211
00:07:27,430 --> 00:07:25,599
terrain and the area of the of the tower

212
00:07:30,469 --> 00:07:27,440
so it's just one example that's just one

213
00:07:32,550 --> 00:07:30,479

of many 135 shuttle missions that uh

214
00:07:35,589 --> 00:07:32,560
improved science and improved life here

215
00:07:37,830 --> 00:07:35,599
on earth and uh uh i was honored to to

216
00:07:40,230 --> 00:07:37,840
be a part of that mission and uh and

217
00:07:41,749 --> 00:07:40,240
nowadays that radar is actually hanging

218
00:07:47,909 --> 00:07:41,759
in the ceiling of the smithsonian

219
00:07:51,909 --> 00:07:50,550
hello my name is elena my question is

220
00:07:58,469 --> 00:07:51,919
what

221
00:08:00,070 --> 00:07:58,479
your first space shuttle mission

222
00:08:03,189 --> 00:08:00,080
well mainly it was it was a feeling of

223
00:08:04,950 --> 00:08:03,199
uh of gratitude uh you know i was i

224
00:08:06,710 --> 00:08:04,960
supported as a flight dynamics officer

225
00:08:10,150 --> 00:08:06,720
for for many years before i was selected

226
00:08:12,150 --> 00:08:10,160
to be a flight director in 2007 so i was

227
00:08:13,670 --> 00:08:12,160
part of the team of highly trained

228
00:08:15,749 --> 00:08:13,680
specialists you know that you see you

229
00:08:18,150 --> 00:08:15,759
saw here on camera and so when you get

230
00:08:19,909 --> 00:08:18,160
to pick to be a leader of such a fine

231
00:08:21,909 --> 00:08:19,919
team it really it really is uh it's

232
00:08:23,510 --> 00:08:21,919
humbling and it's it's uh it's an honor

233
00:08:25,029 --> 00:08:23,520
and i just i just felt very fortunate to

234
00:08:27,589 --> 00:08:25,039
be able to do that because it it really

235
00:08:29,589 --> 00:08:27,599
is a lot of fun to work with uh with uh

236
00:08:31,110 --> 00:08:29,599
with people and to pull together a

237
00:08:33,750 --> 00:08:31,120
complex mission plan you get to work

238
00:08:35,029 --> 00:08:33,760

with the astronauts and the trainers and

239
00:08:36,469 --> 00:08:35,039
again you know we don't do this

240
00:08:38,469 --> 00:08:36,479
overnight it takes many months or in

241
00:08:40,149 --> 00:08:38,479
some cases years to develop a mission

242
00:08:41,509 --> 00:08:40,159
plan and to be the flight director you

243
00:08:43,029 --> 00:08:41,519
play a very large role in pulling that

244
00:08:46,710 --> 00:08:43,039
plan together and then executing that so

245
00:08:46,720 --> 00:08:50,550
alan we're gonna go with you next

246
00:08:56,550 --> 00:08:52,870
my name is alan mcdeffie and

247
00:08:58,070 --> 00:08:56,560
my question is what is orion's mission

248
00:09:00,230 --> 00:08:58,080
okay let's say i believe your name was

249
00:09:03,670 --> 00:09:00,240
alan so that i'm glad you asked about uh

250
00:09:06,070 --> 00:09:03,680
orion uh we have a test flight coming up

251
00:09:08,310 --> 00:09:06,080
of the orion spacecraft in december this

252
00:09:09,829 --> 00:09:08,320
year it's going to be an unmanned flight

253
00:09:11,750 --> 00:09:09,839
it's the first test flight of this

254
00:09:13,590 --> 00:09:11,760
capsule and you can see the the orion

255
00:09:16,150 --> 00:09:13,600
spacecraft itself is the capsule on the

256
00:09:17,829 --> 00:09:16,160
far right and uh the the

257
00:09:19,350 --> 00:09:17,839
stuff to the left is includes its uh

258
00:09:22,550 --> 00:09:19,360
it's booster engine it's rocket engine

259
00:09:24,150 --> 00:09:22,560
that's going to take it up to 3600 miles

260
00:09:26,070 --> 00:09:24,160
up in space way above the space

261
00:09:28,389 --> 00:09:26,080
station's orbit space station's down at

262
00:09:30,389 --> 00:09:28,399
about 250 miles so it's going to take it

263
00:09:31,990 --> 00:09:30,399

way up high and then it's going to dive

264
00:09:33,910 --> 00:09:32,000
towards the earth's atmosphere and test

265
00:09:36,070 --> 00:09:33,920
its heat shield which is the uh the

266
00:09:37,750 --> 00:09:36,080
blunt end that you see on the on the cap

267
00:09:39,030 --> 00:09:37,760
selector it separates and it's going to

268
00:09:39,990 --> 00:09:39,040
make sure that the heat shield works

269
00:09:42,710 --> 00:09:40,000
it's going to make sure that all the

270
00:09:45,590 --> 00:09:42,720
navigation systems work and and the

271
00:09:47,110 --> 00:09:45,600
control systems and it's again it's

272
00:09:48,310 --> 00:09:47,120
going to be without any astronauts

273
00:09:50,870 --> 00:09:48,320
because we need to make sure everything

274
00:09:52,790 --> 00:09:50,880
works before we put people inside it but

275
00:09:54,630 --> 00:09:52,800
we're very excited about this mission at

276
00:09:56,310 --> 00:09:54,640
nasa because orion

277
00:09:58,230 --> 00:09:56,320
is the it's not really the replacement

278
00:09:59,910 --> 00:09:58,240
for the space shuttle because it's going

279
00:10:01,110 --> 00:09:59,920
to do different things the space shuttle

280
00:10:03,269 --> 00:10:01,120
hauled

281
00:10:05,350 --> 00:10:03,279
payloads cargo satellites and people up

282
00:10:07,110 --> 00:10:05,360
into low earth orbit it can only go up

283
00:10:09,190 --> 00:10:07,120
to about 300 miles

284
00:10:11,670 --> 00:10:09,200
but the orion will have the capability

285
00:10:13,350 --> 00:10:11,680
to fly for you for many months at

286
00:10:15,990 --> 00:10:13,360
distances very far from the earth even

287
00:10:17,590 --> 00:10:16,000
out to to visit an asteroid or to go to

288
00:10:19,190 --> 00:10:17,600

the moon or mars so we're really looking

289
00:10:21,829 --> 00:10:19,200
forward to putting orion through its uh

290
00:10:24,630 --> 00:10:21,839
its first test flight in december and uh

291
00:10:26,550 --> 00:10:24,640
just to add one of uh chris's colleagues

292
00:10:27,829 --> 00:10:26,560
is actually training

293
00:10:30,150 --> 00:10:27,839
um

294
00:10:32,230 --> 00:10:30,160
just about every day now i'm probably

295
00:10:33,910 --> 00:10:32,240
getting ready for that flight but you

296
00:10:36,069 --> 00:10:33,920
see this flight control room for the

297
00:10:37,509 --> 00:10:36,079
international space station we also have

298
00:10:39,990 --> 00:10:37,519
some flight control rooms in this

299
00:10:41,509 --> 00:10:40,000
building down the hall from here where

300
00:10:43,269 --> 00:10:41,519
the space shuttle was controlled there's

301
00:10:45,110 --> 00:10:43,279
also a room

302
00:10:47,829 --> 00:10:45,120
from which the orion is going to be

303
00:10:49,430 --> 00:10:47,839
controlled after it is launched from the

304
00:10:51,829 --> 00:10:49,440
cape canaveral air force station down in

305
00:10:54,550 --> 00:10:51,839
florida so so one of chris's colleagues

306
00:10:56,870 --> 00:10:54,560
is uh heavy duty training right now for

307
00:11:02,790 --> 00:10:56,880
that uh orion mission that chris just

308
00:11:07,829 --> 00:11:05,190
hello my name is jeremiah strouds and

309
00:11:09,829 --> 00:11:07,839
what are you working on to prepare for

310
00:11:11,910 --> 00:11:09,839
the orion missions

311
00:11:12,630 --> 00:11:11,920
okay yep that's a good follow-up kiera

312
00:11:14,870 --> 00:11:12,640
um

313
00:11:17,190 --> 00:11:14,880

again uh uh the the lead flight director

314
00:11:19,110 --> 00:11:17,200
in charge of orion is mike serafin and

315
00:11:21,030 --> 00:11:19,120
uh i'm a little bit bummed that i don't

316
00:11:22,870 --> 00:11:21,040
get to take part in orion but that's not

317
00:11:24,710 --> 00:11:22,880
my job to do right now i'm a flight

318
00:11:26,870 --> 00:11:24,720
director mainly concentrating on

319
00:11:29,269 --> 00:11:26,880
international space station as well as

320
00:11:31,910 --> 00:11:29,279
um the uh the dragon mission from the

321
00:11:33,430 --> 00:11:31,920
spacex uh the dragon cargo vehicle that

322
00:11:35,430 --> 00:11:33,440
just came to the space station a couple

323
00:11:37,350 --> 00:11:35,440
weeks ago so unfortunately i don't get

324
00:11:39,350 --> 00:11:37,360
to have the fun uh with the with the

325
00:11:40,710 --> 00:11:39,360
team that's doing the new vehicle but uh

326
00:11:42,470 --> 00:11:40,720
they have similar challenges that we

327
00:11:44,550 --> 00:11:42,480
have here on on the space station team

328
00:11:46,790 --> 00:11:44,560
where they've they're developing a

329
00:11:48,310 --> 00:11:46,800
flight plan they're inventing new

330
00:11:49,829 --> 00:11:48,320
procedures things that they need to do

331
00:11:51,829 --> 00:11:49,839
to operate that spacecraft they're

332
00:11:53,430 --> 00:11:51,839
figuring out um when they'll have

333
00:11:55,670 --> 00:11:53,440
communication with the spacecraft and

334
00:11:57,509 --> 00:11:55,680
what commands or what instructions need

335
00:11:59,430 --> 00:11:57,519
to be sent from the ground up to the

336
00:12:00,870 --> 00:11:59,440
spacecraft and they're making sure that

337
00:12:02,389 --> 00:12:00,880
they're trained and ready to go and

338
00:12:03,829 --> 00:12:02,399

they're thinking about what can go wrong

339
00:12:06,069 --> 00:12:03,839
and what are they going to do about

340
00:12:07,910 --> 00:12:06,079
those possible failure scenarios to try

341
00:12:15,350 --> 00:12:07,920
to ensure you know maximum mission

342
00:12:20,949 --> 00:12:18,150
my name is jada and what is it like to

343
00:12:24,069 --> 00:12:20,959
control rp responsible for a space

344
00:12:26,069 --> 00:12:24,079
shuttle mission

345
00:12:29,910 --> 00:12:26,079
what's it like to control a space

346
00:12:33,350 --> 00:12:31,509
yes sir that was the question

347
00:12:35,430 --> 00:12:33,360
okay so it's uh

348
00:12:37,910 --> 00:12:35,440
as you can expect it's uh it's pretty

349
00:12:40,230 --> 00:12:37,920
stressful it can be stressful at times

350
00:12:42,069 --> 00:12:40,240
there's a lot to keep track of but uh

351
00:12:45,509 --> 00:12:42,079
the way that we handle

352
00:12:47,670 --> 00:12:45,519
the stress and the uh and the complexity

353
00:12:50,230 --> 00:12:47,680
is is through preparation and training

354
00:12:51,910 --> 00:12:50,240
so we as i described earlier we spend

355
00:12:54,150 --> 00:12:51,920
you know many months or in some cases

356
00:12:55,670 --> 00:12:54,160
years preparing for a space mission not

357
00:12:58,949 --> 00:12:55,680
only thinking of what the plan is that

358
00:13:00,870 --> 00:12:58,959
we intend to execute but uh but what can

359
00:13:02,550 --> 00:13:00,880
go wrong and what we would need to do in

360
00:13:04,230 --> 00:13:02,560
response to that so

361
00:13:05,750 --> 00:13:04,240
and we actually practice in what's

362
00:13:07,030 --> 00:13:05,760
called simulators

363
00:13:08,949 --> 00:13:07,040

that's where we

364
00:13:11,509 --> 00:13:08,959
we flow data that's generated by a

365
00:13:13,990 --> 00:13:11,519
computer but our displays and screens

366
00:13:16,550 --> 00:13:14,000
look normal and you know looks like

367
00:13:18,710 --> 00:13:16,560
normal in-flight data to us so we have a

368
00:13:20,949 --> 00:13:18,720
practice room which looks similar to

369
00:13:22,470 --> 00:13:20,959
this one and i will practice with with

370
00:13:24,069 --> 00:13:22,480
flight controllers and i'll i'll

371
00:13:25,990 --> 00:13:24,079
rehearse my role as the flight director

372
00:13:27,750 --> 00:13:26,000
in charge of the team and we'll even do

373
00:13:30,550 --> 00:13:27,760
this with astronauts that are in another

374
00:13:32,710 --> 00:13:30,560
building in a space station simulator or

375
00:13:34,310 --> 00:13:32,720
soon to be an orion simulator as well

376
00:13:36,550 --> 00:13:34,320
and we'll practice all those steps

377
00:13:37,990 --> 00:13:36,560
together to make sure that we're ready

378
00:13:43,189 --> 00:13:38,000
when it comes time to actually fly the

379
00:13:47,829 --> 00:13:45,509
hello my name is haru

380
00:13:50,550 --> 00:13:47,839
and my question is do you get

381
00:13:54,389 --> 00:13:50,560
nervous every time you control a space

382
00:13:56,230 --> 00:13:54,399
shuttle or a space station mission

383
00:13:57,110 --> 00:13:56,240
that's a great question haru

384
00:13:59,030 --> 00:13:57,120
uh

385
00:14:01,110 --> 00:13:59,040
short answer is no i don't get nervous

386
00:14:02,389 --> 00:14:01,120
every time but i will admit sometimes

387
00:14:04,389 --> 00:14:02,399
there's you feel a little bit of

388
00:14:06,629 --> 00:14:04,399

butterflies if you have especially a

389
00:14:08,710 --> 00:14:06,639
really uh difficult or challenging shift

390
00:14:10,870 --> 00:14:08,720
coming up for example uh during the

391
00:14:13,350 --> 00:14:10,880
rendezvous of of the dragon mission that

392
00:14:14,710 --> 00:14:13,360
we did a couple weeks ago uh that that

393
00:14:16,870 --> 00:14:14,720
definitely gets your attention or if

394
00:14:19,509 --> 00:14:16,880
you're you know getting ready to oversee

395
00:14:21,509 --> 00:14:19,519
a spacewalk or a launch or a landing

396
00:14:23,750 --> 00:14:21,519
those are times when the stress levels

397
00:14:25,829 --> 00:14:23,760
go up dramatically for not only for us

398
00:14:27,670 --> 00:14:25,839
but for our entire team and the

399
00:14:29,110 --> 00:14:27,680
astronauts and again the way that we

400
00:14:30,949 --> 00:14:29,120
combat that i'll give you a little nasa

401
00:14:33,269 --> 00:14:30,959
secret the way we do that is just what i

402
00:14:35,110 --> 00:14:33,279
talked about before

403
00:14:36,790 --> 00:14:35,120
we deal with uh with the butterflies

404
00:14:38,470 --> 00:14:36,800
through preparation we make sure that

405
00:14:40,629 --> 00:14:38,480
that we're ready to go and we practice

406
00:14:43,030 --> 00:14:40,639
and we plan and we train and you guys

407
00:14:44,470 --> 00:14:43,040
can use the same the same technique if

408
00:14:47,509 --> 00:14:44,480
if you ever get nervous before a big

409
00:14:50,470 --> 00:14:47,519
test or uh you know before a concert or

410
00:14:52,470 --> 00:14:50,480
or or a play the way you can combat that

411
00:14:54,069 --> 00:14:52,480
the you know combat those butterflies is

412
00:14:55,430 --> 00:14:54,079
to is to make sure that you're prepared

413
00:14:57,990 --> 00:14:55,440

that you've studied you've learned your

414
00:15:00,310 --> 00:14:58,000
parts and uh and then that'll maximize

415
00:15:01,990 --> 00:15:00,320
your chances of success as well

416
00:15:04,470 --> 00:15:02,000
it's interesting that you asked that

417
00:15:06,310 --> 00:15:04,480
question because right now in the last

418
00:15:07,910 --> 00:15:06,320
couple of hours on the space station the

419
00:15:08,710 --> 00:15:07,920
crew

420
00:15:11,750 --> 00:15:08,720
even

421
00:15:14,069 --> 00:15:11,760
for

422
00:15:15,430 --> 00:15:14,079
quite a number of days so far

423
00:15:17,829 --> 00:15:15,440
three additional crew members just

424
00:15:20,710 --> 00:15:17,839
arrived two weeks ago and this morning

425
00:15:22,389 --> 00:15:20,720
they spent about two hours conducting an

426
00:15:23,990 --> 00:15:22,399
onboard training exercise where they

427
00:15:25,750 --> 00:15:24,000
went through emergency drills they went

428
00:15:27,110 --> 00:15:25,760
through their own fire drill just like

429
00:15:28,550 --> 00:15:27,120
you guys would

430
00:15:30,069 --> 00:15:28,560
at your school

431
00:15:32,069 --> 00:15:30,079
the crew members did that on the space

432
00:15:34,069 --> 00:15:32,079
station this morning and they did that

433
00:15:35,910 --> 00:15:34,079
with the help and interaction with this

434
00:15:38,310 --> 00:15:35,920
flight control team and a flight control

435
00:15:40,710 --> 00:15:38,320
team in russia and other flight control

436
00:15:43,269 --> 00:15:40,720
teams that support space station so yeah

437
00:15:45,749 --> 00:15:43,279
you're never too old to be ready for any

438
00:15:47,990 --> 00:15:45,759

kind of an emergency or or as as chris

439
00:15:50,150 --> 00:15:48,000
said preparation for the mission itself

440
00:15:51,749 --> 00:15:50,160
so that was a great question and good

441
00:15:58,550 --> 00:15:51,759
timing for what's going on on the space

442
00:16:04,389 --> 00:16:01,910
my name is kyle um my question

443
00:16:07,189 --> 00:16:04,399
is um are you excited to help with the

444
00:16:10,230 --> 00:16:07,199
orion mission

445
00:16:11,590 --> 00:16:10,240
thank you kyle um i would be excited by

446
00:16:13,670 --> 00:16:11,600
the way

447
00:16:16,949 --> 00:16:13,680
i would be excited if i was working it

448
00:16:19,030 --> 00:16:16,959
but uh i i'm i'm not involved with orion

449
00:16:20,389 --> 00:16:19,040
but i am excited to see it fly i am

450
00:16:21,910 --> 00:16:20,399
looking forward to seeing it go i think

451
00:16:23,509 --> 00:16:21,920
everybody here at nasa is really looking

452
00:16:27,030 --> 00:16:23,519
forward to it because you know the

453
00:16:29,269 --> 00:16:27,040
shuttle was retired back in uh in 2011

454
00:16:31,590 --> 00:16:29,279
so we've been we've been waiting for an

455
00:16:34,150 --> 00:16:31,600
american capability to launch you know

456
00:16:36,150 --> 00:16:34,160
americans into space right now americans

457
00:16:38,150 --> 00:16:36,160
fly into space on a russian spacecraft

458
00:16:40,069 --> 00:16:38,160
the soyuz spacecraft

459
00:16:42,069 --> 00:16:40,079
and so nasa is working on the orion to

460
00:16:43,990 --> 00:16:42,079
give us american capability to get into

461
00:16:47,670 --> 00:16:44,000
space and to go beyond

462
00:16:49,269 --> 00:16:47,680
low earth orbit on other missions and

463
00:16:51,910 --> 00:16:49,279

also there are two private companies

464
00:16:54,389 --> 00:16:51,920
boeing and spacex are both working on

465
00:16:56,069 --> 00:16:54,399
commercial commercially provided launch

466
00:16:58,310 --> 00:16:56,079
vehicles and spacecraft that will

467
00:16:59,910 --> 00:16:58,320
shuttle astronauts back and forth to the

468
00:17:01,269 --> 00:16:59,920
international space station so there's

469
00:17:02,629 --> 00:17:01,279
there's a lot of really really cool

470
00:17:03,829 --> 00:17:02,639
things going on in nasa and a lot of

471
00:17:10,390 --> 00:17:03,839
things to look forward to over the next

472
00:17:15,829 --> 00:17:13,350
my name is joseph and my question is

473
00:17:18,069 --> 00:17:15,839
have you ever worked the space shuttle

474
00:17:20,630 --> 00:17:18,079
mission that something really bad

475
00:17:25,350 --> 00:17:23,669
no fortunately not the the as a flight

476
00:17:28,230 --> 00:17:25,360
director and as a flight dynamics

477
00:17:30,870 --> 00:17:28,240
officers uh that all of my missions were

478
00:17:33,350 --> 00:17:30,880
successful i was not on console during

479
00:17:39,029 --> 00:17:33,360
uh during the columbia accident or the

480
00:17:43,830 --> 00:17:41,669
hi my name is dylan and my question is

481
00:17:46,870 --> 00:17:43,840
did you follow curiosities landing on

482
00:17:48,549 --> 00:17:46,880
mars has gary do you think it

483
00:17:50,470 --> 00:17:48,559
how scary do you think it was during the

484
00:17:52,310 --> 00:17:50,480
seven minutes to tear the plate

485
00:17:55,190 --> 00:17:52,320
controllers or curiosity before it

486
00:17:57,590 --> 00:17:55,200
landed on the surface of the planet

487
00:17:59,590 --> 00:17:57,600
yeah uh that's a great question and uh

488
00:18:02,390 --> 00:17:59,600

probably like you guys i i follow

489
00:18:04,470 --> 00:18:02,400
curiosity quite a bit uh and uh i

490
00:18:05,909 --> 00:18:04,480
remember watching the landing and uh and

491
00:18:07,830 --> 00:18:05,919
i remember having a lot of sympathy for

492
00:18:09,669 --> 00:18:07,840
the for the i'm sure that they were

493
00:18:12,710 --> 00:18:09,679
sweating bullets there at uh the jet

494
00:18:14,950 --> 00:18:12,720
propulsion lab or jpl out in out in los

495
00:18:16,310 --> 00:18:14,960
angeles when their uh spacecraft was was

496
00:18:17,430 --> 00:18:16,320
going through the i believe the seven

497
00:18:21,270 --> 00:18:17,440
minutes of terror that you mentioned

498
00:18:22,789 --> 00:18:21,280
there uh on re-entry into uh on to mars

499
00:18:24,710 --> 00:18:22,799
uh because you know they had spent so

500
00:18:26,390 --> 00:18:24,720
much so many years preparing for that

501
00:18:28,070 --> 00:18:26,400
mission and building it and uh it was

502
00:18:30,310 --> 00:18:28,080
all coming down to that that critical

503
00:18:32,150 --> 00:18:30,320
mission phase of uh successful landing

504
00:18:33,909 --> 00:18:32,160
but uh they were successful the

505
00:18:35,990 --> 00:18:33,919
curiosity is doing a great job it's been

506
00:18:36,789 --> 00:18:36,000
on mars now for about a little over two

507
00:18:38,310 --> 00:18:36,799
years

508
00:18:40,310 --> 00:18:38,320
they uh that the

509
00:18:42,070 --> 00:18:40,320
the rover has just arrived at mount

510
00:18:42,710 --> 00:18:42,080
sharp so it's going to give them a lot

511
00:18:45,029 --> 00:18:42,720
of

512
00:18:46,710 --> 00:18:45,039
opportunities now to study the geology

513
00:18:48,710 --> 00:18:46,720

of mars because on that mountain

514
00:18:50,150 --> 00:18:48,720
different levels of rocks are exposed so

515
00:18:52,630 --> 00:18:50,160
it'll be different it'll give them the

516
00:18:54,390 --> 00:18:52,640
ability to sample from different eras

517
00:18:56,310 --> 00:18:54,400
different times in the past and

518
00:18:58,230 --> 00:18:56,320
different types of rocks and they've got

519
00:18:59,750 --> 00:18:58,240
cameras and they've got a i'll give you

520
00:19:02,070 --> 00:18:59,760
a big word that you can ask your teacher

521
00:19:04,390 --> 00:19:02,080
about a mass spectrometer that actually

522
00:19:06,390 --> 00:19:04,400
allows them to to analyze the chemical

523
00:19:07,830 --> 00:19:06,400
composition of the rocks so they can

524
00:19:11,350 --> 00:19:07,840
understand more about the history of

525
00:19:12,710 --> 00:19:11,360
mars and the big mystery with mars is

526
00:19:14,549 --> 00:19:12,720
there's evidence that there used to be

527
00:19:16,549 --> 00:19:14,559
liquid water but that doesn't make sense

528
00:19:19,190 --> 00:19:16,559
because it's too far from the sun for

529
00:19:21,350 --> 00:19:19,200
liquid water to exist so we we don't

530
00:19:22,950 --> 00:19:21,360
know why the climate changed on mars we

531
00:19:24,470 --> 00:19:22,960
don't know why there used to be liquid

532
00:19:26,390 --> 00:19:24,480
water but now you know where's all the

533
00:19:28,630 --> 00:19:26,400
water gone is it locked up in the ground

534
00:19:31,430 --> 00:19:28,640
or did it escape into space so there's a

535
00:19:32,630 --> 00:19:31,440
lot to be learned on mars that will help

536
00:19:35,190 --> 00:19:32,640
us better understand the earth's

537
00:19:36,390 --> 00:19:35,200
environment and climate and uh plus it's

538
00:19:43,270 --> 00:19:36,400

just really cool seeing pictures from

539
00:19:47,510 --> 00:19:45,350
my name is emma

540
00:19:50,070 --> 00:19:47,520
what was your favorite space shuttle or

541
00:19:52,789 --> 00:19:50,080
space station mission to be flight

542
00:19:55,510 --> 00:19:52,799
director on

543
00:19:58,150 --> 00:19:55,520
yeah my uh my favorite space station

544
00:20:01,110 --> 00:19:58,160
mission as flight director was uh was

545
00:20:04,390 --> 00:20:01,120
expedition 34 and that that one flew uh

546
00:20:05,430 --> 00:20:04,400
from november of 2012 to march of 2013.

547
00:20:07,350 --> 00:20:05,440
so it's a little over a year and a half

548
00:20:09,669 --> 00:20:07,360
ago and what made that special for me

549
00:20:11,669 --> 00:20:09,679
was um i was the lead flight director

550
00:20:14,789 --> 00:20:11,679
for that mission so i was i was not

551
00:20:16,549 --> 00:20:14,799
sitting here in mission control uh you

552
00:20:18,789 --> 00:20:16,559
know during that mission but rather i

553
00:20:20,710 --> 00:20:18,799
was overseeing all the teams that were

554
00:20:22,230 --> 00:20:20,720
that were operating the mission and so i

555
00:20:24,070 --> 00:20:22,240
got to be closely involved with the crew

556
00:20:26,470 --> 00:20:24,080
during their training leading up to the

557
00:20:27,909 --> 00:20:26,480
mission uh involved with the scientists

558
00:20:29,750 --> 00:20:27,919
and the team of people that come up with

559
00:20:31,350 --> 00:20:29,760
the experiments that we're going to do

560
00:20:33,350 --> 00:20:31,360
and then working with uh with a great

561
00:20:35,270 --> 00:20:33,360
team of flight controllers to oversee

562
00:20:37,110 --> 00:20:35,280
that mission over about four months that

563
00:20:38,390 --> 00:20:37,120

i was in charge of and so that was that

564
00:20:39,909 --> 00:20:38,400
was especially rewarding it was a very

565
00:20:44,789 --> 00:20:39,919
successful mission it was it was a great

566
00:20:50,149 --> 00:20:47,270
hi my name is abby um what is your

567
00:20:53,750 --> 00:20:50,159
favorite part of your job

568
00:20:54,470 --> 00:20:53,760
i think uh for me it would be um

569
00:20:57,110 --> 00:20:54,480
the

570
00:20:58,310 --> 00:20:57,120
preparing a plan basically uh

571
00:20:59,990 --> 00:20:58,320
taking part

572
00:21:01,350 --> 00:21:00,000
in the preparation of a space flight

573
00:21:03,510 --> 00:21:01,360
from the very beginning when someone

574
00:21:05,909 --> 00:21:03,520
says hey wouldn't it be cool if we do

575
00:21:07,669 --> 00:21:05,919
this or that you know what for example

576
00:21:09,830 --> 00:21:07,679
an instrument that was just delivered to

577
00:21:11,830 --> 00:21:09,840
the space station is called rapidscat

578
00:21:13,510 --> 00:21:11,840
it's a radar scatterometer again it's

579
00:21:15,909 --> 00:21:13,520
another uh instrument that was built out

580
00:21:18,149 --> 00:21:15,919
of the jet propulsion lab or jpl out in

581
00:21:21,510 --> 00:21:18,159
california so i got to be involved with

582
00:21:23,590 --> 00:21:21,520
uh with the the planning to install that

583
00:21:24,870 --> 00:21:23,600
rapid scat on the outside of station so

584
00:21:26,390 --> 00:21:24,880
the best part is when you're working

585
00:21:27,590 --> 00:21:26,400
with people that have a great idea to do

586
00:21:29,270 --> 00:21:27,600
some science

587
00:21:31,029 --> 00:21:29,280
and then you help them figure out how to

588
00:21:32,549 --> 00:21:31,039

make that happen how to get that up to

589
00:21:34,470 --> 00:21:32,559
the space station how to get it

590
00:21:36,230 --> 00:21:34,480
installed right and how to you know how

591
00:21:37,510 --> 00:21:36,240
to activate it and how to get it running

592
00:21:39,510 --> 00:21:37,520
and then you see the thing working in

593
00:21:41,669 --> 00:21:39,520
rapid scats working right now measuring

594
00:21:43,590 --> 00:21:41,679
ocean winds that helps us better predict

595
00:21:45,350 --> 00:21:43,600
hurricanes and better predict and

596
00:21:48,630 --> 00:21:45,360
understand the earth's climate so it's

597
00:21:50,390 --> 00:21:48,640
just great to take part from start to

598
00:21:52,789 --> 00:21:50,400
accomplishment of a project and work

599
00:21:54,710 --> 00:21:52,799
with uh you know work in a in a you know

600
00:21:56,710 --> 00:21:54,720
very challenging area because uh you

601
00:21:58,230 --> 00:21:56,720
know space flight is is the really most

602
00:22:00,630 --> 00:21:58,240
exciting thing about it is that it's the

603
00:22:02,390 --> 00:22:00,640
future it's it's real exploration so

604
00:22:04,549 --> 00:22:02,400
this is this is what you know we're

605
00:22:06,549 --> 00:22:04,559
preparing humans to leave

606
00:22:08,710 --> 00:22:06,559
the earth and go out and live into space

607
00:22:11,270 --> 00:22:08,720
so that's the part that i like the most

608
00:22:12,710 --> 00:22:11,280
is taking part in that exploration and

609
00:22:17,029 --> 00:22:12,720
new scientific

610
00:22:21,190 --> 00:22:18,870
my name is aidan kansader and my

611
00:22:22,950 --> 00:22:21,200
question is have you ever been in a

612
00:22:24,830 --> 00:22:22,960
problem where the astronauts have been

613
00:22:29,510 --> 00:22:24,840

in

614
00:22:30,630 --> 00:22:29,520
flight director for about seven years

615
00:22:32,549 --> 00:22:30,640
now um

616
00:22:34,390 --> 00:22:32,559
there's definitely been a few uh

617
00:22:36,549 --> 00:22:34,400
a few uh i won't call them quite

618
00:22:38,630 --> 00:22:36,559
frightful but uh definitely attention

619
00:22:40,789 --> 00:22:38,640
getting moments in space

620
00:22:42,230 --> 00:22:40,799
one of them that stands out is uh back

621
00:22:44,710 --> 00:22:42,240
in 2012

622
00:22:46,549 --> 00:22:44,720
there was a piece of space debris that

623
00:22:48,870 --> 00:22:46,559
came uncomfortably close to the space

624
00:22:51,270 --> 00:22:48,880
station and normally we get a warning

625
00:22:54,070 --> 00:22:51,280
about that from the air force and they

626
00:22:55,510 --> 00:22:54,080
they use radars and to track the debris

627
00:22:57,590 --> 00:22:55,520
and micro meteoroids that are up in

628
00:22:59,510 --> 00:22:57,600
space and we have one of our folks here

629
00:23:00,870 --> 00:22:59,520
in mission control that monitors that

630
00:23:03,190 --> 00:23:00,880
and determines if anything is going to

631
00:23:05,029 --> 00:23:03,200
get too close to the space station and

632
00:23:07,350 --> 00:23:05,039
in some cases we'll even do a collision

633
00:23:09,830 --> 00:23:07,360
avoidance burn to move the space station

634
00:23:12,070 --> 00:23:09,840
out of the way before that object comes

635
00:23:14,390 --> 00:23:12,080
zinging by our orbit but in this case

636
00:23:16,310 --> 00:23:14,400
back in uh i think march of 2012 we

637
00:23:19,190 --> 00:23:16,320
didn't get adequate warning we did not

638
00:23:20,950 --> 00:23:19,200

have time to plan an evasive maneuver so

639
00:23:22,710 --> 00:23:20,960
we had to tell the astronauts and had to

640
00:23:24,789 --> 00:23:22,720
get them to close all the hatches

641
00:23:26,070 --> 00:23:24,799
between the modules where they live so

642
00:23:27,830 --> 00:23:26,080
that everything was airtight on the

643
00:23:30,149 --> 00:23:27,840
space station and then they had to go

644
00:23:32,630 --> 00:23:30,159
into their soyuz spacecraft and shut the

645
00:23:35,110 --> 00:23:32,640
hatches and uh and stay in there and

646
00:23:36,870 --> 00:23:35,120
wait until this object passed by and of

647
00:23:39,190 --> 00:23:36,880
course anything you know we're flying at

648
00:23:40,950 --> 00:23:39,200
five miles a second and so is any object

649
00:23:42,549 --> 00:23:40,960
so even something the size of a marble

650
00:23:44,070 --> 00:23:42,559
could do uh serious damage to the space

651
00:23:45,510 --> 00:23:44,080
station so that was a little that was a

652
00:23:46,870 --> 00:23:45,520
little nerve-wracking waiting for the

653
00:23:48,710 --> 00:23:46,880
clock to count down to zero but

654
00:23:50,310 --> 00:23:48,720
fortunately that object passed by

655
00:23:51,590 --> 00:23:50,320
probably with a couple hundred within a

656
00:23:53,430 --> 00:23:51,600
couple hundred meters of the space

657
00:23:55,269 --> 00:23:53,440
station but it it didn't uh didn't

658
00:23:56,870 --> 00:23:55,279
impact the space station and we sent the

659
00:23:58,870 --> 00:23:56,880
crew back on there back on their

660
00:24:00,390 --> 00:23:58,880
business

661
00:24:13,990 --> 00:24:00,400
all right well forest lake looks like

662
00:24:14,000 --> 00:24:17,190
hi my name

663
00:24:22,470 --> 00:24:18,549

with is

664
00:24:27,269 --> 00:24:23,909
i could not hear that question if you

665
00:24:30,070 --> 00:24:27,279
could repeat that a little bit louder

666
00:24:32,870 --> 00:24:30,080
wow how could we get involved with some

667
00:24:34,390 --> 00:24:32,880
student activities in our school

668
00:24:36,390 --> 00:24:34,400
all right that's a that's a great uh

669
00:24:38,549 --> 00:24:36,400
closing question because um i'll tell

670
00:24:41,110 --> 00:24:38,559
you a little story um

671
00:24:42,710 --> 00:24:41,120
i i was inspired to take up a career in

672
00:24:45,110 --> 00:24:42,720
science and engineering when i watched

673
00:24:47,750 --> 00:24:45,120
the apollo moon landings but um it was

674
00:24:49,590 --> 00:24:47,760
while i was in fifth grade that uh i was

675
00:24:51,430 --> 00:24:49,600
talking with another fellow fifth grader

676
00:24:53,350 --> 00:24:51,440
and uh and uh he knew i was interested

677
00:24:55,750 --> 00:24:53,360
in aviation and space and science

678
00:24:58,230 --> 00:24:55,760
fiction and he said well you ought to be

679
00:25:00,549 --> 00:24:58,240
an aerospace engineer and i said

680
00:25:02,149 --> 00:25:00,559
aerospace engineer that's what i'll do

681
00:25:04,230 --> 00:25:02,159
and that's the plan that i followed so

682
00:25:05,669 --> 00:25:04,240
you can look where it got me so so you

683
00:25:08,230 --> 00:25:05,679
too can take the advice of a fifth

684
00:25:10,710 --> 00:25:08,240
grader uh to plan your future so i would

685
00:25:12,710 --> 00:25:10,720
encourage you guys if uh you know to

686
00:25:14,549 --> 00:25:12,720
find out the areas you're interested in

687
00:25:16,310 --> 00:25:14,559
read books about them if there's a

688
00:25:18,390 --> 00:25:16,320

school club definitely get involved with

689
00:25:20,390 --> 00:25:18,400
that you guys are at a technology magnet

690
00:25:21,990 --> 00:25:20,400
so there's probably a math club math is

691
00:25:24,070 --> 00:25:22,000
the language of science and engineering

692
00:25:26,950 --> 00:25:24,080
so you definitely want to learn all you

693
00:25:29,430 --> 00:25:26,960
can with math if there's museums or

694
00:25:30,149 --> 00:25:29,440
or parks in the area that have uh you

695
00:25:31,830 --> 00:25:30,159
know

696
00:25:33,590 --> 00:25:31,840
things that appeal to you

697
00:25:35,029 --> 00:25:33,600
you can always go visit those and of

698
00:25:36,630 --> 00:25:35,039
course if your

699
00:25:38,549 --> 00:25:36,640
teacher or your parents know anybody

700
00:25:39,669 --> 00:25:38,559
that works you know at a hospital or at

701
00:25:41,350 --> 00:25:39,679
a factory where you know you're

702
00:25:42,950 --> 00:25:41,360
interested in what they're doing ask the

703
00:25:44,310 --> 00:25:42,960
grown-ups grumps love talking about what

704
00:25:45,990 --> 00:25:44,320
they do

705
00:25:47,990 --> 00:25:46,000
and would love sharing that with you

706
00:25:49,110 --> 00:25:48,000
guys it's never too early for for each

707
00:25:51,830 --> 00:25:49,120
of you to start thinking about what you

708
00:25:53,909 --> 00:25:51,840
want to do with your future

709
00:25:55,510 --> 00:25:53,919
that's a great question and we uh we

710
00:25:56,950 --> 00:25:55,520
really appreciate you guys you're a

711
00:26:00,549 --> 00:25:56,960
good-looking

712
00:26:09,350 --> 00:26:00,559
in

713
00:26:10,950 --> 00:26:09,360

out about what nasa's all about what

714
00:26:12,870 --> 00:26:10,960
we're doing not only here for the

715
00:26:15,269 --> 00:26:12,880
international space station but for the

716
00:26:18,390 --> 00:26:15,279
agency itself and don't forget you guys

717
00:26:20,310 --> 00:26:18,400
are the future of uh what we do in here

718
00:26:22,230 --> 00:26:20,320
as chris and i will be gone by the time

719
00:26:24,870 --> 00:26:22,240
you guys may be the ones that are

720
00:26:26,630 --> 00:26:24,880
heading out to mars or beyond so