
PAO

1
00:00:05,349 --> 00:00:03,669
hi welcome to mission control houston

2
00:00:06,869 --> 00:00:05,359
and thank you for joining us today we're

3
00:00:08,710 --> 00:00:06,879
inside the international space station

4
00:00:11,110 --> 00:00:08,720
flight control room where the orbit 2

5
00:00:12,150 --> 00:00:11,120
team is monitoring the systems and the

6
00:00:14,070 --> 00:00:12,160
cruise activities aboard the

7
00:00:16,230 --> 00:00:14,080
international space station we're here

8
00:00:18,070 --> 00:00:16,240
today to talk with uh sixth to eighth

9
00:00:20,230 --> 00:00:18,080
grade students that are out at

10
00:00:22,710 --> 00:00:20,240
huntsville alabama at

11
00:00:24,390 --> 00:00:22,720
space camp and here with us today is a

12
00:00:26,790 --> 00:00:24,400
special guest she knows a little about

13
00:00:29,589 --> 00:00:26,800

space camp liz warren who is also the

14
00:00:30,950 --> 00:00:29,599
space station uh science communication

15
00:00:32,549 --> 00:00:30,960
coordinator

16
00:00:33,990 --> 00:00:32,559
welcome liz and thank you for coming

17
00:00:35,750 --> 00:00:34,000
thank you very much for having me i'm

18
00:00:38,229 --> 00:00:35,760
very excited to speak with you thank you

19
00:00:40,069 --> 00:00:38,239
and what is also very very very special

20
00:00:41,670 --> 00:00:40,079
about liz being here is

21
00:00:42,790 --> 00:00:41,680
well you've been here at nasa for eight

22
00:00:45,590 --> 00:00:42,800
years now

23
00:00:47,910 --> 00:00:45,600
and um she's a space camp graduate she

24
00:00:50,869 --> 00:00:47,920
went level one and level two

25
00:00:53,029 --> 00:00:50,879
and um it's also was recently inducted

26
00:00:55,510 --> 00:00:53,039
into the space camp hall of fame just

27
00:00:57,830 --> 00:00:55,520
this year yes i was congratulations it

28
00:00:59,830 --> 00:00:57,840
was a lot of fun it's a huge honor so

29
00:01:01,430 --> 00:00:59,840
many people have gone to space camp just

30
00:01:03,750 --> 00:01:01,440
like the students were speaking with

31
00:01:04,869 --> 00:01:03,760
today i believe while i was there in

32
00:01:08,070 --> 00:01:04,879
june

33
00:01:09,750 --> 00:01:08,080
the 600 000th graduate walked through

34
00:01:11,510 --> 00:01:09,760
the doors of space camp

35
00:01:12,870 --> 00:01:11,520
so that's exciting so again we have a

36
00:01:18,950 --> 00:01:12,880
special treat for you guys so we're

37
00:01:24,469 --> 00:01:21,910
hi i'm maggie swanian and i'm from

38
00:01:27,830 --> 00:01:24,479

duluth georgia

39
00:01:29,270 --> 00:01:27,840
my question is what are the

40
00:01:30,550 --> 00:01:29,280
what are all the

41
00:01:32,550 --> 00:01:30,560
um

42
00:01:35,350 --> 00:01:32,560
kind of like

43
00:01:37,990 --> 00:01:35,360
defects almost of being in space too

44
00:01:41,350 --> 00:01:38,000
long what happens to your body what

45
00:01:43,030 --> 00:01:41,360
happens if you're there too long or for

46
00:01:45,270 --> 00:01:43,040
a long period of time

47
00:01:46,550 --> 00:01:45,280
well that's a great question and it's

48
00:01:48,630 --> 00:01:46,560
actually very appropriate i'm a

49
00:01:50,230 --> 00:01:48,640
physiologist so that's like the thing

50
00:01:52,550 --> 00:01:50,240
i'm most interested in what happens to

51
00:01:54,870 --> 00:01:52,560
the human body when you go to space for

52
00:01:56,630 --> 00:01:54,880
a really long time and

53
00:01:58,469 --> 00:01:56,640
while it looks like a lot of fun to live

54
00:02:01,190 --> 00:01:58,479
in space and float around it looks like

55
00:02:03,190 --> 00:02:01,200
a like a great time it's not really that

56
00:02:05,429 --> 00:02:03,200
good for your body

57
00:02:07,749 --> 00:02:05,439
gravity is this force that we live with

58
00:02:10,150 --> 00:02:07,759
on earth all the time and it helps us

59
00:02:12,309 --> 00:02:10,160
maintain strong bones and muscles and a

60
00:02:15,270 --> 00:02:12,319
strong cardiovascular system in

61
00:02:18,150 --> 00:02:15,280
microgravity while those systems tend to

62
00:02:21,430 --> 00:02:18,160
decondition or get weaker so astronauts

63
00:02:24,390 --> 00:02:21,440

can lose bone mass bone strength

64
00:02:25,910 --> 00:02:24,400
muscle strength and mass and also their

65
00:02:29,110 --> 00:02:25,920
hearts get a little bit weaker among

66
00:02:31,270 --> 00:02:29,120
some other changes fortunately we have

67
00:02:33,350 --> 00:02:31,280
studied these changes and we know how to

68
00:02:35,910 --> 00:02:33,360
prevent them or prevent some of the

69
00:02:38,550 --> 00:02:35,920
changes that occur so astronauts have to

70
00:02:40,150 --> 00:02:38,560
exercise about two hours every day

71
00:02:42,630 --> 00:02:40,160
and we make sure that they eat very

72
00:02:44,550 --> 00:02:42,640
nutritious meals and so just like living

73
00:02:46,229 --> 00:02:44,560
here on earth it's important to exercise

74
00:02:48,830 --> 00:02:46,239
and eat well and that helps our

75
00:02:53,750 --> 00:02:48,840
astronauts helps you as

76
00:02:55,589 --> 00:02:53,760
well good question we have another one

77
00:02:59,750 --> 00:02:55,599
my name is emma hearn and i'm from

78
00:03:02,869 --> 00:02:59,760
snowville georgia and my question is

79
00:03:04,790 --> 00:03:02,879
what kind like when

80
00:03:07,350 --> 00:03:04,800
when did you decide you wanted to be an

81
00:03:08,869 --> 00:03:07,360
astronaut or work at nasa

82
00:03:10,869 --> 00:03:08,879
i think i was pretty young when i

83
00:03:12,869 --> 00:03:10,879
decided that that being an astronaut

84
00:03:14,949 --> 00:03:12,879
would be pretty cool and definitely

85
00:03:16,390 --> 00:03:14,959
working at nasa i might have been even

86
00:03:17,430 --> 00:03:16,400
younger than you

87
00:03:22,470 --> 00:03:17,440
and

88
00:03:24,470 --> 00:03:22,480

questions asked my parents how do i do

89
00:03:27,270 --> 00:03:24,480
this i talked to teachers

90
00:03:29,910 --> 00:03:27,280
and really anyone can can work at nasa

91
00:03:31,830 --> 00:03:29,920
any there's a variety of interests

92
00:03:33,350 --> 00:03:31,840
engineering and science and math of

93
00:03:35,589 --> 00:03:33,360
course help you

94
00:03:38,390 --> 00:03:35,599
open up many doors to career fields but

95
00:03:40,229 --> 00:03:38,400
nasa has people that are artists and

96
00:03:42,070 --> 00:03:40,239
lawyers as well

97
00:03:43,430 --> 00:03:42,080
but i knew pretty young that that i

98
00:03:45,509 --> 00:03:43,440
wanted to contribute to space

99
00:03:47,670 --> 00:03:45,519
exploration and

100
00:03:50,070 --> 00:03:47,680
i think it was in particular there was

101
00:03:52,630 --> 00:03:50,080
one very inspiring space shuttle mission

102
00:03:54,309 --> 00:03:52,640
to me it was sts-40 it was in the year

103
00:03:56,309 --> 00:03:54,319
1991

104
00:03:58,630 --> 00:03:56,319
i was still in high school and this

105
00:04:00,710 --> 00:03:58,640
mission was dedicated to studying space

106
00:04:02,390 --> 00:04:00,720
life sciences and i didn't know very

107
00:04:04,229 --> 00:04:02,400
much about space life sciences but i

108
00:04:06,550 --> 00:04:04,239
knew that i liked space and i knew that

109
00:04:08,229 --> 00:04:06,560
i liked biology and this particular

110
00:04:11,270 --> 00:04:08,239
space shuttle mission combined both of

111
00:04:13,270 --> 00:04:11,280
my interests and uh with that mission i

112
00:04:15,350 --> 00:04:13,280
decided i'm gonna go be a physiologist

113
00:04:16,949 --> 00:04:15,360

at nasa it took a couple years but here

114
00:04:18,870 --> 00:04:16,959
i am

115
00:04:23,990 --> 00:04:18,880
and we're very glad to have you here

116
00:04:29,510 --> 00:04:26,870
hi my name is cameron and

117
00:04:31,749 --> 00:04:29,520
i'm from atlanta georgia and i was

118
00:04:35,350 --> 00:04:31,759
wondering have you ever sent any other

119
00:04:36,790 --> 00:04:35,360
monkeys to space other than mrs baker

120
00:04:40,950 --> 00:04:36,800
and abel

121
00:04:42,469 --> 00:04:40,960
special monkeys but in fact a lot of

122
00:04:44,710 --> 00:04:42,479
different animals including other

123
00:04:46,870 --> 00:04:44,720
monkeys have flown in space in fact our

124
00:04:48,070 --> 00:04:46,880
early space program since we weren't

125
00:04:50,469 --> 00:04:48,080
really sure what would happen to the

126
00:04:52,469 --> 00:04:50,479
human body living in space we we had

127
00:04:54,629 --> 00:04:52,479
animals go first and kind of test the

128
00:04:56,629 --> 00:04:54,639
waters so to speak

129
00:04:58,870 --> 00:04:56,639
but in fact we've uh even on the

130
00:05:00,870 --> 00:04:58,880
international space station we have a

131
00:05:03,590 --> 00:05:00,880
brand new aquarium it's called the

132
00:05:05,430 --> 00:05:03,600
aquatic habitat and pretty soon we're

133
00:05:06,909 --> 00:05:05,440
going to have some fish on board so we

134
00:05:08,629 --> 00:05:06,919
can learn about

135
00:05:10,950 --> 00:05:08,639
multi-generational studies in other

136
00:05:12,150 --> 00:05:10,960
words send up some fish that are going

137
00:05:14,070 --> 00:05:12,160
to to

138
00:05:16,469 --> 00:05:14,080

have babies will study their babies and

139
00:05:18,390 --> 00:05:16,479
then their babies so we can learn uh

140
00:05:20,310 --> 00:05:18,400
developmentally what happens in

141
00:05:26,550 --> 00:05:20,320
microgravity but yeah lots of animals

142
00:05:30,710 --> 00:05:29,029
do we have another one

143
00:05:32,390 --> 00:05:30,720
hi i'm margaret ann

144
00:05:35,350 --> 00:05:32,400
and i'm from

145
00:05:38,550 --> 00:05:35,360
duluth georgia and my question is

146
00:05:39,749 --> 00:05:38,560
who controls the shuttle or the rocket

147
00:05:41,990 --> 00:05:39,759
is it you

148
00:05:44,070 --> 00:05:42,000
or the astronauts

149
00:05:45,830 --> 00:05:44,080
well i think a lot of the controlling of

150
00:05:47,110 --> 00:05:45,840
vehicles actually happens from the

151
00:05:49,350 --> 00:05:47,120
ground

152
00:05:51,110 --> 00:05:49,360
but amico do you want to chime in you

153
00:05:53,189 --> 00:05:51,120
know you work here in the international

154
00:05:55,350 --> 00:05:53,199
space station control room this this

155
00:05:57,670 --> 00:05:55,360
entire room is full of a team and and

156
00:05:59,990 --> 00:05:57,680
not only this team there are many other

157
00:06:03,110 --> 00:06:00,000
folks that are not inside this room that

158
00:06:04,469 --> 00:06:03,120
uh manage and work the systems that are

159
00:06:07,629 --> 00:06:04,479
the international space station which is

160
00:06:10,870 --> 00:06:07,639
now flying um

161
00:06:11,670 --> 00:06:10,880
230 mile i mean 30 miles above the earth

162
00:06:13,590 --> 00:06:11,680
and

163
00:06:15,990 --> 00:06:13,600

you know orbiting the earth what how

164
00:06:18,629 --> 00:06:16,000
many times a day nine years 16 times a

165
00:06:21,189 --> 00:06:18,639
day every 90 minutes yeah um of course

166
00:06:22,870 --> 00:06:21,199
the astronauts are on board you know

167
00:06:24,710 --> 00:06:22,880
most of the most of the rockets to make

168
00:06:27,029 --> 00:06:24,720
sure that all the systems are operating

169
00:06:29,510 --> 00:06:27,039
nominally and and uh of course they have

170
00:06:31,749 --> 00:06:29,520
to throw switches and certainly during

171
00:06:34,390 --> 00:06:31,759
landing they're they're having to make

172
00:06:36,550 --> 00:06:34,400
key inputs as well

173
00:06:38,550 --> 00:06:36,560
does that answer your question yep it's

174
00:06:40,550 --> 00:06:38,560
a team there's no uh

175
00:06:42,390 --> 00:06:40,560
no one person that manages all of that

176
00:06:45,029 --> 00:06:42,400
obviously and that's why teamwork is so

177
00:06:47,189 --> 00:06:45,039
very important to us here um and it's

178
00:06:49,830 --> 00:06:47,199
also something that you can probably use

179
00:06:52,230 --> 00:06:49,840
yourself as um you

180
00:06:54,390 --> 00:06:52,240
continue to work on your your

181
00:06:56,070 --> 00:06:54,400
your education career and then later in

182
00:06:58,629 --> 00:06:56,080
life in your career you'll see that

183
00:07:00,230 --> 00:06:58,639
teamwork is very valuable in all aspects

184
00:07:05,110 --> 00:07:00,240
of your life good question do we have

185
00:07:10,550 --> 00:07:08,390
um i'm kira hoskin from atlanta georgia

186
00:07:13,270 --> 00:07:10,560
um about how many people has america

187
00:07:15,430 --> 00:07:13,280
attempted to send up to space

188
00:07:18,950 --> 00:07:15,440

i think total there's been

189
00:07:21,270 --> 00:07:18,960
close to 500 people total who have been

190
00:07:23,909 --> 00:07:21,280
to space and i actually don't know the

191
00:07:26,790 --> 00:07:23,919
distribution of americans versus

192
00:07:28,309 --> 00:07:26,800
russians versus other countries

193
00:07:29,670 --> 00:07:28,319
but that's actually a pretty small

194
00:07:31,909 --> 00:07:29,680
number when you consider all of the

195
00:07:33,189 --> 00:07:31,919
human beings that have existed on our

196
00:07:35,589 --> 00:07:33,199
planet we've been sending people to

197
00:07:37,749 --> 00:07:35,599
space for 50 years now which which

198
00:07:40,230 --> 00:07:37,759
sounds like a long time probably to to

199
00:07:44,070 --> 00:07:40,240
uh to you but but that's that's just

200
00:07:46,230 --> 00:07:44,080
only been a very short time um so i

201
00:07:47,749 --> 00:07:46,240
think you know in the future our numbers

202
00:07:49,589 --> 00:07:47,759
are going to keep growing as as

203
00:07:50,869 --> 00:07:49,599
commercial space flight really comes on

204
00:07:52,710 --> 00:07:50,879
board in fact

205
00:07:55,110 --> 00:07:52,720
you know there's even been

206
00:07:57,350 --> 00:07:55,120
space flight participants or or tourists

207
00:07:59,510 --> 00:07:57,360
as a less commonly used term but there

208
00:08:02,230 --> 00:07:59,520
are companies right now who are who are

209
00:08:04,710 --> 00:08:02,240
working towards sending

210
00:08:06,390 --> 00:08:04,720
people who just buy a ticket to space

211
00:08:09,589 --> 00:08:06,400
and that's that's kind of a neat thing

212
00:08:11,749 --> 00:08:09,599
opening up this this once very very

213
00:08:13,029 --> 00:08:11,759

restricted area to to more people so i

214
00:08:16,070 --> 00:08:13,039
think i think more people are going to

215
00:08:17,589 --> 00:08:16,080
go to space uh very soon very good and

216
00:08:19,510 --> 00:08:17,599
as liz said i mean i don't really know

217
00:08:21,830 --> 00:08:19,520
that distribution is well i don't have

218
00:08:23,589 --> 00:08:21,840
my cheat sheet with me um however but i

219
00:08:24,950 --> 00:08:23,599
have talked with several of these folks

220
00:08:26,230 --> 00:08:24,960
who have flown to the international

221
00:08:28,390 --> 00:08:26,240
space station and i will tell you that

222
00:08:30,070 --> 00:08:28,400
they all recognize that it is a

223
00:08:31,430 --> 00:08:30,080
privilege and an honor to fly aboard the

224
00:08:33,909 --> 00:08:31,440
international space station but it is

225
00:08:36,469 --> 00:08:33,919
something that is obtainable and so if

226
00:08:37,909 --> 00:08:36,479
it's something that you aspire to do you

227
00:08:39,430 --> 00:08:37,919
know i would encourage you to continue

228
00:08:40,550 --> 00:08:39,440
with your studies that is always first

229
00:08:41,350 --> 00:08:40,560
and foremost

230
00:08:45,190 --> 00:08:41,360
um

231
00:08:47,670 --> 00:08:45,200
nasa it's very very important so

232
00:08:48,949 --> 00:08:47,680
continue with that and uh

233
00:08:51,269 --> 00:08:48,959
you'll you'll

234
00:08:53,829 --> 00:08:51,279
see your dreams absolutely you know one

235
00:08:55,509 --> 00:08:53,839
of one of the key aspects of space camp

236
00:08:58,310 --> 00:08:55,519
and one of the things that we learn at

237
00:09:00,070 --> 00:08:58,320
space camp is teamwork uh the importance

238
00:09:02,870 --> 00:09:00,080

of being a good follower as well as a

239
00:09:04,790 --> 00:09:02,880
good leader so those skills i i recall

240
00:09:07,670 --> 00:09:04,800
learning um pretty much for the first

241
00:09:09,910 --> 00:09:07,680
time at space camp and space academy

242
00:09:11,110 --> 00:09:09,920
and believe me those skills those little

243
00:09:13,030 --> 00:09:11,120
little bits that you take away from

244
00:09:14,949 --> 00:09:13,040
space camp they're with you for for the

245
00:09:17,670 --> 00:09:14,959
rest of your life i still draw upon

246
00:09:19,269 --> 00:09:17,680
experiences that i learned at space camp

247
00:09:23,110 --> 00:09:19,279
absolutely good question do we have

248
00:09:28,310 --> 00:09:25,030
hi i'm matt stone from lawrenceville

249
00:09:31,269 --> 00:09:28,320
georgia and my question is

250
00:09:34,630 --> 00:09:31,279
what is the longest period of time

251
00:09:36,949 --> 00:09:34,640
that an astronaut has been in space

252
00:09:40,150 --> 00:09:36,959
matt that's a good question the longest

253
00:09:43,110 --> 00:09:40,160
time at once like in one consecutive uh

254
00:09:45,870 --> 00:09:43,120
stay in space uh was actually uh done by

255
00:09:49,509 --> 00:09:45,880
a russian his name is valeri polyakov

256
00:09:51,910 --> 00:09:49,519
438 days so well over a year this

257
00:09:53,430 --> 00:09:51,920
gentleman stayed in space

258
00:09:55,110 --> 00:09:53,440
we have other we have many other

259
00:09:56,949 --> 00:09:55,120
astronauts and cosmonauts that when you

260
00:09:58,470 --> 00:09:56,959
add up their the number of stays that

261
00:10:00,389 --> 00:09:58,480
they've been in space have just been

262
00:10:03,269 --> 00:10:00,399
tremendous i think uh

263
00:10:05,269 --> 00:10:03,279

sergey krikalov has well over over a

264
00:10:06,069 --> 00:10:05,279
couple of years correct

265
00:10:10,069 --> 00:10:06,079
um

266
00:10:12,150 --> 00:10:10,079
a special day for the commander of the

267
00:10:14,790 --> 00:10:12,160
space station gennady padalka today

268
00:10:17,030 --> 00:10:14,800
actually marks his 700th cumulative time

269
00:10:19,269 --> 00:10:17,040
in space so yeah

270
00:10:21,430 --> 00:10:19,279
so several people who have have uh

271
00:10:26,470 --> 00:10:21,440
chalked up some time yeah good question

272
00:10:31,750 --> 00:10:29,030
yeah um my name is sarah

273
00:10:33,190 --> 00:10:31,760
and my question is that um if you could

274
00:10:36,790 --> 00:10:33,200
predict

275
00:10:38,230 --> 00:10:36,800
when humans could start going on mars

276
00:10:40,230 --> 00:10:38,240
you know

277
00:10:41,990 --> 00:10:40,240
we are learning every day

278
00:10:43,910 --> 00:10:42,000
on the international space station how

279
00:10:46,470 --> 00:10:43,920
to live and work in space efficiently

280
00:10:49,350 --> 00:10:46,480
and safely it's a very hard thing to do

281
00:10:52,389 --> 00:10:49,360
just keeping a vehicle in an operational

282
00:10:54,870 --> 00:10:52,399
state is very hard to do just yesterday

283
00:10:56,710 --> 00:10:54,880
we completed a very complex and very

284
00:10:59,430 --> 00:10:56,720
important spacewalk because we had an

285
00:11:01,190 --> 00:10:59,440
electrical problem on the space station

286
00:11:03,750 --> 00:11:01,200
so every day we're learning how to go

287
00:11:05,509 --> 00:11:03,760
how to live and work safely in space

288
00:11:08,230 --> 00:11:05,519

we're going to go to mars it's just a

289
00:11:10,870 --> 00:11:08,240
matter of time and national priority i

290
00:11:12,710 --> 00:11:10,880
think if we had to go soon we could we

291
00:11:15,190 --> 00:11:12,720
could go but there's still a lot we need

292
00:11:17,910 --> 00:11:15,200
to learn for example

293
00:11:19,990 --> 00:11:17,920
just human beings being in space for

294
00:11:22,949 --> 00:11:20,000
that long is really hard there are some

295
00:11:25,190 --> 00:11:22,959
challenges with radiation

296
00:11:26,389 --> 00:11:25,200
and so there's a lot we need to learn

297
00:11:28,630 --> 00:11:26,399
but

298
00:11:30,389 --> 00:11:28,640
i i i'm sure we're going to get there uh

299
00:11:36,310 --> 00:11:30,399
eventually

300
00:11:40,389 --> 00:11:37,990
hi my name is brandon and i live in

301
00:11:43,509 --> 00:11:40,399
lawrenceville georgia and my question is

302
00:11:45,190 --> 00:11:43,519
how would astronauts like

303
00:11:47,509 --> 00:11:45,200
move around and do

304
00:11:50,949 --> 00:11:47,519
regular everyday things with

305
00:11:52,230 --> 00:11:50,959
less much less gravity

306
00:11:53,670 --> 00:11:52,240
living on the international space

307
00:11:54,829 --> 00:11:53,680
station

308
00:11:56,710 --> 00:11:54,839
we say

309
00:11:58,870 --> 00:11:56,720
microgravity and

310
00:12:00,949 --> 00:11:58,880
you can see video i hope you you're able

311
00:12:02,710 --> 00:12:00,959
to watch nasa tv or some of the

312
00:12:05,910 --> 00:12:02,720
excellent footage we have on the

313
00:12:07,430 --> 00:12:05,920

nasa.gov website and youtube sites

314
00:12:08,949 --> 00:12:07,440
it looks like a blast it looks like fun

315
00:12:10,470 --> 00:12:08,959
it goes like this

316
00:12:12,069 --> 00:12:10,480
it's very slow motion

317
00:12:13,670 --> 00:12:12,079
yeah and all you need it's very

318
00:12:15,590 --> 00:12:13,680
effortless though if you want to move

319
00:12:17,990 --> 00:12:15,600
all the way across a room all you need

320
00:12:20,230 --> 00:12:18,000
to do is push gently on on the wall that

321
00:12:22,710 --> 00:12:20,240
you're near and you'll you'll float to

322
00:12:24,870 --> 00:12:22,720
the other side of the room so

323
00:12:26,629 --> 00:12:24,880
it looks like a lot of fun but it looks

324
00:12:29,190 --> 00:12:26,639
also looks pretty easy you can use your

325
00:12:31,190 --> 00:12:29,200
hands you can use your feet and you see

326
00:12:32,790 --> 00:12:31,200
them lifting very large heavy things

327
00:12:34,310 --> 00:12:32,800
that traditionally we would not be able

328
00:12:36,230 --> 00:12:34,320
to lift here on earth but also i know

329
00:12:38,629 --> 00:12:36,240
that at times it can complicate things

330
00:12:40,310 --> 00:12:38,639
and as liz had mentioned earlier about

331
00:12:42,389 --> 00:12:40,320
even just the uh you know if you imagine

332
00:12:44,310 --> 00:12:42,399
the gravity especially on our bodies you

333
00:12:47,190 --> 00:12:44,320
know just the simple movements that we

334
00:12:49,670 --> 00:12:47,200
make standing sitting and walking even

335
00:12:50,389 --> 00:12:49,680
though you don't have a you may not have

336
00:13:31,430 --> 00:12:50,399
a

337
00:13:32,710 --> 00:13:31,440
once once it's in orbit it just goes

338
00:13:35,030 --> 00:13:32,720

around and around the earth it's

339
00:13:37,190 --> 00:13:35,040
constantly falling though essentially

340
00:13:39,590 --> 00:13:37,200
when we when we talk about microgravity

341
00:13:41,269 --> 00:13:39,600
um we can you could also say free fall

342
00:13:42,790 --> 00:13:41,279
so the space station is always falling

343
00:13:45,110 --> 00:13:42,800
toward the earth but the great thing is

344
00:13:47,509 --> 00:13:45,120
the earth is also moving away from it so

345
00:13:49,829 --> 00:13:47,519
that's this neat balance between gravity

346
00:13:51,269 --> 00:13:49,839
pulling it down and and the force of the

347
00:13:52,790 --> 00:13:51,279
space station and the speed of the space

348
00:13:54,710 --> 00:13:52,800
station carrying it away it's it's a

349
00:13:57,350 --> 00:13:54,720
nice balance which which creates that

350
00:13:59,350 --> 00:13:57,360
micro gravity environment

351
00:14:00,710 --> 00:13:59,360
but the way it stays in space is is

352
00:14:02,470 --> 00:14:00,720
every once in a while we have to give it

353
00:14:04,949 --> 00:14:02,480
a little bit of a boost because there's

354
00:14:07,350 --> 00:14:04,959
just a little bit of friction out there

355
00:14:08,790 --> 00:14:07,360
just a few air molecules and everyone

356
00:14:10,629 --> 00:14:08,800
every time the space station hits one of

357
00:14:12,629 --> 00:14:10,639
those little air molecules it slows down

358
00:14:13,910 --> 00:14:12,639
ever so slightly

359
00:14:15,829 --> 00:14:13,920
so every once in a while we have to give

360
00:14:17,750 --> 00:14:15,839
the space station a little extra boost

361
00:14:20,550 --> 00:14:17,760
and it'll stay up there indefinitely

362
00:14:22,790 --> 00:14:20,560
until we're ready to take it down

363
00:14:26,150 --> 00:14:22,800

very good question very smart kids i can

364
00:14:28,470 --> 00:14:26,160
tell do we have another one

365
00:14:29,670 --> 00:14:28,480
hi my name is regan uh i'm from

366
00:14:31,110 --> 00:14:29,680
huntsville

367
00:14:32,550 --> 00:14:31,120
what are the qualifications of an

368
00:14:34,870 --> 00:14:32,560
astronaut

369
00:14:37,590 --> 00:14:34,880
hey reign well the qualifications for

370
00:14:40,150 --> 00:14:37,600
astronauts are that they have to have an

371
00:14:42,230 --> 00:14:40,160
advanced uh education so you've got to

372
00:14:43,430 --> 00:14:42,240
finish college get a bachelor of science

373
00:14:47,350 --> 00:14:43,440
degree

374
00:14:48,389 --> 00:14:47,360
in science math technology engineering

375
00:14:50,550 --> 00:14:48,399
and also

376
00:14:52,870 --> 00:14:50,560
usually a work experience the more

377
00:14:54,150 --> 00:14:52,880
breadth you have seems to be really

378
00:14:56,710 --> 00:14:54,160
valuable

379
00:14:59,509 --> 00:14:56,720
our astronauts have have a wide variety

380
00:15:00,790 --> 00:14:59,519
of skill sets and experience there are

381
00:15:03,110 --> 00:15:00,800
people who are

382
00:15:07,110 --> 00:15:03,120
marine biologists there are geologists

383
00:15:09,350 --> 00:15:07,120
there are engineers there are

384
00:15:11,750 --> 00:15:09,360
boy there are a whole variety there's

385
00:15:14,710 --> 00:15:11,760
medical doctors so it almost seems like

386
00:15:16,389 --> 00:15:14,720
any career that you choose um

387
00:15:18,870 --> 00:15:16,399
and if you want to be an astronaut be

388
00:15:20,629 --> 00:15:18,880

really good at what you do

389
00:15:22,470 --> 00:15:20,639
and enjoy what you're doing choose a

390
00:15:24,550 --> 00:15:22,480
field that that is something you enjoy

391
00:15:26,550 --> 00:15:24,560
and you'll probably excel if you're

392
00:15:27,430 --> 00:15:26,560
doing something that you really enjoy

393
00:15:32,470 --> 00:15:27,440
and

394
00:15:33,910 --> 00:15:32,480
there are people in the military who

395
00:15:36,870 --> 00:15:33,920
become astronauts because of their

396
00:15:37,749 --> 00:15:36,880
experience flying so there's a there's a

397
00:15:43,910 --> 00:15:37,759
great

398
00:15:49,269 --> 00:15:43,920
really high skill sets and abilities

399
00:15:54,790 --> 00:15:51,910
hi i'm emily i'm from georgia besides

400
00:15:57,430 --> 00:15:54,800
exercise what do astronauts do

401
00:15:59,269 --> 00:15:57,440
boy astronauts are very very busy when i

402
00:16:01,189 --> 00:15:59,279
said they exercise two hours a day

403
00:16:02,389 --> 00:16:01,199
that's crammed in the middle of a very

404
00:16:04,470 --> 00:16:02,399
busy day

405
00:16:06,230 --> 00:16:04,480
an average day in space usually wake uh

406
00:16:08,069 --> 00:16:06,240
wake up around six in the morning now

407
00:16:10,790 --> 00:16:08,079
when i say six in the morning that's uh

408
00:16:12,949 --> 00:16:10,800
uh on greenwich mean time so for houston

409
00:16:14,790 --> 00:16:12,959
and for huntsville that's about two in

410
00:16:16,230 --> 00:16:14,800
the morning right or one in the morning

411
00:16:17,829 --> 00:16:16,240
depending on if it's if it's central

412
00:16:20,310 --> 00:16:17,839
daylight or if it's daylight savings

413
00:16:21,829 --> 00:16:20,320

time or not um wake up at six have a

414
00:16:23,829 --> 00:16:21,839
little bit of time

415
00:16:25,670 --> 00:16:23,839
for hygiene eating breakfast getting

416
00:16:27,829 --> 00:16:25,680
ready for the day getting dressed and

417
00:16:29,269 --> 00:16:27,839
then right into a conference where you

418
00:16:31,670 --> 00:16:29,279
speak with ground controllers here in

419
00:16:33,749 --> 00:16:31,680
the space station control room and you

420
00:16:35,269 --> 00:16:33,759
kind of talk about what's going to go go

421
00:16:37,189 --> 00:16:35,279
on for the day and then you get right

422
00:16:39,110 --> 00:16:37,199
into doing science experiments

423
00:16:40,230 --> 00:16:39,120
maintenance of the space station and it

424
00:16:42,870 --> 00:16:40,240
takes a lot of work just to keep the

425
00:16:44,710 --> 00:16:42,880
space station going a variety of space

426
00:16:47,430 --> 00:16:44,720
station experiments you may be working

427
00:16:49,030 --> 00:16:47,440
with flame and combustion one minute and

428
00:16:50,790 --> 00:16:49,040
then the next minute taking an

429
00:16:53,350 --> 00:16:50,800
ultrasound or the next hour taking an

430
00:16:55,910 --> 00:16:53,360
ultrasound images of your heart and then

431
00:16:58,230 --> 00:16:55,920
you may go 10 to the aquatic habitat

432
00:17:00,790 --> 00:16:58,240
where you may have some fish

433
00:17:02,470 --> 00:17:00,800
and then have a quick lunch usually keep

434
00:17:03,990 --> 00:17:02,480
working throughout the day

435
00:17:06,150 --> 00:17:04,000
maybe have another conference with a

436
00:17:09,189 --> 00:17:06,160
doctor or the flight director just to

437
00:17:10,710 --> 00:17:09,199
keep tabs on how things are going

438
00:17:12,630 --> 00:17:10,720

the day usually ends with another

439
00:17:13,909 --> 00:17:12,640
conference where i talk about what

440
00:17:15,429 --> 00:17:13,919
happened during the day with the ground

441
00:17:16,870 --> 00:17:15,439
controllers talk maybe about what's

442
00:17:19,029 --> 00:17:16,880
going to happen the next day what worked

443
00:17:20,549 --> 00:17:19,039
what didn't work

444
00:17:22,870 --> 00:17:20,559
and in the middle there i said you know

445
00:17:24,549 --> 00:17:22,880
you had your two hours of exercise and

446
00:17:26,309 --> 00:17:24,559
then and then you have a little bit of

447
00:17:28,789 --> 00:17:26,319
free time and then and then bed and

448
00:17:29,909 --> 00:17:28,799
that's a very very busy day the

449
00:17:32,390 --> 00:17:29,919
astronauts

450
00:17:35,669 --> 00:17:32,400
have a tremendous workload and almost

451
00:17:38,150 --> 00:17:35,679
every minute is accounted for

452
00:17:39,830 --> 00:17:38,160
very busy day and it's every day every

453
00:17:41,190 --> 00:17:39,840
day they get a little time to talk to

454
00:17:43,350 --> 00:17:41,200
their families on the weekends and they

455
00:17:45,350 --> 00:17:43,360
can make a phone call here and there

456
00:17:47,029 --> 00:17:45,360
but but otherwise they're extremely busy

457
00:17:48,710 --> 00:17:47,039
there's six people on the international

458
00:17:50,950 --> 00:17:48,720
space station and they're working very

459
00:17:53,029 --> 00:17:50,960
hard so you can imagine how much work is

460
00:17:54,870 --> 00:17:53,039
getting done

461
00:17:56,630 --> 00:17:54,880
very good question and i think we have

462
00:18:00,070 --> 00:17:56,640
time for another one do we have another

463
00:18:04,390 --> 00:18:01,430

my name is abigail and i'm from

464
00:18:05,510 --> 00:18:04,400
huntsville alabama and i was wondering

465
00:18:07,510 --> 00:18:05,520
um

466
00:18:08,549 --> 00:18:07,520
have there ever been any problems in

467
00:18:10,070 --> 00:18:08,559
with this

468
00:18:11,909 --> 00:18:10,080
rocket ship or anything that happened

469
00:18:14,710 --> 00:18:11,919
that wasn't supposed to happen

470
00:18:16,470 --> 00:18:14,720
absolutely space space travel abigail is

471
00:18:18,390 --> 00:18:16,480
is is difficult we've been doing it for

472
00:18:20,710 --> 00:18:18,400
50 years we're still learning

473
00:18:22,549 --> 00:18:20,720
there have absolutely been some

474
00:18:24,310 --> 00:18:22,559
challenges to overcome we've had we've

475
00:18:27,029 --> 00:18:24,320
had some accidents along the way we've

476
00:18:28,710 --> 00:18:27,039
lost some people and that's very hard

477
00:18:30,390 --> 00:18:28,720
it's something that we accept in the

478
00:18:31,750 --> 00:18:30,400
space business though

479
00:18:33,909 --> 00:18:31,760
we go into this knowing that we're

480
00:18:36,470 --> 00:18:33,919
pushing the very boundaries of human

481
00:18:38,070 --> 00:18:36,480
ability and when you're exploring and

482
00:18:39,350 --> 00:18:38,080
you're pushing boundaries

483
00:18:41,990 --> 00:18:39,360
there's going to be some losses and

484
00:18:44,230 --> 00:18:42,000
we've had some very sad losses

485
00:18:46,230 --> 00:18:44,240
but it also gives nasa an opportunity

486
00:18:47,909 --> 00:18:46,240
and our energy and our international

487
00:18:49,909 --> 00:18:47,919
partners to really shine too because

488
00:18:51,190 --> 00:18:49,919

when you overcome a challenge it really

489
00:18:53,029 --> 00:18:51,200
feels good

490
00:18:55,270 --> 00:18:53,039
like i mentioned earlier just yesterday

491
00:18:57,029 --> 00:18:55,280
there was a very very difficult eva

492
00:18:59,430 --> 00:18:57,039
that's a spacewalk

493
00:19:01,510 --> 00:18:59,440
that was performed that fixed a really

494
00:19:03,750 --> 00:19:01,520
serious problem with power

495
00:19:06,070 --> 00:19:03,760
that it was basically cut the space

496
00:19:09,190 --> 00:19:06,080
station's power by about half

497
00:19:11,270 --> 00:19:09,200
essentially and so every day we're

498
00:19:12,789 --> 00:19:11,280
having challenges almost every day and

499
00:19:14,789 --> 00:19:12,799
when we overcome those challenges it

500
00:19:16,710 --> 00:19:14,799
feels really good and it helps us to

501
00:19:18,470 --> 00:19:16,720
learn so that we can do better in the

502
00:19:20,789 --> 00:19:18,480
future

503
00:19:22,870 --> 00:19:20,799
and maybe one day get to mars

504
00:19:27,270 --> 00:19:22,880
i believe it we will

505
00:19:30,710 --> 00:19:29,270
what was the first mission they ever

506
00:19:32,390 --> 00:19:30,720
worked on

507
00:19:35,590 --> 00:19:32,400
me personally

508
00:19:38,070 --> 00:19:35,600
i was doing research as a college

509
00:19:40,630 --> 00:19:38,080
student the first mission i helped with

510
00:19:41,510 --> 00:19:40,640
was sts-84

511
00:19:43,830 --> 00:19:41,520
and

512
00:19:45,430 --> 00:19:43,840
this experiment actually

513
00:19:47,270 --> 00:19:45,440

went to the mir space station it

514
00:19:49,190 --> 00:19:47,280
launched on the space shuttle went to

515
00:19:51,350 --> 00:19:49,200
the mir space station and stayed there

516
00:19:54,070 --> 00:19:51,360
with astronaut mike foale and it was a

517
00:19:56,470 --> 00:19:54,080
little little uh experiment that studied

518
00:20:00,070 --> 00:19:56,480
circadian rhythms or or sleep and how

519
00:20:02,950 --> 00:20:00,080
well astronauts may um may learn uh how

520
00:20:04,789 --> 00:20:02,960
to how to sleep better and how light

521
00:20:06,549 --> 00:20:04,799
affects how well they sleep and actually

522
00:20:07,909 --> 00:20:06,559
the experiment was on little beetles we

523
00:20:11,110 --> 00:20:07,919
launched little beetles and little

524
00:20:12,630 --> 00:20:11,120
miniature um holding canisters and that

525
00:20:14,230 --> 00:20:12,640
was the first the first mission that i

526
00:20:16,310 --> 00:20:14,240
worked on and i've been working ever

527
00:20:18,950 --> 00:20:16,320
since on a whole bunch of missions it's

528
00:20:20,549 --> 00:20:18,960
it's it's been a tremendous honor and i

529
00:20:22,950 --> 00:20:20,559
love doing it every day

530
00:20:23,750 --> 00:20:22,960
and if it's something you want to do

531
00:20:25,430 --> 00:20:23,760
just

532
00:20:28,070 --> 00:20:25,440
keep working at it it's sometimes

533
00:20:30,870 --> 00:20:28,080
there's obstacles to overcome in school

534
00:20:33,270 --> 00:20:30,880
or in your personal life

535
00:20:35,029 --> 00:20:33,280
i was very very happy and lucky that i

536
00:20:38,789 --> 00:20:35,039
knew what i wanted to do so i just set

537
00:20:44,310 --> 00:20:38,799
my goal and i worked toward it steadily

538
00:20:49,909 --> 00:20:47,430

my name is gemin and i'm from ohio and

539
00:20:52,230 --> 00:20:49,919
how did the people know where to land

540
00:20:53,110 --> 00:20:52,240
curiosity on mars

541
00:20:54,470 --> 00:20:53,120
wow

542
00:20:56,149 --> 00:20:54,480
i don't even know the answer to that

543
00:20:58,549 --> 00:20:56,159
question but i can guess

544
00:21:00,830 --> 00:20:58,559
and i think they chose a place on mars

545
00:21:03,110 --> 00:21:00,840
that was really interesting to them

546
00:21:04,870 --> 00:21:03,120
geologically but i am definitely not the

547
00:21:06,630 --> 00:21:04,880
right person to ask there's so many

548
00:21:09,029 --> 00:21:06,640
things to learn about nasa and we can't

549
00:21:10,710 --> 00:21:09,039
possibly all know all the answers

550
00:21:12,230 --> 00:21:10,720
and i'm certainly not the person you ask

551
00:21:14,830 --> 00:21:12,240
either i'm sorry i don't know the answer

552
00:21:16,789 --> 00:21:14,840
to that but you can go to

553
00:21:18,390 --> 00:21:16,799
www.nasa.gov there's a ton of

554
00:21:20,470 --> 00:21:18,400
information there

555
00:21:22,149 --> 00:21:20,480
obviously there's a ton of information

556
00:21:23,909 --> 00:21:22,159
about mars curiosity there are several

557
00:21:25,669 --> 00:21:23,919
people who tweet

558
00:21:27,029 --> 00:21:25,679
on twitter so if any of you guys are on

559
00:21:29,590 --> 00:21:27,039
twitter

560
00:21:30,549 --> 00:21:29,600
go there i would say follow the flight

561
00:21:31,830 --> 00:21:30,559
director

562
00:21:34,310 --> 00:21:31,840
mohawk guy

563
00:21:36,310 --> 00:21:34,320

uh bobak pradowski he's um known as

564
00:21:37,830 --> 00:21:36,320
tweets out loud on twitter and you can

565
00:21:40,070 --> 00:21:37,840
get a lot of information about what

566
00:21:42,710 --> 00:21:40,080
exactly is going on with that mars rover

567
00:21:49,830 --> 00:21:42,720
um there on mars and in the that landed

568
00:21:55,830 --> 00:21:52,789
hi i'm nicole i'm from stone mountain

569
00:21:58,310 --> 00:21:55,840
georgia and i was wondering how it felt

570
00:22:00,470 --> 00:21:58,320
when you had a successful landing from

571
00:22:02,390 --> 00:22:00,480
either a human or an animal and like

572
00:22:04,630 --> 00:22:02,400
they came back and they went there with

573
00:22:06,710 --> 00:22:04,640
no problems

574
00:22:08,789 --> 00:22:06,720
well that that mission that i mentioned

575
00:22:11,110 --> 00:22:08,799
earlier sts-84 being that it was the

576
00:22:13,990 --> 00:22:11,120
first mission that uh that i worked on

577
00:22:15,590 --> 00:22:14,000
personally um it was tremendous i had

578
00:22:18,149 --> 00:22:15,600
watched a lot of space shuttle missions

579
00:22:20,149 --> 00:22:18,159
launched before that as and and just

580
00:22:21,990 --> 00:22:20,159
watching those missions happen very

581
00:22:24,310 --> 00:22:22,000
exciting and thrilling but when you have

582
00:22:26,149 --> 00:22:24,320
a part when you're playing a part in a

583
00:22:27,909 --> 00:22:26,159
small role

584
00:22:30,789 --> 00:22:27,919
it really gives you tremendous

585
00:22:32,630 --> 00:22:30,799
satisfaction everyone here at nasa

586
00:22:34,870 --> 00:22:32,640
pretty much everyone has a very small

587
00:22:36,630 --> 00:22:34,880
role for the most part when you add up

588
00:22:38,950 --> 00:22:36,640

all those people working together you

589
00:22:41,029 --> 00:22:38,960
can do tremendous things and you know

590
00:22:41,990 --> 00:22:41,039
the astronauts they're just the most

591
00:22:45,270 --> 00:22:42,000
visible

592
00:22:46,870 --> 00:22:45,280
pieces of us of a mission um but there's

593
00:22:48,549 --> 00:22:46,880
there's thousands of people working

594
00:22:50,870 --> 00:22:48,559
every day to make sure that we're

595
00:22:53,270 --> 00:22:50,880
successful and all those thousands of

596
00:22:56,070 --> 00:22:54,470
i get tremendous

597
00:22:58,070 --> 00:22:56,080
self-satisfaction knowing that i'm

598
00:23:00,070 --> 00:22:58,080
helping just the littlest bit and that

599
00:23:02,390 --> 00:23:00,080
that makes me feel really good it's it

600
00:23:04,470 --> 00:23:02,400
just makes you feel just good inside and

601
00:23:08,070 --> 00:23:04,480
i think that's a in overall the

602
00:23:10,149 --> 00:23:08,080
consensus here i honestly um at landing

603
00:23:12,390 --> 00:23:10,159
you know i've seen many many missions

604
00:23:14,310 --> 00:23:12,400
land and i can tell you every time we

605
00:23:16,390 --> 00:23:14,320
land and we have a successful mission i

606
00:23:17,350 --> 00:23:16,400
get goosebumps i get excited it doesn't

607
00:23:19,110 --> 00:23:17,360
change

608
00:23:21,029 --> 00:23:19,120
i never become desensitized well i think

609
00:23:21,830 --> 00:23:21,039
yeah yeah i've seen it once i've seen it

610
00:23:23,270 --> 00:23:21,840
all

611
00:23:25,590 --> 00:23:23,280
every mission is different and every

612
00:23:27,909 --> 00:23:25,600
mission is special and everyone involved

613
00:23:29,909 --> 00:23:27,919

in that is very special and unique and

614
00:23:32,230 --> 00:23:29,919
important to us as well as the mission

615
00:23:33,990 --> 00:23:32,240
as well and um so yeah it's very

616
00:23:36,390 --> 00:23:34,000
important to us and i think of course we

617
00:23:37,110 --> 00:23:36,400
feel elated when we know that we nailed

618
00:23:47,350 --> 00:23:37,120
it

619
00:23:49,350 --> 00:23:47,360
and i was wondering about how many

620
00:23:51,510 --> 00:23:49,360
different types of animals have you sent

621
00:23:54,870 --> 00:23:51,520
up to space

622
00:23:56,789 --> 00:23:54,880
well personally let's talk generically

623
00:23:59,669 --> 00:23:56,799
boy there's been fish there's been

624
00:24:02,390 --> 00:23:59,679
monkeys there's been insects

625
00:24:04,710 --> 00:24:02,400
there's been mice and rats

626
00:24:06,470 --> 00:24:04,720
i would say at least 10 probably

627
00:24:09,190 --> 00:24:06,480
different types of animals have been in

628
00:24:11,590 --> 00:24:09,200
space and and we can we can study them

629
00:24:13,830 --> 00:24:11,600
and learn from them as well as from our

630
00:24:15,029 --> 00:24:13,840
astronauts um

631
00:24:17,029 --> 00:24:15,039
so i think

632
00:24:18,390 --> 00:24:17,039
yeah quite a few critters have gone up

633
00:24:20,950 --> 00:24:18,400
into space so

634
00:24:22,950 --> 00:24:20,960
along with our people quitters

635
00:24:24,390 --> 00:24:22,960
i think uh that's about all the time

636
00:24:26,149 --> 00:24:24,400
that we have that was the last question

637
00:24:28,390 --> 00:24:26,159
we really appreciate you guys coming out

638
00:24:29,669 --> 00:24:28,400

and joining us again we are inside the

639
00:24:32,470 --> 00:24:29,679
international space station flight