
PAO

1
00:00:06,230 --> 00:00:04,550
hi welcome to mission control houston

2
00:00:07,749 --> 00:00:06,240
and thank you for joining us today we're

3
00:00:09,669 --> 00:00:07,759
inside the international space station

4
00:00:11,990 --> 00:00:09,679
flight control room where the orbit 2

5
00:00:13,030 --> 00:00:12,000
team is monitoring the systems and the

6
00:00:14,950 --> 00:00:13,040
cruise activities aboard the

7
00:00:17,109 --> 00:00:14,960
international space station we're here

8
00:00:18,950 --> 00:00:17,119
today to talk with uh sixth to eighth

9
00:00:22,630 --> 00:00:18,960
grade students that are out at

10
00:00:24,230 --> 00:00:22,640
huntsville alabama at uh space camp and

11
00:00:26,710 --> 00:00:24,240
here with us today is a special guest

12
00:00:29,269 --> 00:00:26,720
she knows a little about space camp liz

13
00:00:31,910 --> 00:00:29,279

warren who is also the space station

14
00:00:33,430 --> 00:00:31,920
science communication coordinator

15
00:00:34,870 --> 00:00:33,440
welcome liz and thank you for coming

16
00:00:36,630 --> 00:00:34,880
thank you very much for having me i'm

17
00:00:39,110 --> 00:00:36,640
very excited to speak with you thank you

18
00:00:40,950 --> 00:00:39,120
and what is also very very very special

19
00:00:42,549 --> 00:00:40,960
about liz being here is

20
00:00:43,670 --> 00:00:42,559
well you've been here at nasa for eight

21
00:00:46,549 --> 00:00:43,680
years now

22
00:00:48,790 --> 00:00:46,559
and um she is a space camp graduate she

23
00:00:51,750 --> 00:00:48,800
went level one and level two

24
00:00:53,910 --> 00:00:51,760
and um it's also was recently inducted

25
00:00:56,389 --> 00:00:53,920
into the space camp hall of fame just

26
00:00:58,709 --> 00:00:56,399
this year yes i was congratulations it

27
00:01:00,709 --> 00:00:58,719
was a lot of fun it's a huge honor so

28
00:01:02,310 --> 00:01:00,719
many people have gone to space camp just

29
00:01:04,710 --> 00:01:02,320
like all the students were speaking with

30
00:01:08,870 --> 00:01:04,720
today i believe while i was there in

31
00:01:10,630 --> 00:01:08,880
june uh the 600 000th graduate walked

32
00:01:12,390 --> 00:01:10,640
through the doors of space camp

33
00:01:13,750 --> 00:01:12,400
so that's exciting so again we have a

34
00:01:19,830 --> 00:01:13,760
special treat for you guys so we're

35
00:01:25,429 --> 00:01:22,789
hi i'm maggie swanian and i'm from

36
00:01:28,789 --> 00:01:25,439
duluth georgia um

37
00:01:30,149 --> 00:01:28,799
my question is what are the

38
00:01:31,429 --> 00:01:30,159

what are all the

39
00:01:33,429 --> 00:01:31,439
um

40
00:01:36,310 --> 00:01:33,439
kind of like

41
00:01:38,870 --> 00:01:36,320
defects almost of being in space too

42
00:01:42,230 --> 00:01:38,880
long what happens to your body what

43
00:01:43,910 --> 00:01:42,240
happens if you're there too long or for

44
00:01:46,149 --> 00:01:43,920
a long period of time

45
00:01:47,429 --> 00:01:46,159
well that's a great question and it's

46
00:01:49,510 --> 00:01:47,439
actually very appropriate i'm a

47
00:01:51,109 --> 00:01:49,520
physiologist so that's like the thing

48
00:01:53,429 --> 00:01:51,119
i'm most interested in what happens to

49
00:01:56,310 --> 00:01:53,439
the human body when you go to space for

50
00:01:58,310 --> 00:01:56,320
a really long time and while it looks

51
00:01:59,910 --> 00:01:58,320
like a lot of fun to live in space and

52
00:02:02,550 --> 00:01:59,920
float around it looks like a like a

53
00:02:04,069 --> 00:02:02,560
great time it's not really that good for

54
00:02:06,310 --> 00:02:04,079
your body

55
00:02:08,630 --> 00:02:06,320
gravity is this force that we live with

56
00:02:11,029 --> 00:02:08,640
on earth all the time and it helps us

57
00:02:13,190 --> 00:02:11,039
maintain strong bones and muscles and a

58
00:02:16,150 --> 00:02:13,200
strong cardiovascular system in

59
00:02:19,110 --> 00:02:16,160
microgravity while those systems tend to

60
00:02:22,869 --> 00:02:19,120
decondition or get weaker so astronauts

61
00:02:25,589 --> 00:02:22,879
can lose bone mass bone strength muscle

62
00:02:27,270 --> 00:02:25,599
strength and mass and also their hearts

63
00:02:30,390 --> 00:02:27,280

get a little bit weaker among some other

64
00:02:32,630 --> 00:02:30,400
changes fortunately we have studied

65
00:02:34,790 --> 00:02:32,640
these changes and we know how to prevent

66
00:02:37,430 --> 00:02:34,800
them or prevent some of the changes that

67
00:02:39,430 --> 00:02:37,440
occur so astronauts have to exercise

68
00:02:41,030 --> 00:02:39,440
about two hours every day

69
00:02:43,589 --> 00:02:41,040
and we make sure that they eat very

70
00:02:45,430 --> 00:02:43,599
nutritious meals and so just like living

71
00:02:47,110 --> 00:02:45,440
here on earth it's important to exercise

72
00:02:50,790 --> 00:02:47,120
and eat well and that helps our

73
00:02:54,710 --> 00:02:50,800
astronauts helps you as well

74
00:03:00,710 --> 00:02:56,550
my name is emma hearn and i'm from

75
00:03:03,670 --> 00:03:00,720
snowville georgia and my question is

76
00:03:05,750 --> 00:03:03,680
what kind like when

77
00:03:08,229 --> 00:03:05,760
when did you decide you wanted to be an

78
00:03:09,750 --> 00:03:08,239
astronaut or work at nasa

79
00:03:11,750 --> 00:03:09,760
i think i was pretty young when i

80
00:03:13,750 --> 00:03:11,760
decided that that being an astronaut

81
00:03:15,830 --> 00:03:13,760
would be pretty cool and definitely

82
00:03:17,270 --> 00:03:15,840
working at nasa i might have been even

83
00:03:21,030 --> 00:03:17,280
younger than you

84
00:03:23,190 --> 00:03:21,040
and i just set my goals and asked a lot

85
00:03:25,350 --> 00:03:23,200
of questions asked my parents how do i

86
00:03:28,149 --> 00:03:25,360
do this i talked to teachers

87
00:03:30,869 --> 00:03:28,159
and really anyone can can work at nasa

88
00:03:32,710 --> 00:03:30,879

any there's a variety of interests

89
00:03:34,229 --> 00:03:32,720
engineering and science and math of

90
00:03:36,470 --> 00:03:34,239
course help you

91
00:03:39,350 --> 00:03:36,480
open up many doors to career fields but

92
00:03:41,110 --> 00:03:39,360
nasa has people that are artists and

93
00:03:42,949 --> 00:03:41,120
lawyers as well

94
00:03:44,309 --> 00:03:42,959
but i knew pretty young that that i

95
00:03:46,390 --> 00:03:44,319
wanted to contribute to space

96
00:03:48,630 --> 00:03:46,400
exploration and

97
00:03:51,030 --> 00:03:48,640
i think it was in particular there was

98
00:03:53,509 --> 00:03:51,040
one very inspiring space shuttle mission

99
00:03:55,190 --> 00:03:53,519
to me it was sts-40 it was in the year

100
00:03:57,190 --> 00:03:55,200
1991

101
00:03:59,509 --> 00:03:57,200
i was still in high school and this

102
00:04:01,589 --> 00:03:59,519
mission was dedicated to studying space

103
00:04:03,270 --> 00:04:01,599
life sciences and i didn't know very

104
00:04:05,110 --> 00:04:03,280
much about space life sciences but i

105
00:04:07,509 --> 00:04:05,120
knew that i liked space and i knew that

106
00:04:09,110 --> 00:04:07,519
i liked biology and this particular

107
00:04:11,190 --> 00:04:09,120
space shuttle mission combined both of

108
00:04:13,350 --> 00:04:11,200
my interests and

109
00:04:15,670 --> 00:04:13,360
with that mission i decided i'm to go be

110
00:04:17,830 --> 00:04:15,680
a physiologist at nasa it took a couple

111
00:04:19,749 --> 00:04:17,840
years but here i am

112
00:04:24,870 --> 00:04:19,759
and we're very glad to have you here

113
00:04:30,390 --> 00:04:27,749

hi my name is cameron and

114
00:04:32,629 --> 00:04:30,400
i'm from atlanta georgia and i was

115
00:04:36,230 --> 00:04:32,639
wondering have you ever sent any other

116
00:04:37,670 --> 00:04:36,240
monkeys to space other than mrs baker

117
00:04:41,830 --> 00:04:37,680
and abel

118
00:04:43,350 --> 00:04:41,840
special monkeys but in fact a lot of

119
00:04:45,590 --> 00:04:43,360
different animals including other

120
00:04:47,749 --> 00:04:45,600
monkeys have flown in space in fact our

121
00:04:48,950 --> 00:04:47,759
early space program since we weren't

122
00:04:51,350 --> 00:04:48,960
really sure what would happen to the

123
00:04:53,350 --> 00:04:51,360
human body living in space we had

124
00:04:55,510 --> 00:04:53,360
animals go first and kind of test the

125
00:04:57,590 --> 00:04:55,520
waters so to speak

126
00:04:59,749 --> 00:04:57,600
but in fact we've even on the

127
00:05:01,749 --> 00:04:59,759
international space station we have a

128
00:05:04,550 --> 00:05:01,759
brand new aquarium it's called the

129
00:05:06,310 --> 00:05:04,560
aquatic habitat and pretty soon we're

130
00:05:07,790 --> 00:05:06,320
going to have some fish on board so we

131
00:05:09,510 --> 00:05:07,800
can learn about

132
00:05:11,830 --> 00:05:09,520
multi-generational studies in other

133
00:05:13,029 --> 00:05:11,840
words send up some fish that are going

134
00:05:14,950 --> 00:05:13,039
to to

135
00:05:17,350 --> 00:05:14,960
have babies will study their babies and

136
00:05:19,270 --> 00:05:17,360
then their babies so we can learn uh

137
00:05:21,189 --> 00:05:19,280
developmentally what happens in

138
00:05:27,430 --> 00:05:21,199

microgravity but yeah lots of animals

139
00:05:31,590 --> 00:05:29,909
do we have another one

140
00:05:33,350 --> 00:05:31,600
hi i'm margaret ann

141
00:05:36,230 --> 00:05:33,360
and i'm from

142
00:05:39,430 --> 00:05:36,240
duluth georgia and my question is

143
00:05:40,629 --> 00:05:39,440
who controls the shuttle or the rocket

144
00:05:42,870 --> 00:05:40,639
is it you

145
00:05:44,950 --> 00:05:42,880
or the astronauts

146
00:05:46,710 --> 00:05:44,960
well i think a lot of the controlling of

147
00:05:49,909 --> 00:05:46,720
vehicles actually happens from the

148
00:05:51,510 --> 00:05:49,919
ground um but amico do you want to chime

149
00:05:53,430 --> 00:05:51,520
in you know you work here in the

150
00:05:55,749 --> 00:05:53,440
international space station control room

151
00:05:57,510 --> 00:05:55,759
this this entire room is full of a team

152
00:06:00,150 --> 00:05:57,520
and and not only this team there are

153
00:06:02,710 --> 00:06:00,160
many other folks that are not inside

154
00:06:04,790 --> 00:06:02,720
this room that uh manage and work the

155
00:06:06,550 --> 00:06:04,800
systems that are the international space

156
00:06:08,590 --> 00:06:06,560
station which is now flying

157
00:06:11,749 --> 00:06:08,600
um

158
00:06:12,550 --> 00:06:11,759
230 mile i mean 30 miles above the earth

159
00:06:14,469 --> 00:06:12,560
and

160
00:06:16,870 --> 00:06:14,479
you know orbiting the earth what how

161
00:06:19,510 --> 00:06:16,880
many times a day nine years 16 times a

162
00:06:22,070 --> 00:06:19,520
day every 90 minutes yeah um of course

163
00:06:23,749 --> 00:06:22,080

the astronauts are on board you know

164
00:06:25,590 --> 00:06:23,759
most of the most of the rockets to make

165
00:06:27,990 --> 00:06:25,600
sure that all the systems are operating

166
00:06:30,390 --> 00:06:28,000
nominally and and uh of course they have

167
00:06:32,710 --> 00:06:30,400
to throw switches and certainly during

168
00:06:35,110 --> 00:06:32,720
landing they're they're having to make

169
00:06:37,270 --> 00:06:35,120
key inputs as well

170
00:06:39,430 --> 00:06:37,280
and does that answer your question yeah

171
00:06:41,430 --> 00:06:39,440
it's a team there's no

172
00:06:43,270 --> 00:06:41,440
no one person that manages all of that

173
00:06:45,430 --> 00:06:43,280
obviously and that's why teamwork is so

174
00:06:47,110 --> 00:06:45,440
very important to us here

175
00:06:50,790 --> 00:06:47,120
and it's also something that you can

176
00:06:53,189 --> 00:06:50,800
probably use yourself as um you

177
00:06:55,270 --> 00:06:53,199
continue to work on your your

178
00:06:56,950 --> 00:06:55,280
your education career and then later in

179
00:06:59,510 --> 00:06:56,960
life in your career you'll see that

180
00:07:01,110 --> 00:06:59,520
teamwork is very valuable in all aspects

181
00:07:05,990 --> 00:07:01,120
of your life good question do we have

182
00:07:11,430 --> 00:07:09,830
um i'm kira hoskin from atlanta georgia

183
00:07:14,150 --> 00:07:11,440
about how many people has america

184
00:07:16,390 --> 00:07:14,160
attempted to send up to space

185
00:07:19,830 --> 00:07:16,400
i think total there's been

186
00:07:22,150 --> 00:07:19,840
close to 500 people total who have been

187
00:07:24,790 --> 00:07:22,160
to space and i actually don't know the

188
00:07:27,670 --> 00:07:24,800

distribution of americans versus

189
00:07:29,189 --> 00:07:27,680
russians versus other countries

190
00:07:30,629 --> 00:07:29,199
but that's actually a pretty small

191
00:07:32,790 --> 00:07:30,639
number when you consider all of the

192
00:07:34,070 --> 00:07:32,800
human beings that have existed on our

193
00:07:36,469 --> 00:07:34,080
planet we've been sending people to

194
00:07:38,950 --> 00:07:36,479
space for 50 years now which which

195
00:07:41,430 --> 00:07:38,960
sounds like a long time probably to to

196
00:07:44,070 --> 00:07:41,440
to you but but that's that's just only

197
00:07:44,869 --> 00:07:44,080
been a very short time

198
00:07:46,710 --> 00:07:44,879
so

199
00:07:48,629 --> 00:07:46,720
i think you know in the future our

200
00:07:50,469 --> 00:07:48,639
numbers are going to keep growing as as

201
00:07:51,749 --> 00:07:50,479
commercial space flight really comes on

202
00:07:53,589 --> 00:07:51,759
board in fact

203
00:07:55,830 --> 00:07:53,599
you know there's even been

204
00:07:58,230 --> 00:07:55,840
space flight participants or or tourists

205
00:08:00,390 --> 00:07:58,240
as a less commonly used term but there

206
00:08:03,589 --> 00:08:00,400
are companies right now who are who are

207
00:08:06,230 --> 00:08:03,599
working towards sending uh people who

208
00:08:07,990 --> 00:08:06,240
just buy a ticket to space uh and that's

209
00:08:10,469 --> 00:08:08,000
that's kind of a neat thing opening up

210
00:08:12,710 --> 00:08:10,479
uh this this once very very uh

211
00:08:13,909 --> 00:08:12,720
restricted area to to more people so i

212
00:08:16,950 --> 00:08:13,919
think i think more people are going to

213
00:08:18,469 --> 00:08:16,960

go to space uh very soon very good and

214
00:08:20,390 --> 00:08:18,479
as liz said i mean i don't really know

215
00:08:21,990 --> 00:08:20,400
that distribution is well i don't have

216
00:08:23,830 --> 00:08:22,000
my cheat sheet with me

217
00:08:25,430 --> 00:08:23,840
however but i have talked with several

218
00:08:26,710 --> 00:08:25,440
of these folks who have flown to the

219
00:08:29,029 --> 00:08:26,720
international space station and i will

220
00:08:30,550 --> 00:08:29,039
tell you that they all recognize that it

221
00:08:31,990 --> 00:08:30,560
is a privilege and an honor to fly

222
00:08:34,310 --> 00:08:32,000
aboard the international space station

223
00:08:36,630 --> 00:08:34,320
but it is something that is obtainable

224
00:08:38,389 --> 00:08:36,640
and so if it's something that you aspire

225
00:08:39,829 --> 00:08:38,399
to do you know i would encourage you to

226
00:08:42,230 --> 00:08:39,839
continue with your studies that is

227
00:08:44,870 --> 00:08:42,240
always first and foremost

228
00:08:46,550 --> 00:08:44,880
even just to come to work here at nasa

229
00:08:48,550 --> 00:08:46,560
it's very very important so continue

230
00:08:49,829 --> 00:08:48,560
with that and

231
00:08:52,150 --> 00:08:49,839
you'll you'll

232
00:08:54,710 --> 00:08:52,160
see your dreams absolutely you know one

233
00:08:56,389 --> 00:08:54,720
of one of the key aspects of space camp

234
00:08:58,710 --> 00:08:56,399
and one of the things that we learn at

235
00:09:00,550 --> 00:08:58,720
space camp is teamwork and the

236
00:09:03,190 --> 00:09:00,560
importance of being a good follower as

237
00:09:05,350 --> 00:09:03,200
well as a good leader so those skills i

238
00:09:07,269 --> 00:09:05,360

i recall learning um pretty much for the

239
00:09:10,230 --> 00:09:07,279
first time at space camp and space

240
00:09:11,590 --> 00:09:10,240
academy um and believe me those skills

241
00:09:13,350 --> 00:09:11,600
those little little bits that you take

242
00:09:15,110 --> 00:09:13,360
away from space camp uh they're with you

243
00:09:17,430 --> 00:09:15,120
for for the rest of your life i still

244
00:09:18,630 --> 00:09:17,440
draw upon experiences that i learned at

245
00:09:20,150 --> 00:09:18,640
space camp

246
00:09:23,990 --> 00:09:20,160
absolutely good question do we have

247
00:09:29,190 --> 00:09:25,910
hi i'm matt stone from lawrenceville

248
00:09:32,150 --> 00:09:29,200
georgia and my question is

249
00:09:35,590 --> 00:09:32,160
what is the longest period of time

250
00:09:37,829 --> 00:09:35,600
that an astronaut has been in space

251
00:09:41,110 --> 00:09:37,839
matt that's a good question the longest

252
00:09:42,710 --> 00:09:41,120
time at once like in one consecutive

253
00:09:44,790 --> 00:09:42,720
stay in space

254
00:09:46,829 --> 00:09:44,800
was actually done by a russian his name

255
00:09:50,470 --> 00:09:46,839
is valeri polyakov

256
00:09:52,870 --> 00:09:50,480
438 days so well over a year this

257
00:09:54,310 --> 00:09:52,880
gentleman stayed in space um

258
00:09:56,070 --> 00:09:54,320
we have other we have many other

259
00:09:57,829 --> 00:09:56,080
astronauts and cosmonauts that when you

260
00:09:59,430 --> 00:09:57,839
add up there the number of stays that

261
00:10:01,269 --> 00:09:59,440
they've been in space have just been

262
00:10:04,150 --> 00:10:01,279
tremendous i think uh

263
00:10:06,949 --> 00:10:04,160

sergey krikalov has well over over a

264
00:10:08,949 --> 00:10:06,959
couple of years correct um

265
00:10:10,949 --> 00:10:08,959
there's been a number also even today is

266
00:10:13,030 --> 00:10:10,959
a special day for the commander of the

267
00:10:15,750 --> 00:10:13,040
space station gennady padalka today

268
00:10:17,990 --> 00:10:15,760
actually marks his 700th cumulative time

269
00:10:20,150 --> 00:10:18,000
in space so yeah

270
00:10:22,310 --> 00:10:20,160
so several people who have have uh

271
00:10:27,430 --> 00:10:22,320
chalked up some time yeah good question

272
00:10:32,630 --> 00:10:29,910
yeah um my name is sarah

273
00:10:34,069 --> 00:10:32,640
and my question is that um if you could

274
00:10:37,670 --> 00:10:34,079
predict

275
00:10:39,110 --> 00:10:37,680
when humans could start going on mars

276
00:10:41,190 --> 00:10:39,120
you know uh

277
00:10:42,870 --> 00:10:41,200
we are learning every day

278
00:10:44,790 --> 00:10:42,880
on the international space station how

279
00:10:47,350 --> 00:10:44,800
to live and work in space efficiently

280
00:10:50,310 --> 00:10:47,360
and safely it's a very hard thing to do

281
00:10:53,269 --> 00:10:50,320
just keeping a vehicle in an operational

282
00:10:55,750 --> 00:10:53,279
state is very hard to do just yesterday

283
00:10:57,590 --> 00:10:55,760
we completed a very complex and very

284
00:11:00,389 --> 00:10:57,600
important spacewalk because we had an

285
00:11:02,069 --> 00:11:00,399
electrical problem on the space station

286
00:11:04,630 --> 00:11:02,079
so every day we're learning how to go

287
00:11:06,470 --> 00:11:04,640
how to live and work safely in space

288
00:11:09,110 --> 00:11:06,480

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

289
00:11:11,750 --> 00:11:09,120
matter of time and national priority i

290
00:11:13,590 --> 00:11:11,760
think if we had to go soon we could we

291
00:11:17,110 --> 00:11:13,600
could go but there's still a lot we need

292
00:11:19,430 --> 00:11:17,120
to learn for example um just human

293
00:11:21,590 --> 00:11:19,440
beings being in space for that long is

294
00:11:24,949 --> 00:11:21,600
really hard there are some challenges

295
00:11:27,269 --> 00:11:24,959
with radiation um and so there's a lot

296
00:11:29,509 --> 00:11:27,279
we need to learn but um

297
00:11:31,350 --> 00:11:29,519
i i i'm sure we're going to get there uh

298
00:11:37,190 --> 00:11:31,360
eventually

299
00:11:41,269 --> 00:11:38,870
hi my name is brandon and i live in

300
00:11:44,470 --> 00:11:41,279
lawrenceville georgia and my question is

301
00:11:46,150 --> 00:11:44,480
how would astronauts like

302
00:11:48,470 --> 00:11:46,160
move around and do

303
00:11:51,829 --> 00:11:48,480
regular everyday things with

304
00:11:53,110 --> 00:11:51,839
less much less gravity

305
00:11:54,550 --> 00:11:53,120
living on the international space

306
00:11:57,990 --> 00:11:54,560
station

307
00:11:59,829 --> 00:11:58,000
we say microgravity um and uh you can

308
00:12:02,310 --> 00:11:59,839
see video i hope you you're able to

309
00:12:04,470 --> 00:12:02,320
watch nasa tv or some of the excellent

310
00:12:07,110 --> 00:12:04,480
footage we have on on the nasa.gov

311
00:12:08,870 --> 00:12:07,120
website and youtube sites um it looks

312
00:12:12,069 --> 00:12:08,880
like a blast it looks like they go like

313
00:12:13,910 --> 00:12:12,079

this it's very slow motion yeah and all

314
00:12:15,509 --> 00:12:13,920
you need it's very effortless though if

315
00:12:17,990 --> 00:12:15,519
you want to move all the way across a

316
00:12:19,670 --> 00:12:18,000
room all you need to do is push gently

317
00:12:21,750 --> 00:12:19,680
on on the wall that you're near and

318
00:12:23,590 --> 00:12:21,760
you'll you'll float to the other side of

319
00:12:25,750 --> 00:12:23,600
the room so

320
00:12:27,590 --> 00:12:25,760
it looks like a lot of fun but it looks

321
00:12:30,069 --> 00:12:27,600
also looks pretty easy you can use your

322
00:12:32,069 --> 00:12:30,079
hands you can use your feet and you see

323
00:12:33,670 --> 00:12:32,079
them lifting very large heavy things

324
00:12:35,190 --> 00:12:33,680
that traditionally we would not be able

325
00:12:37,110 --> 00:12:35,200
to lift here on earth but also i know

326
00:12:39,509 --> 00:12:37,120
that at times it can complicate things

327
00:12:41,190 --> 00:12:39,519
and as liz had mentioned earlier about

328
00:12:43,269 --> 00:12:41,200
even just the uh you know if you imagine

329
00:12:45,269 --> 00:12:43,279
the gravity especially on our bodies you

330
00:12:48,069 --> 00:12:45,279
know just the simple movements that we

331
00:12:50,550 --> 00:12:48,079
make standing sitting and walking even

332
00:12:51,430 --> 00:12:50,560
though you don't have a you may not have

333
00:13:32,310 --> 00:12:51,440
a

334
00:13:33,670 --> 00:13:32,320
once once it's in orbit it just goes

335
00:13:35,910 --> 00:13:33,680
around and around the earth it's

336
00:13:38,470 --> 00:13:35,920
constantly falling though essentially

337
00:13:40,790 --> 00:13:38,480
when we when we talk about microgravity

338
00:13:42,470 --> 00:13:40,800

we can you can also say free fall so the

339
00:13:43,829 --> 00:13:42,480
space station is always falling toward

340
00:13:45,990 --> 00:13:43,839
the earth but the great thing is the

341
00:13:48,389 --> 00:13:46,000
earth is also moving away from it so

342
00:13:50,710 --> 00:13:48,399
that's this neat balance between gravity

343
00:13:52,150 --> 00:13:50,720
pulling it down and and the force of the

344
00:13:53,670 --> 00:13:52,160
space station and his feet of the space

345
00:13:55,590 --> 00:13:53,680
station carrying it away it's it's a

346
00:13:58,230 --> 00:13:55,600
nice balance which which creates that

347
00:14:00,230 --> 00:13:58,240
microgravity environment

348
00:14:01,590 --> 00:14:00,240
but the way it stays in space is is

349
00:14:03,350 --> 00:14:01,600
every once in a while we have to give it

350
00:14:05,829 --> 00:14:03,360
a little bit of a boost because there's

351
00:14:08,310 --> 00:14:05,839
just a little bit of friction out there

352
00:14:09,670 --> 00:14:08,320
just a few air molecules and everyone

353
00:14:11,509 --> 00:14:09,680
every time the space station hits one of

354
00:14:13,590 --> 00:14:11,519
those little air molecules it slows down

355
00:14:14,790 --> 00:14:13,600
ever so slightly

356
00:14:16,790 --> 00:14:14,800
so every once in a while we have to give

357
00:14:18,629 --> 00:14:16,800
the space station a little extra boost

358
00:14:21,430 --> 00:14:18,639
and it'll stay up there indefinitely

359
00:14:23,670 --> 00:14:21,440
until we're ready to take it down

360
00:14:27,030 --> 00:14:23,680
very good question very smart kids i can

361
00:14:29,350 --> 00:14:27,040
tell do we have another one

362
00:14:30,550 --> 00:14:29,360
hi my name is reagan uh i'm from

363
00:14:32,069 --> 00:14:30,560

huntsville

364
00:14:33,430 --> 00:14:32,079
what are the qualifications of an

365
00:14:35,750 --> 00:14:33,440
astronaut

366
00:14:38,470 --> 00:14:35,760
hey reign well the qualifications for

367
00:14:39,670 --> 00:14:38,480
astronauts are that they have to have an

368
00:14:41,350 --> 00:14:39,680
advanced

369
00:14:44,310 --> 00:14:41,360
education so you've got to finish

370
00:14:48,230 --> 00:14:44,320
college get a bachelor of science degree

371
00:14:49,269 --> 00:14:48,240
in science math technology engineering

372
00:14:51,430 --> 00:14:49,279
and also

373
00:14:53,750 --> 00:14:51,440
usually a work experience the more

374
00:14:55,030 --> 00:14:53,760
breadth you have seems to be really

375
00:14:57,590 --> 00:14:55,040
valuable

376
00:15:00,470 --> 00:14:57,600
our astronauts have have a wide variety

377
00:15:01,670 --> 00:15:00,480
of skill sets and experience there are

378
00:15:03,990 --> 00:15:01,680
people who are

379
00:15:07,990 --> 00:15:04,000
marine biologists there are geologists

380
00:15:10,230 --> 00:15:08,000
there are engineers there are

381
00:15:12,710 --> 00:15:10,240
boy there are a whole variety there's

382
00:15:15,670 --> 00:15:12,720
medical doctors so it almost seems like

383
00:15:17,269 --> 00:15:15,680
any career that you choose

384
00:15:19,750 --> 00:15:17,279
and if you want to be an astronaut be

385
00:15:21,509 --> 00:15:19,760
really good at what you do

386
00:15:23,829 --> 00:15:21,519
and enjoy what you're doing choose a

387
00:15:25,670 --> 00:15:23,839
field that is something you enjoy and

388
00:15:27,430 --> 00:15:25,680

you'll probably excel if you're doing

389
00:15:28,389 --> 00:15:27,440
something that you really enjoy

390
00:15:33,350 --> 00:15:28,399
and

391
00:15:34,790 --> 00:15:33,360
there are people in the military who

392
00:15:37,749 --> 00:15:34,800
become astronauts because of their

393
00:15:38,710 --> 00:15:37,759
experience flying so there's a there's a

394
00:15:44,790 --> 00:15:38,720
great

395
00:15:50,150 --> 00:15:44,800
really high skill sets and abilities

396
00:15:55,670 --> 00:15:52,790
hi i'm emily i'm from georgia besides

397
00:15:58,310 --> 00:15:55,680
exercise what do astronauts do

398
00:16:00,230 --> 00:15:58,320
boy astronauts are very very busy when i

399
00:16:02,069 --> 00:16:00,240
said they exercise two hours a day

400
00:16:03,269 --> 00:16:02,079
that's crammed in the middle of a very

401
00:16:05,350 --> 00:16:03,279
busy day

402
00:16:07,110 --> 00:16:05,360
an average day in space usually wake

403
00:16:09,269 --> 00:16:07,120
wake up around six in the morning now

404
00:16:11,670 --> 00:16:09,279
when i say six in the morning that's uh

405
00:16:13,829 --> 00:16:11,680
on greenwich mean time so for houston

406
00:16:15,670 --> 00:16:13,839
and for huntsville that's about two in

407
00:16:17,110 --> 00:16:15,680
the morning right or one in the morning

408
00:16:18,790 --> 00:16:17,120
depending on if it's if it's central

409
00:16:20,069 --> 00:16:18,800
daylight or if it's daylight savings

410
00:16:22,710 --> 00:16:20,079
time or not

411
00:16:24,710 --> 00:16:22,720
wake up at six have a little bit of time

412
00:16:26,550 --> 00:16:24,720
for hygiene eating breakfast getting

413
00:16:28,710 --> 00:16:26,560

ready for the day getting dressed and

414
00:16:30,150 --> 00:16:28,720
then right into a conference where you

415
00:16:32,629 --> 00:16:30,160
speak with ground controllers here in

416
00:16:34,629 --> 00:16:32,639
the space station control room and you

417
00:16:36,150 --> 00:16:34,639
kind of talk about what's going to go go

418
00:16:38,069 --> 00:16:36,160
on for the day and then you get right

419
00:16:39,990 --> 00:16:38,079
into doing science experiments

420
00:16:41,189 --> 00:16:40,000
maintenance of the space station and it

421
00:16:43,749 --> 00:16:41,199
takes a lot of work just to keep the

422
00:16:45,670 --> 00:16:43,759
space station going um variety of space

423
00:16:48,389 --> 00:16:45,680
station experiments you may be working

424
00:16:49,910 --> 00:16:48,399
with flame and combustion one minute and

425
00:16:51,749 --> 00:16:49,920
then the next minute taking an

426
00:16:54,230 --> 00:16:51,759
ultrasound or the next hour taking an

427
00:16:56,870 --> 00:16:54,240
ultrasound images of your heart and then

428
00:16:59,110 --> 00:16:56,880
you may go 10 to the aquatic habitat

429
00:17:01,749 --> 00:16:59,120
where you may have some fish

430
00:17:03,430 --> 00:17:01,759
and then have a quick lunch usually keep

431
00:17:04,949 --> 00:17:03,440
working throughout the day

432
00:17:07,029 --> 00:17:04,959
maybe have another conference with the

433
00:17:10,069 --> 00:17:07,039
doctor or the flight director just to

434
00:17:11,590 --> 00:17:10,079
keep tabs on how things are going

435
00:17:13,510 --> 00:17:11,600
the day usually ends with another

436
00:17:14,789 --> 00:17:13,520
conference where i talk about what

437
00:17:16,309 --> 00:17:14,799
happened during the day with the ground

438
00:17:17,750 --> 00:17:16,319

controllers talk maybe about what's

439
00:17:19,909 --> 00:17:17,760
going to happen the next day what worked

440
00:17:21,429 --> 00:17:19,919
what didn't work

441
00:17:23,750 --> 00:17:21,439
and in the middle there i said you know

442
00:17:25,510 --> 00:17:23,760
you had your two hours of exercise and

443
00:17:27,189 --> 00:17:25,520
then and then you have a little bit of

444
00:17:29,669 --> 00:17:27,199
free time and then and then bed and

445
00:17:30,870 --> 00:17:29,679
that's a very very busy day the

446
00:17:32,950 --> 00:17:30,880
astronauts

447
00:17:36,549 --> 00:17:32,960
have a tremendous workload and

448
00:17:39,029 --> 00:17:36,559
almost every minute is accounted for

449
00:17:40,710 --> 00:17:39,039
very busy day and it's every day every

450
00:17:42,070 --> 00:17:40,720
day they get a little time to talk to

451
00:17:44,230 --> 00:17:42,080
their families on the weekends and they

452
00:17:46,230 --> 00:17:44,240
can make a phone call here and there

453
00:17:47,909 --> 00:17:46,240
but but otherwise they're extremely busy

454
00:17:49,590 --> 00:17:47,919
there's six people on the international

455
00:17:51,830 --> 00:17:49,600
space station and they're working very

456
00:17:53,909 --> 00:17:51,840
hard so you can imagine how much work is

457
00:17:55,750 --> 00:17:53,919
getting done

458
00:17:57,590 --> 00:17:55,760
very good question and i think we have

459
00:18:01,029 --> 00:17:57,600
time for another one do we have another

460
00:18:05,270 --> 00:18:02,310
my name is abigail and i'm from

461
00:18:06,390 --> 00:18:05,280
huntsville alabama and i was wondering

462
00:18:08,470 --> 00:18:06,400
um

463
00:18:09,430 --> 00:18:08,480

have there ever been any problems in

464
00:18:10,950 --> 00:18:09,440
with this

465
00:18:12,789 --> 00:18:10,960
rocket ship or anything that happened

466
00:18:15,669 --> 00:18:12,799
that wasn't supposed to happen

467
00:18:17,350 --> 00:18:15,679
absolutely space space travel abigail is

468
00:18:19,909 --> 00:18:17,360
is is difficult we've been doing it for

469
00:18:22,310 --> 00:18:19,919
50 years we're still learning there have

470
00:18:23,830 --> 00:18:22,320
absolutely been um some challenges to

471
00:18:25,669 --> 00:18:23,840
overcome we've had we've had some

472
00:18:28,390 --> 00:18:25,679
accidents along the way we've lost some

473
00:18:29,990 --> 00:18:28,400
people and that's very hard it's

474
00:18:31,270 --> 00:18:30,000
something that we accept in the space

475
00:18:32,630 --> 00:18:31,280
business though

476
00:18:34,789 --> 00:18:32,640
we go into this knowing that we're

477
00:18:37,350 --> 00:18:34,799
pushing the very boundaries of human

478
00:18:38,950 --> 00:18:37,360
ability and when you're exploring and

479
00:18:40,230 --> 00:18:38,960
you're pushing boundaries

480
00:18:43,270 --> 00:18:40,240
there's going to be some losses and

481
00:18:45,590 --> 00:18:43,280
we've had some very sad losses um but it

482
00:18:47,669 --> 00:18:45,600
also gives nasa an opportunity and our

483
00:18:49,110 --> 00:18:47,679
energy and our international partners to

484
00:18:51,190 --> 00:18:49,120
really shine too because when you

485
00:18:52,150 --> 00:18:51,200
overcome a challenge it really feels

486
00:18:53,909 --> 00:18:52,160
good

487
00:18:56,150 --> 00:18:53,919
like i mentioned earlier just yesterday

488
00:18:57,909 --> 00:18:56,160

there was a very very difficult eva

489
00:19:00,310 --> 00:18:57,919
that's a spacewalk

490
00:19:03,190 --> 00:19:00,320
that was performed that fixed a really

491
00:19:05,110 --> 00:19:03,200
serious problem with power um that it

492
00:19:08,710 --> 00:19:05,120
was basically cut the space station's

493
00:19:11,430 --> 00:19:08,720
power by about half essentially and so

494
00:19:13,110 --> 00:19:11,440
every day we're having challenges almost

495
00:19:15,110 --> 00:19:13,120
every day and when we overcome those

496
00:19:17,190 --> 00:19:15,120
challenges it feels really good and it

497
00:19:19,430 --> 00:19:17,200
helps us to learn so that we can do

498
00:19:21,669 --> 00:19:19,440
better in the future

499
00:19:23,750 --> 00:19:21,679
and maybe one day get to mars

500
00:19:28,150 --> 00:19:23,760
i believe it we will

501
00:19:31,669 --> 00:19:30,150
what was the first mission they ever

502
00:19:33,270 --> 00:19:31,679
worked on

503
00:19:36,470 --> 00:19:33,280
me personally

504
00:19:38,950 --> 00:19:36,480
i was doing research as a college

505
00:19:41,590 --> 00:19:38,960
student the first mission i helped with

506
00:19:42,390 --> 00:19:41,600
was sts-84

507
00:19:44,710 --> 00:19:42,400
and

508
00:19:46,310 --> 00:19:44,720
this experiment actually

509
00:19:48,150 --> 00:19:46,320
went to the mir space station it

510
00:19:50,150 --> 00:19:48,160
launched on the space shuttle went to

511
00:19:52,230 --> 00:19:50,160
the mir space station and stayed there

512
00:19:55,029 --> 00:19:52,240
with astronaut mike foale and it was a

513
00:19:57,350 --> 00:19:55,039

little little uh experiment that studied

514
00:19:59,510 --> 00:19:57,360
circadian rhythms or or sleep and how

515
00:20:02,390 --> 00:19:59,520
well astronauts may um

516
00:20:03,830 --> 00:20:02,400
may learn uh how to how to sleep better

517
00:20:05,669 --> 00:20:03,840
and how light

518
00:20:07,510 --> 00:20:05,679
affects how well they sleep and actually

519
00:20:08,870 --> 00:20:07,520
the experiment was on little beetles we

520
00:20:11,990 --> 00:20:08,880
launched little beetles and little

521
00:20:13,510 --> 00:20:12,000
miniature um holding canisters and that

522
00:20:15,110 --> 00:20:13,520
was the first the first mission that i

523
00:20:17,270 --> 00:20:15,120
worked on and i've been working ever

524
00:20:19,830 --> 00:20:17,280
since on a whole bunch of missions it's

525
00:20:21,990 --> 00:20:19,840
it's it's been a tremendous honor and i

526
00:20:23,830 --> 00:20:22,000
love doing it every day and if it's

527
00:20:24,630 --> 00:20:23,840
something you want to do

528
00:20:26,310 --> 00:20:24,640
just

529
00:20:28,950 --> 00:20:26,320
keep working at it it's sometimes

530
00:20:31,750 --> 00:20:28,960
there's obstacles to overcome in school

531
00:20:34,149 --> 00:20:31,760
or in your personal life

532
00:20:35,909 --> 00:20:34,159
i was very very happy and lucky that i

533
00:20:39,669 --> 00:20:35,919
knew what i wanted to do so i just set

534
00:20:45,190 --> 00:20:39,679
my goal and i worked toward it steadily

535
00:20:50,870 --> 00:20:48,310
my name is gemin and i'm from ohio and

536
00:20:53,190 --> 00:20:50,880
how did the people know where to land

537
00:20:53,990 --> 00:20:53,200
curiosity on mars

538
00:20:55,350 --> 00:20:54,000

wow

539
00:20:57,029 --> 00:20:55,360
i don't even know the answer that

540
00:20:59,430 --> 00:20:57,039
question but i can guess

541
00:21:01,669 --> 00:20:59,440
and i think they chose a place on mars

542
00:21:03,990 --> 00:21:01,679
that was really interesting to them

543
00:21:05,750 --> 00:21:04,000
geologically but i am definitely not the

544
00:21:07,510 --> 00:21:05,760
right person to ask there's so many

545
00:21:09,909 --> 00:21:07,520
things to learn about nasa and we can't

546
00:21:11,590 --> 00:21:09,919
possibly all know all the answers

547
00:21:13,110 --> 00:21:11,600
and i'm certainly not the person you ask

548
00:21:15,950 --> 00:21:13,120
either i'm sorry i don't know the answer

549
00:21:17,669 --> 00:21:15,960
to that but you can go to

550
00:21:20,710 --> 00:21:17,679
www.nasa.gov there's a ton of

551
00:21:22,470 --> 00:21:20,720
information there um obviously there's a

552
00:21:24,789 --> 00:21:22,480
ton of information about mars curiosity

553
00:21:26,549 --> 00:21:24,799
there are several people who tweet

554
00:21:27,909 --> 00:21:26,559
on twitter so if any of you guys are on

555
00:21:30,470 --> 00:21:27,919
twitter

556
00:21:31,510 --> 00:21:30,480
go there i would say follow the flight

557
00:21:32,789 --> 00:21:31,520
director

558
00:21:35,590 --> 00:21:32,799
mohawk guy

559
00:21:37,430 --> 00:21:35,600
uh bobak podowski he's known as tweets

560
00:21:39,270 --> 00:21:37,440
out loud on twitter and you can get a

561
00:21:41,190 --> 00:21:39,280
lot of information about what exactly is

562
00:21:43,590 --> 00:21:41,200
going on with that mars rover

563
00:21:45,029 --> 00:21:43,600

there on mars and in the who that landed

564
00:21:50,710 --> 00:21:45,039
in the gale crater

565
00:21:55,029 --> 00:21:52,390
hi i'm nicole

566
00:21:57,669 --> 00:21:55,039
i'm from stone mountain georgia and i

567
00:21:59,909 --> 00:21:57,679
was wondering how it felt when you had a

568
00:22:02,149 --> 00:21:59,919
successful landing from either a human

569
00:22:05,510 --> 00:22:02,159
or an animal and like they came back and

570
00:22:07,590 --> 00:22:05,520
they went there with no problems

571
00:22:09,669 --> 00:22:07,600
well that that mission that i mentioned

572
00:22:12,070 --> 00:22:09,679
earlier sts-84 being that it was the

573
00:22:14,950 --> 00:22:12,080
first mission that i worked on

574
00:22:16,470 --> 00:22:14,960
personally um it was tremendous i had

575
00:22:19,029 --> 00:22:16,480
watched a lot of space shuttle missions

576
00:22:21,029 --> 00:22:19,039
launched before that as and and just

577
00:22:22,870 --> 00:22:21,039
watching those missions happen very

578
00:22:25,190 --> 00:22:22,880
exciting and thrilling but when you have

579
00:22:27,029 --> 00:22:25,200
a part when you're playing a part in a

580
00:22:28,789 --> 00:22:27,039
small role

581
00:22:31,669 --> 00:22:28,799
it really gives you tremendous

582
00:22:33,510 --> 00:22:31,679
satisfaction everyone here at nasa

583
00:22:35,750 --> 00:22:33,520
pretty much everyone has a very small

584
00:22:37,510 --> 00:22:35,760
role for the most part when you add up

585
00:22:39,830 --> 00:22:37,520
all those people working together you

586
00:22:41,909 --> 00:22:39,840
can do tremendous things and you know

587
00:22:45,750 --> 00:22:41,919
the astronauts they're just the most

588
00:22:47,430 --> 00:22:45,760

visible pieces of of us of a mission um

589
00:22:49,270 --> 00:22:47,440
but there's there's thousands of people

590
00:22:51,590 --> 00:22:49,280
working every day to make sure that

591
00:22:54,149 --> 00:22:51,600
we're successful and all those thousands

592
00:22:56,310 --> 00:22:54,159
of people um

593
00:22:57,669 --> 00:22:56,320
i get tremendous self-satisfaction

594
00:22:59,750 --> 00:22:57,679
knowing that i'm helping just the

595
00:23:01,830 --> 00:22:59,760
littlest bit and that that makes me feel

596
00:23:04,470 --> 00:23:01,840
really good it's it just makes you feel

597
00:23:07,909 --> 00:23:04,480
just good inside and i think that's a in

598
00:23:10,549 --> 00:23:07,919
overall the consensus here i honestly um

599
00:23:12,710 --> 00:23:10,559
at landing you know i've seen many many

600
00:23:14,549 --> 00:23:12,720
missions land and i can tell you every

601
00:23:16,630 --> 00:23:14,559
time we land and we have a successful

602
00:23:18,230 --> 00:23:16,640
mission i get goosebumps i get excited

603
00:23:19,990 --> 00:23:18,240
it doesn't change

604
00:23:21,990 --> 00:23:20,000
i never become desensitized well i think

605
00:23:22,789 --> 00:23:22,000
yeah yeah i've seen it once i've seen it

606
00:23:24,149 --> 00:23:22,799
all

607
00:23:26,470 --> 00:23:24,159
every mission is different and every

608
00:23:28,870 --> 00:23:26,480
mission is special and everyone involved

609
00:23:30,870 --> 00:23:28,880
in that is very special and unique and

610
00:23:33,430 --> 00:23:30,880
important to us as well as the mission

611
00:23:35,190 --> 00:23:33,440
as well and so yeah it's very important

612
00:23:37,990 --> 00:23:35,200
to us and i think of course we feel

613
00:23:42,789 --> 00:23:38,000

elated when we know that we nailed it

614
00:23:48,310 --> 00:23:45,669
i'm caitlin and i'm from georgia

615
00:23:50,230 --> 00:23:48,320
and i was wondering about how many

616
00:23:52,390 --> 00:23:50,240
different types of animals have you sent

617
00:23:55,830 --> 00:23:52,400
up to space

618
00:23:57,750 --> 00:23:55,840
well personally let's talk generically

619
00:24:00,549 --> 00:23:57,760
boy there's been fish there's been

620
00:24:03,350 --> 00:24:00,559
monkeys there's been insects

621
00:24:05,590 --> 00:24:03,360
there's been mice and rats

622
00:24:07,430 --> 00:24:05,600
i would say at least 10 probably

623
00:24:10,070 --> 00:24:07,440
different types of animals have been in

624
00:24:12,549 --> 00:24:10,080
space and and we can we can study them

625
00:24:14,710 --> 00:24:12,559
and learn from them as well as from our

626
00:24:16,549 --> 00:24:14,720
astronauts um

627
00:24:18,230 --> 00:24:16,559
so i think

628
00:24:19,269 --> 00:24:18,240
quite a few critters have gone up into

629
00:24:21,830 --> 00:24:19,279
space so

630
00:24:23,830 --> 00:24:21,840
along with our people critters

631
00:24:25,350 --> 00:24:23,840
i think uh that's about all the time

632
00:24:27,110 --> 00:24:25,360
that we have that was the last question

633
00:24:29,269 --> 00:24:27,120
we really appreciate you guys coming out

634
00:24:30,549 --> 00:24:29,279
and joining us again we are inside the

635
00:24:33,350 --> 00:24:30,559
international space station flight