

1
00:00:06,309 --> 00:00:01,910
station this is houston are you ready

2
00:00:11,589 --> 00:00:07,829
houston this is the international space

3
00:00:15,910 --> 00:00:13,749
monrovia unified school district this is

4
00:00:22,870 --> 00:00:15,920
mission control houston please call the

5
00:00:32,069 --> 00:00:25,910
station this is shelley bonus here with

6
00:00:35,670 --> 00:00:34,310
monrovia high school we have you loud

7
00:00:37,590 --> 00:00:35,680
and clear greetings aboard the

8
00:00:39,670 --> 00:00:37,600
international space station from the

9
00:00:40,950 --> 00:00:39,680
crew of expedition 34 i'm kevin ford

10
00:00:42,069 --> 00:00:40,960
along with tom marshburn and chris

11
00:00:46,389 --> 00:00:42,079
hadfield

12
00:00:46,399 --> 00:00:49,670
great

13
00:00:55,830 --> 00:00:52,389

hi i'm

14

00:01:03,830 --> 00:00:58,069

how do you digest your food without

15

00:01:09,670 --> 00:01:07,190

well i'm glad we can i'm not a doctor so

16

00:01:11,429 --> 00:01:09,680

i don't know exactly how it works but i

17

00:01:14,070 --> 00:01:11,439

know like when i'm in bed at night i can

18

00:01:16,070 --> 00:01:14,080

still digest my food my organs have a

19

00:01:18,789 --> 00:01:16,080

way of processing the food that works

20

00:01:20,070 --> 00:01:18,799

without the the help of gravity it is a

21

00:01:21,429 --> 00:01:20,080

little bit different it takes a little

22

00:01:22,789 --> 00:01:21,439

while for our bodies to get used to

23

00:01:25,749 --> 00:01:22,799

being up here

24

00:01:27,429 --> 00:01:25,759

my digestive system wasn't exactly uh

25

00:01:28,870 --> 00:01:27,439

normal after i got here for several

26

00:01:31,590 --> 00:01:28,880

weeks and it's always been a little bit

27

00:01:33,670 --> 00:01:31,600

different than earth but i feel good and

28

00:01:35,350 --> 00:01:33,680

i i can digest all my food we have to

29

00:01:37,190 --> 00:01:35,360

eat a lot more up here it seems to me

30

00:01:39,109 --> 00:01:37,200

than i do on earth so i think there are

31

00:01:40,390 --> 00:01:39,119

still some mysteries left and hopefully

32

00:01:42,149 --> 00:01:40,400

one of these days all the smart

33

00:01:56,550 --> 00:01:42,159

scientists will figure it all out maybe

34

00:01:59,350 --> 00:01:58,149

hello

35

00:02:01,990 --> 00:01:59,360

i'm jack

36

00:02:05,350 --> 00:02:02,000

is it always night and never day on on

37

00:02:11,750 --> 00:02:05,360

the iss also what language you use since

38

00:02:16,470 --> 00:02:14,070

well you know jack we go through 16

39

00:02:20,229 --> 00:02:16,480

sunrises and sunsets a day we're going

40

00:02:21,430 --> 00:02:20,239

17 500 miles an hour so that means

41

00:02:23,589 --> 00:02:21,440

time on the space station could be

42

00:02:25,350 --> 00:02:23,599

anytime we want to so between all the

43

00:02:27,510 --> 00:02:25,360

international partners we decided we're

44

00:02:29,110 --> 00:02:27,520

going to use greenwich mean time and the

45

00:02:30,470 --> 00:02:29,120

ground sets our schedule and they tell

46

00:02:33,030 --> 00:02:30,480

us when it's time to go to sleep and

47

00:02:35,670 --> 00:02:33,040

when to wake up so that's how we do it

48

00:02:37,589 --> 00:02:35,680

but we can't look outside and tell

49

00:02:39,750 --> 00:02:37,599

right now the uh

50

00:02:41,910 --> 00:02:39,760

the official language that we use on the

51
00:02:44,550 --> 00:02:41,920
space station is english but we love

52
00:02:46,070 --> 00:02:44,560
learning russian and speaking russian

53
00:02:48,309 --> 00:02:46,080
with our russian colleagues we work a

54
00:02:49,910 --> 00:02:48,319
lot of our procedures in russian and

55
00:02:51,670 --> 00:02:49,920
about a third of the time we're speaking

56
00:02:53,509 --> 00:02:51,680
russian and uh if there's an

57
00:02:55,430 --> 00:02:53,519
international partner up here from japan

58
00:02:56,309 --> 00:02:55,440
or from uh from any of the countries in

59
00:02:58,550 --> 00:02:56,319
europe

60
00:03:00,070 --> 00:02:58,560
then uh we'll hear that language as well

61
00:03:04,790 --> 00:03:00,080
it's a lot of fun learning new languages

62
00:03:15,350 --> 00:03:07,430
hi my name is angel what do you miss

63
00:03:20,149 --> 00:03:16,830

hi angel

64

00:03:23,910 --> 00:03:20,159

uh you know it's a really interesting

65

00:03:25,830 --> 00:03:23,920

place to work up here we are busy there

66

00:03:27,350 --> 00:03:25,840

are experiments the view out the window

67

00:03:29,190 --> 00:03:27,360

is unbelievable

68

00:03:30,710 --> 00:03:29,200

but it's not the same as as being on

69

00:03:32,789 --> 00:03:30,720

earth and i think for me i don't know

70

00:03:35,350 --> 00:03:32,799

what the the other crew members think

71

00:03:36,789 --> 00:03:35,360

but for me the thing i miss the most

72

00:03:39,990 --> 00:03:36,799

is just the

73

00:03:41,990 --> 00:03:40,000

the physical contact of living with

74

00:03:43,990 --> 00:03:42,000

family and friends on earth the the

75

00:03:46,630 --> 00:03:44,000

hugging and handshakes and

76

00:03:48,229 --> 00:03:46,640

and uh just being with people around

77

00:03:51,110 --> 00:03:48,239

that uh you know that you know and you

78

00:03:53,670 --> 00:03:51,120

love um this is a good hard-working crew

79

00:03:55,589 --> 00:03:53,680

we have lots of stuff to do but uh but

80

00:03:57,670 --> 00:03:55,599

everyone likes you know being welcomed

81

00:03:58,869 --> 00:03:57,680

and close to family and i think that's

82

00:04:01,110 --> 00:03:58,879

one of the things i'll really look

83

00:04:02,789 --> 00:04:01,120

forward to when i get home is just

84

00:04:04,949 --> 00:04:02,799

hugging my kids and my wife and and

85

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

seeing people and and that physical

86

00:04:14,630 --> 00:04:06,720

contact of being around

87

00:04:22,950 --> 00:04:17,110

hi i'm kalani what is it like to float

88

00:04:26,950 --> 00:04:24,710

well we can show you how happy it makes

89

00:04:30,230 --> 00:04:26,960

this how's this

90

00:04:32,390 --> 00:04:30,240

well uh you know it's um very unusual at

91

00:04:34,550 --> 00:04:32,400

first imagine imagine if you found

92

00:04:36,629 --> 00:04:34,560

yourself just floating at home or

93

00:04:38,469 --> 00:04:36,639

imagine how what your pet would think if

94

00:04:40,790 --> 00:04:38,479

it found itself floating it's a little

95

00:04:42,629 --> 00:04:40,800

crazy uh the first time it happens to

96

00:04:44,310 --> 00:04:42,639

you and you're a little insecure

97

00:04:45,749 --> 00:04:44,320

you want to grab a hold of things you

98

00:04:47,030 --> 00:04:45,759

want to have pressure on your feet or

99

00:04:49,030 --> 00:04:47,040

when you sit down you like to have

100

00:04:50,310 --> 00:04:49,040

pressure on your backside but we never

101
00:04:52,469 --> 00:04:50,320
have that up here even when we're

102
00:04:55,030 --> 00:04:52,479
sleeping we're floating almost touching

103
00:04:56,629 --> 00:04:55,040
nothing and i would say it's a lot like

104
00:04:57,909 --> 00:04:56,639
being in warm water in a pool or

105
00:04:59,909 --> 00:04:57,919
something if you close your eyes and

106
00:05:01,990 --> 00:04:59,919
imagine just floating and having no

107
00:05:04,390 --> 00:05:02,000
pressure points on you anywhere

108
00:05:06,230 --> 00:05:04,400
so it's really unusual after you get

109
00:05:08,230 --> 00:05:06,240
used to it and you think about it it's

110
00:05:10,390 --> 00:05:08,240
really a lot of fun you can just pick a

111
00:05:12,790 --> 00:05:10,400
corner of the room and float up into

112
00:05:14,550 --> 00:05:12,800
that corner and enjoy floating back down

113
00:05:16,550 --> 00:05:14,560

and of course we like to play a lot of

114

00:05:18,230 --> 00:05:16,560

games up here in zero g so there are a

115

00:05:19,909 --> 00:05:18,240

lot of advantages to being up here i

116

00:05:21,990 --> 00:05:19,919

don't think you'd want to do it forever

117

00:05:23,670 --> 00:05:22,000

because we we're really engineered and

118

00:05:25,270 --> 00:05:23,680

made for gravity and i like running

119

00:05:27,110 --> 00:05:25,280

around and walking through parks and

120

00:05:28,710 --> 00:05:27,120

stuff like that so there are things i

121

00:05:30,150 --> 00:05:28,720

miss about earth i even miss gravity

122

00:05:31,670 --> 00:05:30,160

about earth but i do like floating

123

00:05:36,629 --> 00:05:31,680

around for uh for the time i've been up

124

00:05:46,710 --> 00:05:39,749

hi my name is jared and what do you

125

00:05:50,710 --> 00:05:48,790

well everybody's got their favorite

126

00:05:52,390 --> 00:05:50,720

thing to do during free time we don't

127

00:05:53,990 --> 00:05:52,400

have a lot of it

128

00:05:55,990 --> 00:05:54,000

some of us like to play guitar some of

129

00:05:58,070 --> 00:05:56,000

us like to read but i one thing

130

00:05:59,749 --> 00:05:58,080

everybody loves to do and that's to look

131

00:06:02,469 --> 00:05:59,759

out the window we've got the most

132

00:06:04,790 --> 00:06:02,479

spectacular view i can imagine

133

00:06:06,950 --> 00:06:04,800

being 250 miles above the earth so we're

134

00:06:08,710 --> 00:06:06,960

always looking for interesting beautiful

135

00:06:10,390 --> 00:06:08,720

land forms we're

136

00:06:12,309 --> 00:06:10,400

looking for cities that we recognize

137

00:06:13,830 --> 00:06:12,319

even new cities we've never been to and

138

00:06:15,430 --> 00:06:13,840

we've learned an incredible amount about

139

00:06:16,950 --> 00:06:15,440

the geography of the earth and what it

140

00:06:19,510 --> 00:06:16,960

really looks like not just what it looks

141

00:06:21,590 --> 00:06:19,520

like on a map so probably the

142

00:06:27,350 --> 00:06:21,600

most popular thing to do in our spare

143

00:06:36,070 --> 00:06:29,909

hi my name is grant what inspired you to

144

00:06:41,189 --> 00:06:38,309

hey grant um

145

00:06:42,550 --> 00:06:41,199

you're going to grow up to be something

146

00:06:43,670 --> 00:06:42,560

guaranteed you're going to grow up to be

147

00:06:45,590 --> 00:06:43,680

something

148

00:06:47,590 --> 00:06:45,600

and the question is you know how's that

149

00:06:48,950 --> 00:06:47,600

going to happen and who and what are you

150

00:06:50,870 --> 00:06:48,960

going to grow up to be

151
00:06:52,550 --> 00:06:50,880
and it's really up to you because you're

152
00:06:54,950 --> 00:06:52,560
the product of the the decisions that

153
00:06:58,550 --> 00:06:54,960
you make and for me

154
00:07:01,110 --> 00:06:58,560
when i was your age i was inspired by

155
00:07:03,270 --> 00:07:01,120
the very first people who left earth and

156
00:07:05,189 --> 00:07:03,280
walked in another heavenly body another

157
00:07:08,309 --> 00:07:05,199
planet the first two people who walked

158
00:07:09,270 --> 00:07:08,319
on the moon and their names were

159
00:07:10,629 --> 00:07:09,280
ed

160
00:07:13,029 --> 00:07:10,639
and neal

161
00:07:15,670 --> 00:07:13,039
buzz aldrin and neil armstrong and to me

162
00:07:17,430 --> 00:07:15,680
i just thought you know it's it was up

163
00:07:19,029 --> 00:07:17,440

until yesterday it was impossible to

164

00:07:21,270 --> 00:07:19,039

walk on the moon and now people have

165

00:07:22,870 --> 00:07:21,280

done that and i thought who knows what's

166

00:07:24,390 --> 00:07:22,880

going to be possible for me but i'm

167

00:07:25,749 --> 00:07:24,400

going to start getting ready i'm going

168

00:07:28,070 --> 00:07:25,759

to start thinking about things that i

169

00:07:31,110 --> 00:07:28,080

can do then maybe someday i could do

170

00:07:33,589 --> 00:07:31,120

something like that and over the last 40

171

00:07:35,510 --> 00:07:33,599

years i turned myself into an astronaut

172

00:07:37,110 --> 00:07:35,520

like we all did here and give us a

173

00:07:38,870 --> 00:07:37,120

chance to do something like this and it

174

00:07:43,110 --> 00:07:38,880

was because of those people who inspired

175

00:07:48,390 --> 00:07:46,070

hi i'm emily how do you emotionally

176

00:07:53,430 --> 00:07:48,400

prepare your mind to go into space for

177

00:07:57,909 --> 00:07:55,189

hi emily that that's a really great

178

00:08:00,469 --> 00:07:57,919

question staying in space for uh five or

179

00:08:02,469 --> 00:08:00,479

six months is very challenging uh we

180

00:08:04,469 --> 00:08:02,479

know before we volunteer of course that

181

00:08:06,550 --> 00:08:04,479

we're gonna be here this long and it's

182

00:08:09,270 --> 00:08:06,560

something uh it's something we just set

183

00:08:11,270 --> 00:08:09,280

our sights on when i when i was uh

184

00:08:13,430 --> 00:08:11,280

thinking about coming i was thinking

185

00:08:15,909 --> 00:08:13,440

about how many weekends i had up here i

186

00:08:17,589 --> 00:08:15,919

have about 22 or 23 free weekends the

187

00:08:19,749 --> 00:08:17,599

rest of the time i'm really working hard

188

00:08:21,189 --> 00:08:19,759

and the days just are flying by and what

189

00:08:23,670 --> 00:08:21,199

would i like to do with those weekends

190

00:08:25,510 --> 00:08:23,680

and to me 22 or 23 weekends in space

191

00:08:27,749 --> 00:08:25,520

didn't seem like very many to me so

192

00:08:29,990 --> 00:08:27,759

frankly the time has flown by for me and

193

00:08:31,909 --> 00:08:30,000

i didn't expect it to seem long but for

194

00:08:33,589 --> 00:08:31,919

those things where you you have to might

195

00:08:36,230 --> 00:08:33,599

like i might get an extension and spend

196

00:08:38,230 --> 00:08:36,240

maybe more months in space and when i

197

00:08:40,310 --> 00:08:38,240

have to face something like that i just

198

00:08:42,310 --> 00:08:40,320

kind of face it one day at a time and i

199

00:08:43,990 --> 00:08:42,320

realize that you know if i have to be

200

00:08:45,670 --> 00:08:44,000

someplace that i wouldn't want to be for

201
00:08:47,350 --> 00:08:45,680
a long time i love being here but if it

202
00:08:49,670 --> 00:08:47,360
was something that i wanted to get

203
00:08:51,590 --> 00:08:49,680
through that each day or each hour is

204
00:08:53,269 --> 00:08:51,600
just it's that much shorter for me that

205
00:08:55,110 --> 00:08:53,279
i have remaining if i have to do a long

206
00:08:56,949 --> 00:08:55,120
run for exercise or something like that

207
00:08:59,350 --> 00:08:56,959
so it's just kind of a mental game i

208
00:09:01,269 --> 00:08:59,360
play with myself and i i'm i'm used to

209
00:09:06,389 --> 00:09:01,279
handling those kinds of challenges those

210
00:09:17,269 --> 00:09:08,470
hi my name is stephen and why doesn't

211
00:09:21,430 --> 00:09:18,870
you know why it's because of a lot of

212
00:09:22,310 --> 00:09:21,440
very smart people that planned in

213
00:09:23,670 --> 00:09:22,320

building

214

00:09:25,590 --> 00:09:23,680

this spaceship

215

00:09:27,910 --> 00:09:25,600

and that's why we need a nation with a

216

00:09:29,269 --> 00:09:27,920

lot of knowledge in history a space

217

00:09:30,870 --> 00:09:29,279

faring nation to be able to figure these

218

00:09:33,590 --> 00:09:30,880

things out so

219

00:09:36,150 --> 00:09:33,600

we bring up air in tanks and there's

220

00:09:38,230 --> 00:09:36,160

oxygen in there we also have brought up

221

00:09:39,990 --> 00:09:38,240

liquid oxygen in tanks that's sitting on

222

00:09:41,670 --> 00:09:40,000

the outside of the space station that's

223

00:09:43,670 --> 00:09:41,680

really precious liquid there we don't

224

00:09:45,509 --> 00:09:43,680

want to use that very much but we have a

225

00:09:47,430 --> 00:09:45,519

lot stored up here if we need it

226

00:09:49,030 --> 00:09:47,440

one of the coolest things i think is the

227

00:09:51,190 --> 00:09:49,040

oxygen we breathe in and then breathe

228

00:09:52,230 --> 00:09:51,200

out again and that comes out in the in

229

00:09:53,910 --> 00:09:52,240

our sweat

230

00:09:55,670 --> 00:09:53,920

that's all grabbed by the system of the

231

00:09:57,350 --> 00:09:55,680

space station and they take those oxygen

232

00:09:59,670 --> 00:09:57,360

molecules back out

233

00:10:01,110 --> 00:09:59,680

those systems do and uh put it back into

234

00:10:03,190 --> 00:10:01,120

the air so we can rebreathe a lot of

235

00:10:05,190 --> 00:10:03,200

that oxygen so we use up just a little

236

00:10:06,310 --> 00:10:05,200

bit we have supplies on board but we

237

00:10:07,910 --> 00:10:06,320

reuse

238

00:10:10,069 --> 00:10:07,920

a lot of the oxygen as well it's a

239

00:10:15,509 --> 00:10:10,079

brilliant engineering system and it's

240

00:10:25,509 --> 00:10:17,509

hi i'm gregory what have you discovered

241

00:10:28,790 --> 00:10:27,590

you know i've this was my third space

242

00:10:30,710 --> 00:10:28,800

flight and

243

00:10:32,790 --> 00:10:30,720

on the previous two flights i tried to

244

00:10:34,550 --> 00:10:32,800

tell people afterwards just how

245

00:10:37,110 --> 00:10:34,560

beautiful it is what an amazing

246

00:10:39,110 --> 00:10:37,120

experience a new experience it is

247

00:10:41,829 --> 00:10:39,120

but on this flight because of of new

248

00:10:43,509 --> 00:10:41,839

technology that nasa has put up here

249

00:10:45,910 --> 00:10:43,519

we can send

250

00:10:48,550 --> 00:10:45,920

pictures and sounds and things from the

251
00:10:50,550 --> 00:10:48,560
space station almost right away to the

252
00:10:51,350 --> 00:10:50,560
earth so that people can really start to

253
00:10:54,069 --> 00:10:51,360
see

254
00:10:55,670 --> 00:10:54,079
this new thing that people are doing and

255
00:10:57,750 --> 00:10:55,680
because of that because of all the

256
00:10:59,670 --> 00:10:57,760
different ways the social media and like

257
00:11:02,470 --> 00:10:59,680
talking to you today

258
00:11:05,350 --> 00:11:02,480
what's really surprised me is the huge

259
00:11:07,350 --> 00:11:05,360
amount of reaction to that the hundreds

260
00:11:09,670 --> 00:11:07,360
of thousands of people all around the

261
00:11:11,350 --> 00:11:09,680
world that are directly following what

262
00:11:13,110 --> 00:11:11,360
we're doing here really interested in

263
00:11:14,949 --> 00:11:13,120

what we're doing and actually making it

264

00:11:16,949 --> 00:11:14,959

part of their lives so i think the thing

265

00:11:19,910 --> 00:11:16,959

that surprised me the most and that i

266

00:11:22,069 --> 00:11:19,920

really like is the huge um

267

00:11:24,310 --> 00:11:22,079

support and interest

268

00:11:31,430 --> 00:11:24,320

in this new human exploration of space

269

00:11:35,910 --> 00:11:33,829

hi my name is phoebe and what is the

270

00:11:41,430 --> 00:11:35,920

best part about being in a low gravity

271

00:11:46,790 --> 00:11:43,990

well uh the floating is really really

272

00:11:48,949 --> 00:11:46,800

fun like we said before uh your food

273

00:11:51,190 --> 00:11:48,959

floats your microphone floats

274

00:11:54,629 --> 00:11:51,200

and uh your friends float

275

00:11:55,829 --> 00:11:54,639

but uh what the coolest thing i think is

276

00:11:58,389 --> 00:11:55,839

um

277

00:12:00,389 --> 00:11:58,399

are the experiments that we can do in

278

00:12:02,949 --> 00:12:00,399

this really it's it's all it's for all

279

00:12:06,389 --> 00:12:02,959

practical purposes zero gravity and we

280

00:12:08,629 --> 00:12:06,399

can do things with fluids we can watch a

281

00:12:10,629 --> 00:12:08,639

glob of water react in front of us so

282

00:12:13,030 --> 00:12:10,639

where we can watch it inside

283

00:12:16,470 --> 00:12:13,040

inside a very expensive and intricate

284

00:12:20,150 --> 00:12:16,480

chamber to study fluid flow dynamics

285

00:12:22,310 --> 00:12:20,160

we can study combustion where

286

00:12:25,030 --> 00:12:22,320

things are burning in an environment

287

00:12:27,990 --> 00:12:25,040

where the gravity doesn't force air flow

288

00:12:29,990 --> 00:12:28,000

because uh on the earth there's a

289

00:12:32,470 --> 00:12:30,000

phenomenon called convection when things

290

00:12:34,069 --> 00:12:32,480

burn it pulls air in from one side and

291

00:12:35,829 --> 00:12:34,079

without feeding it air it burns

292

00:12:38,310 --> 00:12:35,839

differently and we have combustion racks

293

00:12:39,590 --> 00:12:38,320

up here and fluids racks and we can

294

00:12:42,790 --> 00:12:39,600

study the way

295

00:12:44,870 --> 00:12:42,800

we behave or we we age and we change in

296

00:12:46,550 --> 00:12:44,880

the microgravity environment and the way

297

00:12:48,629 --> 00:12:46,560

plants and animals do also so there's

298

00:12:51,190 --> 00:12:48,639

just many things you can study without

299

00:12:53,030 --> 00:12:51,200

gravity that can tell us a lot about the

300

00:12:54,949 --> 00:12:53,040

intricate details of the way things work

301
00:12:57,110 --> 00:12:54,959
on earth we can either take them back to

302
00:12:59,509 --> 00:12:57,120
earth or we can use them as

303
00:13:01,110 --> 00:12:59,519
knowledge learned for future space

304
00:13:06,470 --> 00:13:01,120
flights so that's really the coolest

305
00:13:14,150 --> 00:13:08,629
hi my name is even what do you do in

306
00:13:17,829 --> 00:13:16,790
hi eve we've got that all planned out

307
00:13:20,550 --> 00:13:17,839
right now

308
00:13:22,870 --> 00:13:20,560
and what we can do is

309
00:13:24,629 --> 00:13:22,880
uh the main thing we could do is use our

310
00:13:25,430 --> 00:13:24,639
soyuz our spaceship that brought us up

311
00:13:26,710 --> 00:13:25,440
here

312
00:13:27,990 --> 00:13:26,720
we always have that sitting on the

313
00:13:29,670 --> 00:13:28,000

outside doc

314

00:13:31,750 --> 00:13:29,680

ready to bring his home if we need it in

315

00:13:33,430 --> 00:13:31,760

case of an emergency but first we take a

316

00:13:35,509 --> 00:13:33,440

lot of steps we've trained quite a bit

317

00:13:37,590 --> 00:13:35,519

with our russian colleagues

318

00:13:39,110 --> 00:13:37,600

with all of our crewmates to make sure

319

00:13:41,269 --> 00:13:39,120

that we know how to get oxygen if we

320

00:13:43,110 --> 00:13:41,279

need it to to protect the space station

321

00:13:44,710 --> 00:13:43,120

if we need to in case we have an

322

00:13:46,550 --> 00:13:44,720

emergency on board

323

00:13:48,230 --> 00:13:46,560

so if none of that works and there's a

324

00:13:50,310 --> 00:13:48,240

lot that we can do to help the save the

325

00:13:51,829 --> 00:13:50,320

space station and keep ourselves safe

326

00:13:53,750 --> 00:13:51,839

but if none of that works we can go

327

00:13:57,829 --> 00:13:53,760

straight to our soyuz and get home if we

328

00:14:08,069 --> 00:13:59,990

hi my name is carolina and what is the

329

00:14:11,110 --> 00:14:09,590

carolina

330

00:14:13,189 --> 00:14:11,120

i think the most important job in the

331

00:14:15,430 --> 00:14:13,199

space station is always the one you're

332

00:14:16,870 --> 00:14:15,440

doing right now

333

00:14:19,269 --> 00:14:16,880

and because

334

00:14:22,069 --> 00:14:19,279

you can mess everything up with one

335

00:14:23,430 --> 00:14:22,079

little mistake and even something you

336

00:14:24,949 --> 00:14:23,440

don't think is important let's say

337

00:14:27,829 --> 00:14:24,959

you're just taking a picture at the

338

00:14:29,590 --> 00:14:27,839

window with your camera and you uh you

339

00:14:30,949 --> 00:14:29,600

inadvertently bump the window with your

340

00:14:33,269 --> 00:14:30,959

camera and put a big scratch in the

341

00:14:35,189 --> 00:14:33,279

window every astronaut every picture

342

00:14:37,030 --> 00:14:35,199

taken from that moment on is going to

343

00:14:38,949 --> 00:14:37,040

have to live with that scratch or even

344

00:14:40,389 --> 00:14:38,959

if you're just going to the bathroom and

345

00:14:41,990 --> 00:14:40,399

if you do something wrong we have a

346

00:14:43,990 --> 00:14:42,000

careful sequence to make our space

347

00:14:45,750 --> 00:14:44,000

toilet work if you mess something up

348

00:14:47,509 --> 00:14:45,760

there and you mess up the toilet on the

349

00:14:50,550 --> 00:14:47,519

space station it seems like nothing

350

00:14:52,550 --> 00:14:50,560

important but boy it has a real impact

351
00:14:54,069 --> 00:14:52,560
on life on station and that's one of the

352
00:14:55,750 --> 00:14:54,079
things you have to constantly remind

353
00:14:57,590 --> 00:14:55,760
yourself as an astronaut is there's

354
00:15:03,590 --> 00:14:57,600
nothing more important than the thing

355
00:15:12,550 --> 00:15:05,910
hi my name is evan and what does it feel

356
00:15:15,750 --> 00:15:13,430
well

357
00:15:17,829 --> 00:15:15,760
uh that is like one of my favorite

358
00:15:21,509 --> 00:15:17,839
things i've ever done in my life as

359
00:15:24,310 --> 00:15:21,519
liftoff uh i was a pilot before i became

360
00:15:26,710 --> 00:15:24,320
an astronaut and i loved flying fast

361
00:15:29,030 --> 00:15:26,720
things i got to fly fighter aircraft and

362
00:15:31,670 --> 00:15:29,040
the acceleration you get

363
00:15:33,990 --> 00:15:31,680

from the after burners and the engines

364

00:15:36,310 --> 00:15:34,000

is very similar to the feeling you get

365

00:15:37,990 --> 00:15:36,320

on liftoff we climb into the rocket and

366

00:15:39,670 --> 00:15:38,000

in the case of both the space shuttle

367

00:15:42,470 --> 00:15:39,680

and the soyuz rocket that i flew up here

368

00:15:44,069 --> 00:15:42,480

in you you lie on your back it's like

369

00:15:45,829 --> 00:15:44,079

lying on the floor maybe with your feet

370

00:15:48,629 --> 00:15:45,839

up on a stool or something

371

00:15:51,430 --> 00:15:48,639

and um you're just waiting and when the

372

00:15:53,670 --> 00:15:51,440

rocket finally lights it starts to push

373

00:15:55,910 --> 00:15:53,680

you away it's like being in a car that's

374

00:15:58,949 --> 00:15:55,920

accelerating it's pushing you back

375

00:16:00,710 --> 00:15:58,959

backwards and you feel vibrations you

376

00:16:02,710 --> 00:16:00,720

feel the rocket moving a little bit left

377

00:16:04,550 --> 00:16:02,720

and right and a little bit up and down

378

00:16:07,030 --> 00:16:04,560

and as you get lighter and lighter

379

00:16:09,590 --> 00:16:07,040

because the fuel is being used up you

380

00:16:11,110 --> 00:16:09,600

get more and more and more pushing until

381

00:16:13,189 --> 00:16:11,120

your weight you feel like you weigh

382

00:16:15,030 --> 00:16:13,199

three times what you weigh on earth's

383

00:16:17,430 --> 00:16:15,040

surface and then sometimes you get

384

00:16:19,829 --> 00:16:17,440

staging and a new rocket starts and then

385

00:16:21,509 --> 00:16:19,839

you'll the g's will let up a little bit

386

00:16:23,749 --> 00:16:21,519

you'll feel heavy but not as heavy and

387

00:16:25,990 --> 00:16:23,759

then they build up up again and then

388

00:16:28,790 --> 00:16:26,000

when you finally get into space and the

389

00:16:31,110 --> 00:16:28,800

rocket shuts down you're instantly in in

390

00:16:33,030 --> 00:16:31,120

zero gravity and you're floating so it's

391

00:16:34,710 --> 00:16:33,040

a very dynamic part of the flight it's a

392

00:16:37,990 --> 00:16:34,720

very fun part of the flight it's very

393

00:16:40,629 --> 00:16:38,000

intense and uh we we love doing it it's

394

00:16:42,790 --> 00:16:40,639

an adrenaline rush um and i'd love to do

395

00:16:45,509 --> 00:16:42,800

it more but uh but it's a very expensive

396

00:16:47,749 --> 00:16:45,519

and special thing to get to do so uh

397

00:16:52,550 --> 00:16:47,759

that's that's what it's like and i hope

398

00:16:56,310 --> 00:16:54,710

hi my name is nicholas what is the

399

00:17:04,390 --> 00:16:56,320

process like to go through the

400

00:17:07,350 --> 00:17:06,549

well uh kevin described what it feels

401
00:17:09,429 --> 00:17:07,360
like

402
00:17:11,189 --> 00:17:09,439
uh you know it all starts sitting on the

403
00:17:13,189 --> 00:17:11,199
launch pad after at least two and a half

404
00:17:15,110 --> 00:17:13,199
years of training just for that flight

405
00:17:17,189 --> 00:17:15,120
so that's the first step in the process

406
00:17:18,470 --> 00:17:17,199
but once the rocket brings you up one

407
00:17:20,230 --> 00:17:18,480
thing you can feel going through the

408
00:17:22,390 --> 00:17:20,240
atmosphere that's that's very

409
00:17:25,510 --> 00:17:22,400
interesting is the computer in the

410
00:17:27,510 --> 00:17:25,520
rocket is constantly recalculating uh

411
00:17:29,110 --> 00:17:27,520
the orbit that you've got to

412
00:17:30,710 --> 00:17:29,120
to get to the target that you're heading

413
00:17:32,549 --> 00:17:30,720

for and you can feel that you can feel

414

00:17:34,230 --> 00:17:32,559

the engine moving a little bit under the

415

00:17:35,909 --> 00:17:34,240

direction of the computer and it's

416

00:17:38,230 --> 00:17:35,919

almost like a speedboat if you've ever

417

00:17:41,510 --> 00:17:38,240

been in in a boat on a lake going over

418

00:17:42,950 --> 00:17:41,520

wakes just bouncing on top of the waves

419

00:17:45,350 --> 00:17:42,960

so you can feel kind of a bounce a

420

00:17:48,150 --> 00:17:45,360

rhythmic bounce as the rockets figuring

421

00:17:49,590 --> 00:17:48,160

out where to put you in space

422

00:17:52,070 --> 00:17:49,600

you can feel a little bit of the

423

00:17:53,990 --> 00:17:52,080

turbulence of the air and then as soon

424

00:17:55,909 --> 00:17:54,000

as you get out of the atmosphere the

425

00:17:58,310 --> 00:17:55,919

push from behind from the acceleration

426

00:18:00,390 --> 00:17:58,320

of the rocket is nice and smooth and as

427

00:18:02,310 --> 00:18:00,400

kevin mentioned it's just a huge

428

00:18:04,549 --> 00:18:02,320

pressure kind of a gorilla on your chest

429

00:18:07,110 --> 00:18:04,559

you you're taking your breaths and in

430

00:18:08,630 --> 00:18:07,120

sips at that point um it's just to push

431

00:18:14,230 --> 00:18:08,640

all the way up until the main engine cut

432

00:18:22,070 --> 00:18:15,990

my name is farah how do you wash your

433

00:18:24,150 --> 00:18:23,270

hi farah

434

00:18:25,669 --> 00:18:24,160

uh

435

00:18:26,870 --> 00:18:25,679

well how do you wash your clothes on

436

00:18:28,789 --> 00:18:26,880

earth

437

00:18:30,710 --> 00:18:28,799

normally you you put them in a washing

438

00:18:32,390 --> 00:18:30,720

machine and then a lot of water comes in

439

00:18:34,549 --> 00:18:32,400

all the soap gets in mixes it all up

440

00:18:36,630 --> 00:18:34,559

that soapy water goes somewhere and then

441

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

more clean water comes in rinses them

442

00:18:40,470 --> 00:18:38,559

that goes somewhere and then more clean

443

00:18:42,870 --> 00:18:40,480

water comes in for a final rinse it

444

00:18:43,669 --> 00:18:42,880

takes a lot of water to wash clothes

445

00:18:46,789 --> 00:18:43,679

and

446

00:18:49,669 --> 00:18:46,799

soapy dirty used water you need a great

447

00:18:51,110 --> 00:18:49,679

big processing plant well we could do

448

00:18:54,070 --> 00:18:51,120

that on the space station we could

449

00:18:56,150 --> 00:18:54,080

figure out a space washing machine but

450

00:18:58,390 --> 00:18:56,160

it's just not efficient the weight and

451
00:19:00,870 --> 00:18:58,400
the cost and the complexity of it so we

452
00:19:02,630 --> 00:19:00,880
found it's actually just simpler just to

453
00:19:04,950 --> 00:19:02,640
not wash our clothes

454
00:19:06,710 --> 00:19:04,960
and in fact we just wear our clothes

455
00:19:08,870 --> 00:19:06,720
until they get dirty and then we throw

456
00:19:11,270 --> 00:19:08,880
them away it is not as gross as it

457
00:19:13,510 --> 00:19:11,280
sounds because number one we never sit

458
00:19:15,990 --> 00:19:13,520
down or lie down in our clothes so you

459
00:19:18,470 --> 00:19:16,000
never lie on your clothes your clothes

460
00:19:20,630 --> 00:19:18,480
just sort of float on you so they don't

461
00:19:22,630 --> 00:19:20,640
get rubbed against your body and get

462
00:19:24,630 --> 00:19:22,640
dirty nearly as quickly also the space

463
00:19:26,310 --> 00:19:24,640

station's a big clean place so you

464

00:19:27,990 --> 00:19:26,320

hardly ever get dirt or grease or

465

00:19:31,350 --> 00:19:28,000

anything on your clothes

466

00:19:34,710 --> 00:19:31,360

and so it's really not too bad um and

467

00:19:36,470 --> 00:19:34,720

you we have a supply of new clothes

468

00:19:37,990 --> 00:19:36,480

and it's cheaper and easier that way

469

00:19:39,990 --> 00:19:38,000

than it is to try and figure out a way

470

00:19:41,510 --> 00:19:40,000

to properly wash them so if you're an

471

00:19:47,909 --> 00:19:41,520

astronaut you just throw your dirty

472

00:20:00,789 --> 00:19:50,070

hi my name is cameron

473

00:20:06,390 --> 00:20:03,590

okay i think i think yeah the who who

474

00:20:07,909 --> 00:20:06,400

flies the spaceship when

475

00:20:10,070 --> 00:20:07,919

we're asleep

476
00:20:12,470 --> 00:20:10,080
the ground control

477
00:20:14,789 --> 00:20:12,480
is always watching over our spaceship in

478
00:20:16,549 --> 00:20:14,799
fact the the international space station

479
00:20:18,789 --> 00:20:16,559
is really operated by a team on the

480
00:20:21,990 --> 00:20:18,799
ground and controlled through satellite

481
00:20:23,990 --> 00:20:22,000
there are onboard computers that also

482
00:20:26,230 --> 00:20:24,000
monitor it in case ground can't talk to

483
00:20:27,909 --> 00:20:26,240
the space station it has it has kind of

484
00:20:29,190 --> 00:20:27,919
automatic mode that it's flying in it

485
00:20:31,750 --> 00:20:29,200
knows what it's supposed to be doing in

486
00:20:33,110 --> 00:20:31,760
the computers uh continue to fly it

487
00:20:34,789 --> 00:20:33,120
there are computers in the russian

488
00:20:37,029 --> 00:20:34,799

segment watching the computers in the

489

00:20:39,029 --> 00:20:37,039

u.s segment and they they agree on what

490

00:20:40,710 --> 00:20:39,039

should be done and that's the way it's

491

00:20:42,070 --> 00:20:40,720

controlled so if anything needs to

492

00:20:43,270 --> 00:20:42,080

change like we need to turn to a

493

00:20:45,270 --> 00:20:43,280

different attitude maybe for a

494

00:20:46,870 --> 00:20:45,280

rendezvous or docking or something then

495

00:20:49,590 --> 00:20:46,880

the ground control will put that in and

496

00:20:51,190 --> 00:20:49,600

it flies itself so normally we don't on

497

00:20:53,029 --> 00:20:51,200

board actually control it it's all

498

00:20:54,549 --> 00:20:53,039

controlled by the fantastic team on the

499

00:20:56,630 --> 00:20:54,559

ground who's down there supporting us

500

00:21:00,630 --> 00:20:56,640

all the time 24 hours a day seven days a

501

00:21:09,190 --> 00:21:03,590

station this is houston acr thank you

502

00:21:13,909 --> 00:21:11,750

station copies we had a

503

00:21:16,230 --> 00:21:13,919

there you go thank you monrovia high

504

00:21:18,230 --> 00:21:16,240

school unified school district station