



GOLD KNAR

JAXA

1  
00:00:08,150 --> 00:00:04,070  
fisk planetarium this is houston please

2  
00:00:16,310 --> 00:00:10,629  
station this is dr doug duncan at the

3  
00:00:20,310 --> 00:00:18,550  
dr duncan this is mike fossum commander

4  
00:00:41,190 --> 00:00:20,320  
of expedition 29 on the international

5  
00:00:44,389 --> 00:00:42,229  
okay

6  
00:00:47,750 --> 00:00:44,399  
all right loud and clear

7  
00:00:50,389 --> 00:00:47,760  
hi my name is emily my question is does

8  
00:00:54,229 --> 00:00:50,399  
space travel change the way your body

9  
00:00:59,029 --> 00:00:56,630  
hey emily your body definitely has to

10  
00:01:00,869 --> 00:00:59,039  
adjust to gravity right now your body's

11  
00:01:03,590 --> 00:01:00,879  
working hard your bones are working just

12  
00:01:05,429 --> 00:01:03,600  
to hold you up as you stand there uh and

13  
00:01:07,510 --> 00:01:05,439

your heart has to work to move the blood

14

00:01:09,670 --> 00:01:07,520

from down in your legs up to your heart

15

00:01:11,350 --> 00:01:09,680

and lungs and then to your brain it up

16

00:01:13,270 --> 00:01:11,360

here it doesn't have to work so hard and

17

00:01:14,870 --> 00:01:13,280

so your body adapts by getting kind of

18

00:01:16,950 --> 00:01:14,880

lazy and your bones get weak if you

19

00:01:20,789 --> 00:01:16,960

don't work out and

20

00:01:20,799 --> 00:01:28,149

thanks

21

00:01:31,270 --> 00:01:28,870

hi

22

00:01:37,670 --> 00:01:31,280

my name is stephanie

23

00:01:42,069 --> 00:01:39,670

hey stephanie we eat a lot of the same

24

00:01:43,749 --> 00:01:42,079

things that you might eat at home

25

00:01:46,789 --> 00:01:43,759

they're just kind of used sometimes

26

00:01:49,670 --> 00:01:46,799

packaged a little differently

27

00:01:51,830 --> 00:01:49,680

i have some with me right here

28

00:01:53,270 --> 00:01:51,840

when we want to drink you know

29

00:01:54,950 --> 00:01:53,280

when we want to drink some orange juice

30

00:01:56,709 --> 00:01:54,960

we can't just pour a glass of orange

31

00:01:59,270 --> 00:01:56,719

juice because it would fall out of the

32

00:02:01,350 --> 00:01:59,280

glass it wouldn't it'd make a real mess

33

00:02:03,670 --> 00:02:01,360

and so what we do is we have our things

34

00:02:04,789 --> 00:02:03,680

like orange juice inside a bag like this

35

00:02:06,830 --> 00:02:04,799

and i'm going to come just a little

36

00:02:08,949 --> 00:02:06,840

closer so you can see

37

00:02:11,910 --> 00:02:08,959

this and i'm going to try not to make

38

00:02:13,350 --> 00:02:11,920

too much of a mess but see that

39

00:02:18,550 --> 00:02:13,360

that's the orange juice coming out of

40

00:02:18,560 --> 00:02:34,309

then i have to catch it

41

00:02:37,430 --> 00:02:35,110

and

42

00:02:39,030 --> 00:02:37,440

let's say that other foods we have are

43

00:02:41,270 --> 00:02:39,040

things like this it's broccoli and

44

00:02:43,830 --> 00:02:41,280

cheese and so it looks doesn't look very

45

00:02:46,710 --> 00:02:45,589

like this it's not it's they've taken

46

00:02:48,550 --> 00:02:46,720

all of the water out of it it's

47

00:02:50,630 --> 00:02:48,560

dehydrated it's kind of like camping

48

00:02:53,110 --> 00:02:50,640

food so we add hot water

49

00:02:55,270 --> 00:02:53,120

wait a few minutes and it it all

50

00:02:57,350 --> 00:02:55,280

reconstitutes and and turns into

51  
00:02:59,110 --> 00:02:57,360  
something good to eat some of the things

52  
00:03:00,790 --> 00:02:59,120  
we eat

53  
00:03:03,110 --> 00:03:00,800  
don't need water

54  
00:03:07,750 --> 00:03:03,120  
or they don't need any fancy any fancy

55  
00:03:13,030 --> 00:03:09,430  
you know some things we eat are just

56  
00:03:36,949 --> 00:03:15,670  
we just catch them differently

57  
00:03:39,990 --> 00:03:38,149  
wow

58  
00:03:42,630 --> 00:03:40,000  
okay go ahead

59  
00:03:49,509 --> 00:03:42,640  
hi my name is lacey my question is how

60  
00:03:54,309 --> 00:03:52,390  
oh yeah i am lazy that's a good question

61  
00:03:56,229 --> 00:03:54,319  
because day and night don't make don't

62  
00:03:59,190 --> 00:03:56,239  
mean much here we go around the globe in

63  
00:04:02,070 --> 00:03:59,200

90 minutes and so we have a day and a

64

00:04:04,710 --> 00:04:02,080

night every 90 minutes and so that

65

00:04:06,309 --> 00:04:04,720

doesn't you know we can't pay we don't

66

00:04:08,390 --> 00:04:06,319

know what time it is by looking out the

67

00:04:09,910 --> 00:04:08,400

window and checking the sun so we have

68

00:04:12,550 --> 00:04:09,920

to use our watches

69

00:04:15,429 --> 00:04:12,560

and we set a time and it's a

70

00:04:18,069 --> 00:04:15,439

a gmt or standard time and we wake up

71

00:04:20,469 --> 00:04:18,079

based on the clock and we turn on the

72

00:04:22,150 --> 00:04:20,479

lights and when it's day time up here

73

00:04:24,469 --> 00:04:22,160

and when it's night time we turn down

74

00:04:26,790 --> 00:04:24,479

the lights so that our bodies adjust to

75

00:04:37,270 --> 00:04:26,800

uh to thinking it's time to go to sleep

76

00:04:47,270 --> 00:04:41,110

hi my name is anthony and my question is

77

00:04:51,430 --> 00:04:49,430

hey anthony we do lots of different

78

00:04:54,070 --> 00:04:51,440

kinds of experiments right here my

79

00:04:56,870 --> 00:04:54,080

crewmate satoshi just a few minutes ago

80

00:04:59,030 --> 00:04:56,880

got done planting seeds in a in a

81

00:05:01,029 --> 00:04:59,040

special experiment to see how the roots

82

00:05:04,230 --> 00:05:01,039

grow differently

83

00:05:06,390 --> 00:05:04,240

on earth the plant the seed knows

84

00:05:07,909 --> 00:05:06,400

how to grow it gets covered up with dirt

85

00:05:10,469 --> 00:05:07,919

well so how does the seed know whether

86

00:05:12,870 --> 00:05:10,479

to put the roots up or the roots down it

87

00:05:14,469 --> 00:05:12,880

knows because of gravity and so the

88

00:05:16,230 --> 00:05:14,479



gravity tells the roots which way to

89

00:05:17,830 --> 00:05:16,240

grow and so it's very interesting to

90

00:05:19,830 --> 00:05:17,840

study how plants grow up here where

91

00:05:22,310 --> 00:05:19,840

there's no gravity to tell the roots

92

00:05:24,390 --> 00:05:22,320

which direction to go

93

00:05:26,070 --> 00:05:24,400

we do a lot of things with crystals when

94

00:05:29,029 --> 00:05:26,080

when uh

95

00:05:31,590 --> 00:05:29,039

certain materials go from being a liquid

96

00:05:33,430 --> 00:05:31,600

to being solid turning hard they form

97

00:05:35,830 --> 00:05:33,440

crystals inside and we can learn a lot

98

00:05:38,230 --> 00:05:35,840

about them about those materials by

99

00:05:40,390 --> 00:05:38,240

studying the crystals

100

00:05:42,550 --> 00:05:40,400

and we're also guinea pigs up here i

101  
00:05:45,430 --> 00:05:42,560  
mentioned earlier for what our bodies do

102  
00:05:47,830 --> 00:05:45,440  
in space and so we're guinea pigs for

103  
00:05:50,629 --> 00:05:47,840  
watching what happens to our bones and

104  
00:05:52,469 --> 00:05:50,639  
our muscles in space and so that we do

105  
00:05:54,710 --> 00:05:52,479  
you know research on ourselves measuring

106  
00:05:56,550 --> 00:05:54,720  
our hearts and our muscles to actually

107  
00:05:58,230 --> 00:05:56,560  
the size and thickness of our muscles

108  
00:05:59,830 --> 00:05:58,240  
and the strength of our muscles so

109  
00:06:02,070 --> 00:05:59,840  
there's lots of different science going

110  
00:06:04,870 --> 00:06:02,080  
on up here some of the sciences is

111  
00:06:06,870 --> 00:06:04,880  
looking out the windows to measure and

112  
00:06:09,590 --> 00:06:06,880  
record things that are going on on the

113  
00:06:11,350 --> 00:06:09,600

earth we have a new fairly new piece of

114

00:06:12,550 --> 00:06:11,360

equipment on the outside of the space

115

00:06:15,990 --> 00:06:12,560

station

116

00:06:17,110 --> 00:06:16,000

that measures the cosmic rays that's the

117

00:06:21,670 --> 00:06:17,120

really

118

00:06:24,870 --> 00:06:21,680

there's a lot of different science going

119

00:06:24,880 --> 00:06:29,189

thank you

120

00:06:33,430 --> 00:06:31,350

okay

121

00:06:35,189 --> 00:06:33,440

hi my name is eleanor my question is

122

00:06:39,909 --> 00:06:35,199

were you scared or nervous the first

123

00:06:43,189 --> 00:06:40,710

well

124

00:06:45,029 --> 00:06:43,199

eleanor you know you can't tell anybody

125

00:06:48,550 --> 00:06:45,039

this but yes

126

00:06:51,189 --> 00:06:48,560

uh it's just a little bit and i i like

127

00:06:52,550 --> 00:06:51,199

to say you know you're sitting on top of

128

00:06:54,629 --> 00:06:52,560

on the space shuttle you're sitting on

129

00:06:56,150 --> 00:06:54,639

top of this well the space shuttle on

130

00:06:58,469 --> 00:06:56,160

the ground weighs about four and a half

131

00:07:00,710 --> 00:06:58,479

million pounds and about four million

132

00:07:03,029 --> 00:07:00,720

pounds of that is rocket fuel that's

133

00:07:04,870 --> 00:07:03,039

about to push you off the planet with

134

00:07:06,550 --> 00:07:04,880

those seven million pounds of thrust so

135

00:07:08,550 --> 00:07:06,560

anybody that's not a little concerned

136

00:07:10,469 --> 00:07:08,560

getting in a rocket uh doesn't

137

00:07:12,230 --> 00:07:10,479

understand what's going on so sure

138

00:07:14,790 --> 00:07:12,240

there's a little bit of that but mostly

139

00:07:16,230 --> 00:07:14,800

you're excited excited about about

140

00:07:18,390 --> 00:07:16,240

starting the mission because we train

141

00:07:20,710 --> 00:07:18,400

for years to prepare for this we're

142

00:07:23,029 --> 00:07:20,720

excited about going and finally getting

143

00:07:25,270 --> 00:07:23,039

to do that which we've trained so long

144

00:07:27,589 --> 00:07:25,280

to do and for a lot of us myself

145

00:07:29,430 --> 00:07:27,599

included and maybe you it's a dream that

146

00:07:32,950 --> 00:07:29,440

you've had since childhood that that's

147

00:07:32,960 --> 00:07:37,830

thank you

148

00:07:42,950 --> 00:07:39,350

nice and bad

149

00:07:49,749 --> 00:07:42,960

hi my name is jackie my question is why

150

00:07:53,749 --> 00:07:51,430

hey jackie that's a that's a really

151

00:07:55,589 --> 00:07:53,759

interesting question i chose to be an

152

00:07:58,390 --> 00:07:55,599

astronaut or i i wanted to be an

153

00:08:01,670 --> 00:07:58,400

astronaut because i i watched the space

154

00:08:04,070 --> 00:08:01,680

space missions when i was you know young

155

00:08:05,589 --> 00:08:04,080

and it was my dad really loved the space

156

00:08:08,309 --> 00:08:05,599

program and thought it was important and

157

00:08:10,710 --> 00:08:08,319

i remember watching that and thinking

158

00:08:13,110 --> 00:08:10,720

that's just really cool that sounds like

159

00:08:14,790 --> 00:08:13,120

it's really exciting uh i think it's

160

00:08:15,589 --> 00:08:14,800

worth doing

161

00:08:17,189 --> 00:08:15,599

and

162

00:08:19,270 --> 00:08:17,199

it it takes a lot of years of

163

00:08:21,029 --> 00:08:19,280

preparation but it's a it's a great

164

00:08:23,189 --> 00:08:21,039

challenge and it's also great fun you

165

00:08:25,350 --> 00:08:23,199

know we work hard but we also have the

166

00:08:27,749 --> 00:08:25,360

chance to look out of the windows and

167

00:08:29,510 --> 00:08:27,759

see the earth rolling by and i you know

168

00:08:32,070 --> 00:08:29,520

i love to do that when i get the chance

169

00:08:34,389 --> 00:08:32,080

or look out the windows at night and

170

00:08:36,310 --> 00:08:34,399

watch the stars without the atmosphere

171

00:08:38,469 --> 00:08:36,320

between us the moon looks pretty much

172

00:08:41,990 --> 00:08:38,479

the same but the stars really look

173

00:08:47,590 --> 00:08:45,190

looks like fun doesn't it

174

00:08:49,590 --> 00:08:47,600

okay nice and loud partner

175

00:08:52,150 --> 00:08:49,600

hi my name is nikki

176

00:08:57,030 --> 00:08:52,160

my question is did you see her hurricane

177

00:09:02,470 --> 00:08:59,910

oh nikki yes we did see hurricane irene

178

00:09:04,230 --> 00:09:02,480

from space we saw that that big brute of

179

00:09:06,550 --> 00:09:04,240

a hurricane

180

00:09:08,949 --> 00:09:06,560

as it grew i actually saw it

181

00:09:10,550 --> 00:09:08,959

as before it was even a hurricane we saw

182

00:09:12,230 --> 00:09:10,560

the clouds starting to form and of

183

00:09:14,630 --> 00:09:12,240

course we're not professionals in that

184

00:09:15,829 --> 00:09:14,640

area but you can tell when these clouds

185

00:09:18,150 --> 00:09:15,839

start to

186

00:09:19,829 --> 00:09:18,160

get a big kind of around a circulation

187

00:09:21,990 --> 00:09:19,839

pattern going out there that oh

188

00:09:25,350 --> 00:09:22,000



something's brewing so we followed that

189

00:09:26,949 --> 00:09:25,360

and got video and photos of of irene all

190

00:09:29,030 --> 00:09:26,959

the way up until it

191

00:09:30,790 --> 00:09:29,040

it hit the coast and then up the coast

192

00:09:31,829 --> 00:09:30,800

and we got some pictures of flooding

193

00:09:33,910 --> 00:09:31,839

even

194

00:09:36,710 --> 00:09:33,920

not so much of the flood water itself

195

00:09:38,470 --> 00:09:36,720

but it was really clear flying overhead

196

00:09:41,269 --> 00:09:38,480

uh that the

197

00:09:43,990 --> 00:09:41,279

few days after the storm how much muddy

198

00:09:45,750 --> 00:09:44,000

water was out into the ocean that kind

199

00:09:47,590 --> 00:09:45,760

of came as a surprise to me i wasn't

200

00:09:49,350 --> 00:09:47,600

seeing that but all those

201

00:09:51,350 --> 00:09:49,360

that water that's floods it's flooding

202

00:09:53,350 --> 00:09:51,360

the towns and so terrible for the people

203

00:09:55,990 --> 00:09:53,360

eventually it finds its way to the ocean

204

00:09:57,990 --> 00:09:56,000

and it's carrying all that that rubble

205

00:10:00,550 --> 00:09:58,000

people's homes and the dirt and stuff

206

00:10:03,590 --> 00:10:00,560

and it showed up in big brown plumes out

207

00:10:10,710 --> 00:10:03,600

into the ocean very very interesting and

208

00:10:10,720 --> 00:10:13,670

yeah

209

00:10:22,470 --> 00:10:16,230

hi my name is allison my question is how

210

00:10:26,790 --> 00:10:24,710

i that's a good question allison and it

211

00:10:29,030 --> 00:10:26,800

and it's a very fair question too

212

00:10:31,110 --> 00:10:29,040

because all students ask that that at

213

00:10:33,910 --> 00:10:31,120

different points like am i ever going to

214

00:10:36,870 --> 00:10:33,920

use this of course you are

215

00:10:38,550 --> 00:10:36,880

mostly i would say i used the math the

216

00:10:41,030 --> 00:10:38,560

math that i have used

217

00:10:43,430 --> 00:10:41,040

was really the math that it took in my

218

00:10:45,030 --> 00:10:43,440

further studies of engineering and

219

00:10:47,590 --> 00:10:45,040

science because you really can't

220

00:10:49,990 --> 00:10:47,600

understand the real details of how

221

00:10:51,670 --> 00:10:50,000

something works until you can understand

222

00:10:53,990 --> 00:10:51,680

the math behind it when you understand

223

00:10:56,630 --> 00:10:54,000

the math behind an orbit

224

00:10:59,190 --> 00:10:56,640

uh how the space station stays in orbit

225

00:11:01,509 --> 00:10:59,200

well then you kind of have a feel for

226

00:11:03,990 --> 00:11:01,519

how the space station stays in orbit and

227

00:11:07,110 --> 00:11:04,000

i don't have to go back and use the math

228

00:11:08,710 --> 00:11:07,120

on a day-to-day basis and so i don't use

229

00:11:10,150 --> 00:11:08,720

a lot of math

230

00:11:12,389 --> 00:11:10,160

every day

231

00:11:15,430 --> 00:11:12,399

beyond really simple math but what that

232

00:11:18,389 --> 00:11:15,440

math does is helps my brain

233

00:11:20,069 --> 00:11:18,399

learn helps me learn how to think about

234

00:11:21,990 --> 00:11:20,079

things and

235

00:11:23,430 --> 00:11:22,000

to really develop an understanding of

236

00:11:26,230 --> 00:11:23,440

how things work and that's where the

237

00:11:27,829 --> 00:11:26,240

math really comes in important and it it

238

00:11:30,069 --> 00:11:27,839

opens up the world when you can

239

00:11:32,389 --> 00:11:30,079

understand the math and apply the math

240

00:11:33,910 --> 00:11:32,399

and the physics and science all together

241

00:11:38,470 --> 00:11:33,920

then you really understand how things

242

00:11:38,480 --> 00:11:42,069

thank you

243

00:11:46,470 --> 00:11:43,910

hey nice and loud

244

00:11:51,990 --> 00:11:46,480

hi my name is victor my question is what

245

00:11:54,870 --> 00:11:53,590

hey hey victor well that's a good

246

00:11:57,750 --> 00:11:54,880

question you've already seen that

247

00:11:59,430 --> 00:11:57,760

sometimes we play with our food

248

00:12:00,949 --> 00:11:59,440

which your mom tells you not to do but

249

00:12:02,470 --> 00:12:00,959

up here you just can't help it but you

250

00:12:04,629 --> 00:12:02,480

do have to clean up your own mess if

251

00:12:06,069 --> 00:12:04,639

that sticky kool-aid or stick orange

252

00:12:08,790 --> 00:12:06,079

drink gets away

253

00:12:10,870 --> 00:12:08,800

uh you know i would say probably the

254

00:12:12,550 --> 00:12:10,880

favorite pastime of everybody that's

255

00:12:14,870 --> 00:12:12,560

been in space when you have some free

256

00:12:17,030 --> 00:12:14,880

time is go to the window it doesn't

257

00:12:19,269 --> 00:12:17,040

matter day or night there there is

258

00:12:22,870 --> 00:12:19,279

something amazing to see

259

00:12:25,750 --> 00:12:22,880

outside and it that's i love you know

260

00:12:28,389 --> 00:12:25,760

our planet i love being in the outdoors

261

00:12:31,030 --> 00:12:28,399

uh and i i get outdoors every chance i

262

00:12:32,949 --> 00:12:31,040

get to go hiking and i love you know

263

00:12:34,790 --> 00:12:32,959

backpacking around colorado i'm really

264

00:12:36,389 --> 00:12:34,800

jealous that you guys live in colorado

265

00:12:38,790 --> 00:12:36,399

it's such a beautiful beautiful

266

00:12:40,790 --> 00:12:38,800

wonderful place to live

267

00:12:42,629 --> 00:12:40,800

and so i but it to me it's great to

268

00:12:44,550 --> 00:12:42,639

watch it from up above too i'll be back

269

00:12:46,470 --> 00:12:44,560

packing in your mountains again as soon

270

00:12:48,470 --> 00:12:46,480

as i can get rehabilitated and get back

271

00:12:51,590 --> 00:12:48,480

up there but for now i enjoy looking at

272

00:12:51,600 --> 00:12:55,110

okay thanks

273

00:13:02,790 --> 00:12:59,430

okay nice and loud hi my name is carlos

274

00:13:07,509 --> 00:13:02,800

my question is how many days will you be

275

00:13:07,519 --> 00:13:11,910

is that how many days will i be in space

276  
00:13:11,920 --> 00:13:15,430  
yes

277  
00:13:19,590 --> 00:13:17,269  
okay

278  
00:13:20,509 --> 00:13:19,600  
i'll be in space i think the plan is

279  
00:13:22,629 --> 00:13:20,519  
around

280  
00:13:25,750 --> 00:13:22,639  
165 days

281  
00:13:27,350 --> 00:13:25,760  
uh 160 days about that and that might be

282  
00:13:29,910 --> 00:13:27,360  
changing a little bit there's been a few

283  
00:13:31,829 --> 00:13:29,920  
changes in in some of our plans

284  
00:13:34,310 --> 00:13:31,839  
but it'll be about that which is just

285  
00:13:37,269 --> 00:13:34,320  
just short of three months or six months

286  
00:13:38,949 --> 00:13:37,279  
rather and that's a great time i had two

287  
00:13:40,790 --> 00:13:38,959  
short missions on the space shuttle

288  
00:13:43,030 --> 00:13:40,800



which were wonderful but they were just

289

00:13:45,430 --> 00:13:43,040

two weeks and after two weeks you're

290

00:13:47,509 --> 00:13:45,440

finally starting to kind of get used to

291

00:13:49,350 --> 00:13:47,519

living and working up here

292

00:13:51,590 --> 00:13:49,360

but i'll say after two months i was

293

00:13:53,110 --> 00:13:51,600

still learning how to work up here and

294

00:13:54,310 --> 00:13:53,120

now i've been up here about three and a

295

00:13:57,110 --> 00:13:54,320

half months

296

00:13:58,230 --> 00:13:57,120

and uh it's great i'm enjoying every

297

00:14:00,870 --> 00:13:58,240

minute of it

298

00:14:03,750 --> 00:14:00,880

i'd love to go home and visit my family

299

00:14:12,870 --> 00:14:03,760

but you know right now i'm just i'm

300

00:14:17,509 --> 00:14:15,590

hi my name is avery and my question is

301  
00:14:22,629 --> 00:14:17,519  
what is the biggest adjustment to living

302  
00:14:26,710 --> 00:14:25,110  
avery that's a great question

303  
00:14:29,350 --> 00:14:26,720  
the biggest adjustment to living on the

304  
00:14:31,829 --> 00:14:29,360  
space station is things don't

305  
00:14:33,430 --> 00:14:31,839  
they don't fall down

306  
00:14:36,310 --> 00:14:33,440  
when you drop something

307  
00:14:38,629 --> 00:14:36,320  
it falls in any direction it wants

308  
00:14:41,590 --> 00:14:38,639  
it it just has a mind of its own so i i

309  
00:14:43,430 --> 00:14:41,600  
maybe i'm collecting food for dinner and

310  
00:14:45,829 --> 00:14:43,440  
i turn my back on it

311  
00:14:47,829 --> 00:14:45,839  
and to get something else out and then i

312  
00:14:49,030 --> 00:14:47,839  
go looking and it's not here where i

313  
00:14:51,910 --> 00:14:49,040

left it

314

00:14:53,829 --> 00:14:51,920

and instinctively we look down because

315

00:14:56,629 --> 00:14:53,839

our whole lives when you lose something

316

00:14:58,470 --> 00:14:56,639

it probably fell down around your feet

317

00:15:00,470 --> 00:14:58,480

and so we we start looking down but up

318

00:15:02,470 --> 00:15:00,480

here that's absurd because it can fall

319

00:15:04,790 --> 00:15:02,480

up just as easy as it can fall down

320

00:15:07,509 --> 00:15:04,800

because the things we lose don't know up

321

00:15:09,670 --> 00:15:07,519

and down and so you know my broccoli has

322

00:15:11,670 --> 00:15:09,680

has gone out that way out of my reach

323

00:15:12,550 --> 00:15:11,680

and out of my sight and so you lose

324

00:15:14,710 --> 00:15:12,560

stuff

325

00:15:17,430 --> 00:15:14,720

and that is that's really frustrating to

326

00:15:19,269 --> 00:15:17,440

be working on things to have a tool

327

00:15:21,110 --> 00:15:19,279

or you're taking something apart and

328

00:15:22,710 --> 00:15:21,120

there's little pieces and you're trying

329

00:15:24,230 --> 00:15:22,720

to control them trying to stick them to

330

00:15:27,350 --> 00:15:24,240

a piece of duct tape or trying to get

331

00:15:29,430 --> 00:15:27,360

them into as a a baggie or something

332

00:15:31,749 --> 00:15:29,440

like that so you don't lose them

333

00:15:33,670 --> 00:15:31,759

and and something escapes

334

00:15:35,910 --> 00:15:33,680

and that's that's a big adjustment is

335

00:15:38,230 --> 00:15:35,920

learning how to control all of your

336

00:15:41,509 --> 00:15:38,240

things because they they will

337

00:15:46,389 --> 00:15:41,519

wander off in their own directions

338

00:15:52,790 --> 00:15:49,829

hi my name is erica my question is have

339

00:15:57,829 --> 00:15:52,800

you ever been outside of the

340

00:16:03,749 --> 00:15:59,829

yes erica i've been outside of the space

341

00:16:06,629 --> 00:16:03,759

station seven times doing space walks um

342

00:16:09,670 --> 00:16:06,639

and that is an amazing experience to be

343

00:16:11,350 --> 00:16:09,680

outside working on it uh you know it's

344

00:16:12,870 --> 00:16:11,360

uh it's actually it's a very physical

345

00:16:15,269 --> 00:16:12,880

thing because you're moving around in

346

00:16:17,749 --> 00:16:15,279

this spacesuit that's that's inflated

347

00:16:20,069 --> 00:16:17,759

it's pressurized to help keep the oxygen

348

00:16:22,629 --> 00:16:20,079

you know environment around your body uh

349

00:16:25,350 --> 00:16:22,639

to one where you can you you know can

350

00:16:27,829 --> 00:16:25,360

live and and work hard and be strong in

351

00:16:29,430 --> 00:16:27,839

uh at the same time the suit is thick

352

00:16:31,670 --> 00:16:29,440

and so you're working against this

353

00:16:33,509 --> 00:16:31,680

inflated suit and everything you grab

354

00:16:35,910 --> 00:16:33,519

you're walking we call it space walks

355

00:16:38,470 --> 00:16:35,920

but our legs don't do very much we use

356

00:16:40,150 --> 00:16:38,480

our hands to move around the the space

357

00:16:42,710 --> 00:16:40,160

station as we're moving around out there

358

00:16:45,030 --> 00:16:42,720

and going from one place to another

359

00:16:47,110 --> 00:16:45,040

and so it feels sometimes it feels kind

360

00:16:49,189 --> 00:16:47,120

of like you're a fly on the ceiling

361

00:16:51,189 --> 00:16:49,199

that's just hanging on by

362

00:16:53,670 --> 00:16:51,199

by its little claw tips

363

00:16:55,749 --> 00:16:53,680

and looking down at the earth as uh from

364

00:16:57,590 --> 00:16:55,759

outside looking not through these big

365

00:17:00,230 --> 00:16:57,600

thick windows but through the thin

366

00:17:05,189 --> 00:17:00,240

bubble helmet is uh that's pretty

367

00:17:14,549 --> 00:17:07,590

hi my name is mimi and my question is

368

00:17:20,390 --> 00:17:17,750

hi mimi uh that this has been a very

369

00:17:23,750 --> 00:17:20,400

challenging time in the iss we have

370

00:17:26,069 --> 00:17:23,760

been building the iss since 2000

371

00:17:28,470 --> 00:17:26,079

really since the 98 the first pieces

372

00:17:30,150 --> 00:17:28,480

came up first people came up here in the

373

00:17:31,590 --> 00:17:30,160

in the year 2000

374

00:17:34,310 --> 00:17:31,600

and we've had people up here

375

00:17:36,150 --> 00:17:34,320

continuously since then with uh fairly

376

00:17:38,150 --> 00:17:36,160

regular visits from the space shuttle

377

00:17:39,590 --> 00:17:38,160

for most of that time

378

00:17:41,029 --> 00:17:39,600

as we have been building the space

379

00:17:42,470 --> 00:17:41,039

station

380

00:17:44,630 --> 00:17:42,480

we are now done

381

00:17:46,789 --> 00:17:44,640

and the space shuttles flew its last

382

00:17:48,310 --> 00:17:46,799

flight a couple of months ago

383

00:17:50,230 --> 00:17:48,320

so there are no more space shuttle

384

00:17:52,070 --> 00:17:50,240

missions to the space station and we've

385

00:17:54,470 --> 00:17:52,080

transitioned we're transitioning now

386

00:17:56,230 --> 00:17:54,480

from a time of assembly where you're

387

00:17:58,150 --> 00:17:56,240

worried about getting ready for the next

388

00:18:01,430 --> 00:17:58,160



big piece of space station that's coming

389

00:18:03,029 --> 00:18:01,440

up now that's that's behind us we have

390

00:18:05,590 --> 00:18:03,039

accomplished that

391

00:18:08,230 --> 00:18:05,600

uh and now we're moving into bringing

392

00:18:10,630 --> 00:18:08,240

these new experiment facilities uh into

393

00:18:12,230 --> 00:18:10,640

operation and starting up a lot of the

394

00:18:14,950 --> 00:18:12,240

work that the space station was really

395

00:18:16,470 --> 00:18:14,960

built to do so now we can focus on that

396

00:18:18,549 --> 00:18:16,480

a couple of years ago we went from a

397

00:18:20,870 --> 00:18:18,559

three-person crew up to a six-person

398

00:18:22,710 --> 00:18:20,880

crew which gives us more people to do

399

00:18:24,310 --> 00:18:22,720

more of the science and stuff right now

400

00:18:25,430 --> 00:18:24,320

we're down to three people for a little

401  
00:18:27,110 --> 00:18:25,440  
while

402  
00:18:28,710 --> 00:18:27,120  
so we're doing our best to keep that

403  
00:18:31,350 --> 00:18:28,720  
momentum going

404  
00:18:33,750 --> 00:18:31,360  
and uh that that's our mission is to ex

405  
00:18:37,110 --> 00:18:33,760  
first to you know keep the space station

406  
00:18:38,310 --> 00:18:37,120  
operating safely and second is to do a

407  
00:18:40,390 --> 00:18:38,320  
lot of these different science

408  
00:18:42,150 --> 00:18:40,400  
experiments and some of them we get real

409  
00:18:43,750 --> 00:18:42,160  
hands-on where we're physically doing

410  
00:18:46,390 --> 00:18:43,760  
things ourselves and observing and

411  
00:18:48,070 --> 00:18:46,400  
recording and some of them we're just

412  
00:18:50,310 --> 00:18:48,080  
the people that change the samples in

413  
00:18:51,830 --> 00:18:50,320

the furnace you know i don't they don't

414

00:18:54,390 --> 00:18:51,840

they don't let me loose with a

415

00:18:56,470 --> 00:18:54,400

thousand-degree furnace but i'll get in

416

00:18:58,549 --> 00:18:56,480

there change the samples and stuff and

417

00:19:00,549 --> 00:18:58,559

then get it all inspected and closed out

418

00:19:03,110 --> 00:19:00,559

and then the scientists on the ground

419

00:19:04,710 --> 00:19:03,120

are actually running the experiment from

420

00:19:06,789 --> 00:19:04,720

down on earth

421

00:19:08,549 --> 00:19:06,799

and they're controlling the furnace up

422

00:19:13,110 --> 00:19:08,559

here and then we'll bring those samples

423

00:19:17,909 --> 00:19:15,029

okay

424

00:19:20,070 --> 00:19:17,919

hi my name is isabella

425

00:19:25,830 --> 00:19:20,080

my question is what does earth look like

426

00:19:30,710 --> 00:19:28,470

earth is beautiful from space i'd seen

427

00:19:32,150 --> 00:19:30,720

the pictures but to me

428

00:19:33,909 --> 00:19:32,160

i didn't really understand it until i

429

00:19:35,990 --> 00:19:33,919

looked the first time on my first space

430

00:19:38,789 --> 00:19:36,000

shuttle mission my job was to take

431

00:19:41,590 --> 00:19:38,799

photographs of the fuel tank as it fell

432

00:19:43,990 --> 00:19:41,600

away from the space shuttle and so

433

00:19:46,230 --> 00:19:44,000

you know i got to un take off my seat

434

00:19:48,150 --> 00:19:46,240

belts and jump up and go to the window

435

00:19:50,710 --> 00:19:48,160

as soon as we got to space which happens

436

00:19:52,789 --> 00:19:50,720

fairly quickly and so i jump up and i'm

437

00:19:55,750 --> 00:19:52,799

looking out and i realize i'm looking at

438

00:19:57,750 --> 00:19:55,760

the atlantic ocean down below with these

439

00:19:59,830 --> 00:19:57,760

little dappling of white clouds on the

440

00:20:00,789 --> 00:19:59,840

top and then there's a black sky up

441

00:20:02,710 --> 00:20:00,799

above

442

00:20:05,110 --> 00:20:02,720

totally black

443

00:20:07,270 --> 00:20:05,120

and in between was a big curve of the

444

00:20:09,350 --> 00:20:07,280

earth because like the horizon was

445

00:20:11,350 --> 00:20:09,360

curved and i saw out at arm's length

446

00:20:13,110 --> 00:20:11,360

this little thin band

447

00:20:15,990 --> 00:20:13,120

that's our atmosphere

448

00:20:18,470 --> 00:20:16,000

and i it shocked me to see how thin that

449

00:20:21,270 --> 00:20:18,480

really looks from space but the earth is

450

00:20:24,310 --> 00:20:21,280

beautiful you see the oceans clouds

451

00:20:26,470 --> 00:20:24,320

the the the the land masses and and

452

00:20:30,390 --> 00:20:26,480

that's so varied the mountains the

453

00:20:31,990 --> 00:20:30,400

deserts the forests uh the lakes and

454

00:20:34,789 --> 00:20:32,000

there's always something different to

455

00:20:52,549 --> 00:20:34,799

see it is phenomenally i'd say earth is

456

00:20:57,590 --> 00:20:55,430

mike this is dottie we're here in

457

00:20:59,190 --> 00:20:57,600

colorado and it's just been so wonderful

458

00:21:02,710 --> 00:20:59,200

to talk with you and just hear your

459

00:21:04,470 --> 00:21:02,720

answers and uh we're sending a big shout

460

00:21:24,230 --> 00:21:04,480

out you guys want to shout out to mike

461

00:21:28,549 --> 00:21:26,710

oh you guys are awesome dottie you are

462

00:21:30,789 --> 00:21:28,559

wonderful thank you so much for being

463

00:21:33,590 --> 00:21:30,799

there and for the for the folks in

464

00:21:35,830 --> 00:21:33,600

denver what a great event the kids super

465

00:21:37,590 --> 00:21:35,840

questions super questions keep asking

466

00:21:40,070 --> 00:21:37,600

those questions and i hope you get to

467

00:21:41,590 --> 00:21:40,080

come find your own answers someday

468

00:21:55,350 --> 00:21:41,600

thanks a bunch it's been great joining

469

00:22:00,870 --> 00:21:57,350

station this is houston acr that

470

00:22:05,190 --> 00:22:02,870

this planet fisk planetarium and the

471

00:22:07,430 --> 00:22:05,200

university of colorado station you're a