



1
00:00:07,360 --> 00:00:02,880
station this is Houston are you ready

2
00:00:13,369 --> 00:00:09,920
Houston International Space Station yes

3
00:00:14,900 --> 00:00:13,379
ready for the event delvis world of

4
00:00:19,090 --> 00:00:14,910
science this is Mission Control Houston

5
00:00:22,730 --> 00:00:21,080
station this is Frank Lawrence from the

6
00:00:27,140 --> 00:00:22,740
Telus world of science Evanson how do

7
00:00:31,010 --> 00:00:29,510
Frank and the Telus world of science and

8
00:00:32,510 --> 00:00:31,020
everybody in Edmonton hello this is

9
00:00:36,980 --> 00:00:32,520
Chris Hadfield on the International

10
00:00:40,340 --> 00:00:39,200
Chris I tell you we got a bunch of

11
00:00:41,840 --> 00:00:40,350
people here really excited about

12
00:00:43,520 --> 00:00:41,850
speaking with you today and a whole

13
00:00:45,290 --> 00:00:43,530

group of students ready to ask you their

14
00:00:46,520 --> 00:00:45,300
most fundamental questions about you and

15
00:00:48,740 --> 00:00:46,530
what you've done for Canada we're all

16
00:00:50,390 --> 00:00:48,750
just very happy and proud of you and

17
00:00:51,950 --> 00:00:50,400
Canada and the green space agency I

18
00:00:53,060 --> 00:00:51,960
think without me talking any further

19
00:00:54,260 --> 00:00:53,070
we're gonna actually have our students

20
00:00:56,540 --> 00:00:54,270
come up here and actually speak to you

21
00:01:06,050 --> 00:00:56,550
and ask you some of their very profound

22
00:01:09,200 --> 00:01:06,060
questions hi I'm Megan I'm in grade 9

23
00:01:10,790 --> 00:01:09,210
how is your life onboard the space

24
00:01:17,310 --> 00:01:10,800
station being different from your life

25
00:01:22,890 --> 00:01:21,240
Megan it's um it's similar I life is

26

00:01:25,560 --> 00:01:22,900

busy I'm sure it's busy for you it's

27

00:01:27,750 --> 00:01:25,570

very busy as an astronaut but there are

28

00:01:30,330 --> 00:01:27,760

a couple of big differences here here

29

00:01:33,090 --> 00:01:30,340

it's it's not only busy but it's magic

30

00:01:35,880 --> 00:01:33,100

because I can just do this if I feel

31

00:01:40,260 --> 00:01:35,890

like it and I can stand on the wall and

32

00:01:42,300 --> 00:01:40,270

so so you suddenly can do things that

33

00:01:45,120 --> 00:01:42,310

just are impossible on earth and that

34

00:01:47,010 --> 00:01:45,130

layer of magic makes life very different

35

00:01:48,420 --> 00:01:47,020

the way you move and the way you even

36

00:01:50,370 --> 00:01:48,430

think about moving and then the other

37

00:01:52,490 --> 00:01:50,380

thing that's different is right now

38

00:01:54,840 --> 00:01:52,500

we're in the darkness but what you can

39

00:01:57,120 --> 00:01:54,850

see when you float over to the window

40

00:01:59,700 --> 00:01:57,130

Megan it's I mean you could just glanced

41

00:02:02,100 --> 00:01:59,710

out the window and see all of Europe or

42

00:02:04,770 --> 00:02:02,110

when you're over top of Edmonton you can

43

00:02:07,490 --> 00:02:04,780

see all the way to to southern Ontario

44

00:02:09,930 --> 00:02:07,500

and all the way to the Pacific Ocean and

45

00:02:11,880 --> 00:02:09,940

you get to see the whole world and start

46

00:02:13,230 --> 00:02:11,890

thinking of it because we go around it

47

00:02:15,960 --> 00:02:13,240

in 90 minutes you think of it as one

48

00:02:18,360 --> 00:02:15,970

place so it's a busy life which is like

49

00:02:21,270 --> 00:02:18,370

being on earth but it's then there's

50

00:02:23,280 --> 00:02:21,280

this added layer of magic and and

51
00:02:26,670 --> 00:02:23,290
wonderful beauty out the window so it

52
00:02:31,930 --> 00:02:26,680
it's it's like life only magnified and

53
00:02:37,790 --> 00:02:34,970
my name is Anne Germaine and I am in

54
00:02:39,650 --> 00:02:37,800
grade 9 did being in the Royal Canadian

55
00:02:45,230 --> 00:02:39,660
Air Force effect you're becoming an

56
00:02:52,100 --> 00:02:50,380
I am yes it did of course astronauts

57
00:02:54,890 --> 00:02:52,110
generally need to have three things

58
00:02:56,780 --> 00:02:54,900
number one you need to be fit and be

59
00:02:59,390 --> 00:02:56,790
able to pass a really hard physical exam

60
00:03:01,220 --> 00:02:59,400
number two you need to have an advanced

61
00:03:03,710 --> 00:03:01,230
education to prove that you can learn

62
00:03:05,720 --> 00:03:03,720
complicated things and number three you

63
00:03:09,860 --> 00:03:05,730

have to proven that you can make good

64

00:03:11,330 --> 00:03:09,870

decisions when it matters and so the

65

00:03:13,580 --> 00:03:11,340

Canadian astronauts have come from all

66

00:03:17,510 --> 00:03:13,590

different backgrounds medical doctors

67

00:03:20,060 --> 00:03:17,520

engineers physicists but I chose to be

68

00:03:22,040 --> 00:03:20,070

an engineer pilot and a military pilot

69

00:03:24,140 --> 00:03:22,050

and it really helped me in all three

70

00:03:26,780 --> 00:03:24,150

I've not gotten fat I've kept my body

71

00:03:28,160 --> 00:03:26,790

okay all through life I went to

72

00:03:30,440 --> 00:03:28,170

university three different universities

73

00:03:32,240 --> 00:03:30,450

to get an undergraduate and graduate

74

00:03:35,000 --> 00:03:32,250

degrees and the Canadian Air Force

75

00:03:37,340 --> 00:03:35,010

helped me with all of those financially

76

00:03:40,100 --> 00:03:37,350

and giving me the time to study and then

77

00:03:42,110 --> 00:03:40,110

making good decisions when consequences

78

00:03:44,120 --> 00:03:42,120

matter you know in order to command a

79

00:03:45,970 --> 00:03:44,130

spaceship you want someone who's proven

80

00:03:48,890 --> 00:03:45,980

their ability to do that and so

81

00:03:51,170 --> 00:03:48,900

operating complicated machinery my

82

00:03:54,050 --> 00:03:51,180

country trusting me to defend them as

83

00:03:56,000 --> 00:03:54,060

necessary and being a test pilot I think

84

00:03:57,620 --> 00:03:56,010

really helped get me there there's lots

85

00:03:59,320 --> 00:03:57,630

of different ways to achieve your dreams

86

00:04:02,240 --> 00:03:59,330

but the particular path that I chose

87

00:04:06,580 --> 00:04:02,250

worked for me and it's one that's open

88

00:04:11,900 --> 00:04:09,770

hello my name is Ayla I'm in grade 9 and

89

00:04:17,830 --> 00:04:11,910

my question for you is do astronauts

90

00:04:21,140 --> 00:04:20,569

hallo and we first get to space we feel

91

00:04:23,990 --> 00:04:21,150

sick

92

00:04:26,600 --> 00:04:24,000

your body's really confused and so you

93

00:04:28,070 --> 00:04:26,610

know you're dizzy your lunch is floating

94

00:04:31,520 --> 00:04:28,080

around in your belly cuz you're floating

95

00:04:34,070 --> 00:04:31,530

and and you're what you see doesn't

96

00:04:35,840 --> 00:04:34,080

match what you feel so you want to throw

97

00:04:38,180 --> 00:04:35,850

up so how do you throw up if you get

98

00:04:42,080 --> 00:04:38,190

sick in space who the sun's starting to

99

00:04:44,240 --> 00:04:42,090

come up so here's an astronaut barf bag

100

00:04:45,710 --> 00:04:44,250

right here so let's say you're about to

101
00:04:50,629 --> 00:04:45,720
throw up in space quick you get your

102
00:04:54,020 --> 00:04:50,639
barf bag open and now think about what

103
00:04:56,840 --> 00:04:54,030
happens on earth when you throw up now

104
00:04:58,730 --> 00:04:56,850
that'll be okay you you throw up and you

105
00:05:01,280 --> 00:04:58,740
have a bag of something horrible and

106
00:05:03,080 --> 00:05:01,290
then you throw it away but in space if I

107
00:05:05,690 --> 00:05:03,090
throw up in this bag what am I gonna do

108
00:05:07,520 --> 00:05:05,700
with it this bag has to stay with me in

109
00:05:10,790 --> 00:05:07,530
space for months so we want a really

110
00:05:13,879 --> 00:05:10,800
good barf bag so we have one that that

111
00:05:17,719 --> 00:05:13,889
will really protect us and this one has

112
00:05:20,150 --> 00:05:17,729
a has a liner in it so that when you

113
00:05:24,529 --> 00:05:20,160

throw up into it so that when you throw

114

00:05:26,900 --> 00:05:24,539

up into it you can clean your face off

115

00:05:28,760 --> 00:05:26,910

and then you can push everything inside

116

00:05:31,070 --> 00:05:28,770

and then it comes with its own ziplock

117

00:05:32,330 --> 00:05:31,080

to clean put inside the Ziploc and then

118

00:05:34,430 --> 00:05:32,340

you can throw it down into the wet trash

119

00:05:39,230 --> 00:05:34,440

so yes astronauts do occasionally get

120

00:05:40,730 --> 00:05:39,240

sick in space but we have special barf

121

00:05:41,960 --> 00:05:40,740

bags to deal with it I'm just going to

122

00:05:46,260 --> 00:05:41,970

close the shutter cuz it gets a little

123

00:05:51,400 --> 00:05:49,420

hi I'm Ashley and I'm in grade 9 and my

124

00:05:57,070 --> 00:05:51,410

question is how does being in space for

125

00:05:57,080 --> 00:05:59,700

you

126

00:06:06,660 --> 00:06:03,710

it affects us a lot of different ways it

127

00:06:07,500 --> 00:06:06,670

it affects your bones your muscles but

128

00:06:09,540 --> 00:06:07,510

one of the ways that we're learning

129

00:06:11,010 --> 00:06:09,550

recently is it affects your vision we

130

00:06:12,870 --> 00:06:11,020

don't understand why but it makes some

131

00:06:14,610 --> 00:06:12,880

people's vision worse and we're studying

132

00:06:16,080 --> 00:06:14,620

it and trying to figure it out so we

133

00:06:18,990 --> 00:06:16,090

have a lot of new equipment on board

134

00:06:21,840 --> 00:06:19,000

just to test and understand our vision

135

00:06:26,040 --> 00:06:21,850

one of the things we have is a Taunton

136

00:06:28,110 --> 00:06:26,050

ometer this this is actually like a

137

00:06:28,650 --> 00:06:28,120

pressure gauge that you touch to your

138

00:06:30,660 --> 00:06:28,660

eyeball

139

00:06:32,400 --> 00:06:30,670

we put drops just it's weird to put

140

00:06:34,260 --> 00:06:32,410

drops in your eyes with no gravity you

141

00:06:35,430 --> 00:06:34,270

sort of touch the little drop thing to

142

00:06:37,320 --> 00:06:35,440

your eyeball it spreads over your eye

143

00:06:39,420 --> 00:06:37,330

and then one of the other astronauts

144

00:06:42,450 --> 00:06:39,430

will just tap the center of my eyeball

145

00:06:44,730 --> 00:06:42,460

really carefully about ten times and

146

00:06:46,110 --> 00:06:44,740

this lovely little chin ometer will

147

00:06:47,790 --> 00:06:46,120

figure out the pressure inside my

148

00:06:50,640 --> 00:06:47,800

eyeball that's one way to measure our

149

00:06:52,770 --> 00:06:50,650

eyes another is to look into the back of

150

00:06:54,720 --> 00:06:52,780

them and so we put those drops in your

151
00:06:56,670 --> 00:06:54,730
eyes that dilate your eye and then I

152
00:06:59,520 --> 00:06:56,680
actually put this up against my eye and

153
00:07:01,320 --> 00:06:59,530
plug this into a computer and then I can

154
00:07:03,210 --> 00:07:01,330
look into the back of my eyeball and

155
00:07:05,190 --> 00:07:03,220
there are expert doctors on the ground

156
00:07:06,630 --> 00:07:05,200
who are looking at my eyeball while I'm

157
00:07:09,780 --> 00:07:06,640
doing it and we could take photographs

158
00:07:11,280 --> 00:07:09,790
and videos of the optic nerve and or at

159
00:07:13,950 --> 00:07:11,290
least where it comes into my eyeball and

160
00:07:15,660 --> 00:07:13,960
the veins and then the the stuff that's

161
00:07:19,740 --> 00:07:15,670
inside my eye so we can do it that way

162
00:07:22,710 --> 00:07:19,750
and then also we actually do ultrasounds

163
00:07:24,660 --> 00:07:22,720

of our eyeballs and that's in order to

164

00:07:27,240 --> 00:07:24,670

see how our eyeballs are changing what's

165

00:07:29,040 --> 00:07:27,250

going on with the optic nerves and so we

166

00:07:31,170 --> 00:07:29,050

have a full ultrasound machine on board

167

00:07:33,450 --> 00:07:31,180

but we don't need gel you just put a

168

00:07:35,880 --> 00:07:33,460

ball of water in your eye and then you

169

00:07:37,530 --> 00:07:35,890

touch the ultrasound to your eyeball or

170

00:07:40,050 --> 00:07:37,540

just to the water above your eyeball and

171

00:07:42,690 --> 00:07:40,060

move it back and forth and with that we

172

00:07:44,880 --> 00:07:42,700

can see our whole optic nerve we could

173

00:07:46,950 --> 00:07:44,890

see the the lens and the cornea and

174

00:07:48,570 --> 00:07:46,960

everything in beautiful resolution it's

175

00:07:49,860 --> 00:07:48,580

something we've just started doing and

176

00:07:51,720 --> 00:07:49,870

we have experts on the ground who are

177

00:07:53,850 --> 00:07:51,730

helping us do it but with all of these

178

00:07:56,220 --> 00:07:53,860

things we're trying to figure out how

179

00:07:58,530 --> 00:07:56,230

the human body works and what controls

180

00:08:00,060 --> 00:07:58,540

vision and how it changes when you take

181

00:08:02,010 --> 00:08:00,070

away something as simple as gravity

182

00:08:03,180 --> 00:08:02,020

we're learning more about eyeballs but

183

00:08:05,490 --> 00:08:03,190

we're also learning more about how to

184

00:08:07,920 --> 00:08:05,500

stay in space permanently so if you go

185

00:08:12,580 --> 00:08:07,930

to Mars you won't show up there with

186

00:08:19,309 --> 00:08:16,399

hi Josh great Tim are there any items

187

00:08:22,129 --> 00:08:19,319

you are using currently using on this

188

00:08:27,770 --> 00:08:22,139

ISS that you think might become added to

189

00:08:32,719 --> 00:08:30,379

oh yes I mean the Space Station is a

190

00:08:35,060 --> 00:08:32,729

laboratory with a hundred more than a

191

00:08:36,969 --> 00:08:35,070

hundred experiments running Chris

192

00:08:40,159 --> 00:08:36,979

Cassidy's running experiments right now

193

00:08:42,260 --> 00:08:40,169

of how solids burns we can better

194

00:08:44,330 --> 00:08:42,270

understand extinguishing and the actual

195

00:08:46,580 --> 00:08:44,340

process of flame itself when you take

196

00:08:48,080 --> 00:08:46,590

away convection there's a Canadian

197

00:08:50,110 --> 00:08:48,090

experiment running right down here right

198

00:08:53,330 --> 00:08:50,120

now that that is looking at

199

00:08:54,860 --> 00:08:53,340

nanoparticles and how they form and meld

200

00:08:58,340 --> 00:08:54,870

together when you take away gravity so

201
00:09:01,540 --> 00:08:58,350
we understand fundamental tiny particle

202
00:09:05,120 --> 00:09:01,550
processes but I think one of the coolest

203
00:09:08,380 --> 00:09:05,130
is this one here which is called micro

204
00:09:11,810 --> 00:09:08,390
flow which is a Canadian invention that

205
00:09:14,510 --> 00:09:11,820
is like a blood analysis machine in a

206
00:09:15,980 --> 00:09:14,520
little tiny box and the right now you

207
00:09:18,500 --> 00:09:15,990
have to go to a hospital to get a full

208
00:09:21,110 --> 00:09:18,510
blood work done but this which just came

209
00:09:23,120 --> 00:09:21,120
up a month or so ago can take blood

210
00:09:26,120 --> 00:09:23,130
samples and analyze them using laser

211
00:09:29,510 --> 00:09:26,130
light and within just a few minutes give

212
00:09:31,490 --> 00:09:29,520
me a sense of what what the what the

213
00:09:34,160 --> 00:09:31,500

health of my blood is you could also use

214

00:09:35,930 --> 00:09:34,170

it for analyzing other liquids and so

215

00:09:37,880 --> 00:09:35,940

think about what all this could do all

216

00:09:39,650 --> 00:09:37,890

across Canada we're in a remote

217

00:09:41,210 --> 00:09:39,660

community you don't have to fly someone

218

00:09:42,740 --> 00:09:41,220

to the hospital or you don't have to

219

00:09:45,320 --> 00:09:42,750

have a big hospital staff in a small

220

00:09:47,000 --> 00:09:45,330

small town but in fact this type of

221

00:09:48,620 --> 00:09:47,010

machine could help people analyze their

222

00:09:50,270 --> 00:09:48,630

blood right close to where they are so

223

00:09:52,790 --> 00:09:50,280

there's all kinds of stuff going on

224

00:09:56,290 --> 00:09:52,800

board and Canadian inventions are right

225

00:10:00,530 --> 00:09:59,240

hi my name is Antonio Brennan how was

226

00:10:02,060 --> 00:10:00,540

work with all the other astronauts

227

00:10:08,829 --> 00:10:02,070

aboard a space station like does

228

00:10:13,910 --> 00:10:11,750

thanks for the question we we try not to

229

00:10:16,820 --> 00:10:13,920

have language posed a problem and the

230

00:10:18,860 --> 00:10:16,830

way we deal with it is by studying for

231

00:10:21,410 --> 00:10:18,870

years beforehand when I got hired as an

232

00:10:22,610 --> 00:10:21,420

astronaut I hardly knew any russian at

233

00:10:26,060 --> 00:10:22,620

all I do like duh

234

00:10:29,960 --> 00:10:26,070

nyet and Sputnik but and Soviet you know

235

00:10:31,670 --> 00:10:29,970

I didn't know any Russian words but we

236

00:10:33,560 --> 00:10:31,680

started cooperating with them in just

237

00:10:35,540 --> 00:10:33,570

three years after I was chosen as an

238

00:10:38,210 --> 00:10:35,550

astronaut I went to help build the

239

00:10:40,430 --> 00:10:38,220

Russian space station so for the last 20

240

00:10:43,700 --> 00:10:40,440

years I've been learning Russian and for

241

00:10:45,380 --> 00:10:43,710

me languages I mean the more languages

242

00:10:46,850 --> 00:10:45,390

you learn to speak the more people you

243

00:10:49,130 --> 00:10:46,860

can communicate with and try to

244

00:10:52,220 --> 00:10:49,140

understand so we focus on each other's

245

00:10:56,300 --> 00:10:52,230

languages and on board we have French

246

00:10:57,920 --> 00:10:56,310

language a little bit of Chinese a

247

00:11:00,829 --> 00:10:57,930

little bit of Spanish English and

248

00:11:03,019 --> 00:11:00,839

Russian right now and mostly we just

249

00:11:05,300 --> 00:11:03,029

work in English and Russian then I speak

250

00:11:07,370 --> 00:11:05,310

passable Russian the Russians speak

251

00:11:09,740 --> 00:11:07,380

passable English and it works out fine

252

00:11:11,510 --> 00:11:09,750

but it's like anywhere even if you speak

253

00:11:13,640 --> 00:11:11,520

the same language sometimes it's hard to

254

00:11:15,230 --> 00:11:13,650

communicate the important part is to try

255

00:11:17,329 --> 00:11:15,240

and really listen to what the other

256

00:11:18,829 --> 00:11:17,339

person is saying and and really pay

257

00:11:22,330 --> 00:11:18,839

attention and make sure that you're

258

00:11:27,340 --> 00:11:25,240

hey I'm Sonia and my question is when

259

00:11:29,769 --> 00:11:27,350

you're in this pretty suit and you have

260

00:11:31,090 --> 00:11:29,779

it and you're outside of the station can

261

00:11:35,140 --> 00:11:31,100

you feel the Sun where I mean you're

262

00:11:40,210 --> 00:11:38,170

well you sure can yeah it's a hundred

263

00:11:43,810 --> 00:11:40,220

and fifty degrees Celsius out there a

264

00:11:46,300 --> 00:11:43,820

hundred and fifty C in the Sun so it you

265

00:11:48,790 --> 00:11:46,310

know it's that's 50% hotter than boiling

266

00:11:51,579 --> 00:11:48,800

water so when the Sun comes on you it's

267

00:11:53,019 --> 00:11:51,589

like the worst day where you walk out in

268

00:11:55,150 --> 00:11:53,029

the Summer Sun and it's right on your

269

00:11:57,730 --> 00:11:55,160

bare skin it is really hot your suit

270

00:12:00,760 --> 00:11:57,740

gets hot we actively cool the suit we

271

00:12:03,070 --> 00:12:00,770

pumped cool water and we have special

272

00:12:05,650 --> 00:12:03,080

clothing like like a liquid-cooled long

273

00:12:06,730 --> 00:12:05,660

underwear to cool us up there because

274

00:12:10,150 --> 00:12:06,740

otherwise you couldn't take the heat

275

00:12:12,900 --> 00:12:10,160

it's it's a wickedly hot Sun and and

276

00:12:15,250 --> 00:12:12,910

there's no air to to blend it it's just

277

00:12:20,699 --> 00:12:15,260

blaring glaring right on top of you

278

00:12:25,509 --> 00:12:23,920

hi I'd say in grade 9 what kind of games

279

00:12:31,319 --> 00:12:25,519

or activities are most common among the

280

00:12:36,430 --> 00:12:35,139

you know we work a lot and when we don't

281

00:12:37,900 --> 00:12:36,440

have work to do

282

00:12:40,600 --> 00:12:37,910

a lot of the time we just go to the

283

00:12:42,280 --> 00:12:40,610

window because the world the world is

284

00:12:44,050 --> 00:12:42,290

more beautiful than you can imagine more

285

00:12:47,160 --> 00:12:44,060

beautiful than I can imagine I'm looking

286

00:12:49,449 --> 00:12:47,170

at it all the time it's constantly being

287

00:12:51,190 --> 00:12:49,459

revealed to you and they'll they'll

288

00:12:53,440 --> 00:12:51,200

angle with the light and the weather and

289

00:12:55,900 --> 00:12:53,450

everything changes so it's different

290

00:12:56,530 --> 00:12:55,910

every time so that's one of the things

291

00:12:57,970 --> 00:12:56,540

we do

292

00:12:59,949 --> 00:12:57,980

we're playing Scrabble we have a

293

00:13:02,730 --> 00:12:59,959

Scrabble game going up on the roof or

294

00:13:05,560 --> 00:13:02,740

the ceiling of of one of the modules and

295

00:13:08,050 --> 00:13:05,570

a lot of people are musicians as well

296

00:13:09,970 --> 00:13:08,060

and Tom and I both are musicians and

297

00:13:13,000 --> 00:13:09,980

Pavel Vinogradov in the Russian segment

298

00:13:15,759 --> 00:13:13,010

so we have a guitar and a ukulele and a

299

00:13:18,370 --> 00:13:15,769

keyboard on board and so a lot of the

300

00:13:20,800 --> 00:13:18,380

time in our spare time we we play music

301
00:13:22,449 --> 00:13:20,810
so there's no shortage of things to do

302
00:13:25,840 --> 00:13:22,459
and when you have the world at your

303
00:13:29,700 --> 00:13:25,850
window it's it cheese it's even hard to

304
00:13:34,570 --> 00:13:32,920
hi I'm Megan some grade 8 and I was

305
00:13:39,490 --> 00:13:34,580
wondering what do stars look like from

306
00:13:45,350 --> 00:13:43,190
Megan may look a lot like they do from

307
00:13:48,230 --> 00:13:45,360
Earth except there's no air no

308
00:13:49,970 --> 00:13:48,240
atmosphere no particles of water

309
00:13:52,400 --> 00:13:49,980
droplets or anything in the way so

310
00:13:54,740 --> 00:13:52,410
they're crystal-clear they're hard to

311
00:13:57,560 --> 00:13:54,750
see because we're inside with the lights

312
00:13:59,690 --> 00:13:57,570
on so in order to see the stars because

313
00:14:01,519 --> 00:13:59,700

it never gets night inside so you have

314

00:14:03,560 --> 00:14:01,529

to shut all the lights off and let your

315

00:14:05,990 --> 00:14:03,570

eyes adjust big so you can see them but

316

00:14:07,670 --> 00:14:06,000

when you do it's like if you go out way

317

00:14:10,069 --> 00:14:07,680

outside of Edmonds and way way out and

318

00:14:14,269 --> 00:14:10,079

dark maybe maybe north up towards I

319

00:14:16,130 --> 00:14:14,279

don't know up towards Fort McMurray or

320

00:14:17,690 --> 00:14:16,140

somewhere or halfway up there or Grand

321

00:14:19,910 --> 00:14:17,700

Prairie and get way out where it's dark

322

00:14:21,860 --> 00:14:19,920

and then let your eyes totally adjust on

323

00:14:23,690 --> 00:14:21,870

a beautiful crystal clear cold night and

324

00:14:26,269 --> 00:14:23,700

that's sort of what it's like where the

325

00:14:30,100 --> 00:14:26,279

Milky Way looks milky and where the

326

00:14:32,180 --> 00:14:30,110

stars are so pure and they don't twinkle

327

00:14:33,889 --> 00:14:32,190

because there's no air making them

328

00:14:36,500 --> 00:14:33,899

oscillate in twinkle so they're like

329

00:14:39,630 --> 00:14:36,510

tiny perfect points of light it's

330

00:14:45,790 --> 00:14:44,290

hi i'm charlie in grade 9 and i was

331

00:14:51,699 --> 00:14:45,800

wondering with the biggest goal you're

332

00:14:59,660 --> 00:14:56,559

Eliot's to increase human understanding

333

00:15:03,590 --> 00:14:59,670

and also human opportunity those two

334

00:15:05,420 --> 00:15:03,600

things you know we can only live the

335

00:15:07,369 --> 00:15:05,430

lives we live because of the inventions

336

00:15:08,600 --> 00:15:07,379

and the understanding that our parents

337

00:15:11,119 --> 00:15:08,610

and our grandparents and the people

338

00:15:13,639 --> 00:15:11,129

before them figured out so to be able to

339

00:15:15,860 --> 00:15:13,649

push back human capability and knowledge

340

00:15:17,239 --> 00:15:15,870

that's one of the main goals the other

341

00:15:21,019 --> 00:15:17,249

is to let other people have this

342

00:15:22,999 --> 00:15:21,029

opportunity when I was eight or nine

343

00:15:25,100 --> 00:15:23,009

years old it was impossible for a

344

00:15:27,290 --> 00:15:25,110

Canadian to fly in space and there was

345

00:15:29,360 --> 00:15:27,300

no space agency no program and it wasn't

346

00:15:31,819 --> 00:15:29,370

until I was in university before the

347

00:15:34,549 --> 00:15:31,829

first Canadian flew in space now a

348

00:15:36,499 --> 00:15:34,559

Canadians commanding a space ship so

349

00:15:38,600 --> 00:15:36,509

that process of making things more

350

00:15:41,890 --> 00:15:38,610

possible for Canadians that's one of my

351

00:15:47,570 --> 00:15:45,170

hi I am Rebecca from grade 9 and I was

352

00:15:53,530 --> 00:15:47,580

wondering what you miss most about Earth

353

00:16:01,300 --> 00:15:56,830

well Rebecca I guess I missed the close

354

00:16:02,920 --> 00:16:01,310

human contact you know you I don't have

355

00:16:05,650 --> 00:16:02,930

family here to give a hug to and and

356

00:16:07,540 --> 00:16:05,660

such you don't see you kind of it's a

357

00:16:09,400 --> 00:16:07,550

little bit isolated but the other thing

358

00:16:11,140 --> 00:16:09,410

I really miss is a hot shower you know

359

00:16:12,580 --> 00:16:11,150

up here you can't have a shower of

360

00:16:13,750 --> 00:16:12,590

course the water wouldn't have anywhere

361

00:16:17,350 --> 00:16:13,760

to go and we don't have that much water

362

00:16:19,150 --> 00:16:17,360

so we just take sponge baths and that

363

00:16:20,620 --> 00:16:19,160

being able to stand under a hot shower

364

00:16:24,310 --> 00:16:20,630

and have it beat on your body that's

365

00:16:31,190 --> 00:16:24,320

that's a nice visceral feeling so I miss

366

00:16:36,360 --> 00:16:34,380

I'm hi my name is Connor and I'm in

367

00:16:40,770 --> 00:16:36,370

grade 9 and my question is how do you

368

00:16:46,750 --> 00:16:43,660

Connor we have to choose what time of

369

00:16:48,310 --> 00:16:46,760

day so we choose English time like

370

00:16:50,530 --> 00:16:48,320

Greenwich Time in London England and

371

00:16:51,760 --> 00:16:50,540

then when it because we had to choose

372

00:16:55,720 --> 00:16:51,770

some time and that's halfway between

373

00:16:58,840 --> 00:16:55,730

Moscow and and Houston where our mission

374

00:17:00,610 --> 00:16:58,850

main mission controls are so so we kind

375

00:17:02,380 --> 00:17:00,620

of split the difference but when it's

376

00:17:07,030 --> 00:17:02,390

time to go to sleep you get your

377

00:17:09,760 --> 00:17:07,040

sleeping bag here's mine and you can see

378

00:17:11,050 --> 00:17:09,770

it has strings hanging from it so I'm

379

00:17:12,640 --> 00:17:11,060

just going to show you what it's like to

380

00:17:14,679 --> 00:17:12,650

climb into a sleeping bag in

381

00:17:17,350 --> 00:17:14,689

weightlessness and then I'll talk to you

382

00:17:23,829 --> 00:17:17,360

again maybe I'll be able to yell at you

383

00:17:26,470 --> 00:17:23,839

while I'm talking so you uh you just get

384

00:17:32,660 --> 00:17:26,480

yourself nice and stable and you float

385

00:17:39,440 --> 00:17:35,270

zip it up put your arms through the

386

00:17:40,940 --> 00:17:39,450

armholes so that you don't get

387

00:17:44,690 --> 00:17:40,950

completely hampered when you're inside

388

00:17:46,160 --> 00:17:44,700

and then you just tie it on those four

389

00:17:47,570 --> 00:17:46,170

little strings on the back to the wall

390

00:17:50,450 --> 00:17:47,580

and then when you want to go to sleep

391

00:17:53,440 --> 00:17:50,460

you just relax and you can relax

392

00:17:56,390 --> 00:17:53,450

you can relax every muscle in your body

393

00:17:59,240 --> 00:17:56,400

your head tips forward your arms float

394

00:18:02,710 --> 00:17:59,250

up and your legs float up and you can

395

00:18:05,690 --> 00:18:02,720

just drift off beautifully to sleep you

396

00:18:07,640 --> 00:18:05,700

you don't have to roll over and then you

397

00:18:09,890 --> 00:18:07,650

don't get a hot spot you know on your

398

00:18:10,970 --> 00:18:09,900

shoulder and and you don't need a pillow

399

00:18:14,570 --> 00:18:10,980

because you don't have to hold your head

400

00:18:17,240 --> 00:18:14,580

up so sleeping in space is beautifully

401
00:18:18,500 --> 00:18:17,250
relaxing with every muscle completely

402
00:18:21,980 --> 00:18:18,510
relaxed until you wake up the next

403
00:18:23,450 --> 00:18:21,990
morning all you need to do is just tie

404
00:18:29,690 --> 00:18:23,460
yourself to the wall so you don't float

405
00:18:31,850 --> 00:18:29,700
away and bump into something hi I'm Cole

406
00:18:38,299 --> 00:18:31,860
from grade 9 what were or are your

407
00:18:40,370 --> 00:18:38,309
greatest fears about being in space my

408
00:18:44,030 --> 00:18:40,380
greatest fear is not knowing what I'm

409
00:18:45,500 --> 00:18:44,040
doing one because you know I should know

410
00:18:47,330 --> 00:18:45,510
what I'm doing especially if they trust

411
00:18:48,440 --> 00:18:47,340
me to command the spaceship but number

412
00:18:51,350 --> 00:18:48,450
two is because if I don't know what I'm

413
00:18:53,090 --> 00:18:51,360

doing it might kill me or kill other

414

00:18:54,620 --> 00:18:53,100

people I mean there are places in the

415

00:18:58,220 --> 00:18:54,630

spaceship where if you turn one valve

416

00:19:00,289 --> 00:18:58,230

the space station starts losing its

417

00:19:02,600 --> 00:19:00,299

pressure out to space so you want to

418

00:19:06,590 --> 00:19:02,610

know how everything works so my biggest

419

00:19:08,900 --> 00:19:06,600

fear is being incompetent and so that's

420

00:19:11,000 --> 00:19:08,910

why I spent so long training and getting

421

00:19:13,310 --> 00:19:11,010

ready so that by the time I got here I

422

00:19:15,230 --> 00:19:13,320

would not only understand everything but

423

00:19:17,720 --> 00:19:15,240

I would have the confidence about it

424

00:19:20,060 --> 00:19:17,730

like like writing an exam where you're

425

00:19:21,140 --> 00:19:20,070

sure that you know every answer because

426

00:19:23,419 --> 00:19:21,150

you've studied and put in the work

427

00:19:27,919 --> 00:19:23,429

beforehand and then you're not fearful

428

00:19:32,190 --> 00:19:30,419

commander Hadfield on behalf of all the

429

00:19:34,020 --> 00:19:32,200

students and participants here at the

430

00:19:35,490 --> 00:19:34,030

Telus world of science Edmonton we would

431

00:19:37,500 --> 00:19:35,500

like to thank you for speaking with us

432

00:19:49,750 --> 00:19:37,510

today and we wish you a safe and

433

00:19:54,230 --> 00:19:51,920

thank you very much it's been great

434

00:19:55,910 --> 00:19:54,240

talking to you everybody enjoy the day

435

00:19:57,770 --> 00:19:55,920

and I know there's some specialists from

436

00:19:59,750 --> 00:19:57,780

the Canadian Space Agency there to

437

00:20:01,310 --> 00:19:59,760

answer questions for you as well so

438

00:20:04,649 --> 00:20:01,320

bye-bye and I look forward to my next

439

00:20:09,849 --> 00:20:04,659

trip to Edmonton see ya

440

00:20:13,289 --> 00:20:09,859

thank you the station this is Houston

441

00:20:15,549 --> 00:20:13,299

ACR that concludes the event thank you

442

00:20:18,279 --> 00:20:15,559

thank you tellus world of science

443

00:20:20,049 --> 00:20:18,289

station we are now resuming operational