
GOLD
AWARD

1
00:00:07,430 --> 00:00:02,629
station this is houston are you ready

2
00:00:12,070 --> 00:00:10,310
good afternoon we're ready for the event

3
00:00:14,390 --> 00:00:12,080
carver high school this is mission

4
00:00:19,029 --> 00:00:14,400
control houston please call station for

5
00:00:23,029 --> 00:00:20,870
station this is congresswoman terry

6
00:00:28,550 --> 00:00:23,039
sewell at carver high school in

7
00:00:33,110 --> 00:00:31,269
you hear me carver high school this is

8
00:00:46,229 --> 00:00:33,120
mike fossum on the international space

9
00:00:46,239 --> 00:00:52,069
well astronaut folsom

10
00:00:58,069 --> 00:00:53,830
we want to thank you for taking the time

11
00:01:02,389 --> 00:01:00,069
really looking forward to both an

12
00:01:05,350 --> 00:01:02,399
inspirational and informative session

13
00:01:07,510 --> 00:01:05,360

our students will ask the questions now

14
00:01:09,510 --> 00:01:07,520
and they will introduce themselves

15
00:01:13,270 --> 00:01:09,520
what school they're from and ask their

16
00:01:19,109 --> 00:01:15,030
that's great

17
00:01:24,550 --> 00:01:21,830
my name is brianna erskine and i'm from

18
00:01:30,710 --> 00:01:24,560
taint middle school is it difficult to

19
00:01:35,590 --> 00:01:33,670
hi brianna good question i think for me

20
00:01:39,109 --> 00:01:35,600
the hardest part for me is leaving

21
00:01:41,590 --> 00:01:39,119
behind my family i'm married i have four

22
00:01:44,230 --> 00:01:41,600
kids and i have a granddaughter now too

23
00:01:45,670 --> 00:01:44,240
so it's hard for me to be away from home

24
00:01:47,749 --> 00:01:45,680
for a long time for those kind of

25
00:02:02,709 --> 00:01:47,759
reasons but i think what i'm doing here

26
00:02:02,719 --> 00:02:05,830
my name is lord

27
00:02:10,869 --> 00:02:06,830
my name

28
00:02:14,229 --> 00:02:10,879
is from hurting k28 middle school

29
00:02:22,150 --> 00:02:14,239
how long do you have to train

30
00:02:27,270 --> 00:02:24,390
hey louis it's a great question how long

31
00:02:29,270 --> 00:02:27,280
do you have to train for a mission uh

32
00:02:31,430 --> 00:02:29,280
the the training goes on for many years

33
00:02:34,630 --> 00:02:31,440
it really started when i was in school

34
00:02:38,150 --> 00:02:34,640
just like you as i began an interest in

35
00:02:41,190 --> 00:02:38,160
math and science and technology uh and

36
00:02:43,430 --> 00:02:41,200
and began actually laying the the basics

37
00:02:45,910 --> 00:02:43,440
or the foundations for my mission up

38
00:02:48,229 --> 00:02:45,920

here back when i was in grade school

39
00:02:50,309 --> 00:02:48,239
after you go through college and and

40
00:02:52,869 --> 00:02:50,319
work and are selected as an astronaut

41
00:02:55,589 --> 00:02:52,879
well then for a space station mission

42
00:02:57,910 --> 00:02:55,599
like this it was intensive training

43
00:02:59,589 --> 00:02:57,920
for two and a half years of dedicated

44
00:03:00,550 --> 00:02:59,599
training before i launched on this

45
00:03:03,110 --> 00:03:00,560
mission

46
00:03:05,110 --> 00:03:03,120
uh which is a a long time so you take

47
00:03:07,910 --> 00:03:05,120
two and a half years of training and

48
00:03:09,830 --> 00:03:07,920
then almost half a year in space so

49
00:03:11,990 --> 00:03:09,840
that's a that's a three year chunk out

50
00:03:13,509 --> 00:03:12,000
of your life and it is wonderful i'm

51
00:03:15,190 --> 00:03:13,519
enjoying every minute of it of the

52
00:03:25,589 --> 00:03:15,200
training and now every minute of the

53
00:03:29,270 --> 00:03:28,229
i'm takiyah vader from engineer k-8

54
00:03:31,350 --> 00:03:29,280
school

55
00:03:37,350 --> 00:03:31,360
how long does it take the space station

56
00:03:42,470 --> 00:03:39,270
that's a good really good question and

57
00:03:44,789 --> 00:03:42,480
it's kind of surprising it only takes us

58
00:03:46,869 --> 00:03:44,799
90 minutes to go all the way around the

59
00:03:48,309 --> 00:03:46,879
earth just an hour and a half

60
00:03:50,789 --> 00:03:48,319
because that's because we're going over

61
00:03:53,429 --> 00:03:50,799
17 000 miles an hour

62
00:03:55,429 --> 00:03:53,439
or about five miles a second and so it's

63
00:03:56,789 --> 00:03:55,439

it's really pretty amazing to look out

64
00:03:58,630 --> 00:03:56,799
the window and i've done this a few

65
00:04:02,149 --> 00:03:58,640
times when i had time on a weekend to

66
00:04:05,509 --> 00:04:02,159
just watch the world go by and to see

67
00:04:08,470 --> 00:04:05,519
an entire day in about 45 minutes and

68
00:04:10,869 --> 00:04:08,480
then night night time also about 45

69
00:04:13,110 --> 00:04:10,879
minutes so it's it's a it's pretty

70
00:04:14,789 --> 00:04:13,120
pretty cool to see that so knowing

71
00:04:16,229 --> 00:04:14,799
whether it's light outside doesn't

72
00:04:17,030 --> 00:04:16,239
doesn't make any difference to us

73
00:04:18,949 --> 00:04:17,040
because

74
00:04:20,710 --> 00:04:18,959
it doesn't get dark at night here when

75
00:04:22,790 --> 00:04:20,720
it's time for us to go to bed the sun is

76
00:04:24,390 --> 00:04:22,800
still shining bright and we're still

77
00:04:34,710 --> 00:04:24,400
going around the earth having a day and

78
00:04:39,189 --> 00:04:37,510
my name is santiago romero and

79
00:04:40,870 --> 00:04:39,199
i'm i'm an 8th grade student from

80
00:04:41,670 --> 00:04:40,880
wickerson middle school and my question

81
00:04:43,110 --> 00:04:41,680
is

82
00:04:45,510 --> 00:04:43,120
when are you on

83
00:04:47,430 --> 00:04:45,520
when when you are on the space station

84
00:04:49,670 --> 00:04:47,440
what prevents everyone and everything

85
00:04:53,909 --> 00:04:49,680
from bringing being sucked out into

86
00:04:59,030 --> 00:04:56,710
so tell that the answer to that is we

87
00:05:00,629 --> 00:04:59,040
don't open the windows uh we have

88
00:05:02,390 --> 00:05:00,639

windows these

89
00:05:04,390 --> 00:05:02,400
are our windows right behind me but

90
00:05:06,469 --> 00:05:04,400
there's no way to open those windows

91
00:05:08,950 --> 00:05:06,479
there's a cover on the outside and

92
00:05:10,550 --> 00:05:08,960
sometimes if you're listening to nasa tv

93
00:05:13,029 --> 00:05:10,560
we might talk about opening the windows

94
00:05:14,710 --> 00:05:13,039
but we're not really opening the windows

95
00:05:16,710 --> 00:05:14,720
we'll just there's a cover that helps

96
00:05:18,550 --> 00:05:16,720
protect the windows from being damaged

97
00:05:20,070 --> 00:05:18,560
by something or sometimes we want to

98
00:05:21,430 --> 00:05:20,080
keep the light

99
00:05:26,230 --> 00:05:21,440
from getting

100
00:05:28,950 --> 00:05:26,240
in and so the whole space station is

101
00:05:31,029 --> 00:05:28,960
sealed up and to keep all of the air

102
00:05:32,710 --> 00:05:31,039
inside and that's really really

103
00:05:34,310 --> 00:05:32,720
important and anytime we're doing

104
00:05:36,230 --> 00:05:34,320
something we do have little vents that

105
00:05:37,830 --> 00:05:36,240
go outside and we have hatches like when

106
00:05:40,230 --> 00:05:37,840
we do walks

107
00:05:42,230 --> 00:05:40,240
or have a hatch to the space shuttle or

108
00:05:44,790 --> 00:05:42,240
hatch to the soyuz spacecraft or one of

109
00:05:46,469 --> 00:05:44,800
our cargo ships and we'd spend a lot of

110
00:05:48,310 --> 00:05:46,479
time to make sure those are sealed

111
00:05:50,710 --> 00:05:48,320
perfectly so we're not going to leak air

112
00:05:53,189 --> 00:05:50,720
through those things now if the hole got

113
00:05:54,230 --> 00:05:53,199

punched in the wall right right behind

114
00:05:55,350 --> 00:05:54,240
here

115
00:05:58,790 --> 00:05:55,360
then

116
00:06:00,070 --> 00:05:58,800
rushing out of those holes and if it's a

117
00:06:02,390 --> 00:06:00,080
big enough hole then we're all going to

118
00:06:03,909 --> 00:06:02,400
get sucked out of it so we're but we

119
00:06:05,749 --> 00:06:03,919
it's all designed so we're not going to

120
00:06:08,070 --> 00:06:05,759
get holes in the wall it makes for an

121
00:06:10,390 --> 00:06:08,080
exciting scene in a movie

122
00:06:18,950 --> 00:06:10,400
but fortunately that kind of thing

123
00:06:22,390 --> 00:06:21,029
my name is elia torrell i'm from dane

124
00:06:25,110 --> 00:06:22,400
payne middle school

125
00:06:27,909 --> 00:06:25,120
what happens to rockin's when at rocket

126
00:06:33,510 --> 00:06:27,919
screen after they have finished with

127
00:06:36,710 --> 00:06:34,710
that's an interesting a really

128
00:06:37,990 --> 00:06:36,720
interesting question what happens to

129
00:06:41,270 --> 00:06:38,000
rockets when they're finished with their

130
00:06:43,029 --> 00:06:41,280
mission uh it it it depends but in

131
00:06:44,710 --> 00:06:43,039
general the rocket

132
00:06:46,790 --> 00:06:44,720
is you could think of it as being made

133
00:06:48,550 --> 00:06:46,800
up of a few different pieces and the

134
00:06:50,870 --> 00:06:48,560
first part is the rocket with all the

135
00:06:53,830 --> 00:06:50,880
fuels and the big rocket engine to get

136
00:06:55,830 --> 00:06:53,840
us off the ground and up into space and

137
00:06:57,990 --> 00:06:55,840
those typically

138
00:07:00,070 --> 00:06:58,000

come in separate sections too and when

139
00:07:03,029 --> 00:07:00,080
they burn out when they use up the fuel

140
00:07:05,350 --> 00:07:03,039
in those sections those things fall away

141
00:07:06,950 --> 00:07:05,360
now the space shuttle kept its engines

142
00:07:08,150 --> 00:07:06,960
and brought those engines back to the

143
00:07:09,909 --> 00:07:08,160
ground

144
00:07:11,749 --> 00:07:09,919
uh to reuse again

145
00:07:13,909 --> 00:07:11,759
and it just the big orange fuel tank

146
00:07:17,029 --> 00:07:13,919
fell away and was actually burned up as

147
00:07:18,790 --> 00:07:17,039
it fell back into the atmosphere

148
00:07:20,550 --> 00:07:18,800
with the other rockets like the soyuz

149
00:07:23,589 --> 00:07:20,560
rocket that i came up on it has some

150
00:07:25,189 --> 00:07:23,599
stages or some some kind of like rockets

151
00:07:26,790 --> 00:07:25,199
stacked on top of each other and the

152
00:07:28,950 --> 00:07:26,800
first ones you burn are the really big

153
00:07:30,629 --> 00:07:28,960
ones at the bottom and those fall away

154
00:07:33,029 --> 00:07:30,639
and the next one lights and it keeps

155
00:07:34,309 --> 00:07:33,039
pushing you up further and further

156
00:07:36,230 --> 00:07:34,319
and but

157
00:07:38,710 --> 00:07:36,240
the short answer is

158
00:07:40,710 --> 00:07:38,720
that today there's very little of

159
00:07:42,710 --> 00:07:40,720
rockets that are re

160
00:07:45,189 --> 00:07:42,720
very little that's reused you've got

161
00:07:46,869 --> 00:07:45,199
the again the rocket part that pushes us

162
00:07:50,070 --> 00:07:46,879
up and then there's the part that we're

163
00:07:52,550 --> 00:07:50,080

in the spaceship part of the rocket that

164
00:07:54,710 --> 00:07:52,560
has the humans you know on the top

165
00:07:56,550 --> 00:07:54,720
and that of course

166
00:07:59,589 --> 00:07:56,560
makes it all the way to orbit is

167
00:08:01,430 --> 00:07:59,599
attached to the space station right now

168
00:08:03,430 --> 00:08:01,440
and then when we go home

169
00:08:05,510 --> 00:08:03,440
that protects us from the

170
00:08:07,830 --> 00:08:05,520
incredibly hot temperatures as we're

171
00:08:11,110 --> 00:08:07,840
re-entering the atmosphere to come home

172
00:08:14,150 --> 00:08:11,120
to earth and a few pieces of that

173
00:08:30,070 --> 00:08:14,160
spaceship get reused but most of it goes

174
00:08:30,080 --> 00:08:33,990
got it

175
00:08:37,269 --> 00:08:35,909
my name is jamir and i'm from hudson

176
00:08:39,110 --> 00:08:37,279
k-38

177
00:08:44,870 --> 00:08:39,120
if i want to be an astronaut what should

178
00:08:49,910 --> 00:08:47,190
well that's a great question because the

179
00:08:51,910 --> 00:08:49,920
the answer to that is depends a lot on

180
00:08:53,910 --> 00:08:51,920
what you really love what are you

181
00:08:57,269 --> 00:08:53,920
interested in i mean everybody that's an

182
00:08:57,990 --> 00:08:57,279
astronaut has a background in education

183
00:09:03,990 --> 00:08:58,000
in

184
00:09:05,190 --> 00:09:04,000
mathematics and that covers a lot of

185
00:09:07,350 --> 00:09:05,200
different areas and when we have

186
00:09:09,190 --> 00:09:07,360
astronauts that are geologists they

187
00:09:10,230 --> 00:09:09,200
really like rocks

188
00:09:13,269 --> 00:09:10,240

chemists

189
00:09:16,070 --> 00:09:13,279
physicists medical doctors engineers of

190
00:09:17,550 --> 00:09:16,080
any kind i'm a mechanical engineer we

191
00:09:20,470 --> 00:09:17,560
have you know

192
00:09:22,550 --> 00:09:20,480
astronautical engineers we have mechanic

193
00:09:25,269 --> 00:09:22,560
or electrical engineers lots of

194
00:09:27,030 --> 00:09:25,279
different kind of engineers too and so

195
00:09:29,110 --> 00:09:27,040
the real answer for what you should

196
00:09:29,829 --> 00:09:29,120
study if you want my job

197
00:09:31,269 --> 00:09:29,839
is

198
00:09:33,110 --> 00:09:31,279
it depends on what you're really

199
00:09:36,150 --> 00:09:33,120
interested in because you have to be

200
00:09:37,750 --> 00:09:36,160
interested in it in order to stick to it

201
00:09:39,190 --> 00:09:37,760
and to be one of the best and that's

202
00:09:40,470 --> 00:09:39,200
what you really want to do is do

203
00:09:41,269 --> 00:09:40,480
something you love

204
00:09:43,509 --> 00:09:41,279
and

205
00:09:46,070 --> 00:09:43,519
work at it really hard so you can be one

206
00:09:48,790 --> 00:09:46,080
of the best people ever doing whatever

207
00:09:51,030 --> 00:09:48,800
it is that you love doing and that's how

208
00:10:01,190 --> 00:09:51,040
you have your best chance of taking my

209
00:10:06,389 --> 00:10:03,750
my name is maya wilson from casey ray

210
00:10:11,910 --> 00:10:06,399
school how long have you spent space and

211
00:10:16,550 --> 00:10:14,310
oh that's that's a great question milo

212
00:10:19,110 --> 00:10:16,560
i've been up here this time four and a

213
00:10:21,269 --> 00:10:19,120

half months in space

214
00:10:23,590 --> 00:10:21,279
which is uh that's a long time for me i

215
00:10:26,470 --> 00:10:23,600
flow twice on the space shuttle and for

216
00:10:28,870 --> 00:10:26,480
those missions that was just two weeks

217
00:10:31,750 --> 00:10:28,880
and i thought those were long and really

218
00:10:33,750 --> 00:10:31,760
busy and now this is really long to be

219
00:10:35,430 --> 00:10:33,760
up here five and a half months

220
00:10:37,269 --> 00:10:35,440
we've had people on the space station

221
00:10:39,750 --> 00:10:37,279
longer the russians have had people

222
00:10:41,990 --> 00:10:39,760
living in space for over a year and so

223
00:10:43,990 --> 00:10:42,000
you could theoretically you could stay

224
00:10:47,350 --> 00:10:44,000
longer than five and a half or six

225
00:10:48,150 --> 00:10:47,360
months which is what we're planning for

226
00:10:50,310 --> 00:10:48,160
but

227
00:10:53,030 --> 00:10:50,320
normally we don't do that because living

228
00:10:54,750 --> 00:10:53,040
in space is kind of hard on the body

229
00:10:56,949 --> 00:10:54,760
it's hard on your bones in your

230
00:10:58,150 --> 00:10:56,959
cardiovascular system your heart and

231
00:11:00,069 --> 00:10:58,160
lungs

232
00:11:02,069 --> 00:11:00,079
to to be up here where it gets kind of

233
00:11:05,269 --> 00:11:02,079
lazy because my bones don't have to

234
00:11:07,590 --> 00:11:05,279
support my body i'm just floating around

235
00:11:11,269 --> 00:11:07,600
and so when i'm just floating around my

236
00:11:14,389 --> 00:11:12,550
maybe

237
00:11:17,750 --> 00:11:14,399
floating around out of control

238
00:11:20,069 --> 00:11:17,760

uh and so it's a and the muscles don't

239
00:11:22,550 --> 00:11:20,079
have to do as much work up here because

240
00:11:24,710 --> 00:11:22,560
nothing weighs anything it has mass but

241
00:11:26,710 --> 00:11:24,720
it doesn't have weight and so i can move

242
00:11:29,750 --> 00:11:26,720
things around that weigh a thousand

243
00:11:32,230 --> 00:11:29,760
pounds as long as i move slowly it's

244
00:11:34,790 --> 00:11:32,240
okay so it's hard on the body to be up

245
00:11:44,150 --> 00:11:34,800
here for for a long time so we limit it

246
00:11:49,190 --> 00:11:46,550
my name is jayla glenn and i'm from

247
00:11:58,710 --> 00:11:49,200
hudson k2a school how often do you get

248
00:12:03,509 --> 00:12:00,629
almost every day

249
00:12:06,470 --> 00:12:03,519
we we have different ways to do that uh

250
00:12:09,670 --> 00:12:06,480
every weekend i get a a video conference

251
00:12:12,550 --> 00:12:09,680
just 15 minutes and sometimes longer uh

252
00:12:13,350 --> 00:12:12,560
with my wife and and one son that's at

253
00:12:15,910 --> 00:12:13,360
home

254
00:12:18,629 --> 00:12:15,920
uh and the other kids if they're there

255
00:12:21,269 --> 00:12:18,639
i we also have a telephone it's not a

256
00:12:22,870 --> 00:12:21,279
normal telephone like you have but it's

257
00:12:25,190 --> 00:12:22,880
through the computers and stuff where i

258
00:12:26,949 --> 00:12:25,200
can actually call people and so i call

259
00:12:28,629 --> 00:12:26,959
my my family

260
00:12:31,030 --> 00:12:28,639
almost every day i have the chance to

261
00:12:33,350 --> 00:12:31,040
call my family and say hi and talk about

262
00:12:35,590 --> 00:12:33,360
school and work and how things are going

263
00:12:37,350 --> 00:12:35,600

so that's one way that we keep in touch

264
00:12:39,430 --> 00:12:37,360
we also have email

265
00:12:41,590 --> 00:12:39,440
and so it's not as fast as email you

266
00:12:43,350 --> 00:12:41,600
can't trade emails i can't send one and

267
00:12:45,350 --> 00:12:43,360
you can't receive it and answer me right

268
00:12:47,509 --> 00:12:45,360
back and and then i get it we have a

269
00:12:50,389 --> 00:12:47,519
conversation like that it doesn't work

270
00:12:52,150 --> 00:12:50,399
that well but it it is a way of staying

271
00:13:00,629 --> 00:12:52,160
in touch with family and friends which

272
00:13:05,269 --> 00:13:03,110
my name is ray shaw taylor from carver

273
00:13:07,110 --> 00:13:05,279
high school and my question is have you

274
00:13:18,629 --> 00:13:07,120
ever encountered anything unusual while

275
00:13:22,790 --> 00:13:20,389
would make for a good scene in the movie

276
00:13:25,190 --> 00:13:22,800
i haven't seen anything like that uh

277
00:13:28,389 --> 00:13:25,200
i've seen unusual things though i i've

278
00:13:30,790 --> 00:13:28,399
seen the aurora borealis and australis

279
00:13:33,269 --> 00:13:30,800
the the northern and southern lights are

280
00:13:35,670 --> 00:13:33,279
starting to become more active now and

281
00:13:37,750 --> 00:13:35,680
that's a fascinating thing to see with

282
00:13:39,030 --> 00:13:37,760
your eyes up here where you're not on

283
00:13:40,949 --> 00:13:39,040
the ground you can see them in the

284
00:13:43,110 --> 00:13:40,959
northern parts of the united states you

285
00:13:45,430 --> 00:13:43,120
can see it sometimes

286
00:13:47,110 --> 00:13:45,440
or in the southern parts of the world

287
00:13:49,189 --> 00:13:47,120
but up here you have the chance to fly

288
00:13:51,030 --> 00:13:49,199

through those areas and

289
00:13:53,189 --> 00:13:51,040
and you can actually we actually fly

290
00:13:55,829 --> 00:13:53,199
through it and it's it's a pretty

291
00:13:57,829 --> 00:13:55,839
strange thing with this incredible green

292
00:13:58,710 --> 00:13:57,839
kind of waving lights and there's some

293
00:14:00,949 --> 00:13:58,720
red

294
00:14:02,550 --> 00:14:00,959
glowing in the atmosphere up above too

295
00:14:05,910 --> 00:14:02,560
which is really cool

296
00:14:07,189 --> 00:14:05,920
uh i think other than that the

297
00:14:09,430 --> 00:14:07,199
you know that's probably the coolest

298
00:14:20,470 --> 00:14:09,440
thing of all of this really cool

299
00:14:24,470 --> 00:14:22,389
my name is kiera victor and i attend

300
00:14:29,670 --> 00:14:24,480
carver high school i want to know why do

301
00:14:34,389 --> 00:14:31,829
hey carrick good question we wear

302
00:14:36,150 --> 00:14:34,399
spacesuits for the same reason uh when

303
00:14:37,910 --> 00:14:36,160
we're talking about why

304
00:14:39,990 --> 00:14:37,920
we don't you know because there's a

305
00:14:42,870 --> 00:14:40,000
vacuum outside there's no air outside we

306
00:14:44,629 --> 00:14:42,880
don't all get sucked outside and die

307
00:14:46,629 --> 00:14:44,639
the spacesuit we wear for the same

308
00:14:47,350 --> 00:14:46,639
reason to keep that air pressure around

309
00:14:50,550 --> 00:14:47,360
us

310
00:14:52,389 --> 00:14:50,560
our air pressure up here

311
00:14:54,310 --> 00:14:52,399
where we're living and working in space

312
00:14:56,949 --> 00:14:54,320
is the same as the air pressure around

313
00:14:58,710 --> 00:14:56,959

you right now in alabama and and we keep

314
00:15:01,110 --> 00:14:58,720
it that way because that's what where

315
00:15:02,470 --> 00:15:01,120
our bodies were designed to work at this

316
00:15:04,550 --> 00:15:02,480
kind of pressure and live at this

317
00:15:07,110 --> 00:15:04,560
pressure the spacesuit is designed to

318
00:15:09,910 --> 00:15:07,120
keep the air pressure around our bodies

319
00:15:12,389 --> 00:15:09,920
to to uh to help keep us healthy it also

320
00:15:13,910 --> 00:15:12,399
protects us from extreme cold

321
00:15:16,470 --> 00:15:13,920
or heat

322
00:15:18,910 --> 00:15:16,480
i've done seven space walks and outside

323
00:15:20,870 --> 00:15:18,920
the temperatures can get plus and minus

324
00:15:22,870 --> 00:15:20,880
200 degrees

325
00:15:24,949 --> 00:15:22,880
if it if it's away from the sun it gets

326
00:15:27,110 --> 00:15:24,959
really really cold and if the sun's

327
00:15:30,470 --> 00:15:27,120
shining on things it can get 200 degrees

328
00:15:32,949 --> 00:15:30,480
or even hotter from the intense energy

329
00:15:46,470 --> 00:15:32,959
on it so it the spacesuit protects us

330
00:15:50,069 --> 00:15:48,389
my name is marvel rhodes and i attend

331
00:15:52,069 --> 00:15:50,079
george washington high school my

332
00:15:54,710 --> 00:15:52,079
question is why do the rockets get i

333
00:16:00,389 --> 00:15:54,720
mean excuse me how do the rockets get to

334
00:16:04,550 --> 00:16:01,350
it's a

335
00:16:05,670 --> 00:16:04,560
good question margo the the rockets use

336
00:16:08,230 --> 00:16:05,680
thrust

337
00:16:09,829 --> 00:16:08,240
and they generate a lot of energy you

338
00:16:12,710 --> 00:16:09,839

know pushing out of the back of the

339
00:16:16,069 --> 00:16:12,720
rocket and it we combine a fuel

340
00:16:17,590 --> 00:16:16,079
and an oxidizer and a

341
00:16:21,030 --> 00:16:17,600
simple way to think of it would be like

342
00:16:23,910 --> 00:16:21,040
gasoline and oxygen it's not gasoline

343
00:16:25,829 --> 00:16:23,920
but you know it's fuels that that that

344
00:16:27,430 --> 00:16:25,839
we're all familiar with and you combine

345
00:16:30,470 --> 00:16:27,440
the two of them together it makes an

346
00:16:33,350 --> 00:16:30,480
explosive mixture that burns really

347
00:16:35,189 --> 00:16:33,360
really well and very very quickly uh and

348
00:16:37,509 --> 00:16:35,199
you know if you have some some gasoline

349
00:16:39,030 --> 00:16:37,519
or alcohol that that's out

350
00:16:41,110 --> 00:16:39,040
uh you know and you light it and i'm not

351
00:16:43,189 --> 00:16:41,120
recommending that uh you know you'll see

352
00:16:45,350 --> 00:16:43,199
that it burns and kind of a it mixes

353
00:16:47,430 --> 00:16:45,360
with air and stuff when when you mix the

354
00:16:50,550 --> 00:16:47,440
oxygen with it in that rocket engine it

355
00:16:54,790 --> 00:16:50,560
creates uh i mean a tremendous reaction

356
00:16:58,069 --> 00:16:54,800
of of force as the those liquids are

357
00:17:00,470 --> 00:16:58,079
expanding then into hot gas and the

358
00:17:03,189 --> 00:17:00,480
nozzle of the rocket kind of funnels

359
00:17:05,510 --> 00:17:03,199
that and push and directs it to push it

360
00:17:07,029 --> 00:17:05,520
down and you're sitting up on top of it

361
00:17:08,630 --> 00:17:07,039
and so that it's that's the kind of

362
00:17:09,909 --> 00:17:08,640
force that's generated from that

363
00:17:12,549 --> 00:17:09,919

combustion

364
00:17:13,990 --> 00:17:12,559
of the oxidizer and the fuel

365
00:17:17,750 --> 00:17:14,000
and then going through the nozzle of the

366
00:17:19,909 --> 00:17:17,760
rocket to push and it's literally a push

367
00:17:22,710 --> 00:17:19,919
i don't know the numbers for the soyuz

368
00:17:24,710 --> 00:17:22,720
rocket for the space shuttle it it

369
00:17:26,710 --> 00:17:24,720
weighs about four and a half million

370
00:17:29,270 --> 00:17:26,720
pounds sitting on the ground

371
00:17:32,230 --> 00:17:29,280
uh that's the the space shuttle itself

372
00:17:34,310 --> 00:17:32,240
and the fuel tanks and everything else

373
00:17:37,029 --> 00:17:34,320
and when it's leaving the earth it's

374
00:17:38,070 --> 00:17:37,039
pushing with over 7 million pounds of

375
00:17:40,070 --> 00:17:38,080
thrust

376
00:17:42,950 --> 00:17:40,080
and so that's that's a tremendous amount

377
00:17:43,830 --> 00:17:42,960
of incredible energies involved to get

378
00:17:45,830 --> 00:17:43,840
us

379
00:17:46,630 --> 00:17:45,840
from sitting still on the surface of the

380
00:17:49,430 --> 00:17:46,640
earth

381
00:17:51,669 --> 00:17:49,440
and into orbit around the planet

382
00:17:53,990 --> 00:17:51,679
in about nine minutes

383
00:18:05,110 --> 00:17:54,000
it's a it's huge energies involved it's

384
00:18:09,510 --> 00:18:07,510
my name is demarcus jimbo and i attend

385
00:18:11,669 --> 00:18:09,520
dave payne middle school

386
00:18:14,070 --> 00:18:11,679
why are things different in space for

387
00:18:19,350 --> 00:18:14,080
example why do footprints stay on the

388
00:18:24,870 --> 00:18:22,470

oh that's a great question uh marcus the

389
00:18:26,789 --> 00:18:24,880
the the with for the moon

390
00:18:28,710 --> 00:18:26,799
i mean what changes the earth all the

391
00:18:30,390 --> 00:18:28,720
time if you go out and put footprints in

392
00:18:33,590 --> 00:18:30,400
the mud today

393
00:18:35,430 --> 00:18:33,600
sometime in the next week or two so the

394
00:18:37,190 --> 00:18:35,440
wind's going to come along somebody else

395
00:18:39,029 --> 00:18:37,200
is going to come along and step on them

396
00:18:40,950 --> 00:18:39,039
or a car is going to drive over them or

397
00:18:43,669 --> 00:18:40,960
it's going to rain again and it's going

398
00:18:45,190 --> 00:18:43,679
to wash it away the moon doesn't have

399
00:18:47,110 --> 00:18:45,200
the kind of weather that we have here

400
00:18:48,630 --> 00:18:47,120
because the weather depends on

401
00:18:51,110 --> 00:18:48,640
an atmosphere

402
00:18:53,830 --> 00:18:51,120
and rain and wind

403
00:18:55,510 --> 00:18:53,840
erosion processes and things like that

404
00:18:57,430 --> 00:18:55,520
that's why the moon has all these

405
00:18:59,510 --> 00:18:57,440
craters if you look at the moon with a

406
00:19:01,909 --> 00:18:59,520
good set of binoculars you can see these

407
00:19:03,750 --> 00:19:01,919
craters pockmarking the moon it's really

408
00:19:06,310 --> 00:19:03,760
amazing

409
00:19:08,230 --> 00:19:06,320
but the earth is in the same space that

410
00:19:09,750 --> 00:19:08,240
the moon is in so when we look at the

411
00:19:11,909 --> 00:19:09,760
earth and i look at the earth and i'm

412
00:19:14,549 --> 00:19:11,919
looking for these craters and you can

413
00:19:16,870 --> 00:19:14,559

find some there's there are many craters

414
00:19:18,789 --> 00:19:16,880
on the earth but they're barely visible

415
00:19:21,750 --> 00:19:18,799
most of them are just barely visible

416
00:19:24,390 --> 00:19:21,760
anymore because over time

417
00:19:26,950 --> 00:19:24,400
the weather processes have kind of

418
00:19:29,510 --> 00:19:26,960
washed away or eroded away

419
00:19:31,350 --> 00:19:29,520
most of the big signs of these craters

420
00:19:32,710 --> 00:19:31,360
as well as on the earth we have plate

421
00:19:34,950 --> 00:19:32,720
tectonics and that gets really

422
00:19:37,510 --> 00:19:34,960
complicated where the plates that make

423
00:19:39,430 --> 00:19:37,520
up the surface of our earth are shifting

424
00:19:42,070 --> 00:19:39,440
and grinding against each other over

425
00:19:43,590 --> 00:19:42,080
time and uh you know so there's several

426
00:19:45,510 --> 00:19:43,600
things but those footprints they leave

427
00:19:46,630 --> 00:19:45,520
on the moon are going to be there for a

428
00:19:48,710 --> 00:19:46,640
long time

429
00:19:50,070 --> 00:19:48,720
and i think it's really kind of cool to

430
00:19:52,789 --> 00:19:50,080
think about the fact that there are

431
00:19:54,310 --> 00:19:52,799
still you know our human footprints on

432
00:19:55,830 --> 00:19:54,320
the moon and someday we're going to go

433
00:19:58,150 --> 00:19:55,840
back up there and we're going to see

434
00:20:01,190 --> 00:19:58,160
that the footprints and the tire tracks

435
00:20:02,549 --> 00:20:01,200
from the lunar rovers and someday

436
00:20:04,470 --> 00:20:02,559
we're going to be putting human

437
00:20:06,390 --> 00:20:04,480
footprints on mars

438
00:20:07,830 --> 00:20:06,400

and that's a really cool thing too but

439
00:20:09,990 --> 00:20:07,840
they're not going to stay on mars

440
00:20:11,350 --> 00:20:10,000
because mars has wind

441
00:20:13,510 --> 00:20:11,360
it doesn't have much atmosphere it's

442
00:20:15,190 --> 00:20:13,520
very thin but it does have wind that

443
00:20:17,350 --> 00:20:15,200
kicks up big dust storms so the

444
00:20:19,110 --> 00:20:17,360
footprints on mars will make the history

445
00:20:24,950 --> 00:20:19,120
books but they won't be there a hundred

446
00:20:29,110 --> 00:20:27,430
commander felson thank you so much we

447
00:20:31,110 --> 00:20:29,120
are just so thrilled to have this

448
00:20:33,270 --> 00:20:31,120
opportunity and i know i speak on behalf

449
00:20:35,510 --> 00:20:33,280
of all those students here and

450
00:20:37,510 --> 00:20:35,520
birmingham and bessemer city schools and

451
00:20:39,430 --> 00:20:37,520
americans to say thank you for your

452
00:20:52,149 --> 00:20:39,440
service thank you so much for this

453
00:20:55,510 --> 00:20:53,750
safe travels

454
00:20:58,470 --> 00:20:55,520
oh

455
00:21:00,710 --> 00:20:58,480
thank you very much the the the children

456
00:21:02,870 --> 00:21:00,720
are amazing those were some awesome

457
00:21:04,870 --> 00:21:02,880
questions some really good questions i

458
00:21:06,710 --> 00:21:04,880
can tell they're really thinking and i

459
00:21:08,630 --> 00:21:06,720
know that the the purpose of this is to

460
00:21:10,470 --> 00:21:08,640
expose them to different ideas about the

461
00:21:13,430 --> 00:21:10,480
science and technology engineering and

462
00:21:14,789 --> 00:21:13,440
math that are key to our future there's

463
00:21:15,750 --> 00:21:14,799

a lot of things that they hear about in

464
00:21:16,789 --> 00:21:15,760
the world

465
00:21:18,470 --> 00:21:16,799
then and

466
00:21:19,669 --> 00:21:18,480
the key to figuring out some of these

467
00:21:21,750 --> 00:21:19,679
problems that they hear about in the

468
00:21:23,430 --> 00:21:21,760
news are really

469
00:21:25,350 --> 00:21:23,440
delving into the science and the

470
00:21:26,950 --> 00:21:25,360
technology behind these things to find

471
00:21:29,590 --> 00:21:26,960
out better solutions for a better

472
00:21:31,270 --> 00:21:29,600
tomorrow and enjoy the

473
00:21:33,270 --> 00:21:31,280
enjoy the adventures because it is fun

474
00:21:35,510 --> 00:21:33,280
stuff it's exciting stuff i've really

475
00:21:37,190 --> 00:21:35,520
enjoyed talking to you and

476
00:21:40,870 --> 00:21:37,200
now it's mike fossum on the

477
00:21:46,230 --> 00:21:43,430
station this is houston acr thank you

478
00:21:47,830 --> 00:21:46,240
that concludes the event

479
00:21:49,830 --> 00:21:47,840
and thank you carver high school

480
00:21:51,270 --> 00:21:49,840
representative sewell and students