



Show 74
19.March.2010

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1
00:00:21,269 --> 00:00:09,589
welcome to the skeptic zone the podcast

2
00:00:25,830 --> 00:00:23,429
hello and welcome to the skeptic zone

3
00:00:28,230 --> 00:00:25,840
episode number 74

4
00:00:30,710 --> 00:00:28,240
for the 19th of march richard saunders

5
00:00:32,549 --> 00:00:30,720
here with you once again on today's

6
00:00:33,430 --> 00:00:32,559
episode we have an interview with stuart

7
00:00:36,630 --> 00:00:33,440
gough

8
00:00:38,950 --> 00:00:36,640
from redeemer baptist school

9
00:00:41,270 --> 00:00:38,960
he's a science teacher now redeemer

10
00:00:44,069 --> 00:00:41,280
baptist school based here in sydney do

11
00:00:45,990 --> 00:00:44,079
very well each year in the young

12
00:00:47,190 --> 00:00:46,000
scientist awards

13
00:00:49,910 --> 00:00:47,200

very well

14

00:00:51,670 --> 00:00:49,920

so we sent along our reporter iran segev

15

00:00:53,510 --> 00:00:51,680

to ask stewart

16

00:00:55,990 --> 00:00:53,520

why they do so well i think you'll find

17

00:00:57,670 --> 00:00:56,000

this interview very interesting

18

00:00:59,830 --> 00:00:57,680

following that we have another blast

19

00:01:02,310 --> 00:00:59,840

from the past with myself and dr paul

20

00:01:03,510 --> 00:01:02,320

willis appearing of stephen soyker on

21

00:01:05,350 --> 00:01:03,520

net fm

22

00:01:08,390 --> 00:01:05,360

in 2001

23

00:01:10,830 --> 00:01:08,400

and uh paul being a paleontologist the

24

00:01:14,149 --> 00:01:10,840

topic of discussion was

25

00:01:16,390 --> 00:01:14,159

creationism now thank you very much to

26

00:01:17,590 --> 00:01:16,400

all those people who wrote to me and

27

00:01:19,270 --> 00:01:17,600

told me

28

00:01:21,670 --> 00:01:19,280

what they do while they're listening to

29

00:01:23,350 --> 00:01:21,680

the skeptic zone last week i posed the

30

00:01:25,030 --> 00:01:23,360

question in the think tank i wonder what

31

00:01:27,109 --> 00:01:25,040

our listeners are doing

32

00:01:29,429 --> 00:01:27,119

i've discovered people do the garden or

33

00:01:31,990 --> 00:01:29,439

they walk their dog or they take a long

34

00:01:34,390 --> 00:01:32,000

walk to the end of the street and back

35

00:01:36,550 --> 00:01:34,400

some people drive some people are in the

36

00:01:39,109 --> 00:01:36,560

gym but thank you everybody for letting

37

00:01:41,270 --> 00:01:39,119

me know i i really enjoy hearing about

38

00:01:42,469 --> 00:01:41,280

what the listeners are up to

39

00:01:43,910 --> 00:01:42,479

so

40

00:01:45,429 --> 00:01:43,920

i hope you

41

00:01:47,830 --> 00:01:45,439

carry on doing all those wonderful

42

00:02:06,630 --> 00:01:47,840

things while you listen to this episode

43

00:02:10,710 --> 00:02:09,029

i'm here at redeemer baptist school in

44

00:02:14,150 --> 00:02:10,720

north parramatta with

45

00:02:15,750 --> 00:02:14,160

who's the head teacher of science

46

00:02:18,710 --> 00:02:15,760

no i'm just one of the class teachers of

47

00:02:20,390 --> 00:02:18,720

science okay we have is there a head

48

00:02:22,949 --> 00:02:20,400

teacher for science we do have a head

49

00:02:24,309 --> 00:02:22,959

teacher science we have a number of

50

00:02:26,550 --> 00:02:24,319

staff members who have been in our

51

00:02:28,710 --> 00:02:26,560

schools for over 20 years

52

00:02:30,949 --> 00:02:28,720

so the head teachers been here for about

53

00:02:33,830 --> 00:02:30,959

28 years or since the school started

54

00:02:35,670 --> 00:02:33,840

i've been here for this is my 25th year

55

00:02:38,150 --> 00:02:35,680

so i'm still one of the junior members

56

00:02:39,430 --> 00:02:38,160

of the sciences faculty

57

00:02:41,910 --> 00:02:39,440

we're walking around the campus here

58

00:02:44,229 --> 00:02:41,920

it's a beautiful campus very large now

59

00:02:46,390 --> 00:02:44,239

obviously the reason that we

60

00:02:48,229 --> 00:02:46,400

we met at the um

61

00:02:50,710 --> 00:02:48,239

science teachers science teachers

62

00:02:52,309 --> 00:02:50,720

association in new south wales event

63

00:02:53,350 --> 00:02:52,319

where the young scientist of the year

64

00:02:55,830 --> 00:02:53,360

awards

65

00:02:56,630 --> 00:02:55,840

and um and the reason we met there was

66

00:02:58,150 --> 00:02:56,640

because

67

00:02:59,910 --> 00:02:58,160

redeemer baptist school traditionally

68

00:03:01,030 --> 00:02:59,920

does very well

69

00:03:02,630 --> 00:03:01,040

in those

70

00:03:05,750 --> 00:03:02,640

events can you tell us a little bit

71

00:03:08,790 --> 00:03:05,760

about that well in terms of statistics

72

00:03:12,710 --> 00:03:08,800

we have been entering young scientists

73

00:03:14,550 --> 00:03:12,720

uh since 1987 was our first entry that

74

00:03:16,229 --> 00:03:14,560

was actually called the science talent

75

00:03:18,790 --> 00:03:16,239

search back then

76

00:03:21,030 --> 00:03:18,800

and we would have uh

77

00:03:24,390 --> 00:03:21,040

had a number of good results in those

78

00:03:25,830 --> 00:03:24,400

days mainly with video projects as a

79

00:03:26,790 --> 00:03:25,840

science teacher

80

00:03:42,949 --> 00:03:26,800

i

81

00:03:46,470 --> 00:03:42,959

you had to get these reels from the

82

00:03:48,390 --> 00:03:46,480

state library sent by train um to the

83

00:03:51,430 --> 00:03:48,400

school and it was and put on the big

84

00:03:54,149 --> 00:03:51,440

film projectors and so and at that time

85

00:03:56,630 --> 00:03:54,159

the video vhs was just coming in so i

86

00:03:58,630 --> 00:03:56,640

had a video camera so

87

00:04:00,470 --> 00:03:58,640

i decided to make a lot of videos and

88

00:04:02,070 --> 00:04:00,480

get students to make videos

89

00:04:02,949 --> 00:04:02,080

which related to the content we were

90

00:04:04,949 --> 00:04:02,959

doing

91

00:04:06,869 --> 00:04:04,959

and we entered those into the original

92

00:04:08,949 --> 00:04:06,879

science talent search we got a first

93

00:04:10,149 --> 00:04:08,959

place one year a second and third the

94

00:04:12,309 --> 00:04:10,159

following year

95

00:04:14,910 --> 00:04:12,319

we then had a bit of a break because the

96

00:04:18,229 --> 00:04:14,920

competition started to change and in

97

00:04:19,030 --> 00:04:18,239

1992 is when the young scientist

98

00:04:22,150 --> 00:04:19,040

uh

99

00:04:24,230 --> 00:04:22,160

the the scientists association

100

00:04:25,909 --> 00:04:24,240

re-molded the competition called it the

101
00:04:28,950 --> 00:04:25,919
young scientist awards

102
00:04:31,990 --> 00:04:28,960
and since that time uh we have won i

103
00:04:34,230 --> 00:04:32,000
think it's 213 state awards in the young

104
00:04:37,270 --> 00:04:34,240
science competition we usually get about

105
00:04:39,110 --> 00:04:37,280
10 to 15 per year and we're easily

106
00:04:40,550 --> 00:04:39,120
uh have more awards than any other

107
00:04:42,390 --> 00:04:40,560
school

108
00:04:45,270 --> 00:04:42,400
in that in those competitions

109
00:04:47,510 --> 00:04:45,280
and you also uh your students also

110
00:04:49,590 --> 00:04:47,520
participate in the bhp bulletin

111
00:04:51,030 --> 00:04:49,600
competition yeah well the what happens

112
00:04:52,870 --> 00:04:51,040
is the best students from the young

113
00:04:55,030 --> 00:04:52,880

scientists get selected to go to the

114

00:04:57,270 --> 00:04:55,040

national bhp awards

115

00:04:59,510 --> 00:04:57,280

and so this year we would have had two

116

00:05:01,590 --> 00:04:59,520

of the 16 australian finals with from

117

00:05:03,510 --> 00:05:01,600

our school

118

00:05:05,510 --> 00:05:03,520

and we have gone very well again at the

119

00:05:07,909 --> 00:05:05,520

bhp science awards

120

00:05:09,749 --> 00:05:07,919

they have been going for 25 years or so

121

00:05:11,029 --> 00:05:09,759

now

122

00:05:12,550 --> 00:05:11,039

we've had more

123

00:05:13,749 --> 00:05:12,560

finalists than any other school in

124

00:05:16,550 --> 00:05:13,759

australia

125

00:05:18,310 --> 00:05:16,560

and more winning entries in that as well

126

00:05:19,830 --> 00:05:18,320

and i just want to point out that we

127

00:05:22,070 --> 00:05:19,840

just went past

128

00:05:24,629 --> 00:05:22,080

a window and we and there were there was

129

00:05:26,790 --> 00:05:24,639

a huge big skeleton in there it's a

130

00:05:28,629 --> 00:05:26,800

large whale bone

131

00:05:30,150 --> 00:05:28,639

we would have we have a school camp down

132

00:05:32,310 --> 00:05:30,160

the south coast

133

00:05:33,189 --> 00:05:32,320

and there was a whale that had been

134

00:05:34,790 --> 00:05:33,199

um

135

00:05:37,350 --> 00:05:34,800

you know washed up on the beach on the

136

00:05:39,110 --> 00:05:37,360

rocks for many years and once you start

137

00:05:41,350 --> 00:05:39,120

decompose we

138

00:05:43,350 --> 00:05:41,360

took samples of the that's the hip joint

139

00:05:45,350 --> 00:05:43,360

by the yeah where the fin goes into the

140

00:05:46,870 --> 00:05:45,360

whale through the backbone

141

00:05:49,350 --> 00:05:46,880

and uh yeah we've got a couple of

142

00:05:51,350 --> 00:05:49,360

specimens we brought back it took a few

143

00:05:54,310 --> 00:05:51,360

months and years to remove the smell we

144

00:05:56,629 --> 00:05:54,320

left it outside let the ants eat it away

145

00:05:57,990 --> 00:05:56,639

but now it's um and it's now inside it's

146

00:05:58,950 --> 00:05:58,000

now inside

147

00:06:00,870 --> 00:05:58,960

kids love

148

00:06:03,430 --> 00:06:00,880

love that absolutely

149

00:06:06,230 --> 00:06:03,440

kids love the hands-on as you know

150

00:06:09,270 --> 00:06:06,240

and actually getting specimens live

151
00:06:12,230 --> 00:06:09,280
specimens in the class

152
00:06:15,510 --> 00:06:12,240
attracts students straight away

153
00:06:17,830 --> 00:06:15,520
so obviously there is

154
00:06:20,469 --> 00:06:17,840
there's obviously a lot of information

155
00:06:21,830 --> 00:06:20,479
or a lot of knowledge that's being

156
00:06:22,950 --> 00:06:21,840
transferred to the children while

157
00:06:25,110 --> 00:06:22,960
they're here while they're doing their

158
00:06:27,670 --> 00:06:25,120
science lessons how much focus is there

159
00:06:29,990 --> 00:06:27,680
on methodology on on the science as a

160
00:06:31,749 --> 00:06:30,000
not as a process rather than as a body

161
00:06:33,590 --> 00:06:31,759
of knowledge

162
00:06:35,430 --> 00:06:33,600
well the science curriculum in new south

163
00:06:38,550 --> 00:06:35,440

wales

164

00:06:41,510 --> 00:06:38,560

does like to give a a very good balance

165

00:06:43,830 --> 00:06:41,520

on process and skills

166

00:06:46,390 --> 00:06:43,840

with knowledge so just

167

00:06:49,110 --> 00:06:46,400

just to do the curriculum we do would do

168

00:06:50,870 --> 00:06:49,120

a 50 50 split between the knowledge

169

00:06:53,189 --> 00:06:50,880

and the process

170

00:06:56,309 --> 00:06:53,199

however

171

00:07:02,469 --> 00:06:59,990

i try to increase the process

172

00:07:04,469 --> 00:07:02,479

and skill side by getting students

173

00:07:06,790 --> 00:07:04,479

involved in these

174

00:07:09,510 --> 00:07:06,800

exterior competitions

175

00:07:11,589 --> 00:07:09,520

such as the young scientists

176
00:07:12,870 --> 00:07:11,599
because they learn and take away skills

177
00:07:14,710 --> 00:07:12,880
the rest of their life they'll never

178
00:07:17,189 --> 00:07:14,720
forget

179
00:07:18,710 --> 00:07:17,199
so we're just coming up now to

180
00:07:20,550 --> 00:07:18,720
my main display

181
00:07:22,390 --> 00:07:20,560
students when they

182
00:07:24,309 --> 00:07:22,400
when we say let's do a science project

183
00:07:27,270 --> 00:07:24,319
don't know where to start

184
00:07:28,230 --> 00:07:27,280
and that is the biggest problem with uh

185
00:07:29,909 --> 00:07:28,240
most

186
00:07:31,350 --> 00:07:29,919
schools in new south wales and australia

187
00:07:34,309 --> 00:07:31,360
face

188
00:07:36,710 --> 00:07:34,319

all students have to do a compulsory

189

00:07:38,790 --> 00:07:36,720

uh student research project they have to

190

00:07:40,710 --> 00:07:38,800

do one in year seven and eight

191

00:07:42,710 --> 00:07:40,720

one in year nine and ten

192

00:07:44,629 --> 00:07:42,720

and if you're a senior student you also

193

00:07:46,230 --> 00:07:44,639

have to do an independent research

194

00:07:48,550 --> 00:07:46,240

project

195

00:07:50,230 --> 00:07:48,560

but the thing is you can't just say give

196

00:07:51,909 --> 00:07:50,240

them a brochure and say this is what you

197

00:07:52,950 --> 00:07:51,919

have to do

198

00:07:58,070 --> 00:07:52,960

they need

199

00:08:00,869 --> 00:07:58,080

to start where to get ideas from and

200

00:08:02,950 --> 00:08:00,879

what makes our program unique

201
00:08:05,510 --> 00:08:02,960
is that we have introduced a program

202
00:08:06,790 --> 00:08:05,520
called the inspire program it's an

203
00:08:08,869 --> 00:08:06,800
acronym

204
00:08:11,029 --> 00:08:08,879
inspire stands for informing and

205
00:08:14,950 --> 00:08:11,039
nurturing science projects that are

206
00:08:16,629 --> 00:08:14,960
innovative rewarding and enjoyable

207
00:08:18,469 --> 00:08:16,639
the most important part of that is the

208
00:08:19,909 --> 00:08:18,479
informing stage

209
00:08:22,710 --> 00:08:19,919
kids

210
00:08:25,909 --> 00:08:22,720
just just don't know where to start

211
00:08:27,909 --> 00:08:25,919
so and really they don't know how to

212
00:08:30,629 --> 00:08:27,919
write a project up and what's what's

213
00:08:33,430 --> 00:08:30,639

needed to do a good project

214

00:08:35,589 --> 00:08:33,440

so we have developed over the years

215

00:08:39,350 --> 00:08:35,599

collected a lot of resources i have a

216

00:08:42,149 --> 00:08:39,360

lot of video and dvd resources

217

00:08:44,070 --> 00:08:42,159

so i can actually show

218

00:08:46,230 --> 00:08:44,080

videos of kids of

219

00:08:48,150 --> 00:08:46,240

i can go to like a kindergarten class

220

00:08:50,710 --> 00:08:48,160

and i have videos of kindergarten level

221

00:08:52,790 --> 00:08:50,720

projects where students are talking

222

00:08:55,350 --> 00:08:52,800

about their project

223

00:08:58,710 --> 00:08:55,360

so what in what year does that start in

224

00:09:00,389 --> 00:08:58,720

our inspire program is from utah from

225

00:09:02,949 --> 00:09:00,399

kindergarten right through the year 12.

226

00:09:04,710 --> 00:09:02,959

it's a whole school program

227

00:09:06,790 --> 00:09:04,720

i will elaborate more some years it's

228

00:09:08,470 --> 00:09:06,800

more compulsory than others

229

00:09:10,389 --> 00:09:08,480

like for instance we have maker

230

00:09:11,910 --> 00:09:10,399

compulsory in year five through the year

231

00:09:13,509 --> 00:09:11,920

10

232

00:09:14,310 --> 00:09:13,519

every second year

233

00:09:15,750 --> 00:09:14,320

the

234

00:09:17,590 --> 00:09:15,760

science curriculum in new south wales

235

00:09:19,910 --> 00:09:17,600

you have to do a project every two years

236

00:09:21,269 --> 00:09:19,920

okay and so we generally have a year on

237

00:09:23,509 --> 00:09:21,279

and year off

238

00:09:24,310 --> 00:09:23,519

although can i say the year off year is

239

00:09:26,310 --> 00:09:24,320

still

240

00:09:27,910 --> 00:09:26,320

very busy this is our year off year

241

00:09:29,190 --> 00:09:27,920

that's for projects there's lots of

242

00:09:30,710 --> 00:09:29,200

projects

243

00:09:32,630 --> 00:09:30,720

that's where they have to officially do

244

00:09:33,509 --> 00:09:32,640

a project

245

00:09:36,150 --> 00:09:33,519

and

246

00:09:38,389 --> 00:09:36,160

i still have even though it's it's a

247

00:09:40,630 --> 00:09:38,399

optional year i still have

248

00:09:43,269 --> 00:09:40,640

at least 15 projects going on at the

249

00:09:45,030 --> 00:09:43,279

moment i know of kids are started right

250

00:09:47,269 --> 00:09:45,040

down those younger years

251

00:09:50,389 --> 00:09:47,279

we also have a number of our top level

252

00:09:52,949 --> 00:09:50,399

projects who have firstly won the

253

00:09:55,269 --> 00:09:52,959

science teachers young science awards

254

00:09:56,949 --> 00:09:55,279

probably gone well and won at bhp

255

00:09:59,190 --> 00:09:56,959

they're also represented australia at

256

00:10:00,790 --> 00:09:59,200

the inter intel international science

257

00:10:03,110 --> 00:10:00,800

and engineering fair

258

00:10:05,990 --> 00:10:03,120

where it's 1 500 students from around

259

00:10:08,310 --> 00:10:06,000

the world and australia this year is

260

00:10:10,550 --> 00:10:08,320

sending four students

261

00:10:12,710 --> 00:10:10,560

and we have two of those students going

262

00:10:16,150 --> 00:10:12,720

now the idea the good thing about this

263

00:10:17,990 --> 00:10:16,160

is we can now use those displays

264

00:10:20,230 --> 00:10:18,000

when they come back to australia as

265

00:10:22,069 --> 00:10:20,240

displays for other kids to see what to

266

00:10:24,389 --> 00:10:22,079

do of course and we have two displays

267

00:10:25,350 --> 00:10:24,399

here can you maybe describe one of them

268

00:10:26,550 --> 00:10:25,360

okay

269

00:10:29,190 --> 00:10:26,560

i'll

270

00:10:31,110 --> 00:10:29,200

have a display here which which was a

271

00:10:32,710 --> 00:10:31,120

which was the actually one the team

272

00:10:34,630 --> 00:10:32,720

display competition they won a thousand

273

00:10:35,750 --> 00:10:34,640

us dollars for the best

274

00:10:38,870 --> 00:10:35,760

display

275

00:10:41,110 --> 00:10:38,880

it was a project that looked at um

276
00:10:42,069 --> 00:10:41,120
upon the color blindness

277
00:10:44,310 --> 00:10:42,079
and

278
00:10:47,350 --> 00:10:44,320
they came up with a

279
00:10:49,269 --> 00:10:47,360
a optical device that you

280
00:10:51,030 --> 00:10:49,279
that tells you the color of an object so

281
00:10:53,350 --> 00:10:51,040
you put it on your shirt and it'll give

282
00:10:55,750 --> 00:10:53,360
you that color there's 729 colors

283
00:10:57,509 --> 00:10:55,760
programmed excellent so it's called a

284
00:10:58,870 --> 00:10:57,519
used red

285
00:11:01,030 --> 00:10:58,880
green and blue light it's called a tri

286
00:11:03,190 --> 00:11:01,040
tri-stimulus colorimeter

287
00:11:05,030 --> 00:11:03,200
and but it did something which is you

288
00:11:06,710 --> 00:11:05,040

can get those sort of things now on the

289

00:11:10,470 --> 00:11:06,720

market but what

290

00:11:14,790 --> 00:11:13,269

had a memory and it remembered one color

291

00:11:16,790 --> 00:11:14,800

and then you put it on the adjacent

292

00:11:18,630 --> 00:11:16,800

color and it then can tell you the

293

00:11:21,670 --> 00:11:18,640

difference in luminosity the luminance

294

00:11:23,670 --> 00:11:21,680

contrast between the two surfaces

295

00:11:26,230 --> 00:11:23,680

which is really important because in the

296

00:11:28,790 --> 00:11:26,240

building industry

297

00:11:30,790 --> 00:11:28,800

if you go near a train platform you'll

298

00:11:33,590 --> 00:11:30,800

have those tactile indicators which are

299

00:11:36,870 --> 00:11:33,600

the yellow strips or blue strips

300

00:11:37,670 --> 00:11:36,880

and they have to meet a color contrast

301

00:11:39,430 --> 00:11:37,680

um

302

00:11:40,150 --> 00:11:39,440

so vision impaired people don't walk off

303

00:11:41,110 --> 00:11:40,160

the

304

00:11:42,389 --> 00:11:41,120

you know

305

00:11:44,550 --> 00:11:42,399

on the tracks

306

00:11:47,670 --> 00:11:44,560

buildings also all stairways must have

307

00:11:50,710 --> 00:11:47,680

those treads uh public thoroughfares and

308

00:11:52,870 --> 00:11:50,720

so what they the problem is

309

00:11:54,550 --> 00:11:52,880

no one had actually designed a device to

310

00:11:56,389 --> 00:11:54,560

measure this aluminum contrast you must

311

00:11:58,310 --> 00:11:56,399

have a 30 percent

312

00:11:59,269 --> 00:11:58,320

contrast according to the australian

313

00:12:01,910 --> 00:11:59,279

standard

314

00:12:04,870 --> 00:12:01,920

so they build a device that actually

315

00:12:07,430 --> 00:12:04,880

um does that previously you'd have to

316

00:12:09,269 --> 00:12:07,440

get companies like csiro to come in and

317

00:12:10,629 --> 00:12:09,279

take your measurements and it'll cost

318

00:12:12,069 --> 00:12:10,639

you over a thousand dollars to get a

319

00:12:14,629 --> 00:12:12,079

report done

320

00:12:17,030 --> 00:12:14,639

now you just get their color illuminator

321

00:12:18,230 --> 00:12:17,040

put it on the two different um objects

322

00:12:19,590 --> 00:12:18,240

and

323

00:12:21,750 --> 00:12:19,600

instantly to give you the measurements

324

00:12:23,110 --> 00:12:21,760

it is quite amazing so high school high

325

00:12:27,829 --> 00:12:23,120

school students they're high school

326

00:12:30,310 --> 00:12:27,839

students this has taken off in april

327

00:12:31,509 --> 00:12:30,320

an australian company called pathfinders

328

00:12:33,190 --> 00:12:31,519

has

329

00:12:34,949 --> 00:12:33,200

is manufacturing

330

00:12:35,829 --> 00:12:34,959

the color illuminator

331

00:12:37,670 --> 00:12:35,839

and

332

00:12:40,069 --> 00:12:37,680

it's having its official opening up at

333

00:12:41,750 --> 00:12:40,079

the end tweet heads in april

334

00:12:43,190 --> 00:12:41,760

uh not official opening the official

335

00:12:44,790 --> 00:12:43,200

launch yeah

336

00:12:46,870 --> 00:12:44,800

and

337

00:12:50,230 --> 00:12:46,880

yeah this is this is going to be nearly

338

00:12:52,790 --> 00:12:50,240

every building spectre every um

339

00:12:54,949 --> 00:12:52,800

every company that audits buildings

340

00:12:56,310 --> 00:12:54,959

architects will need to get a device

341

00:12:57,670 --> 00:12:56,320

such as this

342

00:13:00,069 --> 00:12:57,680

because they have to meet this train

343

00:13:02,389 --> 00:13:00,079

standard yeah but there's also if i may

344

00:13:04,550 --> 00:13:02,399

just uh point out something there's at

345

00:13:05,430 --> 00:13:04,560

the very center of the display

346

00:13:08,150 --> 00:13:05,440

there's

347

00:13:09,829 --> 00:13:08,160

two pictures of of a pair of bananas

348

00:13:11,030 --> 00:13:09,839

correct one shows them under normal

349

00:13:12,790 --> 00:13:11,040

vision where they're a little bit green

350

00:13:15,910 --> 00:13:12,800

you can tell that they're not ripe yet

351

00:13:17,829 --> 00:13:15,920

yes um the color blind according to the

352

00:13:21,350 --> 00:13:17,839

second picture shows them as bright

353

00:13:22,470 --> 00:13:21,360

yellow and ripe um i didn't actually

354

00:13:23,750 --> 00:13:22,480

know that

355

00:13:25,910 --> 00:13:23,760

that would be the effect of color

356

00:13:27,350 --> 00:13:25,920

blindness i suppose that's blue that's

357

00:13:29,670 --> 00:13:27,360

the there's the red green color

358

00:13:32,550 --> 00:13:29,680

blindness which is the most common form

359

00:13:34,550 --> 00:13:32,560

yeah so and maps say

360

00:13:35,430 --> 00:13:34,560

topographical maps where they use colors

361

00:13:40,470 --> 00:13:35,440

to

362

00:13:42,230 --> 00:13:40,480

elevation they can't tell so for for

363

00:13:43,910 --> 00:13:42,240

people with color blindness that that

364

00:13:45,990 --> 00:13:43,920

could be a huge help having that device

365

00:13:48,389 --> 00:13:46,000

around just being able to quickly

366

00:13:50,629 --> 00:13:48,399

uh yeah you know just just use it

367

00:13:52,870 --> 00:13:50,639

to test whatever it is and another thing

368

00:13:54,230 --> 00:13:52,880

but even people have normal vision it's

369

00:13:55,509 --> 00:13:54,240

very hard in the morning when you get up

370

00:13:57,269 --> 00:13:55,519

for work and you've got to find your

371

00:13:59,350 --> 00:13:57,279

blue or your black trousers or your

372

00:14:00,870 --> 00:13:59,360

socks i mean it's very embarrassing

373

00:14:02,389 --> 00:14:00,880

going out with you think you've got your

374

00:14:03,750 --> 00:14:02,399

blue trousers on it's actually black

375

00:14:06,069 --> 00:14:03,760

because your light's not good enough

376

00:14:07,910 --> 00:14:06,079

whether you put this machine on your on

377

00:14:09,670 --> 00:14:07,920

your trousers and it'll tell you well i

378

00:14:11,590 --> 00:14:09,680

must tell you that fifty percent of our

379

00:14:13,350 --> 00:14:11,600

listeners the female ones have nice just

380

00:14:14,790 --> 00:14:13,360

rolled their eyes

381

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

correct

382

00:14:17,670 --> 00:14:16,240

your husbands won't have the wrong ties

383

00:14:19,189 --> 00:14:17,680

hopefully they can actually see if their

384

00:14:21,110 --> 00:14:19,199

colors do match

385

00:14:22,310 --> 00:14:21,120

fast that is actually

386

00:14:24,230 --> 00:14:22,320

thinking that

387

00:14:25,829 --> 00:14:24,240

these are high school students have been

388

00:14:27,189 --> 00:14:25,839

able to do something like this not just

389

00:14:29,430 --> 00:14:27,199

in terms of the

390

00:14:30,949 --> 00:14:29,440

research and following methodology and

391

00:14:32,629 --> 00:14:30,959

passing the peer review but also

392

00:14:34,550 --> 00:14:32,639

actually getting it to the point where

393

00:14:36,389 --> 00:14:34,560

it's of international practical

394

00:14:39,430 --> 00:14:36,399

implications is is

395

00:14:41,509 --> 00:14:39,440

quite admirable okay so this actually is

396

00:14:43,670 --> 00:14:41,519

a good time to ask so

397

00:14:45,910 --> 00:14:43,680

what is it obviously i mean the results

398

00:14:48,150 --> 00:14:45,920

are there we know that redeemer baptist

399

00:14:50,470 --> 00:14:48,160

school does better than other schools

400

00:14:51,189 --> 00:14:50,480

um in science

401

00:14:53,189 --> 00:14:51,199

so

402

00:14:55,189 --> 00:14:53,199

one thing is by

403

00:14:57,030 --> 00:14:55,199

ensuring that the methodology is right

404

00:14:59,189 --> 00:14:57,040

correct okay so that but that that can't

405

00:15:01,110 --> 00:14:59,199

be all the whole story it's got to be

406

00:15:03,590 --> 00:15:01,120

something else in terms of

407

00:15:06,150 --> 00:15:03,600

maybe the enthusiasm and

408

00:15:10,310 --> 00:15:06,160

can you can you tell me what you think

409

00:15:12,470 --> 00:15:10,320

you do that makes this happen okay

410

00:15:14,069 --> 00:15:12,480

there's two levels of science projects

411

00:15:15,750 --> 00:15:14,079

you have those which get up to this

412

00:15:17,910 --> 00:15:15,760

international standard and then there's

413

00:15:19,910 --> 00:15:17,920

just a science project in the classroom

414

00:15:21,990 --> 00:15:19,920

so you get a class to work on a project

415

00:15:23,509 --> 00:15:22,000

i'll answer that question in two ways

416

00:15:25,509 --> 00:15:23,519

firstly for the science

417

00:15:27,990 --> 00:15:25,519

level the science class project let's

418

00:15:30,069 --> 00:15:28,000

say you've got 20 kids in your class and

419

00:15:32,150 --> 00:15:30,079

we go to a science project we firstly

420

00:15:33,910 --> 00:15:32,160

try to do individual projects so kids

421

00:15:35,990 --> 00:15:33,920

can choose topics that are interesting

422

00:15:38,069 --> 00:15:36,000

to them

423

00:15:39,750 --> 00:15:38,079

secondly

424

00:15:41,430 --> 00:15:39,760

we would have those

425

00:15:43,030 --> 00:15:41,440

examples to show them what a good

426

00:15:45,189 --> 00:15:43,040

project is

427

00:15:46,949 --> 00:15:45,199

but the probably the main thing that

428

00:15:50,069 --> 00:15:46,959

separates us from most other schools

429

00:15:52,230 --> 00:15:50,079

that i we try to get them to

430

00:15:55,430 --> 00:15:52,240

um get on an industry get into people

431

00:15:57,030 --> 00:15:55,440

who who are experts in the field

432

00:15:59,829 --> 00:15:57,040

and they have to do a huge literature

433

00:16:01,189 --> 00:15:59,839

research to start with i get i make sure

434

00:16:03,189 --> 00:16:01,199

as this when they come to me with an

435

00:16:05,350 --> 00:16:03,199

idea said i say okay has this been done

436

00:16:06,870 --> 00:16:05,360

before go and fight out

437

00:16:08,310 --> 00:16:06,880

and so they'll

438

00:16:10,310 --> 00:16:08,320

look up first let's start with the

439

00:16:11,990 --> 00:16:10,320

internet have a look at that and then we

440

00:16:13,590 --> 00:16:12,000

might look at journals

441

00:16:16,310 --> 00:16:13,600

and then if something's been done on

442

00:16:18,550 --> 00:16:16,320

that before we say okay well let's see

443

00:16:20,230 --> 00:16:18,560

ken is any kind of tangent you can go on

444

00:16:25,030 --> 00:16:20,240

to

445

00:16:27,030 --> 00:16:25,040

people in industry like they need

446

00:16:28,310 --> 00:16:27,040

assistance so they're doing something

447

00:16:30,550 --> 00:16:28,320

because most things most of these

448

00:16:33,509 --> 00:16:30,560

science projects are go beyond the realm

449

00:16:34,710 --> 00:16:33,519

of the cl of a normal classroom teacher

450

00:16:37,430 --> 00:16:34,720

um

451

00:16:39,269 --> 00:16:37,440

so so do you think it's the going out

452

00:16:40,949 --> 00:16:39,279

there in the field and talking to

453

00:16:42,470 --> 00:16:40,959

organizations and maybe making it

454

00:16:43,990 --> 00:16:42,480

something that is not just based in the

455

00:16:46,230 --> 00:16:44,000

school do you think that's that's the

456

00:16:47,590 --> 00:16:46,240

main thing okay yes for the higher level

457

00:16:49,590 --> 00:16:47,600

projects

458

00:16:51,030 --> 00:16:49,600

within the school just over any general

459

00:16:53,509 --> 00:16:51,040

school if you just want to run science

460

00:16:56,150 --> 00:16:53,519

projects obviously you need to have a

461

00:16:57,509 --> 00:16:56,160

teacher who's enthusiastic

462

00:16:59,030 --> 00:16:57,519

and it's time

463

00:17:00,629 --> 00:16:59,040

so

464

00:17:02,550 --> 00:17:00,639

like for instance this morning i walked

465

00:17:04,710 --> 00:17:02,560

into the classroom i just wanted to walk

466

00:17:06,870 --> 00:17:04,720

through the class to get some things

467

00:17:08,390 --> 00:17:06,880

prepared for a lesson and three people

468

00:17:10,309 --> 00:17:08,400

stopped me because i wanted to ask about

469

00:17:11,829 --> 00:17:10,319

their project

470

00:17:13,110 --> 00:17:11,839

do you think this is a good idea and

471

00:17:15,110 --> 00:17:13,120

things like that

472

00:17:16,949 --> 00:17:15,120

and so you don't want to and some one of

473

00:17:18,630 --> 00:17:16,959

the projects was

474

00:17:20,549 --> 00:17:18,640

wasn't a good idea it was wanted to

475

00:17:21,990 --> 00:17:20,559

replace human blood into animal blood

476
00:17:22,710 --> 00:17:22,000
and see if you can the things that i

477
00:17:25,110 --> 00:17:22,720
said

478
00:17:27,429 --> 00:17:25,120
you cannot do that yeah this is some

479
00:17:29,590 --> 00:17:27,439
proteins do why don't you think and then

480
00:17:31,990 --> 00:17:29,600
we just discussing them they want to do

481
00:17:34,310 --> 00:17:32,000
veterinary science when they leave and

482
00:17:35,990 --> 00:17:34,320
they love want to

483
00:17:37,669 --> 00:17:36,000
work with chickens or cats you are kind

484
00:17:39,669 --> 00:17:37,679
of asking probe them what animals they

485
00:17:41,190 --> 00:17:39,679
have and then you kind of develop a

486
00:17:42,470 --> 00:17:41,200
project from that from what they're

487
00:17:43,990 --> 00:17:42,480
interested in

488
00:17:47,590 --> 00:17:44,000

but

489

00:17:50,230 --> 00:17:47,600

you then the thing is you then gotta

490

00:17:52,150 --> 00:17:50,240

the research plan is huge you have to

491

00:17:53,990 --> 00:17:52,160

kind of sit them down generally lunch

492

00:17:55,590 --> 00:17:54,000

time they come to you and i would

493

00:17:57,669 --> 00:17:55,600

probably get two students at lunchtime

494

00:17:59,590 --> 00:17:57,679

who would come and would work out a

495

00:18:01,669 --> 00:17:59,600

research plan how you're going to do it

496

00:18:03,350 --> 00:18:01,679

in a controlled way what interesting

497

00:18:04,870 --> 00:18:03,360

thing are you going to do now the

498

00:18:07,430 --> 00:18:04,880

problem is most of those interesting

499

00:18:08,470 --> 00:18:07,440

things you can't

500

00:18:10,390 --> 00:18:08,480

just

501

00:18:12,390 --> 00:18:10,400

come up with initially

502

00:18:14,070 --> 00:18:12,400

the best is just to get to start on the

503

00:18:16,630 --> 00:18:14,080

project just start and you'll probably

504

00:18:18,390 --> 00:18:16,640

find as you get going interesting side

505

00:18:20,950 --> 00:18:18,400

points will come up and then you can

506

00:18:23,190 --> 00:18:20,960

kind of may change the the direction of

507

00:18:25,110 --> 00:18:23,200

your project

508

00:18:27,029 --> 00:18:25,120

but obviously the big thing is the

509

00:18:28,549 --> 00:18:27,039

teacher needs to spend time with the

510

00:18:30,950 --> 00:18:28,559

student

511

00:18:32,710 --> 00:18:30,960

you have to it's a personal thing and

512

00:18:35,669 --> 00:18:32,720

why i like science projects is that i

513

00:18:37,990 --> 00:18:35,679

actually get to have a you know relate

514

00:18:38,789 --> 00:18:38,000

to the students in a one-to-one

515

00:18:41,110 --> 00:18:38,799

way

516

00:18:43,750 --> 00:18:41,120

it's not just the teacher at the front

517

00:18:47,110 --> 00:18:43,760

passing on their knowledge of a topic

518

00:18:48,870 --> 00:18:47,120

you also later on then go and personally

519

00:18:50,390 --> 00:18:48,880

work with students and they really

520

00:18:52,070 --> 00:18:50,400

respond to that

521

00:18:54,549 --> 00:18:52,080

even the little kids

522

00:18:57,190 --> 00:18:54,559

and and i just have to give time

523

00:19:00,150 --> 00:18:57,200

there's no really other way i can't see

524

00:19:01,510 --> 00:19:00,160

so you think that um it seems reasonable

525

00:19:03,590 --> 00:19:01,520

enough do you think that it's that

526

00:19:05,510 --> 00:19:03,600

one-on-one that also affects the

527

00:19:07,990 --> 00:19:05,520

enthusiasm of the students that that

528

00:19:11,350 --> 00:19:08,000

ability to work with no

529

00:19:12,470 --> 00:19:11,360

no the enthusiasm is

530

00:19:13,909 --> 00:19:12,480

you've got to try to generate the

531

00:19:16,549 --> 00:19:13,919

enthusiasm

532

00:19:18,789 --> 00:19:16,559

in the class to start with

533

00:19:20,950 --> 00:19:18,799

and usually

534

00:19:23,190 --> 00:19:20,960

another way of getting enthusiasm kids

535

00:19:25,669 --> 00:19:23,200

love publicity and media they love to be

536

00:19:27,190 --> 00:19:25,679

on the newspaper and the tv for instance

537

00:19:29,350 --> 00:19:27,200

just behind you

538

00:19:33,590 --> 00:19:29,360

these are all newspapers which have

539

00:19:35,830 --> 00:19:33,600

students from our school um in different

540

00:19:38,070 --> 00:19:35,840

future featured in different articles

541

00:19:39,750 --> 00:19:38,080

some of the magazines i must point out

542

00:19:42,470 --> 00:19:39,760

that we're talking probably you know in

543

00:19:44,070 --> 00:19:42,480

excess of 100 well in excess of 100

544

00:19:45,669 --> 00:19:44,080

people yeah well some of them are

545

00:19:47,830 --> 00:19:45,679

multiple copies but generally i would

546

00:19:52,150 --> 00:19:47,840

have over 100 different articles

547

00:19:54,710 --> 00:19:52,160

um of students um in the in the press

548

00:19:56,470 --> 00:19:54,720

so they get excited a lot of radio

549

00:19:59,190 --> 00:19:56,480

interviews some one of our students was

550

00:20:01,669 --> 00:19:59,200

interviewed by pm on the abc last year

551
00:20:03,270 --> 00:20:01,679
and some so a lot of them on

552
00:20:05,110 --> 00:20:03,280
different different stations depending

553
00:20:09,270 --> 00:20:05,120
on what their project's about

554
00:20:11,350 --> 00:20:09,280
and i try to enthuse students by

555
00:20:16,070 --> 00:20:11,360
giving the opportunity to be to have

556
00:20:17,909 --> 00:20:16,080
their work shown to the public you know

557
00:20:19,430 --> 00:20:17,919
that's a big factor

558
00:20:21,110 --> 00:20:19,440
how would a school that doesn't have

559
00:20:23,029 --> 00:20:21,120
that history that you have that is able

560
00:20:25,510 --> 00:20:23,039
to show projects that have been known in

561
00:20:27,510 --> 00:20:25,520
the past how would a school get just

562
00:20:30,630 --> 00:20:27,520
starting or physically trying to get

563
00:20:32,950 --> 00:20:30,640

into that okay i'll give an example

564

00:20:35,909 --> 00:20:32,960

i am currently involved in a

565

00:20:37,909 --> 00:20:35,919

my science program which is schools it's

566

00:20:40,070 --> 00:20:37,919

a department of education program for

567

00:20:42,070 --> 00:20:40,080

schools in the western sydney

568

00:20:43,750 --> 00:20:42,080

and they have

569

00:20:46,310 --> 00:20:43,760

they want mentors to come into these

570

00:20:48,630 --> 00:20:46,320

schools to show them to help them kids

571

00:20:49,510 --> 00:20:48,640

with their science projects

572

00:20:50,549 --> 00:20:49,520

and

573

00:20:54,390 --> 00:20:50,559

so

574

00:20:56,310 --> 00:20:54,400

there was

575

00:20:58,230 --> 00:20:56,320

no background in science no background

576
00:20:59,830 --> 00:20:58,240
in anything of this and i've been there

577
00:21:01,830 --> 00:20:59,840
this is my fourth year i've been each

578
00:21:03,110 --> 00:21:01,840
year each year there

579
00:21:03,909 --> 00:21:03,120
development

580
00:21:05,669 --> 00:21:03,919
and

581
00:21:08,950 --> 00:21:05,679
they would do a pro they all do projects

582
00:21:11,510 --> 00:21:08,960
they'll do a poster they have a fair

583
00:21:13,590 --> 00:21:11,520
but didn't get anywhere

584
00:21:15,750 --> 00:21:13,600
very similar to how we started

585
00:21:19,350 --> 00:21:15,760
because i didn't know what was needed i

586
00:21:21,669 --> 00:21:19,360
didn't have any guy to go by

587
00:21:23,350 --> 00:21:21,679
and so this the second year

588
00:21:25,430 --> 00:21:23,360

i said to the club the teacher i was

589

00:21:28,310 --> 00:21:25,440

working with

590

00:21:30,870 --> 00:21:28,320

would you mind if we

591

00:21:32,630 --> 00:21:30,880

spent a bit more time on

592

00:21:34,230 --> 00:21:32,640

you know just pick one project let's

593

00:21:36,630 --> 00:21:34,240

spend a bit more time so you have a

594

00:21:39,350 --> 00:21:36,640

model for the rest of your class

595

00:21:41,430 --> 00:21:39,360

and so we did with one project we didn't

596

00:21:44,310 --> 00:21:41,440

spend much time but they looked at

597

00:21:46,870 --> 00:21:44,320

us on long jumps and whether when you

598

00:21:48,870 --> 00:21:46,880

have most long kids doing long jump look

599

00:21:51,029 --> 00:21:48,880

at the sand and the whole body goes

600

00:21:52,870 --> 00:21:51,039

downwards but if you look straight ahead

601
00:21:54,070 --> 00:21:52,880
how much extra distance can you get by

602
00:21:56,390 --> 00:21:54,080
just looking straight ahead as you're

603
00:21:58,230 --> 00:21:56,400
supposed to do and then look at the sand

604
00:22:00,149 --> 00:21:58,240
so i said well what you need to do is

605
00:22:02,149 --> 00:22:00,159
firstly see is how much of a problem

606
00:22:04,310 --> 00:22:02,159
that is so they had their athletic

607
00:22:06,710 --> 00:22:04,320
carnival and they found that about 97

608
00:22:08,789 --> 00:22:06,720
percent of kids looked at the sand

609
00:22:10,630 --> 00:22:08,799
and only two i think three kids didn't

610
00:22:12,470 --> 00:22:10,640
and they were one the some of the some

611
00:22:13,669 --> 00:22:12,480
of the place getters

612
00:22:15,590 --> 00:22:13,679
obviously so

613
00:22:17,350 --> 00:22:15,600

they did this project and that so we had

614

00:22:18,630 --> 00:22:17,360

a model and i and they would have

615

00:22:20,950 --> 00:22:18,640

emailed

616

00:22:22,870 --> 00:22:20,960

their tables and i would have sent back

617

00:22:24,230 --> 00:22:22,880

you know well you should do this and

618

00:22:27,270 --> 00:22:24,240

there's a good communication with the

619

00:22:29,190 --> 00:22:27,280

teacher and so they now have a model of

620

00:22:31,590 --> 00:22:29,200

a good project this project that went on

621

00:22:32,549 --> 00:22:31,600

to be one of the top bhp national

622

00:22:34,950 --> 00:22:32,559

winners

623

00:22:36,470 --> 00:22:34,960

um it wasn't a big project it was i

624

00:22:38,070 --> 00:22:36,480

would say is very small wasn't it it

625

00:22:42,310 --> 00:22:38,080

doesn't be huge

626
00:22:43,669 --> 00:22:42,320
but it was a good method methodology

627
00:22:47,990 --> 00:22:43,679
and

628
00:22:49,190 --> 00:22:48,000
for their school to use i said to the i

629
00:22:51,990 --> 00:22:49,200
said to

630
00:22:56,230 --> 00:22:52,000
that teacher you now need to either get

631
00:22:58,549 --> 00:22:56,240
it as a pdf document so all kids can

632
00:23:00,549 --> 00:22:58,559
have a look at it and

633
00:23:01,750 --> 00:23:00,559
and use it as a benchmark and say you

634
00:23:03,430 --> 00:23:01,760
know what to do

635
00:23:05,110 --> 00:23:03,440
because unless they have that

636
00:23:06,789 --> 00:23:05,120
they'll just continue every year just

637
00:23:09,029 --> 00:23:06,799
have projects with look good but don't

638
00:23:11,110 --> 00:23:09,039

go don't aren't the same level as the

639

00:23:13,669 --> 00:23:11,120

top level projects

640

00:23:16,310 --> 00:23:13,679

so but now they have that

641

00:23:17,909 --> 00:23:16,320

um they're now increasing the all

642

00:23:20,789 --> 00:23:17,919

classes from year three to year six are

643

00:23:24,070 --> 00:23:20,799

now doing science projects this year um

644

00:23:26,310 --> 00:23:24,080

they have resumed a company nearby at

645

00:23:28,549 --> 00:23:26,320

bella vista coming to their school and

646

00:23:30,950 --> 00:23:28,559

they have nearly 20 scientists

647

00:23:32,549 --> 00:23:30,960

working as mentors in that school

648

00:23:35,990 --> 00:23:32,559

and it's totally changed that school

649

00:23:37,350 --> 00:23:36,000

around now you obviously value the

650

00:23:38,950 --> 00:23:37,360

science competitions of various kinds of

651
00:23:40,789 --> 00:23:38,960
science awards and science competitions

652
00:23:46,230 --> 00:23:40,799
can you tell me why that is what do you

653
00:23:50,230 --> 00:23:47,590
we don't just

654
00:23:53,830 --> 00:23:50,240
enter a science competition just to win

655
00:23:58,710 --> 00:23:56,230
schools have a lot of different

656
00:24:00,470 --> 00:23:58,720
extracurricular stuff they can do like

657
00:24:03,029 --> 00:24:00,480
as a science teacher i could enter my

658
00:24:05,350 --> 00:24:03,039
students into the science olympiads i

659
00:24:07,430 --> 00:24:05,360
could do eureka awards there's a whole

660
00:24:08,710 --> 00:24:07,440
series awards you can solo card

661
00:24:09,430 --> 00:24:08,720
challenges

662
00:24:12,870 --> 00:24:09,440
so

663
00:24:15,110 --> 00:24:12,880

pick i just we just happened to pick the

664

00:24:17,830 --> 00:24:15,120

young sciences awards because we thought

665

00:24:19,750 --> 00:24:17,840

that if we get all kids doing science

666

00:24:22,870 --> 00:24:19,760

projects we're actually setting them up

667

00:24:26,789 --> 00:24:24,710

and it's not just something they will

668

00:24:28,470 --> 00:24:26,799

just do now and forget about that

669

00:24:30,830 --> 00:24:28,480

they're learning skills they can build

670

00:24:34,070 --> 00:24:30,840

on the next year they can develop their

671

00:24:35,990 --> 00:24:34,080

projects and because we're a k-12 school

672

00:24:39,350 --> 00:24:36,000

if we can get kids in our preparatory

673

00:24:41,350 --> 00:24:39,360

school doing a project

674

00:24:44,230 --> 00:24:41,360

when they do it again two years time

675

00:24:45,510 --> 00:24:44,240

it's the next level up and it continues

676
00:24:46,630 --> 00:24:45,520
year to year

677
00:24:49,990 --> 00:24:46,640
and

678
00:24:51,350 --> 00:24:50,000
curriculum so we have students who

679
00:24:53,990 --> 00:24:51,360
didn't win anything for the first six

680
00:24:56,230 --> 00:24:54,000
years of their science projects now

681
00:24:58,630 --> 00:24:56,240
top projects just because

682
00:25:01,590 --> 00:24:58,640
they have built on their previous

683
00:25:02,870 --> 00:25:01,600
skills and now they are you know tops

684
00:25:05,110 --> 00:25:02,880
their top skills in australia you can

685
00:25:06,310 --> 00:25:05,120
say do you think the competition is the

686
00:25:08,149 --> 00:25:06,320
fact that there is an award a

687
00:25:11,029 --> 00:25:08,159
competition a medal

688
00:25:13,510 --> 00:25:11,039

a place in in in the on the winning

689

00:25:14,710 --> 00:25:13,520

panel uh winning um

690

00:25:16,310 --> 00:25:14,720

on the podium

691

00:25:17,669 --> 00:25:16,320

do you think that actually encourages

692

00:25:19,590 --> 00:25:17,679

students do you think they're definitely

693

00:25:21,909 --> 00:25:19,600

so there's a value in the competition

694

00:25:23,750 --> 00:25:21,919

itself in terms of just the will to to

695

00:25:24,549 --> 00:25:23,760

win or to get something definitely

696

00:25:26,070 --> 00:25:24,559

yeah

697

00:25:28,630 --> 00:25:26,080

like every school has to do a research

698

00:25:30,149 --> 00:25:28,640

project but these projects such as young

699

00:25:31,669 --> 00:25:30,159

science awards

700

00:25:33,430 --> 00:25:31,679

they have

701
00:25:35,430 --> 00:25:33,440
like you can win a trip to america from

702
00:25:37,350 --> 00:25:35,440
year 9 to 12 for two students or you can

703
00:25:38,870 --> 00:25:37,360
win a couple hundred dollars if you win

704
00:25:41,029 --> 00:25:38,880
your category

705
00:25:42,710 --> 00:25:41,039
that does inspire students obviously

706
00:25:44,390 --> 00:25:42,720
there is a perception in certain parts

707
00:25:45,830 --> 00:25:44,400
of the public certainly in the

708
00:25:47,510 --> 00:25:45,840
non-religious parts of the public that

709
00:25:48,710 --> 00:25:47,520
there is a contradiction between science

710
00:25:51,110 --> 00:25:48,720
and religion

711
00:25:52,390 --> 00:25:51,120
now obviously here that contradiction

712
00:25:53,990 --> 00:25:52,400
does not exist because you're a

713
00:25:55,909 --> 00:25:54,000

religious school with a

714

00:25:57,350 --> 00:25:55,919

very successful science program do you

715

00:25:59,029 --> 00:25:57,360

want to talk about that

716

00:26:00,310 --> 00:25:59,039

i do agree in history there's been a big

717

00:26:01,350 --> 00:26:00,320

potential

718

00:26:02,470 --> 00:26:01,360

um

719

00:26:04,630 --> 00:26:02,480

conflict

720

00:26:06,070 --> 00:26:04,640

you can just look at the copernicus and

721

00:26:07,909 --> 00:26:06,080

all the time with the

722

00:26:08,710 --> 00:26:07,919

with the heliocentric and geocentric

723

00:26:11,750 --> 00:26:08,720

view

724

00:26:14,870 --> 00:26:11,760

but um

725

00:26:17,110 --> 00:26:14,880

we don't in our science curriculum put a

726
00:26:20,310 --> 00:26:17,120
heavy on that conflict we would we have

727
00:26:22,549 --> 00:26:20,320
a curriculum which we teach we if we if

728
00:26:25,430 --> 00:26:22,559
if evolution is there we'll teach the

729
00:26:28,470 --> 00:26:25,440
theory of evolution um

730
00:26:32,070 --> 00:26:28,480
we don't spend time giving necessarily

731
00:26:33,430 --> 00:26:32,080
our opinions how right or wrong it is we

732
00:26:35,430 --> 00:26:33,440
definitely if there's

733
00:26:37,750 --> 00:26:35,440
loophole if there's a gap in the

734
00:26:40,149 --> 00:26:37,760
evolution model would say that

735
00:26:41,750 --> 00:26:40,159
if there was if we talked about the we

736
00:26:42,870 --> 00:26:41,760
go back to the

737
00:26:44,230 --> 00:26:42,880
uh

738
00:26:47,590 --> 00:26:44,240

the earth being the center of the

739

00:26:49,430 --> 00:26:47,600

universe where the church was against

740

00:26:50,950 --> 00:26:49,440

science that's probably the biggest

741

00:26:53,909 --> 00:26:50,960

point in history where there was a

742

00:26:55,190 --> 00:26:53,919

conflict and

743

00:26:57,669 --> 00:26:55,200

and

744

00:26:59,269 --> 00:26:57,679

would say yeah the church

745

00:27:04,149 --> 00:26:59,279

in the bible did talk about the sun

746

00:27:07,990 --> 00:27:06,070

you can still both were correct in the

747

00:27:10,310 --> 00:27:08,000

way you know what i mean like uh the

748

00:27:12,470 --> 00:27:10,320

bible might or not have

749

00:27:14,789 --> 00:27:12,480

laid it out um

750

00:27:15,669 --> 00:27:14,799

this is how the universe is structured i

751
00:27:17,830 --> 00:27:15,679
mean

752
00:27:20,870 --> 00:27:17,840
it was to the people who was written to

753
00:27:22,710 --> 00:27:20,880
and the son obviously appears to go over

754
00:27:24,630 --> 00:27:22,720
but it's not saying that bob was wrong

755
00:27:25,830 --> 00:27:24,640
it's just that to the audience it was

756
00:27:28,230 --> 00:27:25,840
written

757
00:27:30,950 --> 00:27:28,240
it was logical you're not gonna

758
00:27:32,630 --> 00:27:30,960
so in terms of in a normal class

759
00:27:35,830 --> 00:27:32,640
situation

760
00:27:38,470 --> 00:27:36,710
we

761
00:27:40,630 --> 00:27:38,480
see that

762
00:27:43,029 --> 00:27:40,640
religion and science

763
00:27:44,230 --> 00:27:43,039

are not opposites we're very clear about

764

00:27:46,470 --> 00:27:44,240

that

765

00:27:47,909 --> 00:27:46,480

um there may be ethical issues where

766

00:27:49,669 --> 00:27:47,919

science

767

00:27:51,350 --> 00:27:49,679

is kind of going the area which they

768

00:27:53,190 --> 00:27:51,360

shouldn't be

769

00:27:56,389 --> 00:27:53,200

it's going too far and it should leave

770

00:27:58,549 --> 00:27:56,399

things alone especially human life

771

00:28:00,070 --> 00:27:58,559

and obviously we'll not be happy with

772

00:28:01,750 --> 00:28:00,080

that

773

00:28:04,070 --> 00:28:01,760

but we don't see them as opposite

774

00:28:06,070 --> 00:28:04,080

conflicting views

775

00:28:08,470 --> 00:28:06,080

um maybe if i can just point out

776
00:28:10,149 --> 00:28:08,480
something you mentioned the sun the sun

777
00:28:11,990 --> 00:28:10,159
going around the earth as long as you do

778
00:28:14,710 --> 00:28:12,000
not treat the bible as a science book

779
00:28:17,269 --> 00:28:14,720
you do not expect it to actually explain

780
00:28:18,230 --> 00:28:17,279
the underlying scientific facts

781
00:28:19,669 --> 00:28:18,240
then i don't think that would

782
00:28:21,269 --> 00:28:19,679
necessarily be a problem dude it's good

783
00:28:23,110 --> 00:28:21,279
you know i don't think it's a problem

784
00:28:24,950 --> 00:28:23,120
not at all

785
00:28:26,549 --> 00:28:24,960
like you get

786
00:28:29,510 --> 00:28:26,559
like this morning on the news report

787
00:28:31,909 --> 00:28:29,520
they talk about the permafrost

788
00:28:34,789 --> 00:28:31,919

that methane gas is leaking through the

789

00:28:35,750 --> 00:28:34,799

permafrost and that's another uh example

790

00:28:41,269 --> 00:28:35,760

of

791

00:28:43,830 --> 00:28:41,279

made a phrase that said this has been

792

00:28:45,669 --> 00:28:43,840

the highest level of methane

793

00:28:47,110 --> 00:28:45,679

in antarctica for the last 60 million

794

00:28:49,669 --> 00:28:47,120

years

795

00:28:51,590 --> 00:28:49,679

and when i heard that i often have a

796

00:28:53,669 --> 00:28:51,600

question how they know

797

00:28:56,310 --> 00:28:53,679

they how can they say that what about in

798

00:28:58,549 --> 00:28:56,320

the idea of an ice age

799

00:29:00,310 --> 00:28:58,559

that is where i would if i had that

800

00:29:02,470 --> 00:29:00,320

situation a class where you watch a

801
00:29:04,549 --> 00:29:02,480
video and they make a comment

802
00:29:07,190 --> 00:29:04,559
which has no real

803
00:29:09,110 --> 00:29:07,200
evidence or measurement to go with it i

804
00:29:11,909 --> 00:29:09,120
say you need to be careful

805
00:29:15,269 --> 00:29:11,919
what you hear when those things are said

806
00:29:17,190 --> 00:29:15,279
and so we're also teaching students

807
00:29:18,310 --> 00:29:17,200
to discriminate

808
00:29:20,470 --> 00:29:18,320
uh

809
00:29:22,310 --> 00:29:20,480
back from possible facts you know what i

810
00:29:24,070 --> 00:29:22,320
mean thank you very much to your god for

811
00:29:34,230 --> 00:29:24,080
being with me on the skeptics that thank

812
00:29:39,350 --> 00:29:36,310
this is eugenie scott national center

813
00:29:43,350 --> 00:29:39,360

for science education you can find us at

814

00:29:47,350 --> 00:29:45,110

come see us if you want to know anything

815

00:29:49,909 --> 00:29:47,360

about the creationism and evolution

816

00:29:51,830 --> 00:29:49,919

conflict in the united states or

817

00:29:53,750 --> 00:29:51,840

more is the pity internationally these

818

00:29:56,950 --> 00:29:53,760

days we are a clearinghouse for

819

00:29:58,870 --> 00:29:56,960

information on this vexing but certainly

820

00:30:03,909 --> 00:29:58,880

very interesting problem

821

00:30:07,750 --> 00:30:05,830

can't get enough of euphoria with one in

822

00:30:09,110 --> 00:30:07,760

a million here in nfl it's after the six

823

00:30:12,549 --> 00:30:09,120

o'clock mark here on thursday which

824

00:30:14,630 --> 00:30:12,559

means it is time for the skeptic tank

825

00:30:17,190 --> 00:30:14,640

good evening skeptics good evening good

826

00:30:19,430 --> 00:30:17,200

evening i don't believe it

827

00:30:22,870 --> 00:30:19,440

oh that's a good one i've we've had in

828

00:30:25,190 --> 00:30:22,880

the studio a very well renowned

829

00:30:27,350 --> 00:30:25,200

paleontologist dr paul willis good

830

00:30:29,669 --> 00:30:27,360

afternoon how are you very good and of

831

00:30:31,510 --> 00:30:29,679

course our regular skeptic dude mr

832

00:30:33,430 --> 00:30:31,520

richard saunders hello steph how you

833

00:30:35,669 --> 00:30:33,440

doing out there really well that's good

834

00:30:38,149 --> 00:30:35,679

nice of you to both drop into the studio

835

00:30:40,549 --> 00:30:38,159

and what do we have in store tonight

836

00:30:42,389 --> 00:30:40,559

with the skeptic tank well uh tonight

837

00:30:45,590 --> 00:30:42,399

we're going to be looking at the subject

838

00:30:47,669 --> 00:30:45,600

of evolution and creationism ah

839

00:30:52,389 --> 00:30:47,679

that's always a very very oh bit of a

840

00:30:55,510 --> 00:30:53,830

but it is it is

841

00:30:58,230 --> 00:30:55,520

it's a debate that was one in science

842

00:30:59,029 --> 00:30:58,240

150 years ago and people still arguing

843

00:31:01,110 --> 00:30:59,039

well

844

00:31:03,350 --> 00:31:01,120

no no the people that

845

00:31:06,149 --> 00:31:03,360

want to argue it are religious

846

00:31:08,149 --> 00:31:06,159

fundamentalists who find it offensive

847

00:31:10,070 --> 00:31:08,159

when reality clashes with their beliefs

848

00:31:12,310 --> 00:31:10,080

right if that hasn't got some people's

849

00:31:14,070 --> 00:31:12,320

backs up but i don't know

850

00:31:16,389 --> 00:31:14,080

we can always try a little bit harder

851
00:31:18,310 --> 00:31:16,399
yeah well essentially the debate was 150

852
00:31:20,710 --> 00:31:18,320
years ago when charles darwin put out

853
00:31:22,389 --> 00:31:20,720
every origin of the species right but

854
00:31:23,909 --> 00:31:22,399
even aren't some scientists say

855
00:31:25,350 --> 00:31:23,919
something to say oh no no that's not

856
00:31:27,190 --> 00:31:25,360
even that might not be true and then

857
00:31:28,710 --> 00:31:27,200
clouding the issue again

858
00:31:31,350 --> 00:31:28,720
there there is an interesting book that

859
00:31:34,149 --> 00:31:31,360
came out a couple years ago called uh in

860
00:31:36,789 --> 00:31:34,159
six days 50 scientists explain why they

861
00:31:37,909 --> 00:31:36,799
accept creationism and if you read that

862
00:31:39,590 --> 00:31:37,919
book there's a couple of things to

863
00:31:41,029 --> 00:31:39,600

notice first of all most of them are not

864

00:31:43,509 --> 00:31:41,039

biologists they don't actually

865

00:31:45,190 --> 00:31:43,519

understand evolution yeah and that if

866

00:31:46,870 --> 00:31:45,200

you understand evolution and

867

00:31:48,310 --> 00:31:46,880

read it you it's quite obvious that they

868

00:31:49,590 --> 00:31:48,320

don't really understand what's going on

869

00:31:51,590 --> 00:31:49,600

the other thing is is that they're all

870

00:31:54,310 --> 00:31:51,600

religious testimonials yeah they're all

871

00:31:56,230 --> 00:31:54,320

people who uh are working as scientists

872

00:31:59,269 --> 00:31:56,240

in various areas of science right

873

00:32:00,950 --> 00:31:59,279

computing or hydraulics or things but

874

00:32:02,870 --> 00:32:00,960

the thing is is what they've sold

875

00:32:05,590 --> 00:32:02,880

themselves on is is

876

00:32:08,789 --> 00:32:05,600

their belief in the bible will not allow

877

00:32:11,509 --> 00:32:08,799

them to uh to do anything else

878

00:32:13,110 --> 00:32:11,519

so they know nothing about about about

879

00:32:14,389 --> 00:32:13,120

evolution at all but they're still

880

00:32:16,950 --> 00:32:14,399

claiming that they do

881

00:32:20,389 --> 00:32:16,960

which well yeah yeah that's probably in

882

00:32:21,110 --> 00:32:20,399

a nutshell yeah okay case in their case

883

00:32:22,630 --> 00:32:21,120

oh

884

00:32:24,870 --> 00:32:22,640

we're getting in there

885

00:32:27,430 --> 00:32:24,880

tonight folks yes indeed and you as a

886

00:32:29,190 --> 00:32:27,440

paleontologist you were able to to show

887

00:32:31,590 --> 00:32:29,200

lots of compelling evidence of course

888

00:32:33,269 --> 00:32:31,600

that over billions of years lots of

889

00:32:34,710 --> 00:32:33,279

things happen with the different life

890

00:32:36,389 --> 00:32:34,720

forms on the planet it is one of the

891

00:32:39,269 --> 00:32:36,399

problems in arguing

892

00:32:41,110 --> 00:32:39,279

against creationists and that is that

893

00:32:43,430 --> 00:32:41,120

in order to actually understand the

894

00:32:45,590 --> 00:32:43,440

evidence against them

895

00:32:47,909 --> 00:32:45,600

i mean i spent like 12 years at

896

00:32:50,710 --> 00:32:47,919

university doing an undergraduate degree

897

00:32:52,630 --> 00:32:50,720

and then a phd going out there splitting

898

00:32:54,870 --> 00:32:52,640

rocks looking at the at the evidence

899

00:32:56,470 --> 00:32:54,880

firsthand the actual evidence i don't

900

00:32:58,310 --> 00:32:56,480

like to be able to have to turn around

901
00:32:59,110 --> 00:32:58,320
to people and say well look take it from

902
00:33:01,110 --> 00:32:59,120
me

903
00:33:03,990 --> 00:33:01,120
but uh but the thing is is that you know

904
00:33:06,230 --> 00:33:04,000
unless you've got a fair grasp on on the

905
00:33:06,950 --> 00:33:06,240
the basic science behind it which does

906
00:33:08,470 --> 00:33:06,960
take

907
00:33:10,630 --> 00:33:08,480
a university degree to get under your

908
00:33:12,870 --> 00:33:10,640
belt and it can all seem a bit

909
00:33:15,269 --> 00:33:12,880
mystifying yeah well i think some people

910
00:33:17,990 --> 00:33:15,279
may have a hard time comprehending the

911
00:33:19,990 --> 00:33:18,000
amount of time in the involved in

912
00:33:22,470 --> 00:33:20,000
evolution of our of where we are right

913
00:33:24,789 --> 00:33:22,480

now that millions or even billions of

914

00:33:26,230 --> 00:33:24,799

dollars yes so do i i have i have

915

00:33:27,669 --> 00:33:26,240

immense problems coming in terms of

916

00:33:29,990 --> 00:33:27,679

those lengths of sites so why not

917

00:33:31,669 --> 00:33:30,000

conveniently just make it seven days

918

00:33:33,830 --> 00:33:31,679

well the thing is is that i have a

919

00:33:36,149 --> 00:33:33,840

greater greater ease of disbelieving the

920

00:33:37,990 --> 00:33:36,159

claim to worlds only say six to ten

921

00:33:39,190 --> 00:33:38,000

thousand years old yeah for instance

922

00:33:41,190 --> 00:33:39,200

where we're sitting right here in the

923

00:33:43,590 --> 00:33:41,200

middle of sydney okay we're sitting on

924

00:33:46,230 --> 00:33:43,600

top of about two kilometers of sandstone

925

00:33:47,750 --> 00:33:46,240

and if you look at that sandstone you

926
00:33:49,750 --> 00:33:47,760
can work out how it was laid down it was

927
00:33:51,830 --> 00:33:49,760
laid down in a river restaurant and it

928
00:33:55,590 --> 00:33:51,840
was laid down at a rate that was

929
00:33:57,269 --> 00:33:55,600
probably less than a meter every decade

930
00:33:59,110 --> 00:33:57,279
right across the whole basin in fact

931
00:34:01,269 --> 00:33:59,120
probably less than a meter every 100

932
00:34:03,590 --> 00:34:01,279
years so you've got you know

933
00:34:06,310 --> 00:34:03,600
many many thousands of years just in

934
00:34:08,389 --> 00:34:06,320
that uh that two kilometers of sandstone

935
00:34:11,349 --> 00:34:08,399
underneath that there's coal in order to

936
00:34:13,190 --> 00:34:11,359
make coal these coal beds uh are only

937
00:34:15,750 --> 00:34:13,200
now a few feet thick but we know in

938
00:34:18,149 --> 00:34:15,760

order to make that coal you need to have

939

00:34:19,829 --> 00:34:18,159

uh swamps that were hundreds of feet

940

00:34:21,190 --> 00:34:19,839

thick that have been compressed yeah how

941

00:34:22,550 --> 00:34:21,200

long does it take to make that

942

00:34:25,030 --> 00:34:22,560

underneath that there are rocks that

943

00:34:27,589 --> 00:34:25,040

have been folded up and have got life or

944

00:34:29,109 --> 00:34:27,599

evidence of sea life folded up inside

945

00:34:31,190 --> 00:34:29,119

them yeah so phenomenal isn't it it

946

00:34:33,030 --> 00:34:31,200

doesn't take long to realize you might

947

00:34:34,869 --> 00:34:33,040

not be able to come to terms with a

948

00:34:36,950 --> 00:34:34,879

million years with 10 million years with

949

00:34:39,030 --> 00:34:36,960

100 million years but it doesn't take

950

00:34:41,669 --> 00:34:39,040

long to realize that the earth is a very

951
00:34:45,030 --> 00:34:41,679
old place and stuff was happening way

952
00:34:47,109 --> 00:34:45,040
back most definitely yes well well well

953
00:34:49,669 --> 00:34:47,119
well we're getting into it now we have a

954
00:34:50,790 --> 00:34:49,679
scientist in the room yes we do i'm

955
00:34:52,950 --> 00:34:50,800
going to play in a little song it's

956
00:34:54,069 --> 00:34:52,960
billy piper she's young billy piper's

957
00:34:57,109 --> 00:34:54,079
only young she's only been around for

958
00:34:59,750 --> 00:34:57,119
what six or seven years i think

959
00:35:01,670 --> 00:34:59,760
i don't think she's nursery rhymes

960
00:35:03,190 --> 00:35:01,680
it's getting close it's something deep

961
00:35:04,950 --> 00:35:03,200
inside

962
00:35:06,230 --> 00:35:04,960
that's not something young person would

963
00:35:15,670 --> 00:35:06,240

be talking about

964

00:35:20,150 --> 00:35:17,190

we're back into the skeptic tank we're

965

00:35:22,230 --> 00:35:20,160

paul willis doctor paul willis and dr

966

00:35:23,670 --> 00:35:22,240

richard saunders oh thank you i'm just

967

00:35:25,430 --> 00:35:23,680

giving you an honorary doctor to be

968

00:35:26,870 --> 00:35:25,440

promoted from that fm the hell why don't

969

00:35:28,710 --> 00:35:26,880

we give one to everyone who's listening

970

00:35:30,069 --> 00:35:28,720

today consider yourself doctors folks

971

00:35:32,150 --> 00:35:30,079

ring up we'll give you an honorary

972

00:35:35,990 --> 00:35:32,160

doctorate at the nfl a doctor in the net

973

00:35:37,430 --> 00:35:36,000

ephemology um now uh paul you you've uh

974

00:35:39,270 --> 00:35:37,440

you've obviously had a bit of fun over

975

00:35:41,510 --> 00:35:39,280

the years with you with the the

976
00:35:42,470 --> 00:35:41,520
creationists they've been uh trying to

977
00:35:44,069 --> 00:35:42,480
challenge

978
00:35:47,030 --> 00:35:44,079
all the evidence that you've been

979
00:35:48,230 --> 00:35:47,040
digging up over the last 12 15 20 the

980
00:35:49,750 --> 00:35:48,240
thing is they don't actually come

981
00:35:53,109 --> 00:35:49,760
directly out and want to challenge you

982
00:35:54,710 --> 00:35:53,119
personally no um because it would be

983
00:35:55,829 --> 00:35:54,720
like pulling wings off of a fly to

984
00:35:59,109 --> 00:35:55,839
respond

985
00:36:00,950 --> 00:35:59,119
um the thing is is that creationists do

986
00:36:02,710 --> 00:36:00,960
have a very well organized system

987
00:36:04,550 --> 00:36:02,720
whereby they go around to country

988
00:36:07,109 --> 00:36:04,560

schools and country

989

00:36:08,950 --> 00:36:07,119

uh uh churches and and put on these

990

00:36:11,589 --> 00:36:08,960

little seminars there's some regular

991

00:36:13,829 --> 00:36:11,599

features of them one of them will be the

992

00:36:15,829 --> 00:36:13,839

most outstanding one to me is that they

993

00:36:17,270 --> 00:36:15,839

generally run out of time and so they

994

00:36:18,790 --> 00:36:17,280

can't have any questions at the end

995

00:36:19,750 --> 00:36:18,800

right uh

996

00:36:21,109 --> 00:36:19,760

which is

997

00:36:22,630 --> 00:36:21,119

fortunate for them because you know

998

00:36:25,190 --> 00:36:22,640

there's so much of the stuff that can be

999

00:36:26,870 --> 00:36:25,200

questioned sure now i have made a point

1000

00:36:30,150 --> 00:36:26,880

over the years of when one of these is

1001
00:36:31,349 --> 00:36:30,160
not too far from my home i i will gladly

1002
00:36:33,030 --> 00:36:31,359
go along

1003
00:36:36,230 --> 00:36:33,040
and make a point of challenging them and

1004
00:36:37,670 --> 00:36:36,240
forcing questions yeah um

1005
00:36:40,950 --> 00:36:37,680
the thing is

1006
00:36:42,630 --> 00:36:40,960
the whole creation evolution discussion

1007
00:36:44,310 --> 00:36:42,640
you've got to realize as an evolutionist

1008
00:36:45,910 --> 00:36:44,320
you're never going to win you're up

1009
00:36:48,790 --> 00:36:45,920
against people who are not interested

1010
00:36:51,349 --> 00:36:48,800
about what is right and what is wrong

1011
00:36:52,230 --> 00:36:51,359
it's a case of their whole

1012
00:36:54,550 --> 00:36:52,240
life

1013
00:36:56,470 --> 00:36:54,560

is unbounded is founded on a literal

1014

00:36:57,910 --> 00:36:56,480

interpretation of the bible and so

1015

00:36:58,870 --> 00:36:57,920

therefore they can't

1016

00:37:00,790 --> 00:36:58,880

begin

1017

00:37:02,950 --> 00:37:00,800

to conceive that anything else might be

1018

00:37:04,870 --> 00:37:02,960

correct no no they can't the thing is

1019

00:37:06,470 --> 00:37:04,880

what's important is is we're not out

1020

00:37:10,069 --> 00:37:06,480

there to

1021

00:37:13,750 --> 00:37:11,990

but if we don't challenge them they will

1022

00:37:15,510 --> 00:37:13,760

win by default they will change other

1023

00:37:18,230 --> 00:37:15,520

people exactly yeah so they're actually

1024

00:37:20,950 --> 00:37:18,240

going around they're organizing seminars

1025

00:37:23,430 --> 00:37:20,960

they have the creation science bus which

1026
00:37:25,349 --> 00:37:23,440
tours australia really yeah um and this

1027
00:37:27,109 --> 00:37:25,359
this goes to to

1028
00:37:29,270 --> 00:37:27,119
mainly to places outside the major

1029
00:37:31,109 --> 00:37:29,280
cities because most major cities have a

1030
00:37:32,950 --> 00:37:31,119
strong anti-creationist

1031
00:37:34,710 --> 00:37:32,960
movement such as myself

1032
00:37:37,349 --> 00:37:34,720
and people from the various museums who

1033
00:37:38,790 --> 00:37:37,359
will go out and and challenge them at

1034
00:37:41,190 --> 00:37:38,800
these sorts of events when they're

1035
00:37:43,589 --> 00:37:41,200
saying creation science so this they're

1036
00:37:46,069 --> 00:37:43,599
somehow saying that yes god did all this

1037
00:37:48,390 --> 00:37:46,079
wonderful stuff in in in what a

1038
00:37:50,230 --> 00:37:48,400

different length of time

1039

00:37:52,390 --> 00:37:50,240

the term creation science

1040

00:37:53,910 --> 00:37:52,400

they're using the word science right and

1041

00:37:55,109 --> 00:37:53,920

straight away it gives people the wrong

1042

00:37:56,470 --> 00:37:55,119

impression like this stuff but they're

1043

00:37:58,390 --> 00:37:56,480

not talking about science at all not at

1044

00:38:00,230 --> 00:37:58,400

all no it's nothing to do with science

1045

00:38:02,870 --> 00:38:00,240

but they use science and they'll use

1046

00:38:04,790 --> 00:38:02,880

scientific terms yeah and and the the

1047

00:38:06,550 --> 00:38:04,800

the giveaway point is that when you

1048

00:38:07,990 --> 00:38:06,560

actually go along to a creationist

1049

00:38:09,990 --> 00:38:08,000

meeting

1050

00:38:11,990 --> 00:38:10,000

they don't talk about the evidence in

1051
00:38:13,829 --> 00:38:12,000
favor of creationism because there is

1052
00:38:15,589 --> 00:38:13,839
none there is no what they try and do is

1053
00:38:17,589 --> 00:38:15,599
attack the evolution it's created

1054
00:38:19,109 --> 00:38:17,599
evolution yeah and they're not really

1055
00:38:21,670 --> 00:38:19,119
just attacking evolution they're taking

1056
00:38:23,270 --> 00:38:21,680
science they will attack geology which

1057
00:38:25,349 --> 00:38:23,280
has really got nothing to do with

1058
00:38:28,230 --> 00:38:25,359
evolution but they will attack geology

1059
00:38:30,310 --> 00:38:28,240
because uh it contradicts their

1060
00:38:31,750 --> 00:38:30,320
worldview they attack physics they say

1061
00:38:34,470 --> 00:38:31,760
things like the speed of light is

1062
00:38:36,790 --> 00:38:34,480
slowing down well hang on no it's one of

1063
00:38:38,150 --> 00:38:36,800

the great constants of the universe

1064

00:38:40,630 --> 00:38:38,160

they will say that the secondary

1065

00:38:42,550 --> 00:38:40,640

thermodynamics uh precludes evolution

1066

00:38:45,030 --> 00:38:42,560

but they obviously don't understand some

1067

00:38:46,790 --> 00:38:45,040

basic physics such as the second the

1068

00:38:48,230 --> 00:38:46,800

nights i don't want to get into the

1069

00:38:49,670 --> 00:38:48,240

nitty-gritty of the argument right but

1070

00:38:51,589 --> 00:38:49,680

that's what they're doing yeah they're

1071

00:38:53,589 --> 00:38:51,599

having a full-out onslaught against all

1072

00:38:55,670 --> 00:38:53,599

of science not just evolution

1073

00:38:56,710 --> 00:38:55,680

because i thought that some some uh

1074

00:38:59,190 --> 00:38:56,720

people that were taking the bible

1075

00:39:00,390 --> 00:38:59,200

literally were beginning to sort of turn

1076

00:39:02,790 --> 00:39:00,400

come around a little bit and start to

1077

00:39:04,630 --> 00:39:02,800

say well okay well it wasn't seven days

1078

00:39:05,670 --> 00:39:04,640

but the basic concept was it was created

1079

00:39:08,470 --> 00:39:05,680

by god

1080

00:39:11,910 --> 00:39:08,480

there are reform uh what are they called

1081

00:39:14,069 --> 00:39:11,920

theistic evil uh theistic evolutionists

1082

00:39:15,190 --> 00:39:14,079

they they believe god sort of directed

1083

00:39:16,310 --> 00:39:15,200

evolution

1084

00:39:17,910 --> 00:39:16,320

look

1085

00:39:20,710 --> 00:39:17,920

the thing is is that there's no evidence

1086

00:39:22,710 --> 00:39:20,720

for it no uh and science is based on

1087

00:39:24,630 --> 00:39:22,720

evidence you know the reason why i

1088

00:39:26,470 --> 00:39:24,640

accept evolution as the there's the

1089

00:39:28,550 --> 00:39:26,480

explanation to why we're here on the

1090

00:39:30,630 --> 00:39:28,560

face of the earth is because when i go

1091

00:39:33,589 --> 00:39:30,640

out and i split the rocks open the

1092

00:39:35,990 --> 00:39:33,599

patterns that i see in the fossils match

1093

00:39:37,270 --> 00:39:36,000

what ought to be there if life has

1094

00:39:39,190 --> 00:39:37,280

changed through time sure over that

1095

00:39:41,270 --> 00:39:39,200

period of time but still

1096

00:39:42,310 --> 00:39:41,280

changing through time

1097

00:39:44,230 --> 00:39:42,320

it's it's the only thing that's

1098

00:39:46,390 --> 00:39:44,240

determining those changes these

1099

00:39:48,069 --> 00:39:46,400

environmental things or is because

1100

00:39:50,550 --> 00:39:48,079

that's what you know

1101
00:39:52,790 --> 00:39:50,560
when you look at the actual design of

1102
00:39:54,790 --> 00:39:52,800
creatures we've got a skeleton it's like

1103
00:39:55,990 --> 00:39:54,800
my god that's that is pretty amazing

1104
00:39:57,750 --> 00:39:56,000
remember that what we're talking about

1105
00:40:00,150 --> 00:39:57,760
before in the time scales involved

1106
00:40:01,990 --> 00:40:00,160
that's right i mean

1107
00:40:03,990 --> 00:40:02,000
that's right there's another thing too

1108
00:40:05,589 --> 00:40:04,000
there if you take it backwards a step

1109
00:40:07,829 --> 00:40:05,599
and say okay so you know

1110
00:40:09,510 --> 00:40:07,839
perfect design and you sort of think

1111
00:40:10,870 --> 00:40:09,520
well maybe

1112
00:40:12,870 --> 00:40:10,880
there must be a god behind perfect

1113
00:40:14,390 --> 00:40:12,880

design the thing is is that most cases

1114

00:40:16,150 --> 00:40:14,400

that you put up from the biological

1115

00:40:17,750 --> 00:40:16,160

world of supposed perfect design really

1116

00:40:19,990 --> 00:40:17,760

ain't that good not perfect the human

1117

00:40:21,990 --> 00:40:20,000

eye is not a perfect way of seeing the

1118

00:40:24,310 --> 00:40:22,000

world if you were god and you would have

1119

00:40:25,990 --> 00:40:24,320

sit down from scratch and design an eye

1120

00:40:26,870 --> 00:40:26,000

you would not come up with the

1121

00:40:28,470 --> 00:40:26,880

design

1122

00:40:29,990 --> 00:40:28,480

and you probably wouldn't come up with

1123

00:40:31,270 --> 00:40:30,000

the millions of different creatures that

1124

00:40:33,109 --> 00:40:31,280

are on this earth all

1125

00:40:35,109 --> 00:40:33,119

eating each other and going

1126

00:40:36,870 --> 00:40:35,119

how come god is so fascinated with

1127

00:40:38,790 --> 00:40:36,880

beetles for god's sake

1128

00:40:40,710 --> 00:40:38,800

you know there's there are so many of

1129

00:40:42,390 --> 00:40:40,720

them so many ants as well i mean the

1130

00:40:44,550 --> 00:40:42,400

thing is is that there's no argument one

1131

00:40:46,710 --> 00:40:44,560

way or the other under creationism as to

1132

00:40:49,030 --> 00:40:46,720

why you would have millions of species

1133

00:40:51,109 --> 00:40:49,040

of ants and bacteria under evolution it

1134

00:40:52,470 --> 00:40:51,119

makes perfect sense that's right

1135

00:40:54,630 --> 00:40:52,480

so again

1136

00:40:56,309 --> 00:40:54,640

it's matching the pattern another a good

1137

00:40:58,309 --> 00:40:56,319

test if i can just button this one in

1138

00:41:00,470 --> 00:40:58,319

because this one comes from paleontology

1139

00:41:01,750 --> 00:41:00,480

for a long time the creationist has been

1140

00:41:04,470 --> 00:41:01,760

saying well you know something as

1141

00:41:05,990 --> 00:41:04,480

complicated as a bird's wing like half a

1142

00:41:08,309 --> 00:41:06,000

wings not going to work so you can't

1143

00:41:10,150 --> 00:41:08,319

have half a bird's wing and so therefore

1144

00:41:11,829 --> 00:41:10,160

you evolutionists show me half a bird's

1145

00:41:13,670 --> 00:41:11,839

wing and i believe that they evolved

1146

00:41:16,870 --> 00:41:13,680

from something else yep

1147

00:41:32,710 --> 00:41:16,880

only in 1999 cordy tricks was found in

1148

00:41:36,870 --> 00:41:35,349

then they say well uh oh okay so no it's

1149

00:41:38,630 --> 00:41:36,880

a bird that's lost it's you know that's

1150

00:41:40,870 --> 00:41:38,640

this lost its wing that doesn't make any

1151
00:41:42,710 --> 00:41:40,880
sense either it's a mutant because like

1152
00:41:44,390 --> 00:41:42,720
it's also got a reptile's tail it's got

1153
00:41:45,829 --> 00:41:44,400
a reptile skull it's got all of these

1154
00:41:53,190 --> 00:41:45,839
dinosaur features if it didn't have the

1155
00:41:56,870 --> 00:41:55,190
comes your way the creation of science i

1156
00:41:58,790 --> 00:41:56,880
create creation the creation is the

1157
00:42:00,470 --> 00:41:58,800
creation let's not put the word science

1158
00:42:02,550 --> 00:42:00,480
in there let's just take that away from

1159
00:42:04,710 --> 00:42:02,560
when the creationist dust comes your way

1160
00:42:06,950 --> 00:42:04,720
get out your eggs and kill them yes and

1161
00:42:08,630 --> 00:42:06,960
say good tricks you swine

1162
00:42:10,950 --> 00:42:08,640
tricks

1163
00:42:14,470 --> 00:42:10,960

okay here's amber sunshine with running

1164

00:42:17,430 --> 00:42:14,480

song in the skeptic tank

1165

00:42:19,270 --> 00:42:17,440

the big exit with pj harvey here in nfm

1166

00:42:20,550 --> 00:42:19,280

stefan with it till seven o'clock and

1167

00:42:21,829 --> 00:42:20,560

we're in the middle of the skeptic tank

1168

00:42:23,829 --> 00:42:21,839

actually we're coming to the tail end of

1169

00:42:26,150 --> 00:42:23,839

it we're draining the tank

1170

00:42:28,630 --> 00:42:26,160

even as we speak we're shoving all sorts

1171

00:42:30,390 --> 00:42:28,640

of things in it solvents to try and dry

1172

00:42:32,150 --> 00:42:30,400

it up and we haven't got one to go let

1173

00:42:32,870 --> 00:42:32,160

me plug the leak all right plug that

1174

00:42:34,550 --> 00:42:32,880

leak

1175

00:42:35,510 --> 00:42:34,560

actually yeah you can plug uh anything

1176

00:42:37,750 --> 00:42:35,520

you like

1177

00:42:39,430 --> 00:42:37,760

like the skeptics like the skeptics in

1178

00:42:41,270 --> 00:42:39,440

fact a couple of those people who would

1179

00:42:42,630 --> 00:42:41,280

like to plug the skeptics by the way i

1180

00:42:45,109 --> 00:42:42,640

don't believe it

1181

00:42:48,230 --> 00:42:45,119

creationists

1182

00:42:49,670 --> 00:42:48,240

yeah look uh i work at the avc uh in the

1183

00:42:51,750 --> 00:42:49,680

science unit and if you want to check

1184

00:42:56,710 --> 00:42:51,760

out the sort of stuff we get up to go to

1185

00:43:00,630 --> 00:42:58,470

science and you'll find catalyst which

1186

00:43:02,150 --> 00:43:00,640

is a program i work on radio national

1187

00:43:04,150 --> 00:43:02,160

we've got the science show and earth

1188

00:43:06,150 --> 00:43:04,160

beaten all sorts of goodies on there if

1189

00:43:08,230 --> 00:43:06,160

you've got a scientific leaning it may

1190

00:43:10,309 --> 00:43:08,240

be a place to contact abc does some good

1191

00:43:19,589 --> 00:43:10,319

stuff with science don't they well thank

1192

00:43:23,990 --> 00:43:21,910

you just came back from a water divining

1193

00:43:25,670 --> 00:43:24,000

challenge i've had a big year i mean one

1194

00:43:27,990 --> 00:43:25,680

month i'm in india and next month i'm in

1195

00:43:30,390 --> 00:43:28,000

the high country of victoria a little

1196

00:43:31,990 --> 00:43:30,400

place called mit emitter one yeah a

1197

00:43:33,990 --> 00:43:32,000

wonderful little village but every year

1198

00:43:35,829 --> 00:43:34,000

they have the mighty mita musta which is

1199

00:43:36,710 --> 00:43:35,839

a big cattle and horse and wood chopping

1200

00:43:38,950 --> 00:43:36,720

show

1201
00:43:41,109 --> 00:43:38,960
yeehaw and the local skeptics put on a

1202
00:43:43,270 --> 00:43:41,119
great water divining or water dowsing

1203
00:43:46,230 --> 00:43:43,280
challenge okay so i went along this year

1204
00:43:47,589 --> 00:43:46,240
uh partly to have a look and i'm also uh

1205
00:43:50,230 --> 00:43:47,599
putting together a little documentary

1206
00:43:52,150 --> 00:43:50,240
about it all day wonderful and saw 30

1207
00:43:53,190 --> 00:43:52,160
water diviners running around the tennis

1208
00:43:55,430 --> 00:43:53,200
court with

1209
00:43:56,870 --> 00:43:55,440
rods and wands and pendulums and all

1210
00:43:58,069 --> 00:43:56,880
sorts of things waving all around the

1211
00:43:59,670 --> 00:43:58,079
place

1212
00:44:01,270 --> 00:43:59,680
and they were trying to win a hundred

1213
00:44:02,950 --> 00:44:01,280

thousand dollars is that right there's a

1214

00:44:03,990 --> 00:44:02,960

hundred thousand dollars or in this case

1215

00:44:07,670 --> 00:44:04,000

i think it was a hundred and ten

1216

00:44:11,109 --> 00:44:10,309

but gst we're all skeptical about that

1217

00:44:13,510 --> 00:44:11,119

and

1218

00:44:15,109 --> 00:44:13,520

well sadly for the diviners although

1219

00:44:17,030 --> 00:44:15,119

beforehand they were predicting a

1220

00:44:18,870 --> 00:44:17,040

hundred percent success rate oh

1221

00:44:21,109 --> 00:44:18,880

absolutely uh

1222

00:44:23,670 --> 00:44:21,119

strangely enough they their results at

1223

00:44:25,510 --> 00:44:23,680

the end of the day fully fell exactly as

1224

00:44:27,270 --> 00:44:25,520

per chance as per chance not much better

1225

00:44:30,309 --> 00:44:27,280

than tossing a coin so they completely

1226

00:44:32,309 --> 00:44:30,319

failed no water was divine well water

1227

00:44:35,190 --> 00:44:32,319

was divine but uh

1228

00:44:37,030 --> 00:44:35,200

overall they failed yes right

1229

00:44:38,950 --> 00:44:37,040

i guess that even though they they

1230

00:44:40,390 --> 00:44:38,960

probably like say they got one out of

1231

00:44:41,910 --> 00:44:40,400

three or something is that what what do

1232

00:44:44,950 --> 00:44:41,920

you do you had some empty there were

1233

00:44:47,190 --> 00:44:44,960

there were 25 uh milk uh plastic milk

1234

00:44:48,870 --> 00:44:47,200

bottles okay wrapped in paper and

1235

00:44:51,510 --> 00:44:48,880

plastic so you couldn't tell what was

1236

00:44:53,829 --> 00:44:51,520

inside right some had water and some had

1237

00:44:55,270 --> 00:44:53,839

sand okay and they ran around and their

1238

00:44:57,030 --> 00:44:55,280

rods would react and say right this

1239

00:44:58,470 --> 00:44:57,040

one's got water and their rods would not

1240

00:44:59,990 --> 00:44:58,480

react to the next one they say right

1241

00:45:01,030 --> 00:45:00,000

that's got sand

1242

00:45:02,550 --> 00:45:01,040

and

1243

00:45:03,990 --> 00:45:02,560

as i said the results at the end of the

1244

00:45:05,750 --> 00:45:04,000

day were like if you walked around and

1245

00:45:07,829 --> 00:45:05,760

tossed a coin over each one you'd get

1246

00:45:10,470 --> 00:45:07,839

similar results to the dowsers there you

1247

00:45:13,510 --> 00:45:10,480

go so all you dowsers out there forget

1248

00:45:14,870 --> 00:45:13,520

it drop it well give it up well until

1249

00:45:16,870 --> 00:45:14,880

they can come to us and actually

1250

00:45:18,950 --> 00:45:16,880

demonstrate there is such a thing as

1251
00:45:20,390 --> 00:45:18,960
dowsing for water or anything else we

1252
00:45:21,910 --> 00:45:20,400
just have to take it as another funny

1253
00:45:23,349 --> 00:45:21,920
claim yeah don't give it up just keep

1254
00:45:28,950 --> 00:45:23,359
coming back to the skeptic still

1255
00:45:31,990 --> 00:45:29,990
yeah

1256
00:45:33,510 --> 00:45:32,000
wonderful stuff and well dr paul's been

1257
00:45:35,349 --> 00:45:33,520
it's been absolutely fantastic having

1258
00:45:38,230 --> 00:45:35,359
you in having a real doctor a real

1259
00:45:41,510 --> 00:45:38,240
paleontologist someone that can

1260
00:45:44,309 --> 00:45:41,520
someone who's got a bone to pick with me

1261
00:45:45,589 --> 00:45:44,319
with a creationist

1262
00:45:46,710 --> 00:45:45,599
and that's all we have people out there

1263
00:45:50,069 --> 00:45:46,720

that if you see the creation of us

1264

00:45:51,990 --> 00:45:50,079

coming along just just stay away from it

1265

00:45:53,750 --> 00:45:52,000

questions

1266

00:45:55,349 --> 00:45:53,760

that is that's the half bird oh look

1267

00:45:56,630 --> 00:45:55,359

just for eggs

1268

00:45:58,710 --> 00:45:56,640

and don't forget what came first the

1269

00:46:01,349 --> 00:45:58,720

chicken or the egg egg laying reptiles

1270

00:46:03,109 --> 00:46:01,359

gave uh evolved into birds so definitely

1271

00:46:03,990 --> 00:46:03,119

the eggs came long before the chickens

1272

00:46:06,710 --> 00:46:04,000

right

1273

00:46:08,230 --> 00:46:06,720

there is the animal it's official okay

1274

00:46:10,069 --> 00:46:08,240

well thanks guys been a wonderful

1275

00:46:11,670 --> 00:46:10,079

skeptic tag this week we're back into

1276
00:46:13,430 --> 00:46:11,680
the music again for our listeners this

1277
00:46:23,030 --> 00:46:13,440
is st lunatic's batter up we'll see you

1278
00:46:27,030 --> 00:46:25,030
astronomy cast takes a fact-based

1279
00:46:28,790 --> 00:46:27,040
journey through the cosmos as it offers

1280
00:46:31,430 --> 00:46:28,800
listeners weekly discussions on

1281
00:46:32,790 --> 00:46:31,440
astronomical topics ranging from planets

1282
00:46:35,270 --> 00:46:32,800
to cosmology

1283
00:46:37,270 --> 00:46:35,280
hosted by fraser kane of universe today

1284
00:46:39,589 --> 00:46:37,280
and myself dr pamela gay of southern

1285
00:46:41,349 --> 00:46:39,599
illinois university edwardsville this

1286
00:46:43,190 --> 00:46:41,359
show brings the questions of an avid

1287
00:46:45,829 --> 00:46:43,200
astronomy lover directly to an

1288
00:46:47,670 --> 00:46:45,839

astronomer together fraser and i explore

1289

00:46:49,510 --> 00:46:47,680

what is known and being discovered about

1290

00:46:51,109 --> 00:46:49,520

the universe around us

1291

00:46:53,109 --> 00:46:51,119

join us each week as we take a

1292

00:47:09,829 --> 00:46:53,119

fact-based journey through the cosmos at

1293

00:47:14,150 --> 00:47:11,910

thank you for listening to this episode

1294

00:47:16,309 --> 00:47:14,160

of the skeptic zone

1295

00:47:18,150 --> 00:47:16,319

next week i hope we have our think tank

1296

00:47:20,630 --> 00:47:18,160

back again

1297

00:47:22,870 --> 00:47:20,640

and thank you also very much to those

1298

00:47:25,510 --> 00:47:22,880

people who subscribe or donate to the

1299

00:47:27,670 --> 00:47:25,520

skeptic zone to help us keep the show

1300

00:47:29,349 --> 00:47:27,680

online and hopefully

1301

00:47:31,190 --> 00:47:29,359

entertaining

1302

00:47:33,270 --> 00:47:31,200

so until our next episode this is

1303

00:47:38,390 --> 00:47:33,280

richard saunders signing off

1304

00:47:42,069 --> 00:47:40,069

you've been listening to the skeptic

1305

00:47:45,430 --> 00:47:42,079

zone visit our website at