

1

00:00:00,000 --> 00:00:02,000

Give us a break.

2

00:00:02,000 --> 00:00:04,000

Don't try what you're about to see at home.

3

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

I'm sorry.

4

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

Tackle a tall tale of TNT.

5

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

And surfing.

6

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

Can you ride away

7

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

created with explosives?

8

00:00:40,000 --> 00:00:42,000

Who are the mythbusters?

9

00:00:42,000 --> 00:00:44,000

Yee-haw!

10

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

Adam Savage

11

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

Time for science!

12

00:00:48,000 --> 00:00:50,000

And Jamie Heineman

13

00:00:50,000 --> 00:00:52,000

Is that beautiful or what?

14

00:00:52,000 --> 00:00:54,000

Between the more than 30 years

15

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

of special effects experience

16

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

it's a great experience.

17

00:00:58,000 --> 00:01:00,000

It bleeds!

18

00:01:00,000 --> 00:01:02,000

Let's go!

19

00:01:02,000 --> 00:01:04,000

Joining them, Grant Imahara

20

00:01:04,000 --> 00:01:06,000

Don't give up on me now!

21

00:01:06,000 --> 00:01:08,000

Tori Belichi

22

00:01:08,000 --> 00:01:10,000

And that's how we like it.

23

00:01:10,000 --> 00:01:12,000

And Carrie Byron

24

00:01:12,000 --> 00:01:14,000

They don't just tell the myths

25

00:01:14,000 --> 00:01:16,000

they put them to the test.

26

00:01:28,000 --> 00:01:30,000

First up, it's Up Up and Away

27

00:01:30,000 --> 00:01:32,000

with Adam and Jamie.

28

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

Ta-da!

29

00:01:34,000 --> 00:01:36,000

Something tells me balloon myth?

30

00:01:36,000 --> 00:01:38,000

Absolutely right.

31

00:01:38,000 --> 00:01:40,000

It's not only balloon myth

32

00:01:40,000 --> 00:01:42,000

it's actually also an idiom.

33

00:01:42,000 --> 00:01:44,000

Have you ever heard the expression

34

00:01:44,000 --> 00:01:46,000

going down like a lead balloon?

35

00:01:46,000 --> 00:01:48,000

You mean like that'll never happen?

36

00:01:48,000 --> 00:01:50,000

Yeah, something impossible.

37

00:01:50,000 --> 00:01:52,000

The myth is that it is totally impossible

38

00:01:52,000 --> 00:01:54,000

to make a balloon like this one

39

00:01:54,000 --> 00:01:56,000

out of lead.

40

00:01:56,000 --> 00:01:58,000

So you're going to build one?

41

00:01:58,000 --> 00:02:00,000

Well that's the only way to test it is to try.

42

00:02:00,000 --> 00:02:02,000

That's what we do.

43

00:02:02,000 --> 00:02:04,000

To go over like a lead balloon

44

00:02:04,000 --> 00:02:06,000

means you've fallen short,

45

00:02:06,000 --> 00:02:08,000

gone bust,

46

00:02:08,000 --> 00:02:10,000

or just plain fail to get off the ground.

47

00:02:10,000 --> 00:02:12,000

Which means an airborne lead balloon

48

00:02:12,000 --> 00:02:14,000

is an oxymoron.

49

00:02:14,000 --> 00:02:16,000

It'll never happen.

50

00:02:16,000 --> 00:02:18,000

Because lead's defining characteristic

51

00:02:18,000 --> 00:02:20,000

is it's heavy.

52

00:02:20,000 --> 00:02:22,000

And heavy just doesn't fly.

53

00:02:22,000 --> 00:02:24,000

Or doesn't.

54

00:02:24,000 --> 00:02:26,000

You know the envelope of this thing weighs

55

00:02:26,000 --> 00:02:28,000

almost 500 pounds?

56

00:02:28,000 --> 00:02:30,000

Yeah and it's huge.

57

00:02:30,000 --> 00:02:32,000

Something tells me we're not going to make

58

00:02:32,000 --> 00:02:34,000

a lead balloon quite that big.

59

00:02:34,000 --> 00:02:36,000

Well I don't think the goal is to make a balloon

60

00:02:36,000 --> 00:02:38,000

that lifts us out of lead.

61

00:02:38,000 --> 00:02:40,000

Let's say it's just big enough to lift itself

62

00:02:40,000 --> 00:02:42,000

and maybe a little basket.

63

00:02:42,000 --> 00:02:44,000

I'll settle for that.

64

00:02:44,000 --> 00:02:46,000

So will I.

65

00:02:46,000 --> 00:02:48,000

So if Adam and Jamie with all their build skills

66

00:02:48,000 --> 00:02:50,000

and engineering nows

67

00:02:50,000 --> 00:02:52,000

can get a lead balloon to fly

68

00:02:52,000 --> 00:02:54,000

then they just can't resist.

69

00:02:54,000 --> 00:02:56,000

I think the biggest problem we're going to have

70

00:02:56,000 --> 00:02:58,000

making a lead balloon is around the material itself.

71

00:02:58,000 --> 00:03:00,000

Because I mean

72

00:03:00,000 --> 00:03:02,000

this balloon is made of fabric that's extremely

73

00:03:02,000 --> 00:03:04,000

light and very strong.

74

00:03:04,000 --> 00:03:06,000

We're going to be building a balloon that's

75

00:03:06,000 --> 00:03:08,000

very heavy and very weak.

76

00:03:08,000 --> 00:03:10,000

So...

77

00:03:10,000 --> 00:03:12,000

not so easy.

78

00:03:12,000 --> 00:03:14,000

After an uplifting perspective on the myth

79

00:03:14,000 --> 00:03:16,000

it's back to worth.

80

00:03:16,000 --> 00:03:18,000

And specifically M5

81

00:03:18,000 --> 00:03:20,000

to get things rolling.

82

00:03:20,000 --> 00:03:22,000

Before they source the all important lead

83

00:03:22,000 --> 00:03:24,000

they decide to split up and see

84

00:03:24,000 --> 00:03:26,000

what they can learn with a stronger

85

00:03:26,000 --> 00:03:28,000

and lighter material aluminum.

86

00:03:28,000 --> 00:03:30,000

My thoughts for doing a small scale build

87

00:03:30,000 --> 00:03:32,000

in aluminum are that I want this thing to look

88

00:03:32,000 --> 00:03:34,000

a balloon like.

89

00:03:34,000 --> 00:03:36,000

I could just make a tube

90

00:03:36,000 --> 00:03:38,000

I could make a lot of different simple shapes

91

00:03:38,000 --> 00:03:40,000

but I really wanted to be as round

92

00:03:40,000 --> 00:03:42,000

as possible.

93

00:03:42,000 --> 00:03:44,000

So I'm actually going to go for an icosahedron.

94

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

That's a 20 sided

95

00:03:46,000 --> 00:03:48,000

regular solid

96

00:03:48,000 --> 00:03:50,000

and each side is an equilateral triangle.

97

00:03:50,000 --> 00:03:52,000

So Adam is basing his

98

00:03:52,000 --> 00:03:54,000

design on one of the five platonic solids.

99

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

The five...

100

00:03:56,000 --> 00:03:58,000

what's it?

101

00:03:58,000 --> 00:04:00,000

The platonic and archa-median solids are

102

00:04:00,000 --> 00:04:02,000

polygons of regular shapes.

103

00:04:02,000 --> 00:04:04,000

Like a cube is one of the regular solids

104

00:04:04,000 --> 00:04:06,000

because it's six squares.

105

00:04:06,000 --> 00:04:08,000

Typically while Adam

106

00:04:08,000 --> 00:04:10,000

approaches the problem with a little magic

107

00:04:10,000 --> 00:04:12,000

math and a silly hat

108

00:04:12,000 --> 00:04:14,000

Jamie keeps things simple.

109

00:04:14,000 --> 00:04:16,000

I figure if

110

00:04:16,000 --> 00:04:18,000

the simplest possible way of building a balloon

111

00:04:18,000 --> 00:04:20,000

is just to put two sheets together

112

00:04:20,000 --> 00:04:22,000

and seal along the edges

113

00:04:22,000 --> 00:04:24,000

why don't I put two sheets together

114

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

the same way but

115

00:04:26,000 --> 00:04:28,000

start by draping them across a hemisphere

116

00:04:28,000 --> 00:04:30,000

a rigid male mole.

117

00:04:30,000 --> 00:04:32,000

With both designs complete

118

00:04:32,000 --> 00:04:34,000

the guys are ready for the float off.

119

00:04:34,000 --> 00:04:36,000

Jamie, do you mind if I go first?

120

00:04:36,000 --> 00:04:38,000

I'm going to fill my balloon first. Is that okay with you?

121

00:04:38,000 --> 00:04:40,000

Is that okay with you? I'd like to fill my balloon first if that's alright with you.

122

00:04:40,000 --> 00:04:42,000

Okay.

123

00:04:46,000 --> 00:04:48,000

Hey!

124

00:04:48,000 --> 00:04:50,000

That's almost balloon-like.

125

00:04:50,000 --> 00:04:52,000

Very nice.

126

00:04:52,000 --> 00:04:54,000

It's an approximately spherical shape.

127

00:04:54,000 --> 00:04:56,000

It's icosahedral.

128

00:04:56,000 --> 00:04:58,000

Icosahedral.

129

00:04:58,000 --> 00:05:00,000

The question now is how will Jamie's

130

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

super simple two-piece compare?

131

00:05:02,000 --> 00:05:04,000

After a blast of fast forward

132

00:05:04,000 --> 00:05:06,000

it's inflated and they're elated.

133

00:05:06,000 --> 00:05:08,000

Ha ha ha ha ha ha ha ha ha!

134

00:05:08,000 --> 00:05:10,000

It's an actual

135

00:05:10,000 --> 00:05:12,000

foil balloon!

136

00:05:12,000 --> 00:05:14,000

So the guys have two different

137

00:05:14,000 --> 00:05:16,000

but successful designs

138

00:05:16,000 --> 00:05:18,000

but they're made of aluminum foil

139

00:05:18,000 --> 00:05:20,000

which is six times lighter

140

00:05:20,000 --> 00:05:22,000

and much stronger than lead.

141

00:05:22,000 --> 00:05:24,000

Fly!

142

00:05:24,000 --> 00:05:26,000

Ha ha ha ha ha ha ha ha ha!!

143

00:05:34,000 --> 00:05:36,000

Next carry grant and Tory

144

00:05:36,000 --> 00:05:38,000

mix science with the art

145

00:05:38,000 --> 00:05:40,000

of surfing and get

146

00:05:40,000 --> 00:05:42,000

an explosive result.

147

00:05:42,000 --> 00:05:42,840

Right here.

148

00:05:42,840 --> 00:05:44,240

How much of lo-ha do you have in that shaka?

149

00:05:44,240 --> 00:05:45,440

So much, it's sick.

150

00:05:45,440 --> 00:05:46,980

What are you guys talking about?

151

00:05:46,980 --> 00:05:49,760

There's this viral video making its way around the internet

152

00:05:49,760 --> 00:05:52,440

where some renegade surfers are landlocked in a city

153

00:05:52,440 --> 00:05:53,800

but they wanna surf.

154

00:05:53,800 --> 00:05:55,460

Yeah, and then they find this canal.

155

00:05:55,460 --> 00:05:56,840

They throw in a bunch of dynamite,

156

00:05:56,840 --> 00:06:00,200

it explodes and creates a wave that one of the surfers rides.

157

00:06:00,200 --> 00:06:01,560

There's no way that could work.

158

00:06:01,560 --> 00:06:04,360

And even if it did, you'd probably be dead, right?

159

00:06:04,360 --> 00:06:06,240

Well, that's what we get to find out.

160

00:06:06,240 --> 00:06:07,080

High five.

161

00:06:07,080 --> 00:06:07,920

Yeah.

162

00:06:07,920 --> 00:06:08,760

Ah!

163

00:06:09,760 --> 00:06:12,840

In this viral video, a team of surfing gorillas

164

00:06:12,840 --> 00:06:15,280

are desperate to catch a wave.

165

00:06:15,280 --> 00:06:16,280

Their solution?

166

00:06:18,400 --> 00:06:21,920

Well, they hold their very own TNT party.

167

00:06:21,920 --> 00:06:24,520

And surf's up, dude.

168

00:06:24,520 --> 00:06:27,080

But were these guys really crazy enough

169

00:06:27,080 --> 00:06:28,720

to surf with dynamite,

170

00:06:28,720 --> 00:06:31,840

or is this just a cutting-edge commercial?

171

00:06:31,840 --> 00:06:33,920

Okay, so how are we gonna test this?

172

00:06:33,920 --> 00:06:36,600

Well, I think first we need some sort of proof of concept

173

00:06:36,640 --> 00:06:40,040

because I don't even know if explosives can set off a wave.

174

00:06:40,040 --> 00:06:42,240

I mean, in the movies sometimes you see a big splash,

175

00:06:42,240 --> 00:06:44,240

but not necessarily a wave.

176

00:06:44,240 --> 00:06:46,680

Well, that raises another issue, which is the depth.

177

00:06:46,680 --> 00:06:48,520

Does it need to be close to the surface

178

00:06:48,520 --> 00:06:50,200

or down further to create a wave?

179

00:06:50,200 --> 00:06:51,320

All right, well, why don't we test that

180

00:06:51,320 --> 00:06:52,760

by building a big water tank?

181

00:06:52,760 --> 00:06:54,440

We'll set off some explosions in it

182

00:06:54,440 --> 00:06:56,160

and see if we even create a wave.

183

00:06:56,160 --> 00:06:59,040

If we do, then we'll set the explosions at different depths

184

00:06:59,040 --> 00:07:01,760

and see if that has an effect on the size of the wave.

185

00:07:01,760 --> 00:07:02,600

Excellent.

186

00:07:02,600 --> 00:07:05,720

So Tori begins tackling this explosive fable

187

00:07:05,720 --> 00:07:07,960

by building a water tank in the backyard.

188

00:07:07,960 --> 00:07:10,120

All right, let's fill it up with water.

189

00:07:10,120 --> 00:07:12,920

High explosives can't be used in the parking lot,

190

00:07:12,920 --> 00:07:16,120

so Tori turns to an old myth-buster favorite.

191

00:07:16,120 --> 00:07:17,960

Cue dramatic music.

192

00:07:17,960 --> 00:07:20,560

The dry ice soda bottle bomb.

193

00:07:20,560 --> 00:07:23,400

Oh, wow!

194

00:07:23,400 --> 00:07:26,080

And here's Tori with the Big Bang Theory.

195

00:07:26,080 --> 00:07:29,120

All right, this is how you make a dry ice bursty bottle.

196

00:07:29,120 --> 00:07:31,960

You take a two-liter bottle of soda, empty it out,

197

00:07:31,960 --> 00:07:33,880

fill it up three quarters away with water,

198

00:07:33,880 --> 00:07:37,400

dump in a bunch of dry ice, put the cap back on,

199

00:07:37,400 --> 00:07:39,240

and as the dry ice is gassing off,

200

00:07:39,240 --> 00:07:42,240

the CO₂ gases are building up pressure inside the bottle

201

00:07:42,240 --> 00:07:44,760

and eventually the bottle will rupture,

202

00:07:44,760 --> 00:07:47,320

giving you the dry ice bursty bottle.

203

00:07:49,280 --> 00:07:52,200

Okay, so we know that this experiment isn't to scale,

204

00:07:52,200 --> 00:07:55,040

but what we're after is what happens to the energy

205

00:07:55,040 --> 00:07:57,600

of an explosion when it's in water.

206

00:07:57,600 --> 00:08:01,600

Does it disturb the surface enough to be considered a wave?

207

00:08:01,600 --> 00:08:04,840

Or does it all just simply go straight up into the air?

208

00:08:04,840 --> 00:08:09,760

To find out, the team start with the least likely candidate

209

00:08:09,760 --> 00:08:13,720

for a surfable wave, a bottle bomb at the bottom of the tank.

210

00:08:13,720 --> 00:08:14,800

Look at the waves.

211

00:08:14,800 --> 00:08:16,400

We're getting some swell.

212

00:08:16,400 --> 00:08:19,120

The first test was with the bottle

213

00:08:19,120 --> 00:08:21,520

almost to the bottom of the pool.

214

00:08:21,520 --> 00:08:26,000

That's the worst case scenario in terms of creating

215

00:08:26,000 --> 00:08:28,240

some movement at the surface,

216

00:08:28,240 --> 00:08:30,680

because it's got to, the explosion's gotta push

217

00:08:30,720 --> 00:08:32,080

all the water above it.

218

00:08:32,080 --> 00:08:34,520

Next, it's a mid-depth detonation.

219

00:08:35,800 --> 00:08:37,200

Woo-hoo!

220

00:08:37,200 --> 00:08:38,880

That was a much bigger wave.

221

00:08:38,880 --> 00:08:41,280

It was a bigger wave, definitely.

222

00:08:41,280 --> 00:08:42,280

And finally,

223

00:08:45,320 --> 00:08:47,560

a bottle bomb at the surface.

224

00:08:47,560 --> 00:08:50,160

It definitely made much smaller, ripply waves.

225

00:08:50,160 --> 00:08:52,440

So the guys have their proof of concept,

226

00:08:52,440 --> 00:08:54,520

and explosion will make waves,

227

00:08:54,520 --> 00:08:59,200

and depth is a factor in the size and quality of those waves.

228

00:08:59,200 --> 00:09:01,440

And you could say Tori's excited.

229

00:09:01,440 --> 00:09:02,440

Yoo-hoo!

230

00:09:03,440 --> 00:09:05,320

Have you lost your damn mind?

231

00:09:05,320 --> 00:09:06,320

Woo-hoo!

232

00:09:08,080 --> 00:09:10,560

So in theory, this might be able to work.

233

00:09:10,560 --> 00:09:13,920

Yeah, but just to clarify, that was not a small scale,

234

00:09:13,920 --> 00:09:15,360

just a proof of concept.

235

00:09:15,360 --> 00:09:17,960

Yeah, but we did show that an explosion will cause a wave.

236

00:09:17,960 --> 00:09:21,800

Yeah, but doesn't a wave have to break before you can ride it?

237

00:09:21,800 --> 00:09:24,600

I'm not really sure, so I think we should go

238

00:09:24,600 --> 00:09:27,920

and talk to a surfing expert, and we could learn how to surf.

239

00:09:27,920 --> 00:09:30,680

Yeah, because if we make a surfable wave, I want to ride it.

240

00:09:30,680 --> 00:09:32,080

Cavalbunga!

241

00:09:32,080 --> 00:09:33,480

Let's rip it!

242

00:09:34,720 --> 00:09:35,720

Up!

243

00:09:37,960 --> 00:09:38,960

Cavalbunga!

244

00:09:43,840 --> 00:09:46,840

Life's a beach when you're a myth buster.

245

00:09:46,840 --> 00:09:50,560

I mean, what if the job requires you to go surfing for work?

246

00:09:50,560 --> 00:09:52,960

And after meeting Heath, their instructor,

247

00:09:52,960 --> 00:09:56,640

we learned that surfing lingo is all geek to grant.

248

00:09:56,680 --> 00:10:01,000

I am ready to rip it and shred some stuff.

249

00:10:01,000 --> 00:10:02,280

They say that right?

250

00:10:02,280 --> 00:10:05,160

Joking aside, before surfing with dynamite,

251

00:10:05,160 --> 00:10:08,680

the team needs to know they can plain old surf.

252

00:10:08,680 --> 00:10:10,160

Oh, it's cold!

253

00:10:10,160 --> 00:10:12,760

Or, you know, even get into the water.

254

00:10:15,400 --> 00:10:18,640

We're at Cowles Beach in Santa Cruz, and this is perfect for us,

255

00:10:18,640 --> 00:10:20,760

because as you can see, the waves are tiny,

256

00:10:20,760 --> 00:10:24,160

and that's probably what we're going to get from an explosion in the water,

257

00:10:24,160 --> 00:10:25,160

our little waves.

258

00:10:25,160 --> 00:10:27,960

And not only that, it's perfect for learning how to surf.

259

00:10:37,200 --> 00:10:41,160

Hot air ballooning is the oldest successful flight technology.

260

00:10:41,160 --> 00:10:44,080

It dates back to 1763,

261

00:10:44,080 --> 00:10:47,560

when the French Mongolia brothers took to the air.

262

00:10:47,560 --> 00:10:52,440

A rich history of refined recreational flying followed,

263

00:10:52,560 --> 00:10:56,640

until heavy metal ballooning, myth buster style.

264

00:10:56,640 --> 00:11:01,840

Adam and Jamie are tackling the myth that it's impossible to make a lead balloon fly.

265

00:11:03,120 --> 00:11:06,120

But they began by brainstorming with aluminum.

266

00:11:07,320 --> 00:11:09,360

What do you think? I mean, they both worked.

267

00:11:09,360 --> 00:11:11,480

I think that we're on to something,

268

00:11:11,480 --> 00:11:14,720

but I don't think we can make any conclusions until we see the lead foil.

269

00:11:16,160 --> 00:11:16,960

You're right.

270

00:11:16,960 --> 00:11:19,520

So all they need is the lead. Simple, right?

271

00:11:19,520 --> 00:11:22,040

I didn't think the lead foil was going to be the hardest part of this myth,

272

00:11:22,120 --> 00:11:25,600

but it was a hassle to find a US supplier.

273

00:11:26,520 --> 00:11:29,000

Hello, Sparkin C, English.

274

00:11:29,000 --> 00:11:33,520

Luckily, Jamie turned up a German maker of lead foils called Epstein.

275

00:11:34,080 --> 00:11:39,040

What this may look like is a box full of rolls of foil that weighs about 30 pounds.

276

00:11:39,040 --> 00:11:41,240

In fact, this is our lead balloon.

277

00:11:42,480 --> 00:11:47,480

Look, it's beautiful, beautiful, but very, very fragile.

278

00:11:47,480 --> 00:11:49,400

The problem is this.

279

00:11:49,480 --> 00:11:53,080

It just kind of falls apart.

280

00:11:53,080 --> 00:11:56,560

It's like almost like wet toilet paper.

281

00:11:57,040 --> 00:11:59,280

There's not going to be any room for error.

282

00:11:59,280 --> 00:12:03,840

It has to be done just exactly so, or we're not going to fly.

283

00:12:04,920 --> 00:12:08,400

Now that we've got this foil, rather than go right to the biggest balloon

284

00:12:08,400 --> 00:12:11,440

we can make with it, we're going to try making an interim balloon.

285

00:12:11,800 --> 00:12:13,800

This is a scale test, if you will.

286

00:12:14,800 --> 00:12:18,800

The guys go for a super simplistic two sheet lead balloon.

287

00:12:18,800 --> 00:12:22,800

And one of the first things they learn is the static from the tape is a problem.

288

00:12:22,800 --> 00:12:25,800

But Adam's Tash Trick solves that.

289

00:12:25,800 --> 00:12:28,800

A little static off, you'll see it drags a little less.

290

00:12:28,800 --> 00:12:29,800

I know, very nice.

291

00:12:29,800 --> 00:12:30,800

Isn't that cool?

292

00:12:30,800 --> 00:12:32,800

There's women out there who are going,

293

00:12:32,800 --> 00:12:34,800

oh, I wish I was that piece of tape right now.

294

00:12:34,800 --> 00:12:35,800

You think?

295

00:12:35,800 --> 00:12:37,800

I'm sure of it.

296

00:12:37,800 --> 00:12:39,800

Raise your hand.

297

00:12:40,800 --> 00:12:41,800

Yeah, you.

298

00:12:41,800 --> 00:12:42,800

Give me a break.

299

00:12:42,800 --> 00:12:45,800

The producers of Mythbusters are not responsible for any marital issues

300

00:12:45,800 --> 00:12:47,800

resulting from raised arms.

301

00:12:49,800 --> 00:12:50,800

All right, go for it.

302

00:12:53,800 --> 00:12:54,800

It's going up.

303

00:12:55,800 --> 00:12:57,800

Who's done this before?

304

00:12:58,800 --> 00:12:59,800

Nobody!

305

00:12:59,800 --> 00:13:03,800

So far, this virgin voyage has been plain sailing.

306

00:13:03,800 --> 00:13:04,800

Dude!

307

00:13:05,800 --> 00:13:06,800

It's a lead balloon.

308

00:13:06,800 --> 00:13:09,800

A degree of care during construction.

309

00:13:09,800 --> 00:13:10,800

I found a tear.

310

00:13:10,800 --> 00:13:13,800

And a few running repairs to seal any small tears.

311

00:13:13,800 --> 00:13:16,800

And Adam thinks they have this myth sewn up.

312

00:13:16,800 --> 00:13:19,800

This is my idea of a perfect scale test.

313

00:13:19,800 --> 00:13:21,800

Several things are clear to me looking at this.

314

00:13:21,800 --> 00:13:25,800

One is we're going to have to go bigger in order to get real buoyancy.

315

00:13:25,800 --> 00:13:27,800

And we're going to go as big as we can.

316

00:13:27,800 --> 00:13:30,800

Two is while the material is not as delicate as I had feared,

317

00:13:30,800 --> 00:13:32,800

it's still really, really delicate.

318

00:13:32,800 --> 00:13:35,800

I mean, tears are forming with just the least provocation.

319

00:13:35,800 --> 00:13:38,800

So we're going to have to be very, very careful.

320

00:13:38,800 --> 00:13:40,800

You're going to ruin it, aren't you?

321

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

The third thing is, I think we're only going to get one chance to get this right.

322

00:13:43,800 --> 00:13:46,800

Like, if big tears start to appear because of the weight of the material,

323

00:13:46,800 --> 00:13:50,800

it's going to be nearly impossible to repair them on the fly.

324

00:13:50,800 --> 00:13:54,800

So we're just going to have to figure out a way to build this and fill it

325

00:13:54,800 --> 00:13:58,800

in a way that involves the least amount of stress on the material.

326

00:13:58,800 --> 00:13:59,800

Three great points.

327

00:13:59,800 --> 00:14:03,800

But surely the main point is it's not yet airborne.

328

00:14:03,800 --> 00:14:06,800

And as Jamie explains, that's because it's not big enough yet.

329

00:14:06,800 --> 00:14:09,800

This balloon has too much lead and not enough helium.

330

00:14:09,800 --> 00:14:14,800

So we need to go larger because the larger the balloon becomes,

331

00:14:14,800 --> 00:14:17,800

the greater the ratio of helium to lead.

332

00:14:17,800 --> 00:14:22,800

It's sort of a funny thing with physics and geometry, but that's the way it works.

333

00:14:22,800 --> 00:14:25,800

Yep, the larger the solid, the greater the volume.

334

00:14:25,800 --> 00:14:29,800

That's the helium compared to the surface area, which is the lead foil.

335

00:14:29,800 --> 00:14:32,800

So the bigger the balloon, the more buoyancy it's got.

336

00:14:32,800 --> 00:14:36,800

And the greater the chance it'll be able to overcome its own weight.

337

00:14:41,800 --> 00:14:45,800

This crazy commercial has got Carrie Grant and Tori thinking,

338

00:14:45,800 --> 00:14:46,800

is it real?

339

00:14:46,800 --> 00:14:51,800

Could you really create a surfable wave with dynamite?

340

00:14:53,800 --> 00:14:57,800

And if so, would any of the team be able to ride it?

341

00:14:57,800 --> 00:15:01,800

A trip to Santa Cruz later, and it's looking good on the surface.

342

00:15:02,800 --> 00:15:06,800

What about the surfing front? But what about the safety aspect?

343

00:15:06,800 --> 00:15:10,800

If you remember, an underwater pressure wave is fatal to fish.

344

00:15:10,800 --> 00:15:11,800

I killed it!

345

00:15:11,800 --> 00:15:14,800

But what about myth busters on a surfboard?

346

00:15:14,800 --> 00:15:18,800

To find out, Carrie has brought in underwater explosive expert Van Romero.

347

00:15:18,800 --> 00:15:23,800

What are the dangers of being in the water when there's an explosion?

348

00:15:23,800 --> 00:15:29,800

Well, when you detonate something underwater, it's much more dangerous than in the air.

349

00:15:29,800 --> 00:15:36,800

You're the same density as water, so the energy in the shockwave will easily be transferred from the water into your body.

350

00:15:36,800 --> 00:15:41,800

As the shockwave continues to go through your body, it reaches the surface of your lungs.

351

00:15:41,800 --> 00:15:44,800

And the inside of your lungs, the density is very low.

352

00:15:44,800 --> 00:15:47,800

When that happens, waves start bouncing all over the place,

353

00:15:47,800 --> 00:15:53,800

and as those, if your lung is subject to that, it'll start to bleed.

354

00:15:53,800 --> 00:15:58,800

So you won't die immediately, but you'll bleed to death in about 24 hours.

355

00:15:58,800 --> 00:16:03,800

Yup, the insurance doesn't cover that, which means they'll need a surfer substitute.

356

00:16:03,800 --> 00:16:06,800

A giant explosion, the Eiffel Shockwave.

357

00:16:06,800 --> 00:16:08,800

I think this is a job for Buster.

358

00:16:08,800 --> 00:16:11,800

Buster can't even stand up on his own. How's he gonna surf?

359

00:16:11,800 --> 00:16:15,800

You know, I don't even think he needs to stand. I tried the cobra position coming in on a few waves, and that worked great.

360

00:16:15,800 --> 00:16:16,800

Yeah, but he still needs to paddle.

361

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

I got it! Robot!

362

00:16:18,800 --> 00:16:19,800

Yes!

363

00:16:19,800 --> 00:16:20,800

I knew it!

364

00:16:20,800 --> 00:16:23,800

Yes, mechanical paddling robot remote control.

365

00:16:23,800 --> 00:16:25,800

So you're gonna make a robot?

366

00:16:25,800 --> 00:16:27,800

Get it, row?

367

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

Whooooooooo!

368

00:16:31,800 --> 00:16:32,800

A problem to solve?

369

00:16:32,800 --> 00:16:34,800

Ready to hang ten?

370

00:16:34,800 --> 00:16:36,800

And a robot to build.

371

00:16:36,800 --> 00:16:38,800

It's a little slice of grand heaven.

372

00:16:38,800 --> 00:16:45,800

Now, one of the most essential things about being able to catch a wave is to get up speed by paddling.

373

00:16:45,800 --> 00:16:49,800

And this, if you don't have enough speed, the wave's just gonna cross by you.

374

00:16:49,800 --> 00:16:56,800

So, I'm gonna make some steel arms, which are going to be Buster's arms, and those will be hooked to a motor.

375

00:16:56,800 --> 00:17:00,800

And as the wave is coming up, I'll start the motor spinning.

376

00:17:00,800 --> 00:17:06,800

That will start the arms of paddling, and you get Buster's speed up so that hopefully, when the wave hits,

377

00:17:06,800 --> 00:17:09,800

he'll be at exactly the right speed and take off.

378

00:17:09,800 --> 00:17:14,800

And while Grant finishes the motor to power the paddles, he's drafting Carrie for some help.

379

00:17:14,800 --> 00:17:22,800

What we're gonna do is trace out an arm profile, and then cut it out of steel.

380

00:17:22,800 --> 00:17:26,800

So, you want to use my arms because they're big and muscular. Is that what you're bringing me over for?

381

00:17:26,800 --> 00:17:30,800

No, no, you're gonna trace my arms, because they're paddling.

382

00:17:30,800 --> 00:17:36,800

But mine have more length, so you could, you know, whew, whew, whew, a lot faster.

383

00:17:36,800 --> 00:17:39,800

Sorry, the piece of steel I bought will fit my arm.

384

00:17:39,800 --> 00:17:42,800

Okay, so do you want me to put a muscle on it?

385

00:17:42,800 --> 00:17:45,800

I'll get a pen.

386

00:17:45,800 --> 00:17:52,800

With Carrie on arm duty, the guys soon whip the body into shape, including a remote control rudder.

387

00:17:52,800 --> 00:17:56,800

AB foam legs and torso modeled, of course, on Grant.

388

00:17:56,800 --> 00:17:58,800

Ta-da!

389

00:17:58,800 --> 00:18:00,800

And a quick paint job.

390

00:18:00,800 --> 00:18:04,800

Okay, so the remote controlled surfing robot is finally done.

391

00:18:04,800 --> 00:18:09,800

It consists of a 10-foot foam board with a paddling mechanism.

392

00:18:09,800 --> 00:18:13,800

It has a swivel, just like your real body would move as you paddle out.

393

00:18:13,800 --> 00:18:19,800

All the electronics are encased in a waterproof enclosure, has a 12-volt battery.

394

00:18:19,800 --> 00:18:23,800

For minor adjustments, there's also a rudder on the back.

395

00:18:23,800 --> 00:18:26,800

And the waves over here, perfect.

396

00:18:26,800 --> 00:18:29,800

Now start paddling, dude! Paddle!

397

00:18:29,800 --> 00:18:33,800

Okay, it's good to go. I'm ready to hit the waves.

398

00:18:33,800 --> 00:18:37,800

So we have our surfer, Frank, bringing the explosives, and our researchers found us a lake.

399

00:18:37,800 --> 00:18:42,800

Yeah, it's an angels camp, and it's a quarry lake, so there's nothing to be killed by the explosion.

400

00:18:42,800 --> 00:18:46,800

So no fish-and-a-barrel type, lethal shockwave of death.

401

00:18:46,800 --> 00:18:49,800

Yeah, well let's get up there and start making waves.

402

00:18:50,800 --> 00:18:55,800

So this beautiful quarry lake is the location for the final experiment.

403

00:18:55,800 --> 00:18:58,800

How's he gonna hang ten? He got no feet.

404

00:18:58,800 --> 00:19:02,800

And the first order of business is a test run with the surfing robot.

405

00:19:02,800 --> 00:19:09,800

I am feeling a little nervous at this point, because none of us are gonna be allowed to surf.

406

00:19:09,800 --> 00:19:12,800

This is our only option for testing the myth.

407

00:19:12,800 --> 00:19:14,800

You look nervous.

408

00:19:14,800 --> 00:19:16,800

Yeah, I'm a little nervous.

409

00:19:16,800 --> 00:19:26,800

Now, that having been said, I'm hoping that Robo Grant has been imbued with the natural surfing talent that Real Grant has.

410

00:19:26,800 --> 00:19:28,800

Well, didn't flip over.

411

00:19:28,800 --> 00:19:33,800

Yep, it looks like Grant has imbued Robo Grant with all of his surfing powers.

412

00:19:33,800 --> 00:19:36,800

Let me try them. Thank you.

413

00:19:37,800 --> 00:19:41,800

Grant switches the paddle action from freestyle to butterfly.

414

00:19:41,800 --> 00:19:43,800

Oh yeah, he is faster though.

415

00:19:43,800 --> 00:19:45,800

Searched up, dude.

416

00:19:45,800 --> 00:19:47,800

So Robo Grant's good to go.

417

00:19:47,800 --> 00:19:49,800

Yeah, spank that water.

418

00:19:49,800 --> 00:19:53,800

But Kari's concerned about our evil geniuses motives.

419

00:19:53,800 --> 00:19:58,800

Does anybody find it creepy how many Grant robots have been on the show?

420

00:19:58,800 --> 00:20:02,800

Is it just me or is he trying to like clone himself and make a little army?

421

00:20:02,800 --> 00:20:04,800

I like it, I think we're keeping it.

422

00:20:07,800 --> 00:20:16,800

The Crucian thing about an adage is the kernel of truth it's based on has become accepted over time.

423

00:20:16,800 --> 00:20:20,800

But mythbusters don't accept the truth, they test it.

424

00:20:20,800 --> 00:20:25,800

And to test the truth of the adage to go down like a lead balloon, they're building one.

425

00:20:25,800 --> 00:20:29,800

Who's done this before? Nobody!

426

00:20:29,800 --> 00:20:33,800

I don't know, what do you think the plan should be for going full scale?

427

00:20:33,800 --> 00:20:39,800

I'm not really in love with that burrito shape, I mean it kind of started to work but it doesn't look like a balloon

428

00:20:39,800 --> 00:20:42,800

and I think it won't handle the stresses once we get much larger.

429

00:20:42,800 --> 00:20:47,800

You're right, and both of these require so much manipulation of the foil.

430

00:20:47,800 --> 00:20:51,800

I mean the one thing we learn from the lead foil is it's way too delicate to make a shape like this.

431

00:20:51,800 --> 00:20:58,800

Yeah, we need to figure out a way of just building it in place and not touching it, just inflating it from there.

432

00:20:58,800 --> 00:21:06,800

I've got an idea that may work. It involves laying the material out piece by piece and taping it as it goes down so we only move it once.

433

00:21:06,800 --> 00:21:13,800

And then hopefully when we inflate it it would unfold, it would be just one of the simplest platonic solids.

434

00:21:13,800 --> 00:21:15,800

So it'll open like a flower.

435

00:21:15,800 --> 00:21:17,800

Exactly, let me try and work that out.

436

00:21:17,800 --> 00:21:21,800

And so our swami of origami goes to work.

437

00:21:21,800 --> 00:21:27,800

The biggest problem that the lead is giving us is that it's delicate and we can't go lifting up huge sheets of it to tape these things.

438

00:21:27,800 --> 00:21:32,800

We have to build our three-dimensional shape flat and then inflate it.

439

00:21:32,800 --> 00:21:40,800

Use the spread distributed load of the helium to bring this thing out into three dimensions.

440

00:21:40,800 --> 00:21:42,800

We can't move the lead around too much.

441

00:21:42,800 --> 00:21:52,800

So I'm going to try and design a way to make a cube so that we lay it out panel by panel flat and then we can inflate it.

442

00:21:52,800 --> 00:21:57,800

Ha ha ha ha ha ha, it works.

443

00:21:57,800 --> 00:22:04,800

Alright, there it is. That's the deal.

444

00:22:04,800 --> 00:22:09,800

With the design and construction map worked out, Adam crunches the all-important numbers.

445

00:22:09,800 --> 00:22:12,800

Roughly 11 kilograms.

446

00:22:12,800 --> 00:22:19,800

He's planning to use 640 square feet of lead, which weighs 11 kilos or 24 pounds.

447

00:22:19,800 --> 00:22:23,800

But will the helium inside that cube have enough lift?

448

00:22:23,800 --> 00:22:29,800

In its cubular form, this thing's going to have 30 kilograms, roughly 70 pounds of lift.

449

00:22:29,800 --> 00:22:33,800

That's far more than the lead that makes it up is going to weigh.

450

00:22:33,800 --> 00:22:39,800

In fact, we'll have so much pointcy out of this that in order to get it fully inflated, I think we're going to have to add some air.

451

00:22:39,800 --> 00:22:42,800

We're going to have to thin out our helium.

452

00:22:42,800 --> 00:22:45,800

That's great, we're weighing the green on this.

453

00:22:45,800 --> 00:22:53,800

So it's full-scale ahead, but the idiosyncrasies of the material mean Jamie's having to go to extraordinary lengths.

454

00:22:53,800 --> 00:23:01,800

This lead balloon is going to be so big that we've got to make special rigs just to get over top of these panels while we're assembling them.

455

00:23:01,800 --> 00:23:07,800

We can't obviously just crawl all over it because the lead is so delicate we'll puncture it in that process.

456

00:23:07,800 --> 00:23:14,800

Therefore, I'm making a big swinging boom arm that we can put on a forklift to put one of us out on the boom.

457

00:23:14,800 --> 00:23:23,800

We'll be on a sort of a car that will have a basket that will be in so our arms can hang down right over top of what we're working on.

458

00:23:23,800 --> 00:23:26,800

Dude, this is elegant and simple.

459

00:23:26,800 --> 00:23:27,800

Damn it.

460

00:23:27,800 --> 00:23:30,800

What we would always want on MythBusters.

461

00:23:31,800 --> 00:23:33,800

Gonna make a lead balloon!

462

00:23:33,800 --> 00:23:36,800

Adam and Jamie have arrived at the Alameda Naval Base.

463

00:23:38,800 --> 00:23:45,800

We've chosen this because we've got plenty of room to fly, we've got no wind, we've got a nice flat surface to build on.

464

00:23:45,800 --> 00:23:48,800

And today we're making our lead balloon.

465

00:23:48,800 --> 00:23:52,800

Or at least that's the plan because the myth states that it's impossible.

466

00:23:52,800 --> 00:23:55,800

A challenge Adam and Jamie seem to be taking personally.

467

00:23:55,800 --> 00:23:59,800

This whole build depends on how carefully we do this.

468

00:23:59,800 --> 00:24:04,800

Success or failure depends on all the little details like a smooth floor.

469

00:24:04,800 --> 00:24:06,800

Why is that piece of tape there?

470

00:24:06,800 --> 00:24:10,800

Well we have dirt on this floor and we've gone through and we've swept it like several times.

471

00:24:10,800 --> 00:24:14,800

We're scraping any little bits of tape or anything that we can get off of it.

472

00:24:14,800 --> 00:24:15,800

It has to be pristine.

473

00:24:15,800 --> 00:24:17,800

We're gonna lay down paper.

474

00:24:17,800 --> 00:24:19,800

We're gonna be wearing booties when we're working around this.

475

00:24:19,800 --> 00:24:21,800

This is gonna be like a medical procedure.

476

00:24:21,800 --> 00:24:24,800

Okay everybody, this is no walk zone.

477

00:24:24,800 --> 00:24:29,800

With military like precision, Jamie directs preparation of the assembly area.

478

00:24:29,800 --> 00:24:32,800

Ready for Adam's origami design.

479

00:24:32,800 --> 00:24:34,800

Yeah, there you go. That's it.

480

00:24:34,800 --> 00:24:40,800

This is basically going to be a 10 foot by 10 foot by 10 foot cube of lead.

481

00:24:40,800 --> 00:24:42,800

So, 10 foot.

482

00:24:42,800 --> 00:24:44,800

Our construction plan is pretty simple.

483

00:24:44,800 --> 00:24:47,800

Jamie will be assembling squares while I'm assembling the regular balloon.

484

00:24:47,800 --> 00:24:49,800

And here's the plan I worked out in the shop.

485

00:24:49,800 --> 00:24:51,800

It's 12 steps, 12 pieces of lead.

486

00:24:51,800 --> 00:24:57,800

Each square gets assembled over on the assembly square and then put together on the home square.

487

00:24:57,800 --> 00:25:02,800

With rubber gloves to protect against what is after all a poisonous material.

488

00:25:02,800 --> 00:25:06,800

The guys begin building the ambitious 12 step plan.

489

00:25:06,800 --> 00:25:14,800

Adam is putting the actual cube together on the home square while Jamie production lines the larger pieces from the 15 inch rolls.

490

00:25:14,800 --> 00:25:19,800

I've got the first side completed and oddly enough it's the bottom.

491

00:25:19,800 --> 00:25:21,800

It's about 100 square feet of lead.

492

00:25:21,800 --> 00:25:23,800

It used up two rolls.

493

00:25:23,800 --> 00:25:31,800

Jamie is working on the second sheet which actually will get cut into triangles to start our actual origami assembly process.

494

00:25:32,800 --> 00:25:38,800

The first square is coming off the assembly line.

495

00:25:38,800 --> 00:25:44,800

And according to Adam's grand origami plan it gets cut into equilateral triangles.

496

00:25:44,800 --> 00:25:46,800

Okay, the first one's coming off.

497

00:25:46,800 --> 00:25:50,800

Before being moved into position on the home square.

498

00:25:50,800 --> 00:25:51,800

It's pretty darn good.

499

00:25:51,800 --> 00:25:55,800

The ingeniously named step two is complete.

500

00:25:55,800 --> 00:25:59,800

When piece two is taped into position, cue the cable car.

501

00:25:59,800 --> 00:26:02,800

What we have here is the largest clear tape dispenser in the world.

502

00:26:02,800 --> 00:26:07,800

Simply insert an atom to tape in all those awkward, hard to reach places.

503

00:26:07,800 --> 00:26:09,800

I've never built anything like this before.

504

00:26:09,800 --> 00:26:14,800

The final result is going to be about seven or eight layers thick in some places.

505

00:26:14,800 --> 00:26:17,800

That's as thick as one of your hairs.

506

00:26:17,800 --> 00:26:21,800

That's how thin the material we're working with is.

507

00:26:21,800 --> 00:26:26,800

So the difference over here in the home square from step one to step 12, nothing.

508

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

You're not going to see a darn thing.

509

00:26:28,800 --> 00:26:31,800

Just at one point we're going to start inflating.

510

00:26:31,800 --> 00:26:34,800

It's going to work like a popcorn popper, hopefully.

511

00:26:41,800 --> 00:26:46,800

After seeing this internet video, Carrie Grant and Tori couldn't resist the myth

512

00:26:46,800 --> 00:26:50,800

that it's possible to catch a wave created by dynamite.

513

00:26:50,800 --> 00:26:55,800

And with RoboGrant all set to surf, Carrie and Tori head out onto the lake

514

00:26:55,800 --> 00:26:57,800

to work out where to place the explosives.

515

00:26:57,800 --> 00:27:01,800

First up, Tori and I are going on a recon mission to figure out what the bottom of the lake bed looks like.

516

00:27:01,800 --> 00:27:05,800

We have a depth finder and the sheriff's department has lent us a boat.

517

00:27:05,800 --> 00:27:10,800

Okay, so we can put the surfer right there and then we can measure back for where we want the explosive.

518

00:27:10,800 --> 00:27:15,800

That's the location, but what about the strength and depth of the charge?

519

00:27:15,800 --> 00:27:19,800

Alright, so our shop test showed that the depth, it definitely is a factor at the size of the wave.

520

00:27:19,800 --> 00:27:23,800

Now that we're out here, why don't we try setting our explosions at different depths

521

00:27:23,800 --> 00:27:25,800

just to see what kind of waves we get?

522

00:27:25,800 --> 00:27:29,800

Well, just to start, we've got 50 pounds. You want to put it about 30 feet, see what happens?

523

00:27:29,800 --> 00:27:30,800

Sounds good.

524

00:27:30,800 --> 00:27:35,800

Now, since we don't really know exactly what depth we want to do this at, we're just trying to figure it out,

525

00:27:35,800 --> 00:27:43,800

I was wondering maybe we should save RoboGrant until we know we got a good depth and we know we're going to get a good wave.

526

00:27:43,800 --> 00:27:44,800

Great.

527

00:27:44,800 --> 00:27:45,800

You don't want to wreck them yet?

528

00:27:45,800 --> 00:27:46,800

Not yet.

529

00:27:46,800 --> 00:27:51,800

Remember, in the viral video, it looks like they use three or four sticks of dynamite.

530

00:27:52,800 --> 00:27:54,800

Maybe three pounds?

531

00:27:54,800 --> 00:27:59,800

But retired FBI agent Frank Doyle thinks that just won't cut it.

532

00:27:59,800 --> 00:28:06,800

He suggests starting with 50 pounds of the high explosive Trinitrotoluene, or TNT.

533

00:28:10,800 --> 00:28:11,800

We're ready to go.

534

00:28:11,800 --> 00:28:12,800

Go.

535

00:28:12,800 --> 00:28:14,800

There we go!

536

00:28:14,800 --> 00:28:16,800

There we go!

537

00:28:16,800 --> 00:28:18,800

There we go!

538

00:28:18,800 --> 00:28:21,800

Three, two, one!

539

00:28:24,800 --> 00:28:26,800

Did you feel the wind?

540

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

Okay, wait, that was 50 pounds. Let's see what kind of wave rolls in.

541

00:28:31,800 --> 00:28:32,800

Well, that's pretty huge.

542

00:28:32,800 --> 00:28:37,800

That was amazing. That was 50 pounds of TNT, 30 feet deep.

543

00:28:37,800 --> 00:28:42,800

What? The wave that ended up making it to the shore? Maybe about an inch high.

544

00:28:44,800 --> 00:28:47,800

Yeah, that energy just totally wasted too deep.

545

00:28:47,800 --> 00:28:49,800

Okay, let's split the difference. Let's bring it up to like 12 feet.

546

00:28:49,800 --> 00:28:51,800

Sounds good to me.

547

00:28:51,800 --> 00:28:52,800

Great.

548

00:28:52,800 --> 00:29:02,800

So what we saw in here was the same kind of behavior we saw in our shop test, which was if you have the charge too deep under too much water, you just get a big kind of thud and no waves.

549

00:29:02,800 --> 00:29:03,800

Make the drop.

550

00:29:03,800 --> 00:29:08,800

So what we're going to do now is move the charge a little bit closer to the surface.

551

00:29:08,800 --> 00:29:10,800

Explosives on the water going down.

552

00:29:10,800 --> 00:29:16,800

And see if we can get more of that energy out and hopefully creating a wave.

553

00:29:16,800 --> 00:29:23,800

All right, Frank, 12 foot depth with 50 pounds of TNT. Let it rip.

554

00:29:23,800 --> 00:29:28,800

Three, two, one, wave!

555

00:29:28,800 --> 00:29:31,800

Wow!

556

00:29:31,800 --> 00:29:34,800

We can't lift the wave.

557

00:29:34,800 --> 00:29:37,800

Oh yeah!

558

00:29:37,800 --> 00:29:38,800

I like it.

559

00:29:38,800 --> 00:29:40,800

Surf's up, man.

560

00:29:40,800 --> 00:29:41,800

It's still coming.

561

00:29:41,800 --> 00:29:44,800

That's about what? Six inches, maybe a foot?

562

00:29:44,800 --> 00:29:47,800

Yeah, the peak of the leading wave looks to be a foot high.

563

00:29:47,800 --> 00:29:53,800

A huge improvement on the 30 foot test, which means the team are happy with the depth of the charge.

564

00:29:53,800 --> 00:29:54,800

12 feet.

565

00:29:54,800 --> 00:29:56,800

It's breaking.

566

00:29:56,800 --> 00:29:57,800

It's breaking.

567

00:29:57,800 --> 00:29:58,800

Yeah!

568

00:29:58,800 --> 00:30:00,800

Little waves.

569

00:30:00,800 --> 00:30:03,800

Next, they want to supersize those waves.

570

00:30:03,800 --> 00:30:07,800

For that, they're going for broke and using their entire supplies.

571

00:30:07,800 --> 00:30:09,800

We want to get on the corner with this.

572

00:30:09,800 --> 00:30:13,800

We're talking about a body bag filled with TNT.

573

00:30:13,800 --> 00:30:15,800

That's 200 pounds.

574

00:30:15,800 --> 00:30:17,800

This should be a really big explosion.

575

00:30:17,800 --> 00:30:20,800

Let us know if you're going to fade back there.

576

00:30:20,800 --> 00:30:23,800

Okay, let's put things into perspective.

577

00:30:23,800 --> 00:30:29,800

This little explosion was a mere half pound of TNT.

578

00:30:29,800 --> 00:30:31,800

Look at the door!

579

00:30:31,800 --> 00:30:32,800

Wow!

580

00:30:32,800 --> 00:30:39,800

So if 200 pounds of TNT doesn't whip up a wave, this myth is truly busted.

581

00:30:39,800 --> 00:30:43,800

Waiting in the wings for his big debut is Robo Grant.

582

00:30:43,800 --> 00:30:48,800

But before the big blast, the real Grant takes time out for a quick pep talk.

583

00:30:48,800 --> 00:30:49,800

Okay, buddy.

584

00:30:49,800 --> 00:30:52,800

Needless to say, this entire experiment rests on you.

585

00:30:52,800 --> 00:30:54,800

This is your time to shine.

586

00:30:54,800 --> 00:30:58,800

You've got a long history of robotic friends to live up to.

587

00:30:58,800 --> 00:31:03,800

Robo Cat, the Mad Batter, the Swordswinging Robot.

588

00:31:03,800 --> 00:31:04,800

This is your chance, man.

589

00:31:04,800 --> 00:31:05,800

All right?

590

00:31:05,800 --> 00:31:06,800

Go out there.

591

00:31:06,800 --> 00:31:07,800

Make us proud.

592

00:31:07,800 --> 00:31:10,800

All right, slap away!

593

00:31:10,800 --> 00:31:13,800

Good luck, buddy!

594

00:31:13,800 --> 00:31:17,800

Robo Grant paddles out to a predetermined distance from ground zero,

595

00:31:17,800 --> 00:31:19,800

while Frank coordinates the drop

596

00:31:19,800 --> 00:31:23,800

before everyone retreats to a safe distance.

597

00:31:23,800 --> 00:31:25,800

This is the big one, you guys.

598

00:31:25,800 --> 00:31:28,800

We're commencing the firing sequence.

599

00:31:28,800 --> 00:31:30,800

Fire in the hole!

600

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

Yeah!

601

00:31:31,800 --> 00:31:32,800

There we go.

602

00:31:32,800 --> 00:31:33,800

Got it.

603

00:31:33,800 --> 00:31:34,800

I'm good.

604

00:31:34,800 --> 00:31:35,800

Straighten them up.

605

00:31:35,800 --> 00:31:36,800

Here we go.

606

00:31:36,800 --> 00:31:37,800

He's going!

607

00:31:37,800 --> 00:31:38,800

Yeah, dude.

608

00:31:38,800 --> 00:31:39,800

He's going!

609

00:31:39,800 --> 00:31:40,800

Perfect line.

610

00:31:40,800 --> 00:31:41,800

I have speed!

611

00:31:41,800 --> 00:31:42,800

I have speed!

612

00:31:42,800 --> 00:31:45,800

Three, two, one.

613

00:31:45,800 --> 00:31:46,800

Next.

614

00:31:50,800 --> 00:31:54,800

Adam and Jamie are testing the accepted truth in the idiom

615

00:31:54,800 --> 00:31:56,800

to go down like a lead balloon.

616

00:31:56,800 --> 00:32:00,800

And if they manage to fly this huge heavy metal inflatable,

617

00:32:00,800 --> 00:32:02,800

it's myth busted.

618

00:32:02,800 --> 00:32:06,800

I define flight as balloon off the ground.

619

00:32:06,800 --> 00:32:11,800

As soon as the balloon is buoyant enough to support its own weight

620

00:32:11,800 --> 00:32:14,800

on top of the helium that's inside of it,

621

00:32:14,800 --> 00:32:16,800

then I say that we've got flight.

622

00:32:16,800 --> 00:32:20,800

Everything after that is just gravy.

623

00:32:20,800 --> 00:32:26,800

The final step in Adam's design, the 12th, is in sight.

624

00:32:26,800 --> 00:32:28,800

Back to the map.

625

00:32:28,800 --> 00:32:31,800

The pressure is on for Adam to get these final pieces right,

626

00:32:31,800 --> 00:32:33,800

but he won't know until they inflate it

627

00:32:33,800 --> 00:32:37,800

if his origami cube has been taped together correctly.

628

00:32:37,800 --> 00:32:38,800

So this is the moment of truth.

629

00:32:38,800 --> 00:32:39,800

We are...

630

00:32:39,800 --> 00:32:41,800

This is one of the many moments of truth,

631

00:32:41,800 --> 00:32:43,800

but we're just about to put the top piece,

632

00:32:43,800 --> 00:32:46,800

number 12, on the structure here,

633

00:32:46,800 --> 00:32:48,800

and then tape it all the way around.

634

00:32:48,800 --> 00:32:50,800

After that, there's some rigour maroll,

635

00:32:50,800 --> 00:32:52,800

but pretty much we're ready to fill.

636

00:32:52,800 --> 00:32:54,800

This might just work.

637

00:32:54,800 --> 00:32:57,800

Oh, no, no, no. It's not going to work.

638

00:32:57,800 --> 00:33:00,800

They're close, but getting that final piece onto the home square

639

00:33:00,800 --> 00:33:02,800

is proving a challenge.

640

00:33:02,800 --> 00:33:04,800

Hold on, hold on. I'm not there.

641

00:33:04,800 --> 00:33:06,800

With everyone's patience as thin as the foil,

642

00:33:06,800 --> 00:33:10,800

tempers and frustrations are only just kept in check.

643

00:33:10,800 --> 00:33:11,800

Slow down, slow down.

644

00:33:11,800 --> 00:33:12,800

Everybody's slow.

645

00:33:12,800 --> 00:33:14,800

Okay, stop. Stop.

646

00:33:14,800 --> 00:33:15,800

But they finally get there

647

00:33:15,800 --> 00:33:17,800

and with piece number 12

648

00:33:17,800 --> 00:33:18,800

taped into position,

649

00:33:18,800 --> 00:33:20,800

Adam bounces back.

650

00:33:20,800 --> 00:33:21,800

I'm now feeling so optimistic

651

00:33:21,800 --> 00:33:22,800

that we're going to get buoyancy

652

00:33:22,800 --> 00:33:24,800

that I'm going to shoot even higher.

653

00:33:24,800 --> 00:33:28,800

And I want this thing looking like a real inflatable balloon,

654

00:33:28,800 --> 00:33:30,800

like with a basket,

655

00:33:30,800 --> 00:33:32,800

and with passengers.

656

00:33:32,800 --> 00:33:35,800

Ha, ha, ha, ha, ha, ha, ha, ha.

657

00:33:35,800 --> 00:33:38,800

Yes, Jamie and I are going to go for a ride

658

00:33:38,800 --> 00:33:39,800

in the lead balloon.

659

00:33:39,800 --> 00:33:44,340

balloon. Their thin flat-pack cube is complete, but how are they going to

660

00:33:44,340 --> 00:33:46,880

inflate it? Jamie and I have been thinking about ways in which this will

661

00:33:46,880 --> 00:33:52,140

fail spectacularly. We're both nervous about this little area in the middle that

662

00:33:52,140 --> 00:33:57,080

has to open like a flower with four edges scraping over each other. And to

663

00:33:57,080 --> 00:34:01,140

hopefully counter-evaluate this, we are going to be filling this balloon both into

664

00:34:01,140 --> 00:34:06,540

the bottom and into the top. We're hoping to pillow it up so the parts will move

665

00:34:06,580 --> 00:34:10,260

and slide over each other with a little less stress than just from the bottom

666

00:34:10,260 --> 00:34:14,700

having to lift like three-quarters of the weight of the balloon. Alright, so 640

667

00:34:14,700 --> 00:34:19,740

square feet of lead, 11 kilograms, 1200 feet of helium. You ready? It's going up.

668

00:34:19,740 --> 00:34:24,300

You gonna man the valves? I'll do that. Alright. Adam is understandably nervous.

669

00:34:24,300 --> 00:34:29,620

His clever design is on the line and as Jamie opens up the helium, one thing's

670

00:34:29,620 --> 00:34:35,220

apparent. It's going to take a while. It's going to be an excruciatingly slow

671

00:34:35,260 --> 00:34:39,420

process. This is the hard part. If we get past this, we're golden.

672

00:34:43,420 --> 00:34:48,420

It's the big one, you guys. Carrie Grant and Tori are just about to put the myth of

673

00:34:48,420 --> 00:34:55,660

surfing with dynamite to the ultimate test. A few feet below the surface of

674

00:34:55,660 --> 00:35:03,820

this quarry lake is 200 pounds of TNT and closer than any human could get is

675

00:35:03,860 --> 00:35:09,420

Robo Grant, the surfing robot hanging out for the perfect wave. I have speed. I

676

00:35:09,420 --> 00:35:12,060

have speed. Here we go.

677

00:35:23,700 --> 00:35:27,580

It was a huge explosion, but is the wave actually surfable?

678

00:35:28,460 --> 00:35:35,580

Robo Grant is paddling furiously and Grant keeps his stunt double on course.

679

00:35:35,580 --> 00:35:45,700

But the wave just rolls right under the surfboard. Despite the outrageously over

680

00:35:45,700 --> 00:35:52,980

the top quantity of TNT, the wave still wasn't surfable. As it radiates from the

681

00:35:53,020 --> 00:35:58,100

epicenter in an ever increasing circle, it runs out of energy, leaving Robo

682

00:35:58,100 --> 00:36:03,020

Grant thinking about his next trip to Maui, unlike the team who when they get a

683

00:36:03,020 --> 00:36:06,780

bang like this are always satisfied.

684

00:36:06,780 --> 00:36:09,780

That was beautiful. Nice job, Al.

685

00:36:09,780 --> 00:36:11,780

Nice job.

686

00:36:15,780 --> 00:36:20,700

That was not anything like the video at all. That was definitely CG and I see one major flaw

687

00:36:20,940 --> 00:36:25,620

with a wave being surfed from an explosion. It's you get a radial wave and it just

688

00:36:25,620 --> 00:36:29,020

dissipates too small. It's not like the ocean where it just carries on.

689

00:36:29,020 --> 00:36:33,140

Yeah, you know he was paddling and paddling and he had enough speed and he looked

690

00:36:33,140 --> 00:36:36,020

like he was starting to catch it but then the wave went away.

691

00:36:36,020 --> 00:36:40,820

Just kind of went, but I mean you can't get a bigger explosion than that for what

692

00:36:40,820 --> 00:36:45,260

we're doing. That was amazing. That was perfect. But on top of all that, if you were

693

00:36:45,260 --> 00:36:49,020

in the water and a bomb that big went off that close to you, you would be dead.

694

00:36:49,340 --> 00:36:51,340

Yeah, so this one's totally busted.

695

00:36:51,340 --> 00:36:53,340

Busted!

696

00:37:02,340 --> 00:37:09,340

Adam and Jamie's mythical lead balloon is in fact complete. The guys are in the process

697

00:37:09,700 --> 00:37:15,700

of inflating their inflatable but it's not as simple as it sounds and it's taking a while.

698

00:37:15,700 --> 00:37:19,580

Well, we've encountered our first slight difficulty which is that the helium doesn't

699

00:37:19,580 --> 00:37:23,460

fill this thing in any kind of even fashion. So as you can see it's heavily weighted towards

700

00:37:23,460 --> 00:37:28,020

one side and I don't want to put too much stress on one part of this balloon. I would

701

00:37:28,020 --> 00:37:32,420

like to even it out as much as I can. So we're going to take a big plastic drop cloth, lay

702

00:37:32,420 --> 00:37:38,420

it over this and use it to kind of even out the helium's filling of the balloon.

703

00:37:38,420 --> 00:37:40,420

Hopefully that'll keep it stable.

704

00:37:40,420 --> 00:37:43,980

I like it. That'll add better. Yeah, me too.

705

00:37:43,980 --> 00:37:50,980

Without a monitoring and fretting over even the slightest tear, I'm nervous because of

706

00:37:50,980 --> 00:37:54,980

the way I saw some cold, gradient hairs in a burrito. But right now I'm conditionally

707

00:37:54,980 --> 00:37:55,980

happy.

708

00:37:55,980 --> 00:38:01,380

And Jamie carefully controlling the flow of helium and air into the top and bottom of

709

00:38:01,380 --> 00:38:05,140

the cube. It slowly but surely rises.

710

00:38:05,140 --> 00:38:10,260

We're putting air in this because we think we actually have too much buoyancy. We want

711

00:38:10,260 --> 00:38:15,100

it to just barely come off the ground. Otherwise we're liable to rip something. If we can

712

00:38:15,100 --> 00:38:18,580

get it so ever so gently goes up, we're golden.

713

00:38:18,580 --> 00:38:23,260

By mixing the heavier and less buoyant air with helium, they're hoping to prevent any

714

00:38:23,260 --> 00:38:27,140

sudden lift that would tear the delicate lead foil apart.

715

00:38:27,140 --> 00:38:30,860

Okay, before it becomes too much trouble, I want to pull the visqueen off and have everyone

716

00:38:30,860 --> 00:38:31,860

grab the cords.

717

00:38:31,860 --> 00:38:32,860

Whatever you think.

718

00:38:32,860 --> 00:38:33,860

Okay.

719

00:38:33,860 --> 00:38:38,260

Adam directs his troops and the plastic drop cloth is carefully removed.

720

00:38:38,260 --> 00:38:42,460

It's looking good. It's looking good. Okay, everyone go ahead and let it up a little bit.

721

00:38:42,460 --> 00:38:43,860

Go ahead. Let's get some helium.

722

00:38:43,860 --> 00:38:48,500

And the flat pack origami cube slowly comes to life.

723

00:38:48,500 --> 00:38:51,660

I don't see any major holes. I don't see any major failure points, but we're keeping

724

00:38:51,660 --> 00:38:53,660

a close eye on it.

725

00:38:53,660 --> 00:38:55,660

Hey, Adam.

726

00:38:55,660 --> 00:38:56,660

Yeah.

727

00:38:56,660 --> 00:39:01,260

Congratulations on the design. It unfolded and twisted out just the way it was supposed

728

00:39:01,260 --> 00:39:04,900

to. Whether it flies or not, I don't know, but your plan worked.

729

00:39:04,900 --> 00:39:06,740

I'm really psyched about this one.

730

00:39:06,740 --> 00:39:11,540

The cube may be taking shape, but with the containment of the plastic gone, the foil

731

00:39:11,540 --> 00:39:13,540

is free to shift and ripple.

732

00:39:13,540 --> 00:39:15,540

There we go. I knew I felt something.

733

00:39:15,540 --> 00:39:17,980

There's a big rip here.

734

00:39:17,980 --> 00:39:20,660

And suddenly the build picks up pace.

735

00:39:20,660 --> 00:39:21,660

Opening tank three.

736

00:39:21,660 --> 00:39:24,180

I got a hole.

737

00:39:24,180 --> 00:39:26,180

Teetering on the tipping point of failure.

738

00:39:26,180 --> 00:39:28,180

Good. Hold on tight to that.

739

00:39:28,180 --> 00:39:30,180

And the promise of flight.

740

00:39:30,180 --> 00:39:36,620

Hold on to it. Hold on to it. Hold on. That's it.

741

00:39:36,620 --> 00:39:37,620

Bottoms up.

742

00:39:37,620 --> 00:39:39,620

And tears up here everywhere.

743

00:39:39,620 --> 00:39:46,100

But like the little boy in the dyke, Adam stays ahead of the leaks, and incredibly, the lead

744

00:39:46,100 --> 00:39:48,100

balloon keeps rising.

745

00:39:48,100 --> 00:39:55,500

It's a balloon. It's made out of lead and it's up there. It's floating, that'll work.

746

00:39:55,500 --> 00:39:59,320

But Adam, for one, ain't satisfied with just off the ground.

747

00:39:59,320 --> 00:40:01,760

I still want more balloon.

748

00:40:01,760 --> 00:40:02,760

That's out of it.

749

00:40:02,760 --> 00:40:03,760

I know.

750

00:40:03,760 --> 00:40:08,800

Bells and baskets he can get without requiring expensive insurance our

751

00:40:08,800 --> 00:40:14,080

disposable hosts are in the basket ready for lift off and with a few more gentle

752

00:40:14,080 --> 00:40:19,140

blasts of helium the real Adam and Jamie watch their experiment go up like a

753

00:40:19,140 --> 00:40:21,220

lead balloon.

754

00:40:21,220 --> 00:40:23,220

Dude!

755

00:40:23,220 --> 00:40:27,220

That is a lead balloon.

756

00:40:27,220 --> 00:40:30,220

I am really pleased.

757

00:40:30,680 --> 00:40:35,800

We might have been able to get away with a smaller balloon but this is a lead

758

00:40:35,800 --> 00:40:38,300

balloon. We did it.

759

00:40:38,300 --> 00:40:42,100

That worked beautifully. It's perfect.

760

00:40:42,100 --> 00:40:49,260

11 kilos of lead hanging right over my head and if I let this go it's going up.

761

00:40:49,260 --> 00:40:51,760

It's just amazing.

762

00:40:51,760 --> 00:40:55,360

Well I tell you that might be ridiculously impractical but you know if

763

00:40:55,360 --> 00:40:59,220

someone says it's impossible we just take it as a challenge.

764

00:40:59,720 --> 00:41:01,720

Busted Idiom!

765

00:41:03,720 --> 00:41:07,220

Which leaves just one thing left to do.

766

00:41:07,220 --> 00:41:08,720

How are we going to get it down?

767

00:41:08,720 --> 00:41:10,220

How about with a baseball?

768

00:41:10,220 --> 00:41:11,720

It's time to destroy it.

769

00:41:11,720 --> 00:41:12,720

It was inevitable really.

770

00:41:12,720 --> 00:41:13,720

Go ahead and throw it.

771

00:41:13,720 --> 00:41:19,720

Like a sandcastle at the end of a summer's day the kids can't help but destroy their creation.

772

00:41:26,720 --> 00:41:27,720

There it is.

773

00:41:28,720 --> 00:41:29,720

Alright.

774

00:41:29,720 --> 00:41:31,720

That's a chunk of lead.

775

00:41:31,720 --> 00:41:33,720

Good job well done. Let's go.

776

00:41:38,720 --> 00:41:41,720

So do you think we could actually make a lead zeppelin?