1

00:00:00,000 --> 00:00:08,740

On this episode of MythBusters, Adam and Jamie stare down the barrel for a death-defying

2

00:00:08,740 --> 00:00:09,740

bullet dodge.

3

00:00:09,740 --> 00:00:15,560

Damn, we want to see how close a sniper could be and you would still be able to dodge his

4

00:00:15,560 --> 00:00:16,560

bullet.

5

00:00:16,560 --> 00:00:18,600

Provided you can see the muzzle flash.

6

00:00:18,600 --> 00:00:20,000

Oh, I saw that.

7

00:00:20,000 --> 00:00:21,640

I totally saw that.

8

00:00:21,640 --> 00:00:24,000

Can you ever dive to survive?

9

00:00:24,000 --> 00:00:27,800

Jamie might be able to dodge a bullet, but can he dance like this?

10

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

Oh, yeah!

11

00:00:28,800 --> 00:00:31,600

Then Buster is used and abused.

12

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

Anybody feel sorry for Buster?

13

00:00:33,600 --> 00:00:34,600

No.

14

00:00:34,600 --> 00:00:44,320

As Carrie Grant and Tori investigate the vertigo-inducing myth that if you fall from a great height,

15

00:00:44,320 --> 00:00:47,800

dropping Buster on his face repeatedly doesn't get old.

16

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

Water has the same impact as pavement.

17

00:00:51,800 --> 00:00:59,600

Who are the MythBusters?

18

00:00:59,600 --> 00:01:00,600

Adam Savage.

19

00:01:00,600 --> 00:01:02,800

I've done it with science for today.

20

00:01:02,800 --> 00:01:03,800

And Jamie Heineman.

21

00:01:03,800 --> 00:01:04,800

Bye-bye.

22

00:01:04,800 --> 00:01:12,800

Between them more than 30 years of special effects experience, joining them, Grant Imahara.

23

00:01:12,800 --> 00:01:15,800

That's why we can never have anything nice.

24

00:01:15,800 --> 00:01:16,800

Tori Bellegi.

25

00:01:16,800 --> 00:01:18,300

I'll try not to let you guys down.

26

00:01:18,300 --> 00:01:19,300

And Carrie Byron.

27

00:01:19,300 --> 00:01:20,300

No!

28

00:01:20,300 --> 00:01:21,300

I went to college for this.

29

00:01:21,300 --> 00:01:23,300

They don't just tell the Myths.

30

00:01:23,300 --> 00:01:30,300

They put them to the test.

31

00:01:30,300 --> 00:01:39,500

All right, this week, as voted by the fans, we are tackling the myth that it is possible

32

00:01:39,500 --> 00:01:40,500

to dodge a bullet.

33

00:01:40,500 --> 00:01:41,500

What do you mean?

34

00:01:41,500 --> 00:01:43,500

You can't move faster than a bullet?

35

00:01:43,500 --> 00:01:45,900

It is not about moving faster than a bullet.

36

00:01:45,900 --> 00:01:49,780

The theory behind this myth is the idea that there is a theoretical distance at which you

37

00:01:49,780 --> 00:01:54,460

could both see a bullet being fired and yet have enough time to get out of the way of

38

00:01:54,460 --> 00:01:58,780

the bullet that's been fired at you before it gets to you and hits you.

39

00:01:58,780 --> 00:02:02,780

The shooter would have to be some distance away, like, say, a sniper.

40

00:02:02,780 --> 00:02:03,780

Exactly.

41

00:02:03,780 --> 00:02:13,020

It's no myth that dodging a bullet at close range is never going to happen.

42

00:02:13,020 --> 00:02:17,660

But when you increase the distance from shooter to target, you increase the travel time for

43

00:02:17,660 --> 00:02:19,620

the bullet.

44

00:02:19,620 --> 00:02:26,420

So assuming a sniper is far enough away and you see him take the shot, can you really

45

00:02:26,420 --> 00:02:29,420

dive to survive?

46

00:02:29,420 --> 00:02:30,420

Here's what I'm thinking.

47

00:02:30,420 --> 00:02:31,740

This story is all about time.

48

00:02:31,740 --> 00:02:32,740

Yeah.

49

00:02:32,740 --> 00:02:36,680

So the first thing I think we want to determine is how much time a bullet spends in the air

50

00:02:36,680 --> 00:02:41,100

between the rifle and the target from a bunch of different distances.

51

00:02:41,100 --> 00:02:42,100

Makes sense to me.

52

00:02:42,100 --> 00:02:43,100

Let's get shooting.

53

00:02:43,100 --> 00:02:44,100

All right.

54

00:02:44,580 --> 00:02:50,460

And to find out just that, Adam and Jamie need a super-sized gun range, like this handy

55

00:02:50,460 --> 00:02:52,860

abandoned airfield.

56

00:02:52,860 --> 00:02:56,500

It's true that in the course of doing Mythbusters, Jamie and I have done our fair bit of shooting

57

00:02:56,500 --> 00:02:58,500

and we're not bad shots.

58

00:02:58,500 --> 00:03:00,500

Oh, Jamie.

59

00:03:00,500 --> 00:03:02,100

Now we're talking.

60

00:03:02,100 --> 00:03:06,180

But for this story, we need real precision, real expertise, and that's why we brought

61

00:03:06,180 --> 00:03:09,220

in one of the finest marksmen in the country.

62

00:03:09,220 --> 00:03:10,220

Don't believe me?

63

00:03:10,220 --> 00:03:11,220

Check this out.

64

00:03:12,220 --> 00:03:20,220

In a modern interpretation of William Tell, the tiny, tasty target is 300 yards away.

65

00:03:31,220 --> 00:03:33,220

That's hot stuff.

66

00:03:33,220 --> 00:03:36,220

How do you like them apples?

67

00:03:36,220 --> 00:03:40,220

Them apples and this shooter are just fine.

68

00:03:41,220 --> 00:03:45,220

Dave Wilwanik has been a US Army sniper for 31 years.

69

00:03:45,220 --> 00:03:47,940

He was commander of the Army shooting team.

70

00:03:47,940 --> 00:03:51,220

He's one of the president's top 100 distinguished riflemen.

71

00:03:51,220 --> 00:03:53,780

It doesn't get any better than that.

72

00:03:53,780 --> 00:03:57,340

He's shooting a .338 sniper rifle.

73

00:03:57,340 --> 00:04:02,580

This is specifically designed for accuracy at extreme distance.

74

00:04:02,580 --> 00:04:09,060

And speaking of distance, 200, 500, and 1200 yards are the marks from which the marksman

75

00:04:09,060 --> 00:04:10,060

will shoot.

76

00:04:11,060 --> 00:04:15,900

The purpose of this test is to shoot the rifle at a fixed distance and record how much time

77

00:04:15,900 --> 00:04:18,540

it takes for the bullet to hit the target.

78

00:04:18,540 --> 00:04:21,540

That's the amount of time that we'll have to dodge a bullet.

79

00:04:21,540 --> 00:04:27,420

And to accurately measure the muzzle to target time, Adam and Jamie set up a foil-based electronic

80

00:04:27,420 --> 00:04:28,420

circuit.

81

00:04:28,420 --> 00:04:29,420

Good.

82

00:04:29,420 --> 00:04:32,500

Here's how we're going to time the bullets' time of flight.

83

00:04:32,500 --> 00:04:35,860

The instant the bullet leaves the gun, it will cross through this piece of paper with

84

00:04:35,860 --> 00:04:37,660

a piece of foil on each side.

85

00:04:37,660 --> 00:04:40,860

When it breaks that piece of paper, the foil will connect, creating an electronic switch

86

00:04:40,860 --> 00:04:45,820

connection which will send a signal through this wire to this year's timer and tell it

87

00:04:45,820 --> 00:04:46,900

to start timing.

88

00:04:46,900 --> 00:04:50,900

That timer will keep timing the whole time the bullet flies through the air.

89

00:04:55,900 --> 00:05:00,300

Right up until our bullet hits the target, crossing through the same type of piece of

90

00:05:00,300 --> 00:05:03,860

paper with foil on both sides, closing a switch connection, telling our timer to stop timing

91

00:05:03,860 --> 00:05:08,740

and giving us an exact time of flight of the bullet from the rifle to the target.

92

00:05:08,740 --> 00:05:15,660

The first distance we'll be sending a bullet to our target is 200 yards, 600 feet, two entire

93

00:05:15,660 --> 00:05:19,780

football fields, end to end, six M5s.

94

00:05:19,780 --> 00:05:26,540

So with dead eye Dave in position, all right, time of flight, 200 yards, his spotter Kevin

95

00:05:26,540 --> 00:05:32,940

all lined up, bias right, ever so slight, and the trusty foil timing system ready to record

96

00:05:32,940 --> 00:05:35,220

the flight time of each round.

97

00:05:35,220 --> 00:05:37,780

Oh right edge Dave.

98

00:05:37,780 --> 00:05:39,020

Right edge.

99

00:05:39,020 --> 00:05:41,300

This test is going to be a breeze.

100

00:05:41,300 --> 00:05:42,300

Send it.

101

00:05:42,300 --> 00:05:43,300

What?

102

00:05:43,300 --> 00:05:44,300

Nothing.

103

00:05:44,300 --> 00:05:49,980

Started timing, it didn't stop timing.

104

00:05:49,980 --> 00:05:50,980

Maybe not.

105

00:05:50,980 --> 00:05:54,620

The trusty timing foil is failing.

106

00:05:54,620 --> 00:05:57,700

Basically we've got an infarction somewhere in the circuit.

107

00:05:57,700 --> 00:05:59,060

The timing is just not working.

108

00:05:59,060 --> 00:06:02,900

We can't tell if it's at the gun or it's at the target, but in order to get timings we

109

00:06:02,900 --> 00:06:08,740

have to suss this out.

110

00:06:08,740 --> 00:06:13,420

Next up is the physics of a fall onto water, really the same as pavement.

111

00:06:13,420 --> 00:06:16,020

Okay, so we've got a good one.

112

00:06:16,020 --> 00:06:19,860

In this episode we're testing that water is as hard as pavement.

113

00:06:19,860 --> 00:06:21,340

Yeah, I've heard this one.

114

00:06:21,340 --> 00:06:25,100

The idea is that if you fall from a height tall enough and you get up enough speed, when

115

00:06:25,100 --> 00:06:27,780

you hit that water it behaves just like pavement.

116

00:06:27,780 --> 00:06:30,660

Wake up Buster, he's got some fallin' to do.

117

00:06:31,660 --> 00:06:36,260

It's an oft repeated urban myth that if you fall into water from a great height rather

118

00:06:36,260 --> 00:06:41,260

than a splash landing, you have a pavement equaling crash landing.

119

00:06:41,260 --> 00:06:46,980

Okay, so I think we need to get Buster rigged with some accelerometers so we know how much

120

00:06:46,980 --> 00:06:51,420

impact he experiences and then drop them on pavement and drop them on water and compare

121

00:06:51,420 --> 00:06:52,420

the results.

122

00:06:52,420 --> 00:06:53,420

Sounds good to me.

123

00:06:53,420 --> 00:06:55,300

But bad for Buster.

124

00:06:55,300 --> 00:06:59,300

Real bad.

125

00:06:59,300 --> 00:07:01,660

This myth is about water behaving like pavement.

126

00:07:01,660 --> 00:07:04,100

Now you may be thinking that's crazy.

127

00:07:04,100 --> 00:07:06,060

Water is soft and pavement is hard.

128

00:07:06,060 --> 00:07:07,300

How can they be the same?

129

00:07:07,300 --> 00:07:09,740

Well, under certain conditions they can be.

130

00:07:09,740 --> 00:07:11,460

Let me demonstrate.

131

00:07:11,460 --> 00:07:16,660

In this syringe I have air, in this syringe I have water with some food coloring in it.

132

00:07:16,660 --> 00:07:19,700

Air is compressible.

133

00:07:19,700 --> 00:07:23,740

Compresses springs back.

134

00:07:23,740 --> 00:07:25,300

Water is incompressible.

135

00:07:25,900 --> 00:07:31,300

I try and push it in and it doesn't compress.

136

00:07:31,300 --> 00:07:34,380

And that's what's going to happen when your body falls out of the sky and hits the surface

137

00:07:34,380 --> 00:07:35,540

of the water.

138

00:07:35,540 --> 00:07:37,580

It doesn't give, just like pavement.

139

00:07:37,580 --> 00:07:41,660

So to find out whether or not water is in fact as hard as pavement, we are going to

140

00:07:41,660 --> 00:07:44,860

be dropping Buster from heights wearing one of these.

141

00:07:44,860 --> 00:07:45,860

This is an accelerometer.

142

00:07:45,860 --> 00:07:50,820

It is an electromechanical device used to measure acceleration forces.

143

00:07:51,140 --> 00:07:56,100

These forces are commonly known as gravitational forces or G forces.

144

00:07:56,100 --> 00:07:59,740

The challenge with our specific experiment is that we are going to be measuring very

145

00:07:59,740 --> 00:08:03,300

high G loads, much higher than ordinary accelerometers can handle.

146

00:08:03,300 --> 00:08:05,060

That's why we have this system.

147

00:08:05,060 --> 00:08:07,180

I'm not fondling as nipple.

148

00:08:07,180 --> 00:08:10,540

It's specifically designed to measure up to 500 Gs.

149

00:08:10,540 --> 00:08:14,380

I've mounted it inside of a waterproof case in Buster's chest.

150

00:08:14,380 --> 00:08:18,540

Just like airplanes have black boxes, Buster has a black box.

151

00:08:18,540 --> 00:08:19,220

This is it.

152

00:08:21,540 --> 00:08:26,620

All rigged up and ready to roll, the team hits the perfect location for a spot of Buster

153

00:08:26,620 --> 00:08:27,620

bouncing.

154

00:08:27,620 --> 00:08:30,660

Here we are at the South San Francisco Water Treatment Center.

155

00:08:30,660 --> 00:08:34,060

And this is the perfect location for us to test this myth.

156

00:08:34,060 --> 00:08:37,220

It's always exciting when the crane shows up.

157

00:08:37,220 --> 00:08:39,700

We have pavement and we have water.

158

00:08:39,700 --> 00:08:43,180

Once we get our crane set, we won't even have to move it.

159

00:08:43,180 --> 00:08:44,180

Bullseye!

160

00:08:44,180 --> 00:08:47,260

You know, Buster has been very, very quiet today.

161

00:08:47,700 --> 00:08:50,020

I have a feeling he might know what we're up to.

162

00:08:51,220 --> 00:08:56,180

In the team's side is a series of consistent comparative drop tests.

163

00:08:56,180 --> 00:09:00,020

Onto water and pavement at ever increasing heights.

164

00:09:02,660 --> 00:09:06,420

OK, so the way Buster falls and lands will affect the results.

165

00:09:06,420 --> 00:09:10,820

So we've rigged this system so that he should fall the same way every single time.

166

00:09:10,820 --> 00:09:13,820

All right, 25 feet, that's good.

167

00:09:13,820 --> 00:09:16,380

And first up is the feet first fall.

168

00:09:16,380 --> 00:09:17,820

How's that for alliteration?

169

00:09:17,820 --> 00:09:23,700

It was perfectly poetic Byron, but Buster, suspended 25 feet above the pavement, doesn't

170

00:09:23,700 --> 00:09:24,700

really care.

171

00:09:26,700 --> 00:09:28,700

In three, two, one.

172

00:09:30,700 --> 00:09:31,700

Ow!

173

00:09:31,700 --> 00:09:34,740

With a long day ahead, the dummy took that one in his stride.

174

00:09:34,740 --> 00:09:36,300

But what do the numbers tell us?

175

00:09:36,300 --> 00:09:39,140

Got a peak g-load of 60 feet.

176

00:09:39,140 --> 00:09:40,860

Well, that seems about right.

177

00:09:40,860 --> 00:09:44,500

I mean, he has his legs to break his fall.

178

00:09:44,500 --> 00:09:50,460

So we just dropped Buster from 25 feet onto the pavement feet first, and he pulled 60

179

00:09:50,460 --> 00:09:51,460

Gs.

180

00:09:51,460 --> 00:09:55,260

Now what we're going to do is hook him back up to the crane, swing him over to the water,

181

00:09:55,260 --> 00:09:59,460

drop him again from 25 feet, feet first, and see how many Gs he pulls.

182

00:09:59,460 --> 00:10:01,260

All right, that looks good.

183

00:10:01,260 --> 00:10:06,900

Now, I know water is technically incompressible, but compared to the pavement, I think we're

184

00:10:06,900 --> 00:10:10,460

going to see a lower G-load because his feet are going to dip in, the water is going to

185

00:10:10,460 --> 00:10:14,740

give, and he's going to be decelerated over a longer time period.

186

00:10:14,740 --> 00:10:16,740

In three, two, one.

187

00:10:18,740 --> 00:10:20,740

Oh, that didn't look so bad.

188

00:10:20,740 --> 00:10:23,180

That's definitely not the same as pavement.

189

00:10:23,180 --> 00:10:25,180

And the numbers bear that out.

190

00:10:25,180 --> 00:10:29,860

Okay, so I got no trigger, which means that that fall was less than 25 Gs.

191

00:10:29,860 --> 00:10:32,060

It won't trigger anything below that.

192

00:10:32,060 --> 00:10:37,780

And remember, in this same situation over pavement, it was 60 Gs.

193

00:10:37,780 --> 00:10:42,140

But the myth states that water equals pavement from a great height.

194

00:10:42,140 --> 00:10:46,420

And at greater heights, Buster will be falling at greater speeds.

195

00:10:46,420 --> 00:10:51,500

Perhaps hitting the water faster means the liquid won't displace and will be haved just

196

00:10:51,500 --> 00:10:53,420

like an incompressible solid.

197

00:10:53,420 --> 00:10:57,060

Buster, my friend, things are looking up.

198

00:10:57,060 --> 00:10:58,060

75 feet up.

199

00:10:58,060 --> 00:11:00,060

That's a long way to fall.

200

00:11:00,060 --> 00:11:02,060

Anybody feel sorry for Buster?

201

00:11:02,060 --> 00:11:03,060

No.

202

00:11:03,060 --> 00:11:04,060

No?

203

00:11:04,060 --> 00:11:05,060

Just checking.

204

00:11:05,060 --> 00:11:06,060

All right, here we go.

205

00:11:06,060 --> 00:11:11,060

75 foot fall, feet first into water in three, two, one.

206

00:11:16,060 --> 00:11:18,020

Ooh, that was a solid hit.

207

00:11:18,020 --> 00:11:22,980

And as Buster is raised and assessed, it looks like he's taken a severe pounding.

208

00:11:22,980 --> 00:11:26,780

But the data in the black box holds the objective key.

209

00:11:26,780 --> 00:11:28,780

We got 29.

210

00:11:28,780 --> 00:11:29,780

No way.

211

00:11:29,780 --> 00:11:30,780

Yeah.

212

00:11:31,500 --> 00:11:36,060

So that's half of what we got on pavement at three times the height.

213

00:11:36,060 --> 00:11:37,060

Wow.

214

00:11:37,060 --> 00:11:38,660

Not good news for the myth.

215

00:11:38,660 --> 00:11:45,620

The fall onto water at 75 feet is half as damaging as pavement from 25 feet.

216

00:11:45,620 --> 00:11:48,980

But there's one more test before the data set is complete.

217

00:11:48,980 --> 00:11:51,500

75 feet onto pavement.

218

00:11:51,500 --> 00:11:52,500

Oh.

219

00:11:52,500 --> 00:11:53,500

Oh!

220

00:11:53,500 --> 00:11:54,500

Oh!

221

00:11:54,500 --> 00:11:55,500

Oh!

222

00:11:55,500 --> 00:11:56,500

Oh!

223

00:11:56,500 --> 00:11:57,500

Oh!

224

00:11:57,500 --> 00:11:58,500

Oh!

225

00:11:58,500 --> 00:11:59,500

Oh!

226

00:11:59,500 --> 00:12:00,500

Oh!

227

00:12:00,500 --> 00:12:01,500

Oh!

228

00:12:01,500 --> 00:12:02,500

Oh!

229

00:12:02,500 --> 00:12:06,500

Watching Buster fall 75 feet onto the pavement was painful.

230

00:12:06,500 --> 00:12:10,500

I mean, his body twisted in ways that a human body never should.

231

00:12:10,500 --> 00:12:15,500

All right, so we just dropped Buster 75 feet, feet first into the pavement.

232

00:12:15,500 --> 00:12:17,500

What kind of jizz do we pull?

233

00:12:17,500 --> 00:12:18,500

Woo-hoo-hoo!

234

00:12:18,500 --> 00:12:21,500

We absolutely maxed out our accelerometer.

235

00:12:21,500 --> 00:12:25,500

Maxed out means that G-Load was in excess of 500.

236

00:12:25,500 --> 00:12:29,500

That's an impact at least 17 times harder than the H2O.

237

00:12:29,500 --> 00:12:33,500

In these circumstances, water clearly does not equal pavement.

238

00:12:33,500 --> 00:12:38,500

But the myth isn't sunk just yet, and here's Grant's theory as to why.

239

00:12:38,500 --> 00:12:39,500

Now water's incompressible.

240

00:12:39,500 --> 00:12:41,500

That's a fact of physics.

241

00:12:41,500 --> 00:12:44,500

And if I put my hand in the water slow enough, the water can displace.

242

00:12:44,500 --> 00:12:46,500

It can move out of the way.

243

00:12:46,500 --> 00:12:50,500

But if Buster were to hit the water fast enough, and if he had enough surface area, the water

244

00:12:50,500 --> 00:12:52,500

wouldn't have a chance to get out of the way.

245

00:12:52,500 --> 00:12:57,500

And because it's incompressible, there'll be some point in which the G-Force is equivalent

246

00:12:57,500 --> 00:13:00,500

between water and pavement.

247

00:13:00,500 --> 00:13:07,500

So because this area may be a factor, it's time to bring out the belly flop.

248

00:13:08,500 --> 00:13:13,500

Up next, the next distance we'll be firing from is 500 yards.

249

00:13:13,500 --> 00:13:16,500

The distance of your average restraining order.

250

00:13:21,500 --> 00:13:26,500

Adam and Jamie are testing the myth that you can literally dodge a bullet,

251

00:13:26,500 --> 00:13:29,500

provided the shooter is far enough away.

252

00:13:29,500 --> 00:13:36,500

And to find out, they've got an expert sniper who's hitting the target first time every time.

253

00:13:36,500 --> 00:13:41,500

And a clever foil-based timing system that isn't.

254

00:13:41,500 --> 00:13:44,500

It didn't work. It didn't stop it.

255

00:13:44,500 --> 00:13:46,500

It's not working.

256

00:13:46,500 --> 00:13:47,500

It has to work.

257

00:13:47,500 --> 00:13:52,500

But despite the foil's initial failings, Adam and Jamie tweak, tinker,

258

00:13:52,500 --> 00:13:57,500

and persevere until the mysterious gremlins in the system are ironed out.

259

00:13:57,500 --> 00:14:01,500

200 yards, time of flight. Fire and will.

260

00:14:05,500 --> 00:14:06,500

Hey, we got a number.

261

00:14:06,500 --> 00:14:07,500

What'd we get?

262

00:14:07,500 --> 00:14:09,500

231 milliseconds.

263

00:14:09,500 --> 00:14:10,500

Let's move back.

264

00:14:10,500 --> 00:14:11,500

Alright.

265

00:14:11,500 --> 00:14:16,500

With that first data point finally in the bag, the team reset for the second shot.

266

00:14:17,500 --> 00:14:22,500

The next distance we'll be firing from is 500 yards, 1,500 feet,

267

00:14:22,500 --> 00:14:26,500

10 Olympic swimming pools approximately, and to end,

268

00:14:26,500 --> 00:14:29,500

or the distance of your average restraining order.

269

00:14:29,500 --> 00:14:33,500

And Dead Eye Dave, once he's assumed the position, focuses...

270

00:14:35,500 --> 00:14:36,500

That's it.

271

00:14:37,500 --> 00:14:40,500

...and hits the bullseye again.

272

00:14:40,500 --> 00:14:42,500

Beautiful. We got a reading.

273

00:14:42,500 --> 00:14:43,500

Love it.

274

00:14:43,500 --> 00:14:45,500

597 milliseconds.

275

00:14:45,500 --> 00:14:51,500

So it's onwards and backwards as the team sets up for the third and final shot.

276

00:14:51,500 --> 00:14:54,500

Nice to get the box gets lighter the longer you walk.

277

00:14:54,500 --> 00:14:58,500

This time from a massive distance of 1,200 yards.

278

00:14:58,500 --> 00:15:04,500

The final distance we'll be shooting from is 1,200 yards, roughly an 8-minute walk.

279

00:15:04,500 --> 00:15:07,500

A kilometer to those of you in every other part of the world besides the United States.

280

00:15:07,500 --> 00:15:12,500

And when I look at the target from here, I think, what target?

281

00:15:12,500 --> 00:15:15,500

But if anyone can make this shot, it's Sniper Dave.

282

00:15:15,500 --> 00:15:17,500

Sniping is actually pretty complicated.

283

00:15:17,500 --> 00:15:22,500

Your modern sniper shows up with a spotter and a computer to get the job done.

284

00:15:22,500 --> 00:15:25,500

He's got a competency for several different things.

285

00:15:25,500 --> 00:15:30,500

Gravity. If our shooter's 1,200 feet away to hit here,

286

00:15:30,500 --> 00:15:35,500

he's actually got to aim at a point directly above 30 feet in the air.

287

00:15:35,500 --> 00:15:37,500

Okay, time of flight.

288

00:15:37,500 --> 00:15:39,500

1,200 yards.

289

00:15:39,500 --> 00:15:46,500

The wind. If the wind's blowing this way, then our shooter's going to have to aim to this side of the target to compensate.

290

00:15:46,500 --> 00:15:48,500

Figure 6 tenths left.

291

00:15:48,500 --> 00:15:51,500

Now he's going to be looking at things like flags if they're there,

292

00:15:51,500 --> 00:15:54,500

or even the grass or mirages to get a clue as to what's going on.

293

00:15:54,500 --> 00:15:59,500

If I'm picking up some surface mirage running right to left about halfway down the range.

294

00:15:59,500 --> 00:16:01,500

Drag. Now this is about air-densing.

295

00:16:01,500 --> 00:16:05,500

Our shooter's going to be looking at barometer, at altitude, at temperature

296

00:16:05,500 --> 00:16:09,500

to determine how dense the air is and be able to compensate for it.

297

00:16:09,500 --> 00:16:11,500

Okay, have I got a light boil?

298

00:16:11,500 --> 00:16:13,500

Hold center and send it.

299

00:16:13,500 --> 00:16:18,500

Now, all these things are a lot for a sniper to keep in mind when he's taking a shot.

300

00:16:18,500 --> 00:16:20,500

It's quite a feat when you think about it.

301

00:16:20,500 --> 00:16:25,500

Never in doubt. Dave threads the eye of the proverbial needle.

302

00:16:25,500 --> 00:16:28,500

And just as important.

303

00:16:28,500 --> 00:16:33,500

Beautiful! We got a reading. 1.791 seconds to target.

304

00:16:33,500 --> 00:16:34,500

Excellent.

305

00:16:34,500 --> 00:16:37,500

Alright, let's draw a graph.

306

00:16:37,500 --> 00:16:40,500

Now that we've got our numbers, it's time to plot them on a graph.

307

00:16:40,500 --> 00:16:44,500

Let's start with the x-axis, 12 increments of 100 yards each.

308

00:16:44,500 --> 00:16:51,500

The y-axis going up and down, that's time from 0 to 2 seconds in quarter-second increments.

309

00:16:51,500 --> 00:16:54,500

Then we draw a grid and plot out our bullet times.

310

00:16:54,500 --> 00:16:59,500

The first bullet from 200 yards took 231 milliseconds to reach its target.

311

00:16:59,500 --> 00:17:03,500

The second bullet from 500 yards took 597 milliseconds.

312

00:17:03,500 --> 00:17:10,500

The third bullet from 1200 yards took 1,790 milliseconds to reach its target.

313

00:17:10,500 --> 00:17:13,500

We then draw a line between these three points and see, oh!

314

00:17:13,500 --> 00:17:15,500

It's perfectly straight.

315

00:17:15,500 --> 00:17:19,500

That means we can take any distance and plot the amount of time it would take the bullet to get there.

316

00:17:19,500 --> 00:17:23,500

Or conversely, we could choose a time and figure out how far away you'd have to shoot

317

00:17:23,500 --> 00:17:25,500

for the bullet to take that length of time.

318

00:17:25,500 --> 00:17:27,500

Isn't graphing lovely?

319

00:17:27,500 --> 00:17:30,500

The day started badly.

320

00:17:31,500 --> 00:17:38,500

But thanks to Dave and his spotter, they've got the numbers they need to kickstart this man.

321

00:17:38,500 --> 00:17:39,500

Well, we got our figures.

322

00:17:39,500 --> 00:17:43,500

We now know how long it will take the bullet to reach its target from any distance we choose.

323

00:17:43,500 --> 00:17:46,500

Well, now we need to know how quickly we can jump out of the way, huh?

324

00:17:46,500 --> 00:17:48,500

Human reaction tests it is. Let's do it.

325

00:17:48,500 --> 00:17:51,500

I can't believe he can hit that target from here.

326

00:17:51,500 --> 00:17:54,500

Hit the target? I can't even see it.

327

00:17:55,500 --> 00:18:03,500

All incompressible materials are equal, but so far, some are more equal than others.

328

00:18:03,500 --> 00:18:08,500

When cluster is dropped feet first, water has nothing like the impact of pavement.

329

00:18:08,500 --> 00:18:12,500

The angle of entry means the water is easily displaced.

330

00:18:12,500 --> 00:18:17,500

Yeah, so that's half what we got on pavement at three times the height.

331

00:18:17,500 --> 00:18:20,500

But what if that was changed to a belly flop?

332

00:18:20,500 --> 00:18:21,500

Time to hog time.

333

00:18:21,500 --> 00:18:26,500

Will the additional surface area save this scientific saga from sinking?

334

00:18:26,500 --> 00:18:32,500

So in case you're wondering, and I'm pretty sure you are dropping Buster on his face repeatedly,

335

00:18:32,500 --> 00:18:33,500

it just doesn't get old.

336

00:18:33,500 --> 00:18:37,500

All right, this is Buster's belly flop into pavement from 25 feet.

337

00:18:37,500 --> 00:18:40,500

In three, two, one.

338

00:18:40,500 --> 00:18:41,500

Oh!

339

00:18:41,500 --> 00:18:42,500

Ah!

340

00:18:42,500 --> 00:18:45,500

That looked painful.

341

00:18:45,500 --> 00:18:48,500

And without his legs, breaking his fun is a pain.

342

00:18:48,500 --> 00:18:54,500

And without his legs, breaking his fall, the g-load was much higher than the feet first test.

343

00:18:56,500 --> 00:18:59,500

So we just dropped Buster, chest first, on the pavement.

344

00:18:59,500 --> 00:19:02,500

We got 286 Gs.

345

00:19:02,500 --> 00:19:05,500

Now what we're going to do is do the same thing on water.

346

00:19:05,500 --> 00:19:08,500

My feeling is we're going to see very similar results.

347

00:19:08,500 --> 00:19:12,500

And I think anybody who's ever jumped off the diving board and done a belly flop

348

00:19:12,500 --> 00:19:14,500

will understand what I'm talking about.

349

00:19:14,500 --> 00:19:15,500

This is going to hurt.

350

00:19:15,500 --> 00:19:18,500

In three, two, one.

351

00:19:18,500 --> 00:19:19,500

Oh!

352

00:19:19,500 --> 00:19:23,500

I give that dive a 9.

353

00:19:25,500 --> 00:19:32,500

Okay, so belly flopping, Buster on pavement at 25 feet was 290 Gs.

354

00:19:32,500 --> 00:19:34,500

And on water, it was 115.

355

00:19:34,500 --> 00:19:38,500

And what that means is sure, water is not as hard as pavement,

356

00:19:38,500 --> 00:19:42,500

but it was a lot closer than when we dropped Buster feet first.

357

00:19:42,500 --> 00:19:43,500

So surface area is important.

358

00:19:43,500 --> 00:19:47,500

The more surface area you have, the harder it is to displace the water.

359

00:19:47,500 --> 00:19:50,500

Now what if Buster was moving a lot faster?

360

00:19:50,500 --> 00:19:55,500

Then we might see the difference between the water and the pavement decrease again.

361

00:19:55,500 --> 00:19:56,500

Let's see.

362

00:19:56,500 --> 00:19:58,500

So the team thinks speed is the key.

363

00:19:58,500 --> 00:20:02,500

And to get Buster moving faster, they need to take him higher.

364

00:20:02,500 --> 00:20:08,500

This is dropping Buster from 50 feet in the belly flop position over water.

365

00:20:08,500 --> 00:20:09,500

Here we go.

366

00:20:09,500 --> 00:20:11,500

In three, two, one.

367

00:20:12,500 --> 00:20:13,500

Oh!

368

00:20:13,500 --> 00:20:14,500

Oh!

369

00:20:14,500 --> 00:20:18,500

Look at the wave that's coming out.

370

00:20:18,500 --> 00:20:23,500

So dropping Buster from 50 feet actually peeled the skin off of his side.

371

00:20:23,500 --> 00:20:27,500

It was such an impact that all of us, I think, felt it.

372

00:20:27,500 --> 00:20:32,500

So it looks like on water at 50 feet, belly flop is giving us 220 Gs.

373

00:20:32,500 --> 00:20:35,500

Now for the all-important comparison.

374

00:20:35,500 --> 00:20:41,500

Will the 50-foot pavement plummet be any closer to water than the 25-foot test?

375

00:20:43,500 --> 00:20:44,500

Take it up.

376

00:20:44,500 --> 00:20:45,500

50 feet.

377

00:20:45,500 --> 00:20:46,500

50 feet.

378

00:20:46,500 --> 00:20:48,500

You might not survive this, you know.

379

00:20:48,500 --> 00:20:50,500

Yeah, 25 looked like it hurt.

380

00:20:51,500 --> 00:20:53,500

Three, two, one.

381

00:20:54,500 --> 00:20:55,500

Oh.

382

00:20:55,500 --> 00:20:56,500

Oh!

383

00:20:56,500 --> 00:20:57,500

Oh!

384

00:20:57,500 --> 00:20:59,500

Hey, still in one piece.

385

00:20:59,500 --> 00:21:01,500

Tell me you didn't feel that.

386

00:21:01,500 --> 00:21:03,500

That made me throw up.

387

00:21:03,500 --> 00:21:06,500

I am so glad it was him and not me.

388

00:21:07,500 --> 00:21:10,500

All right, let's find out how he did.

389

00:21:11,500 --> 00:21:12,500

That was intense.

390

00:21:12,500 --> 00:21:20,500

In fact, it was so intense, the meter maxed out, meaning Buster pulled a g-load of 500 plus.

391

00:21:20,500 --> 00:21:22,500

Oh my God, that's a hard hit.

392

00:21:23,500 --> 00:21:30,500

Buster is bruised and battered, but with the meter unable to register the force of the fall, where does that leave the myth?

393

00:21:31,500 --> 00:21:33,500

So we've maxed out our meter.

394

00:21:33,500 --> 00:21:36,500

That means that we can't compare numbers to the 25-foot drop.

395

00:21:36,500 --> 00:21:40,500

Now it's possible as you go higher that water could become more like pavement.

396

00:21:40,500 --> 00:21:43,500

We just can't test it here right now with this meter.

397

00:21:43,500 --> 00:21:45,500

So that means we have to do two things.

398

00:21:45,500 --> 00:21:51,500

First, you have to find a more myth-bustery way to prepare the fall onto water versus the fall on the concrete.

399

00:21:51,500 --> 00:21:55,500

And second, once you've done that, we have to perform more experiments,

400

00:21:55,500 --> 00:22:00,500

but this time at a much greater height, so high in fact that we reach terminal velocity.

401

00:22:01,500 --> 00:22:07,500

Coming up, so I turn into one of the three Stooges, Adam and Jamie, time their bullet dodging reactions.

402

00:22:13,500 --> 00:22:15,500

We got some good numbers from our sniper.

403

00:22:15,500 --> 00:22:16,500

What's next?

404

00:22:16,500 --> 00:22:19,500

I think the moment has come to time another element of this story.

405

00:22:19,500 --> 00:22:21,500

Human reaction time?

406

00:22:21,500 --> 00:22:26,500

Exactly. If you had to dodge a bullet just how quickly could you get out of its way?

407

00:22:26,500 --> 00:22:28,500

I think I'm going to go get a cup of coffee.

408

00:22:29,500 --> 00:22:33,500

See, he's going to get a cup of coffee, he's going to make him really hyper, and he's going to get out of the way really fast.

409

00:22:34,500 --> 00:22:40,500

So they've got the numbers for flight time and in their attempt to deconstruct this myth without actually shooting at each other,

410

00:22:42,500 --> 00:22:43,500

it works.

411

00:22:43,500 --> 00:22:48,500

The next piece of data is how long it will take to react and move out of the way.

412

00:22:49,500 --> 00:22:52,500

This test is all about measuring a human being's reaction time.

413

00:22:52,500 --> 00:23:00,500

This is our human being, his task to get himself out of the path of a bullet described by the X on his chest and the bullseye behind him.

414

00:23:00,500 --> 00:23:08,500

His signal to move, that the shot has been fired, will be given by this digital camera flash remotely triggered by me from back there.

415

00:23:08,500 --> 00:23:14,500

All of this will be captured by our lovely digital high speed camera,

416

00:23:14,500 --> 00:23:22,500

which when we review the footage of Jamie's dodging a bullet will allow us to time exactly how many milliseconds it took him to do it.

417

00:23:23,500 --> 00:23:25,500

Alright, are you ready Jamie?

418

00:23:25,500 --> 00:23:31,500

Human reaction time speed test at some random point in the very near future.

419

00:23:35,500 --> 00:23:36,500

Nice.

420

00:23:37,500 --> 00:23:42,500

Jamie's fast, his Hoosier reflexes our hone to an almost superhero speed.

421

00:23:43,500 --> 00:23:47,500

Nice work there cowboy, you want to man the remote flash while I try a couple?

422

00:23:47,500 --> 00:23:48,500

Okay.

423

00:23:50,500 --> 00:23:54,500

Adam on the other hand makes up for his slow reactions with his lack of grace.

424

00:23:55,500 --> 00:23:57,500

Now to assess the results.

425

00:23:57,500 --> 00:23:58,500

Here's mine.

426

00:23:59,500 --> 00:24:01,500

So I turn into one of the three Stooges.

427

00:24:05,500 --> 00:24:08,500

But the Heinemann legend continues to grow.

428

00:24:08,500 --> 00:24:10,500

Ha ha ha ha ha ha ha.

429

00:24:10,500 --> 00:24:15,500

Oh, dude, check his bad self out.

430

00:24:15,500 --> 00:24:18,500

He's a bullet dodging Hoosier.

431

00:24:18,500 --> 00:24:24,500

Despite Jamie practicing and honing his Matrix style sway with an artful economy of motion,

432

00:24:24,500 --> 00:24:28,500

it turns out that both Jamie and Adam clocked very similar times.

433

00:24:28,500 --> 00:24:33,500

They're both clear of the target in around 500 milliseconds.

434

00:24:33,500 --> 00:24:37,500

But just for the record, and this is the figure they'll take forward,

435

00:24:37,500 --> 00:24:42,500

Jamie takes the gold with a personal best of 490 milliseconds.

436

00:24:42,500 --> 00:24:46,500

With practice I was able to get my reaction time down to about an eighth of a second

437

00:24:46,500 --> 00:24:49,500

and I was able to clear the bullseye in less than half a second.

438

00:24:49,500 --> 00:24:53,500

Now this is a best-case scenario, but that's actually what we want here

439

00:24:53,500 --> 00:24:59,500

because we want to see what is possible in terms of how close a sniper could be

440

00:24:59,500 --> 00:25:03,500

and you would still in theory be able to dodge his bullet.

441

00:25:03,500 --> 00:25:07,500

And for that distance, it's back to Adam and his graph.

442

00:25:07,500 --> 00:25:10,500

Alright editors, help me out here and put the original graph back on the screen.

443

00:25:10,500 --> 00:25:13,500

Time on the y-axis, distance on the x.

444

00:25:13,500 --> 00:25:17,500

Now if I draw a line from 490 milliseconds out to our plot

445

00:25:17,500 --> 00:25:22,500

and check out the corresponding distance, it's 400 yards.

446

00:25:22,500 --> 00:25:27,500

That is the theoretical distance at which you could possibly dodge a bullet,

447

00:25:27,500 --> 00:25:31,500

but only if you could see the muzzle flash from that distance.

448

00:25:31,500 --> 00:25:33,500

That's what we're about to find out.

449

00:25:33,500 --> 00:25:38,500

And that means it will return to the range for a test where the eyes have it.

450

00:25:38,500 --> 00:25:42,500

The question is, how far away can you see the rifle firing?

451

00:25:42,500 --> 00:25:46,500

Now note, you cannot rely on sound because the bullet travels four times faster

452

00:25:46,500 --> 00:25:50,500

than the speed of sound. You'll get hit by it long before you hear it.

453

00:25:50,500 --> 00:25:52,500

This has to be a visual cue.

454

00:25:52,500 --> 00:25:55,500

A visual cue and a simple plan.

455

00:25:55,500 --> 00:25:59,500

Adam and Jamie will stand down range and look for the muzzle flash

456

00:25:59,500 --> 00:26:03,500

as Sniper Dave shoots at a nearby target.

457

00:26:03,500 --> 00:26:08,500

A little motivation for a sniper.

458

00:26:08,500 --> 00:26:12,500

But rest assured, for safety, Dave will be firing blanks.

459

00:26:12,500 --> 00:26:17,500

This is the real thing and this is a blank, but this isn't just any blank.

460

00:26:17,500 --> 00:26:22,500

This is a theatrical blank that we've selected specifically because what comes out of it

461

00:26:22,500 --> 00:26:26,500

looks exactly the same as what comes out of the real McCoy.

462

00:26:26,500 --> 00:26:30,500

And first up, they're facing the firing squad from 100 yards.

463

00:26:30,500 --> 00:26:32,500

I saw it.

464

00:26:32,500 --> 00:26:33,500

I saw it.

465

00:26:33,500 --> 00:26:36,500

Okay Dave, let's move back to 150.

466

00:26:36,500 --> 00:26:38,500

Cool. Roger moving.

467

00:26:38,500 --> 00:26:42,500

At 100 yards, the flash is as clear as a bell.

468

00:26:42,500 --> 00:26:45,500

And that's also true of 150.

469

00:26:45,500 --> 00:26:46,500

I saw it.

470

00:26:46,500 --> 00:26:47,500

I saw it.

471

00:26:47,500 --> 00:26:50,500

But 200 yards is a different story.

472

00:26:50,500 --> 00:26:54,500

Dave, 200 yards, fire it well.

473

00:26:54,500 --> 00:26:56,500

I didn't see that.

474

00:26:56,500 --> 00:26:58,500

Let's have him do that again.

475

00:26:58,500 --> 00:27:03,500

Dave, let's have one more go.

476

00:27:03,500 --> 00:27:04,500

Did you see it?

477

00:27:04,500 --> 00:27:06,500

I'd say that's at the borderline.

478

00:27:06,500 --> 00:27:09,500

Well, if you've got the eagle eyes, let's push it another 25 yards.

479

00:27:09,500 --> 00:27:17,500

At 225 yards, even eagle-eyed Jamie fails to focus on the flash.

480

00:27:17,500 --> 00:27:19,500

No, I don't have it.

481

00:27:19,500 --> 00:27:21,500

200 yards is our threshold.

482

00:27:21,500 --> 00:27:24,500

With our blank rounds matched to a sniper's round,

483

00:27:24,500 --> 00:27:27,500

our ability to see the rifle firing is 200 yards.

484

00:27:27,500 --> 00:27:30,500

If you look at that on our graph,

485

00:27:30,500 --> 00:27:34,500

yeah, it's not quite enough time for us to get out of the way.

486

00:27:34,500 --> 00:27:39,500

Remember, based on the bullet travel time coupled with the human reaction time,

487

00:27:39,500 --> 00:27:43,500

400 yards was the minimum distance needed to dodge.

488

00:27:43,500 --> 00:27:48,500

But at just half that distance, you can't even see the muzzle flash.

489

00:27:48,500 --> 00:27:49,500

I don't have it.

490

00:27:49,500 --> 00:27:52,500

Luckily, Adam has a plan.

491

00:27:52,500 --> 00:27:53,500

Not all blanks are created equal.

492

00:27:53,500 --> 00:27:57,500

And on Mythbusters, we always like to find out what is the best possible case scenario.

493

00:27:57,500 --> 00:28:02,500

In Hollywood, for instance, a blank for that rifle includes a lot more fire coming out of the tip

494

00:28:02,500 --> 00:28:04,500

because that's more visual for the movies.

495

00:28:04,500 --> 00:28:06,500

So that's what we're going to do.

496

00:28:06,500 --> 00:28:10,500

We're going to start from this distance with a full Hollywood flaming blank

497

00:28:10,500 --> 00:28:14,500

and see how far we can see that rifle firing with one of these.

498

00:28:14,500 --> 00:28:19,500

In other words, for the time being at least, it's out with reality and in with Hollywood.

499

00:28:19,500 --> 00:28:22,500

And the difference is like night and day.

500

00:28:22,500 --> 00:28:25,500

Okay, Dave, 225, fire at will.

501

00:28:25,500 --> 00:28:27,500

Oh, I saw that.

502

00:28:27,500 --> 00:28:30,500

I totally saw that. Let's go to 400.

503

00:28:30,500 --> 00:28:31,500

Okay.

504

00:28:31,500 --> 00:28:34,500

The Hollywood round is the gift that keeps on giving

505

00:28:34,500 --> 00:28:38,500

because it's visible at 400, 800.

506

00:28:38,500 --> 00:28:39,500

I totally saw that.

507

00:28:39,500 --> 00:28:41,500

I did. I saw it.

508

00:28:41,500 --> 00:28:44,500

And even 1200 yards.

509

00:28:45,500 --> 00:28:46,500

I saw that.

510

00:28:46,500 --> 00:28:48,500

I totally saw it.

511

00:28:48,500 --> 00:28:50,500

And I heard it.

512

00:28:50,500 --> 00:28:52,500

That's plenty of time to get out of the way.

513

00:28:52,500 --> 00:28:53,500

Adam's right.

514

00:28:53,500 --> 00:28:56,500

Dodging the Hollywood round sounds like child's play,

515

00:28:56,500 --> 00:29:00,500

but the real world round is altogether more challenging.

516

00:29:01,500 --> 00:29:03,500

Next on Mythbusters.

517

00:29:03,500 --> 00:29:05,500

This pig doesn't want to claw.

518

00:29:05,500 --> 00:29:09,500

The team preps for a terminal velocity pork belly flop.

519

00:29:09,500 --> 00:29:10,500

I know what to call it.

520

00:29:10,500 --> 00:29:11,500

What?

521

00:29:11,500 --> 00:29:12,500

A pork chopper.

522

00:29:12,500 --> 00:29:13,500

Oh!

523

00:29:17,500 --> 00:29:19,500

So the increased surface area of the belly flop

524

00:29:19,500 --> 00:29:22,500

was looking promising, but we need to go higher and faster.

525

00:29:22,500 --> 00:29:23,500

How high and fast are you thinking?

526

00:29:23,500 --> 00:29:25,500

Ooh, what about terminal velocity?

527

00:29:25,500 --> 00:29:26,500

600 feet from a helicopter.

528

00:29:26,500 --> 00:29:27,500

That'd do it.

529

00:29:27,500 --> 00:29:29,500

But we're going to have to figure out a different way

530

00:29:29,500 --> 00:29:31,500

to measure these falls because busters and pieces

531

00:29:31,500 --> 00:29:33,500

and the meter's maxing out.

532

00:29:33,500 --> 00:29:34,500

What about pigs?

533

00:29:34,500 --> 00:29:36,500

We can compare bone breakage.

534

00:29:36,500 --> 00:29:37,500

Seriously?

535

00:29:40,500 --> 00:29:42,500

So to test whether falling onto water

536

00:29:42,500 --> 00:29:44,500

is the same as falling onto pavement,

537

00:29:44,500 --> 00:29:46,500

we've come to Shadowcliff Regional Park.

538

00:29:46,500 --> 00:29:49,500

Now, so far, in the feet first position,

539

00:29:49,500 --> 00:29:51,500

they're not very similar at all.

540

00:29:51,500 --> 00:29:54,500

But in the belly flop position, they're actually quite similar.

541

00:29:54,500 --> 00:29:57,500

The only problem is that our accelerometer,

542

00:29:57,500 --> 00:30:01,500

our measuring device, has maxed out at only 50 feet.

543

00:30:02,500 --> 00:30:04,500

Oh my god, that's a hard hit.

544

00:30:04,500 --> 00:30:06,500

And that's why we're here.

545

00:30:06,500 --> 00:30:09,500

Because this time, we're going to drop our items

546

00:30:09,500 --> 00:30:11,500

from a much greater height.

547

00:30:11,500 --> 00:30:14,500

So high, in fact, that they get to terminal velocity.

548

00:30:14,500 --> 00:30:16,500

The reason we want terminal velocity

549

00:30:16,500 --> 00:30:19,500

is the objects will never be going faster than that

550

00:30:19,500 --> 00:30:22,500

and therefore never have a greater impact on that.

551

00:30:23,500 --> 00:30:26,500

So to give the myth the best chance of working,

552

00:30:26,500 --> 00:30:29,500

the team will be comparing a 600 feet fall

553

00:30:29,500 --> 00:30:31,500

onto pavement and water.

554

00:30:31,500 --> 00:30:33,500

Come on, let's go! Get to the job!

555

00:30:33,500 --> 00:30:36,500

But how exactly will they compare the two?

556

00:30:36,500 --> 00:30:38,500

All right, so we've maxed out our accelerometers,

557

00:30:38,500 --> 00:30:41,500

but we still need to figure out a way to measure the impact

558

00:30:41,500 --> 00:30:44,500

when falling on pavement and on water.

559

00:30:44,500 --> 00:30:45,500

So we can't use a human,

560

00:30:45,500 --> 00:30:47,500

because obviously that's going to kill somebody.

561

00:30:47,500 --> 00:30:50,500

So we've decided to go with the pig.

562

00:30:50,500 --> 00:30:53,500

To collect comparative data, we're going to X-ray the pigs,

563

00:30:53,500 --> 00:30:56,500

then we're going to have an orthopedic surgeon analyze those X-rays,

564

00:30:56,500 --> 00:30:57,500

see how many bones are broken,

565

00:30:57,500 --> 00:31:00,500

and what kind of damage happened when it hit the pavement.

566

00:31:00,500 --> 00:31:03,500

And we'll find out if water is as hard as pavement

567

00:31:03,500 --> 00:31:05,500

and what I had for lunch.

568

00:31:06,500 --> 00:31:08,500

It's gruesome.

569

00:31:08,500 --> 00:31:11,500

But with no way of measuring the force of the fall electronically,

570

00:31:11,500 --> 00:31:14,500

a comparison of the physical damage incurred

571

00:31:14,500 --> 00:31:19,500

will perfectly illustrate the difference between water and pavement.

572

00:31:21,500 --> 00:31:24,500

Okay, I think he's ready. Let's get the bag.

573

00:31:24,500 --> 00:31:27,500

But the squeamish amongst you can rest assured

574

00:31:27,500 --> 00:31:30,500

the pigs will always be concealed in sealed bags,

575

00:31:30,500 --> 00:31:33,500

even when it comes time to assess the damage,

576

00:31:33,500 --> 00:31:36,500

because that will be done with a portable X-ray.

577

00:31:36,500 --> 00:31:39,500

Well, this X-ray is cool technology. How fast does it work?

578

00:31:39,500 --> 00:31:41,500

Well, for the moment we've pushed the button to the moment

579

00:31:41,500 --> 00:31:43,500

we're seeing the X-rays about five seconds.

580

00:31:43,500 --> 00:31:46,500

So is this the weirdest thing you've ever done with it?

581

00:31:46,500 --> 00:31:48,500

It's like a pig sleeping bag.

582

00:31:48,500 --> 00:31:50,500

I'd have to say it is.

583

00:31:50,500 --> 00:31:52,500

Alright, bag that pig.

584

00:31:52,500 --> 00:31:53,500

Nice.

585

00:31:53,500 --> 00:31:56,500

So we're using this specially designed military grade plastic bag

586

00:31:56,500 --> 00:31:57,500

with welded seams.

587

00:31:57,500 --> 00:31:59,500

It's designed so that when you suck the air out,

588

00:31:59,500 --> 00:32:02,500

it will minimize the possibility of rupturing the bag.

589

00:32:02,500 --> 00:32:05,500

Thus preventing further gruesomeness.

590

00:32:06,500 --> 00:32:08,500

Essential to the validity of the result

591

00:32:08,500 --> 00:32:12,500

is the requirement that both pigs fall at the same speed.

592

00:32:13,500 --> 00:32:16,500

Cute little stabilizing chute.

593

00:32:16,500 --> 00:32:19,500

So now that we have our two identical pigs and two identical bags,

594

00:32:19,500 --> 00:32:21,500

one for pavement and one for water,

595

00:32:21,500 --> 00:32:23,500

it's time to attach the chute.

596

00:32:23,500 --> 00:32:24,500

Now, why do we need a chute?

597

00:32:24,500 --> 00:32:28,500

Well, terminal velocity depends on the orientation of the object falls.

598

00:32:28,500 --> 00:32:31,500

Since we want to keep our pig in belly flop position,

599

00:32:31,500 --> 00:32:34,500

we're attaching this stabilization chute,

600

00:32:34,500 --> 00:32:37,500

which will provide just enough drag to keep it like this

601

00:32:37,500 --> 00:32:39,500

without affecting terminal velocity.

602

00:32:39,500 --> 00:32:41,500

First up, pavement.

603

00:32:41,500 --> 00:32:43,500

Pig does a little flop.

604

00:32:43,500 --> 00:32:46,500

Yeah, I'm pretty sure if you were going to push me out of a helicopter,

605

00:32:46,500 --> 00:32:48,500

I wouldn't cooperate either.

606

00:32:49,500 --> 00:32:51,500

Alright, so the pig is in the helicopter.

607

00:32:51,500 --> 00:32:54,500

Operation pork drop is ready to commence.

608

00:32:54,500 --> 00:32:56,500

Oh, god, I'm not looking forward to this.

609

00:32:56,500 --> 00:32:58,500

Okay, we'll be on the ground. Good luck.

610

00:32:58,500 --> 00:32:59,500

Heads up.

611

00:32:59,500 --> 00:33:01,500

I know what to call it.

612

00:33:01,500 --> 00:33:02,500

What?

613

00:33:02,500 --> 00:33:03,500

A pork chopper.

614

00:33:04,500 --> 00:33:08,500

Operation pork drop is all set to commence.

615

00:33:08,500 --> 00:33:10,500

At the target altitude of 600 feet,

616

00:33:10,500 --> 00:33:13,500

Tori will help our poor sign fall guy

617

00:33:13,500 --> 00:33:17,500

into free fall by kicking him out of the chopper.

618

00:33:18,500 --> 00:33:20,500

You guys ready?

619

00:33:20,500 --> 00:33:22,500

Just so you know, if that bag breaks,

620

00:33:22,500 --> 00:33:24,500

I'm going to vomit all over you.

621

00:33:25,500 --> 00:33:26,500

That sucks.

622

00:33:26,500 --> 00:33:28,500

This is my weekend shirt.

623

00:33:29,500 --> 00:33:33,500

Okay, Tori, we are in position and we are ready.

624

00:33:33,500 --> 00:33:35,500

Alright, here we go.

625

00:33:37,500 --> 00:33:41,500

Coming up on Mythbusters, Jamie is staring down the barrel.

626

00:33:41,500 --> 00:33:43,500

The distance. I'll be shooting at Jamie for a...

627

00:33:43,500 --> 00:33:45,500

I love that sentence.

628

00:33:45,500 --> 00:33:47,500

Is 400 yards.

629

00:33:48,500 --> 00:33:51,500

Now, on one hand, we've got our ideal number.

630

00:33:51,500 --> 00:33:54,500

Based on our human reaction time test and our bullet flight time test,

631

00:33:54,500 --> 00:33:58,500

we know that the minimum theoretical distance you could dodge a bullet from

632

00:33:58,500 --> 00:33:59,500

is 400 yards.

633

00:33:59,500 --> 00:34:00,500

Okay.

634

00:34:00,500 --> 00:34:02,500

On the other hand, we've got our maximum distance

635

00:34:02,500 --> 00:34:05,500

you can actually see the sniper's rifle being fired,

636

00:34:05,500 --> 00:34:07,500

which is only 200 yards away.

637

00:34:07,500 --> 00:34:09,500

Go ahead, our theoretical minimum.

638

00:34:09,500 --> 00:34:11,500

You never see the cue to jump out of the way.

639

00:34:11,500 --> 00:34:13,500

Yeah, it's not looking good for the myth.

640

00:34:13,500 --> 00:34:15,500

But we still have a lot of time to do that.

641

00:34:15,500 --> 00:34:17,500

Yeah, it's not looking good for the myth.

642

00:34:17,500 --> 00:34:18,500

But we still got to try it.

643

00:34:18,500 --> 00:34:22,500

Absolutely. I mean, who knows at 200 yards staring down the barrel of a sniper's rifle.

644

00:34:22,500 --> 00:34:26,500

Perhaps your adrenaline kicks in and you become super fast.

645

00:34:26,500 --> 00:34:27,500

It's worth a shot.

646

00:34:27,500 --> 00:34:30,500

But you do realize we can't actually shoot each other with real bullets.

647

00:34:30,500 --> 00:34:33,500

Aha, I've got a plan for that. Check it out.

648

00:34:33,500 --> 00:34:36,500

Here is our sniper and here is our target.

649

00:34:36,500 --> 00:34:39,500

The sniper fires a blank round and when he pulls his trigger,

650

00:34:39,500 --> 00:34:40,500

he clicks a switch.

651

00:34:40,500 --> 00:34:43,500

That switch sets a timer timing for the precise length of time

652

00:34:43,500 --> 00:34:45,500

that bullet would fly through the air.

653

00:34:45,500 --> 00:34:46,500

Yeah.

654

00:34:46,500 --> 00:34:48,500

At the exact millisecond it's supposed to hit the target,

655

00:34:48,500 --> 00:34:53,500

the timer signals a paintball gun to fire a paintball at you.

656

00:34:53,500 --> 00:34:55,500

It's an ouch, but it's not deadly.

657

00:34:55,500 --> 00:34:59,500

So from 200 yards, the flight time we're looking at is 231 milliseconds.

658

00:34:59,500 --> 00:35:01,500

Exactly.

659

00:35:03,500 --> 00:35:06,500

With death off the menu, the guys run away to the runway,

660

00:35:06,500 --> 00:35:09,500

where Jamie starts setting up with the gun.

661

00:35:10,500 --> 00:35:14,500

And 200 yards down range, Adam gets to work on the target.

662

00:35:14,500 --> 00:35:17,500

There it is. X marks the spot.

663

00:35:17,500 --> 00:35:19,500

Then comes the complicated bit.

664

00:35:19,500 --> 00:35:22,500

Timers, wires,

665

00:35:22,500 --> 00:35:24,500

paintball guns,

666

00:35:24,500 --> 00:35:25,500

and that cool,

667

00:35:25,500 --> 00:35:27,500

and remote triggers.

668

00:35:27,500 --> 00:35:28,500

Beauty.

669

00:35:28,500 --> 00:35:31,500

Now since we can't use real bullets for this test,

670

00:35:31,500 --> 00:35:34,500

but we've gathered the information that tells us the exact bullet flight time

671

00:35:34,500 --> 00:35:37,500

for any distance we choose, perfect.

672

00:35:37,500 --> 00:35:40,500

We are going to imitate the bullet's flight electronically.

673

00:35:40,500 --> 00:35:41,500

Here's how.

674

00:35:42,500 --> 00:35:44,500

When this gun fires a blank,

675

00:35:44,500 --> 00:35:47,500

a wire I've mounted on the trigger is going to close the circuit.

676

00:35:47,500 --> 00:35:49,500

Which starts this timer timing,

677

00:35:49,500 --> 00:35:51,500

it will count down for the precise length of time

678

00:35:51,500 --> 00:35:53,500

the bullet should be flying through the air,

679

00:35:53,500 --> 00:35:55,500

and at the instant it's supposed to hit its target,

680

00:35:55,500 --> 00:35:59,500

it will tell this paintball gun to fire around directly into Jamie's chest.

681

00:35:59,500 --> 00:36:01,500

Now will he be able to get out in time?

682

00:36:01,500 --> 00:36:02,500

I think I might.

683

00:36:02,500 --> 00:36:04,500

No, not yet. That's what we're about to find out.

684

00:36:04,500 --> 00:36:08,500

But first there's the obligatory costume change.

685

00:36:08,500 --> 00:36:11,500

Jamie into something that will clearly show the paintball

686

00:36:11,500 --> 00:36:13,500

and Adam into something of his own choosing.

687

00:36:14,500 --> 00:36:16,500

Where is that guy?

688

00:36:16,500 --> 00:36:17,500

Adam!

689

00:36:17,500 --> 00:36:19,500

Adam!

690

00:36:22,500 --> 00:36:23,500

Here I am.

691

00:36:23,500 --> 00:36:24,500

Are you done screwing around?

692

00:36:24,500 --> 00:36:25,500

Let's get to work.

693

00:36:25,500 --> 00:36:26,500

Okay.

694

00:36:26,500 --> 00:36:28,500

Jamie might be able to dodge a bullet,

695

00:36:28,500 --> 00:36:30,500

but can he dance like this?

696

00:36:30,500 --> 00:36:32,500

In their respective outfits,

697

00:36:32,500 --> 00:36:35,500

the guys assume their positions 200 yards apart.

698

00:36:35,500 --> 00:36:38,500

And remember, 200 yards was the maximum distance

699

00:36:38,500 --> 00:36:41,500

from which the guys could see a genuine muzzle flash.

700

00:36:41,500 --> 00:36:42,500

The question is,

701

00:36:42,500 --> 00:36:45,500

does that leave the caffeine-fueled Heinemann

702

00:36:45,500 --> 00:36:48,500

enough time to dodge out of the way?

703

00:36:48,500 --> 00:36:50,500

All right, Jamie, this one's from 200 yards.

704

00:36:50,500 --> 00:36:51,500

You ready?

705

00:36:51,500 --> 00:36:53,500

Okay, fire will.

706

00:36:53,500 --> 00:36:54,500

All right.

707

00:36:54,500 --> 00:36:56,500

Jamie poised to dodge,

708

00:36:56,500 --> 00:36:58,500

waits for Adam to fire the muzzle flash blank,

709

00:36:58,500 --> 00:37:01,500

that will in turn trigger the paintball gun,

710

00:37:01,500 --> 00:37:04,500

the required 230 milliseconds later.

711

00:37:04,500 --> 00:37:07,500

But when that will be, only Adam knows.

712

00:37:10,500 --> 00:37:11,500

Did I get you?

713

00:37:11,500 --> 00:37:13,500

Got me. Give me a second.

714

00:37:13,500 --> 00:37:16,500

Although Jamie clearly saw the muzzle flash,

715

00:37:16,500 --> 00:37:19,500

he had barely moved before the time was up,

716

00:37:19,500 --> 00:37:22,500

and the paintball was fired into his chest.

717

00:37:22,500 --> 00:37:25,500

Undeterred, Jamie tries a couple more times.

718

00:37:27,500 --> 00:37:28,500

But to no avail.

719

00:37:31,500 --> 00:37:32,500

Damn.

720

00:37:32,500 --> 00:37:35,500

At 200 yards, I could see the flash.

721

00:37:35,500 --> 00:37:38,500

I reacted to it and started moving out of its way,

722

00:37:38,500 --> 00:37:41,500

but I just couldn't do it fast enough.

723

00:37:41,500 --> 00:37:43,500

Given that their quickest human reaction result

724

00:37:43,500 --> 00:37:46,500

was 490 milliseconds,

725

00:37:46,500 --> 00:37:49,500

trying to dodge a 200-yard round

726

00:37:49,500 --> 00:37:51,500

in 230 milliseconds

727

00:37:51,500 --> 00:37:54,500

was always looking like a superhuman feat.

728

00:37:54,500 --> 00:37:55,500

Looked totally busted,

729

00:37:55,500 --> 00:37:57,500

but we've come too far to give up.

730

00:37:57,500 --> 00:38:00,500

We're going to switch to a Hollywood muzzle flash.

731

00:38:00,500 --> 00:38:02,500

I totally saw that.

732

00:38:02,500 --> 00:38:03,500

I did. I saw it.

733

00:38:03,500 --> 00:38:05,500

Push the gun back to 400 yards,

734

00:38:05,500 --> 00:38:08,500

which gives us 500 milliseconds to get out of the way

735

00:38:08,500 --> 00:38:12,500

and see if it's theoretically possible to dodge a bullet.

736

00:38:12,500 --> 00:38:14,500

The distance I'll be shooting at Jamie from,

737

00:38:14,500 --> 00:38:16,500

I love that sentence,

738

00:38:16,500 --> 00:38:18,500

is 400 yards.

739

00:38:18,500 --> 00:38:20,500

This is the minimum amount of time

740

00:38:20,500 --> 00:38:22,500

Jamie and his quick reflexes need

741

00:38:22,500 --> 00:38:24,500

to get out of the way in time.

742

00:38:24,500 --> 00:38:25,500

To give him the best chance,

743

00:38:25,500 --> 00:38:27,500

I'll be using a full-flash Hollywood blank,

744

00:38:27,500 --> 00:38:30,500

which is far brighter than the actual sniper round.

745

00:38:30,500 --> 00:38:32,500

I'm set and ready.

746

00:38:32,500 --> 00:38:33,500

Okay, Fire Will.

747

00:38:33,500 --> 00:38:34,500

Got me ahead.

748

00:38:37,500 --> 00:38:38,500

He got me.

749

00:38:38,500 --> 00:38:40,500

It's not the start Jamie wanted,

750

00:38:40,500 --> 00:38:42,500

but he's not going to give up without a fight.

751

00:38:42,500 --> 00:38:44,500

Okay, Adam, Fire Will.

752

00:38:46,500 --> 00:38:47,500

Up, you got me again.

753

00:38:47,500 --> 00:38:49,500

A very long fight.

754

00:38:49,500 --> 00:38:51,500

With each shot,

755

00:38:51,500 --> 00:38:55,500

Jamie is making progress as he hones his technique.

756

00:38:55,500 --> 00:38:57,500

That was close.

757

00:38:57,500 --> 00:38:59,500

But he never quite hones it enough.

758

00:38:59,500 --> 00:39:01,500

So can Adam do any better?

759

00:39:01,500 --> 00:39:02,500

Do you want to try?

760

00:39:02,500 --> 00:39:04,500

You bet I do.

761

00:39:06,500 --> 00:39:08,500

Adam poised like a panther,

762

00:39:08,500 --> 00:39:10,500

gives Jamie the signal, and then...

763

00:39:14,500 --> 00:39:16,500

...gets shot in the chest.

764

00:39:16,500 --> 00:39:20,500

Again, and again, and again.

765

00:39:20,500 --> 00:39:22,500

Well, that was interesting.

766

00:39:22,500 --> 00:39:23,500

At 400 yards,

767

00:39:23,500 --> 00:39:26,500

we've got 500 milliseconds to react and get out of the way,

768

00:39:26,500 --> 00:39:27,500

which ought to be enough time,

769

00:39:27,500 --> 00:39:30,500

but there's a difference between the shop test

770

00:39:30,500 --> 00:39:31,500

and the real world test.

771

00:39:31,500 --> 00:39:34,500

In the shop, we had this super bright flash right in our face.

772

00:39:34,500 --> 00:39:37,500

In the real world, we've got a tiny dot,

773

00:39:37,500 --> 00:39:38,500

1200 feet away.

774

00:39:38,500 --> 00:39:40,500

It's a lot harder to see.

775

00:39:40,500 --> 00:39:43,500

So now, we're going to move that dot to 500 yards,

776

00:39:43,500 --> 00:39:45,500

give Jamie even more time to react

777

00:39:45,500 --> 00:39:47,500

and see if he can deliver the goods.

778

00:39:47,500 --> 00:39:49,500

It really is now or never.

779

00:39:49,500 --> 00:39:50,500

There we go.

780

00:39:50,500 --> 00:39:53,500

With 500 yards and 600 milliseconds

781

00:39:53,500 --> 00:39:55,500

to react to the Hollywood blank,

782

00:39:55,500 --> 00:39:59,500

it's time to step up or get the hell out of dodge.

783

00:39:59,500 --> 00:40:04,500

It's time to call into play those cat-like Hoosier reflexes.

784

00:40:06,500 --> 00:40:07,500

Fire well.

785

00:40:20,500 --> 00:40:22,500

I dodged it.

786

00:40:24,500 --> 00:40:26,500

At last, at 500 yards,

787

00:40:26,500 --> 00:40:29,500

the Heinemann does his best matrix sway,

788

00:40:29,500 --> 00:40:32,500

and the paintball sails clean past.

789

00:40:32,500 --> 00:40:34,500

But, given the status of the myth,

790

00:40:34,500 --> 00:40:36,500

he's not that impressed.

791

00:40:36,500 --> 00:40:39,500

This test showed that I would have been able to dodge a bullet.

792

00:40:41,500 --> 00:40:42,500

But here's the thing.

793

00:40:42,500 --> 00:40:44,500

We were using Hollywood blanks,

794

00:40:44,500 --> 00:40:46,500

and if we were using real bullets,

795

00:40:46,500 --> 00:40:48,500

I wouldn't have been able to see a thing,

796

00:40:48,500 --> 00:40:50,500

and I would have been dead.

797

00:40:50,500 --> 00:40:51,500

Jamie's right.

798

00:40:51,500 --> 00:40:55,500

You may be able to dodge an unrealistically bright Hollywood round,

799

00:40:55,500 --> 00:40:57,500

but in the real world,

800

00:40:57,500 --> 00:40:59,500

well, there's only one conclusion.

801

00:40:59,500 --> 00:41:01,500

So what's the verdict?

802

00:41:01,500 --> 00:41:03,500

The verdict is it's busted.

803

00:41:03,500 --> 00:41:05,500

There is no way you can dodge a sniper's bullet.

804

00:41:05,500 --> 00:41:07,500

Everything about all their equipment,

805

00:41:07,500 --> 00:41:10,500

including their bullets, is designed for concealment.

806

00:41:10,500 --> 00:41:12,500

There's just no way you could see one fire

807

00:41:12,500 --> 00:41:15,500

from far enough away to give you a remote chance

808

00:41:15,500 --> 00:41:16,500

of dodging that thing.

809

00:41:16,500 --> 00:41:17,500

It's busted.

810

00:41:17,500 --> 00:41:19,500

I agree. It's busted.

811

00:41:19,500 --> 00:41:20,500

Let's go.

812

00:41:20,500 --> 00:41:23,500

So you mind pointing that thing the other way?

813

00:41:26,500 --> 00:41:27,500

Next.

814

00:41:28,500 --> 00:41:32,500

Hicks fly, pork drops, and belly flops.

815

00:41:32,500 --> 00:41:35,500

Is water really as hard as pavement?

816

00:41:40,500 --> 00:41:43,500

To find out if water is as hard as pavement,

817

00:41:43,500 --> 00:41:45,500

Carrie Grant and Tori have commenced

818

00:41:45,500 --> 00:41:47,500

Operation Pork Drop.

819

00:41:48,500 --> 00:41:50,500

Okay, so here's the plan.

820

00:41:50,500 --> 00:41:52,500

We've already done drops at 25 and 50 feet.

821

00:41:52,500 --> 00:41:54,500

In the feet first position,

822

00:41:54,500 --> 00:41:56,500

the G-Load was very far apart,

823

00:41:56,500 --> 00:41:59,500

but in the belly flop position, they're much closer.

824

00:41:59,500 --> 00:42:01,500

But just to cover all of our bases,

825

00:42:01,500 --> 00:42:03,500

we're going to go up to 600 feet,

826

00:42:03,500 --> 00:42:06,500

which will ensure that our pig reaches terminal velocity.

827

00:42:06,500 --> 00:42:08,500

So he's going to get in the helicopter,

828

00:42:08,500 --> 00:42:09,500

and he gets to 600 feet,

829

00:42:09,500 --> 00:42:12,500

he's going to kick the pig out of the door,

830

00:42:12,500 --> 00:42:15,500

and then we scoop it up and count the broken bones.

831

00:42:15,500 --> 00:42:19,500

Okay, so we're at our target altitude of 600 feet.

832

00:42:19,500 --> 00:42:22,500

We're hovering directly above the landing zone.

833

00:42:22,500 --> 00:42:23,500

Are you guys ready?

834

00:42:23,500 --> 00:42:25,500

Okay, we're ready.

835

00:42:25,500 --> 00:42:26,500

Okay, here we go.

836

00:42:26,500 --> 00:42:32,500

Operation Pork Drop onto pavement in three, two, one.

837

00:42:38,500 --> 00:42:39,500

Pig is flying.

838

00:42:39,500 --> 00:42:40,500

He's flying.

839

00:42:40,500 --> 00:42:41,500

He's falling.

840

00:42:47,500 --> 00:42:50,500

Despite a terminal velocity of 120 miles per hour

841

00:42:50,500 --> 00:42:54,500

and an incredible estimated G-Load of 5,000 plus,

842

00:42:54,500 --> 00:42:56,500

the bag remained intact,

843

00:42:56,500 --> 00:42:59,500

and Operation Pork Drop was a success.

844

00:42:59,500 --> 00:43:02,500

Now dropping a pig out of a helicopter seems pretty straightforward.

845

00:43:02,500 --> 00:43:05,500

That is, unless you have an uncooperative pig.

846

00:43:05,500 --> 00:43:07,500

But once I got him out of the helicopter,

847

00:43:07,500 --> 00:43:09,500

the drag shoot opened up,

848

00:43:09,500 --> 00:43:11,500

he got into the belly flop position,

849

00:43:11,500 --> 00:43:14,500

and most importantly, he was traveling at terminal velocity.

850

00:43:14,500 --> 00:43:16,500

And the best part is, we hit the pavement.

851

00:43:18,500 --> 00:43:19,500

This was a perfect test.

852

00:43:20,500 --> 00:43:22,500

Dude, that was crazy.

853

00:43:22,500 --> 00:43:25,500

Did you hear that splat?

854

00:43:25,500 --> 00:43:27,500

Yeah, and we got a belly flop.

855

00:43:32,500 --> 00:43:36,500

And now to get the thankfully sealed contents of the bag.

856

00:43:36,500 --> 00:43:37,500

That looked like it hurt.

857

00:43:37,500 --> 00:43:39,500

Over to the X-ray station.

858

00:43:39,500 --> 00:43:42,500

We need to get this pig into the X-ray stack.

859

00:43:42,500 --> 00:43:44,500

Where the technicians take the shots they need.

860

00:43:44,500 --> 00:43:47,500

But before we assess and compare the injuries,

861

00:43:47,500 --> 00:43:50,500

it's go for the H2O.

862

00:43:50,500 --> 00:43:52,500

Get in there pig.

863

00:43:52,500 --> 00:43:55,500

Okay, for this water test, we're going to use a pig of the same weight.

864

00:43:55,500 --> 00:43:57,500

We're going to go to the same height with the helicopter

865

00:43:57,500 --> 00:44:00,500

and drop it to get the same terminal velocity.

866

00:44:00,500 --> 00:44:03,500

God, it's never easy loading a pig into a helicopter.

867

00:44:04,500 --> 00:44:07,500

We're going to smack down on the water in a belly flop position

868

00:44:07,500 --> 00:44:09,500

and find out if water is as hard as pavement.

869

00:44:10,500 --> 00:44:13,500

It's operation port drop phase two.

870

00:44:13,500 --> 00:44:15,500

A port collapse now.

871

00:44:16,500 --> 00:44:17,500

So, we are set.

872

00:44:17,500 --> 00:44:19,500

We have our pig in the helicopter.

873

00:44:19,500 --> 00:44:23,500

We're going to take it up to 600 feet, push it out of the helicopter onto water.

874

00:44:23,500 --> 00:44:26,500

Now so far, we have not seen water behave like pavement,

875

00:44:26,500 --> 00:44:29,500

but we have never dropped anything from this height.

876

00:44:29,500 --> 00:44:31,500

We might see a similarity here,

877

00:44:31,500 --> 00:44:34,500

but we won't know for sure until we pull the pig out of the water,

878

00:44:34,500 --> 00:44:37,500

do an x-ray and compare the two pigs.

879

00:44:37,500 --> 00:44:39,500

We're all set, you guys. Ready?

880

00:44:39,500 --> 00:44:41,500

Okay, Tori, we are good to go.

881

00:44:41,500 --> 00:44:45,500

Port drop number two onto water at terminal velocity.

882

00:44:45,500 --> 00:44:47,500

On the ground.

883

00:44:50,500 --> 00:44:51,500

Ready guys?

884

00:44:51,500 --> 00:44:54,500

Okay, stabilizing, she's flying, she's flying.

885

00:44:54,500 --> 00:44:56,500

Looking good, looking good.

886

00:44:56,500 --> 00:44:58,500

Belly flop, belly flop.

887

00:45:01,500 --> 00:45:05,500

Splash down and once again the stabilizing shoot worked,

888

00:45:05,500 --> 00:45:08,500

serving up the perfect pork belly flop.

889

00:45:08,500 --> 00:45:10,500

So, it didn't sink.

890

00:45:10,500 --> 00:45:14,500

Now to bring home the bacon and put this myth to bed.

891

00:45:14,500 --> 00:45:16,500

We thought the pig was going to sink,

892

00:45:16,500 --> 00:45:19,500

so we got a special rescue crew to go out and dive to get him.

893

00:45:20,500 --> 00:45:22,500

How's the passenger?

894

00:45:22,500 --> 00:45:24,500

But he's actually floating on the water.

895

00:45:24,500 --> 00:45:26,500

Personally, I don't think they're going to bring in a pig

896

00:45:26,500 --> 00:45:29,500

that's quite as damaged as that pavement drop.

897

00:45:29,500 --> 00:45:32,500

So, it looked like a really hard hit.

898

00:45:32,500 --> 00:45:35,500

But there's only one way to tell for sure,

899

00:45:35,500 --> 00:45:38,500

and that's a professional medical assessment of the x-rays

900

00:45:38,500 --> 00:45:41,500

with orthopedic surgeon Dr. Halbrek.

901

00:45:43,500 --> 00:45:44,500

So, did he make it?

902

00:45:44,500 --> 00:45:47,500

How did our pig do on pavement?

903

00:45:47,500 --> 00:45:50,500

Well, the pig on the pavement did really disastrously.

904

00:45:50,500 --> 00:45:52,500

17 fractures.

905

00:45:52,500 --> 00:45:53,500

Wow.

906

00:45:53,500 --> 00:45:57,500

Here's a femur fracture, fracture dislocation of the spine,

907

00:45:57,500 --> 00:46:00,500

and to top it all off, a decapitation.

908

00:46:00,500 --> 00:46:01,500

Oh!

909

00:46:01,500 --> 00:46:03,500

You got a dislocated head.

910

00:46:03,500 --> 00:46:05,500

So, when we dropped the pig on the concrete,

911

00:46:05,500 --> 00:46:10,500

it made us sound like a giant popping balloon.

912

00:46:10,500 --> 00:46:13,500

Now, we didn't open the bag, but we did x-ray it.

913

00:46:13,500 --> 00:46:16,500

What we found inside were many, many broken bones,

914

00:46:16,500 --> 00:46:20,500

and a pelvis that was so shattered, it was unrecognizable,

915

00:46:20,500 --> 00:46:23,500

not to mention decapitation.

916

00:46:23,500 --> 00:46:26,500

It's an unsurprising litany of lethal injuries.

917

00:46:26,500 --> 00:46:29,500

17 clear and catastrophic fractures.

918

00:46:29,500 --> 00:46:32,500

But the key to this myth is the comparison.

919

00:46:32,500 --> 00:46:36,500

All right, so how did it compare to the water drop?

920

00:46:36,500 --> 00:46:38,500

The water drop pig did much better,

921

00:46:38,500 --> 00:46:41,500

although still seven fractures compared to 17.

922

00:46:41,500 --> 00:46:45,500

Six rib fractures, and also a neck fracture,

923

00:46:45,500 --> 00:46:48,500

but not as bad as the decapitation.

924

00:46:48,500 --> 00:46:50,500

It couldn't be clearer.

925

00:46:50,500 --> 00:46:53,500

Two pigs of identical weight falling at the same speed,

926

00:46:53,500 --> 00:46:55,500

landing in the same orientation,

927

00:46:55,500 --> 00:46:58,500

have significantly varied injury diagnoses.

928

00:46:58,500 --> 00:47:01,500

Both the quantity and quality of the bone breaks

929

00:47:01,500 --> 00:47:04,500

means there can only be one result.

930

00:47:04,500 --> 00:47:07,500

But that's not the only reason Carrie's so happy.

931

00:47:07,500 --> 00:47:10,500

Now, having the clear cut results,

932

00:47:10,500 --> 00:47:13,500

that the pig landing on the pavement, bam,

933

00:47:13,500 --> 00:47:17,500

was actually a lot harder than falling on water, was great.

934

00:47:17,500 --> 00:47:20,500

But it was even better, those bags didn't bust open,

935

00:47:20,500 --> 00:47:22,500

and I didn't throw up.

936

00:47:22,500 --> 00:47:24,500

So it turns out pigs don't fly,

937

00:47:24,500 --> 00:47:27,500

but they do fall, and they land hard.

938

00:47:27,500 --> 00:47:30,500

However, as far as the myth is concerned,

939

00:47:30,500 --> 00:47:32,500

if you hit it in the water at any height,

940

00:47:32,500 --> 00:47:34,500

it's not going to be as hard as if you're hitting pavement.

941

00:47:34,500 --> 00:47:36,500

So this myth is busted.

942

00:47:36,500 --> 00:47:37,500

It's busted.

943

00:47:37,500 --> 00:47:39,500

I think we're going to have to call this a bust.

944

00:47:39,500 --> 00:47:42,500

How come we don't have a helicopter to fly home after every myth?