

1

00:00:00,000 --> 00:00:03,280

It may not look like it, but we're professionals.

2

00:00:03,280 --> 00:00:05,000

Do us a favor.

3

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

Don't try this at home!

4

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

Whoa!

5

00:00:07,000 --> 00:00:11,000

On this episode of Mythbusters...

6

00:00:11,000 --> 00:00:15,000

Only in Mythbusters is someone transferred on a stretcher to be dropped off a building.

7

00:00:15,000 --> 00:00:19,000

Adam and Jamie jump on the myth of an inner spring flame.

8

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

That was just as much fun as it seemed like.

9

00:00:21,000 --> 00:00:25,000

If a three-story drop into shallow water is lethal...

10

00:00:26,000 --> 00:00:30,000

Could you cushion the same fall with a mattress?

11

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

I feel like I just got spanked.

12

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

And live to leap another day.

13

00:00:35,000 --> 00:00:36,000

I'm screwed.

14

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

Meanwhile, Carrie, Tori and Grant...

15

00:00:38,000 --> 00:00:39,000

I'm from battle.

16

00:00:39,000 --> 00:00:41,000

...put their boulders to the grindstone.

17

00:00:41,000 --> 00:00:44,000

I like to call this a piece, but on the brick.

18

00:00:44,000 --> 00:00:47,000

Rock in the myth that 15th century canineers...

19

00:00:47,000 --> 00:00:49,000

I love that echo in the canyon.

20

00:00:49,000 --> 00:00:51,000

...fired stone cannonballs.

21

00:00:51,000 --> 00:00:52,000

What?

22

00:00:52,000 --> 00:00:55,000

Would they really do as much damage as metal?

23

00:00:55,000 --> 00:00:58,000

And leave nothing for the enemy to fire back?

24

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

That is the most disturbing castle I've ever seen.

25

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

Who are the Mythbusters?

26

00:01:06,000 --> 00:01:07,000

Adam Savage.

27

00:01:07,000 --> 00:01:09,000

It's so different!

28

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

And Jamie Heineman.

29

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

Well, there's your problem.

30

00:01:12,000 --> 00:01:17,000

Between them more than 30 years of special effects experience...

31

00:01:17,000 --> 00:01:19,000

Together with Tori Belleggi.

32

00:01:19,000 --> 00:01:20,000

That was insane.

33

00:01:20,000 --> 00:01:21,000

Carrie Byron.

34

00:01:21,000 --> 00:01:22,000

We can confirm.

35

00:01:22,000 --> 00:01:23,000

And Grant Imahara.

36

00:01:23,000 --> 00:01:26,000

The Ecapitation Hazard, everybody.

37

00:01:26,000 --> 00:01:29,000

They don't just tell the myths.

38

00:01:29,000 --> 00:01:31,000

They put them to the test.

39

00:01:38,000 --> 00:01:41,000

Okay, so we're starting off with something a bit different.

40

00:01:41,000 --> 00:01:42,000

That's right.

41

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

We're starting off with an apology.

42

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

Because it was during the filming of this episode...

43

00:01:46,000 --> 00:01:49,000

that a cannonball accidentally went through someone's house.

44

00:01:49,000 --> 00:01:50,000

Yeah.

45

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

And we take safety very seriously on our show.

46

00:01:52,000 --> 00:01:55,000

And despite a whole array of safety precautions at the bomb range...

47

00:01:55,000 --> 00:01:57,000

we had a major mishap.

48

00:01:57,000 --> 00:02:00,000

A mishap where we're tremendously relieved that no one got hurt.

49

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

But we're also tremendously sorry that it happened at all.

50

00:02:03,000 --> 00:02:05,000

And with that, let's start our show.

51

00:02:06,000 --> 00:02:10,000

Okay, so first up, a myth that's all about soft landings.

52

00:02:12,000 --> 00:02:13,000

Playing with dolls again, are we?

53

00:02:13,000 --> 00:02:14,000

No, no, no.

54

00:02:14,000 --> 00:02:15,000

I'm setting up a scenario.

55

00:02:15,000 --> 00:02:16,000

For what?

56

00:02:16,000 --> 00:02:17,000

Alright, let me walk you through it.

57

00:02:17,000 --> 00:02:19,000

Picture yourself in a hotel room...

58

00:02:19,000 --> 00:02:22,000

and you're in mortal danger because there's some guys banging on the door...

59

00:02:22,000 --> 00:02:23,000

who want to shoot you.

60

00:02:23,000 --> 00:02:25,000

Now, you can't obviously leave through the normal means like the door.

61

00:02:25,000 --> 00:02:28,000

You've got to leave by jumping off your balcony.

62

00:02:28,000 --> 00:02:31,000

Unfortunately, your balcony, it's 35 feet above the ground.

63

00:02:31,000 --> 00:02:34,000

Fortunately, however, there's a swimming pool below you.

64

00:02:34,000 --> 00:02:37,000

Unfortunately, that swimming pool is only 4.5 feet deep.

65

00:02:37,000 --> 00:02:38,000

That could get ugly.

66

00:02:38,000 --> 00:02:39,000

Very ugly.

67

00:02:39,000 --> 00:02:41,000

This comes from the show Burn Notice.

68

00:02:41,000 --> 00:02:43,000

And what our hero is explaining to the audience...

69

00:02:43,000 --> 00:02:46,000

is he throws a mattress out the window and into the pool...

70

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

and then he jumps into the mattress to safety.

71

00:02:48,000 --> 00:02:51,000

So the myth is that if you need to jump into a shallow pool from a height...

72

00:02:51,000 --> 00:02:53,000

you should throw a mattress down there first.

73

00:02:53,000 --> 00:02:55,000

I couldn't have said it better myself.

74

00:02:55,000 --> 00:02:57,000

According to this Burn Notice myth...

75

00:02:57,000 --> 00:02:59,000

there's no way you could leap and live...

76

00:02:59,000 --> 00:03:03,000

after a 35 foot drop into shallow water.

77

00:03:03,000 --> 00:03:05,000

However, breaking your fall with a mattress...

78

00:03:05,000 --> 00:03:08,000

could supposedly save your body.

79

00:03:08,000 --> 00:03:12,000

So would a crash landing really leave you with more of a spring in your step...

80

00:03:12,000 --> 00:03:13,000

than a splash landing?

81

00:03:13,000 --> 00:03:15,000

So, how do you want to test this?

82

00:03:15,000 --> 00:03:18,000

Well, clearly the main thing here is to test what it's like to jump onto a mattress...

83

00:03:18,000 --> 00:03:21,000

in a pool, but we need to compare that to what it would be like...

84

00:03:21,000 --> 00:03:23,000

just jumping into the pool as well.

85

00:03:23,000 --> 00:03:24,000

Yeah, indeed.

86

00:03:24,000 --> 00:03:27,000

And we're going to need a pool that's exactly 4.5 feet deep.

87

00:03:27,000 --> 00:03:29,000

Well, let's get a crane and some dummies...

88

00:03:29,000 --> 00:03:32,000

and attach some sensors to them and drop them off, see what happens.

89

00:03:32,000 --> 00:03:33,000

That's perfect. Let's do it.

90

00:03:33,000 --> 00:03:38,000

So it's straight to the shallow end at Defremery Pool in Oakland.

91

00:03:38,000 --> 00:03:39,000

That's a nice pool.

92

00:03:39,000 --> 00:03:40,000

It ought to work.

93

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

Let's see if we can get Buster hurt.

94

00:03:42,000 --> 00:03:43,000

Okay.

95

00:03:43,000 --> 00:03:46,000

Where they'll hoist Buster up for this three-story story.

96

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

Turns out one of the most difficult parts of this shoot...

97

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

is just getting the grate all into the pool area.

98

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

It's a bit of a tight squeeze.

99

00:03:52,000 --> 00:03:55,000

This whole story comes down to if you have 35 feet to jump...

100

00:03:55,000 --> 00:03:58,000

and you've got a pool below you that's only 4.5 feet deep...

101

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

is it better to jump into the regular pool...

102

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

or onto a mattress floating in that pool?

103

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

With all the drops that Buster's going to do...

104

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

we're going to want to make sure we know how hard he's dropping...

105

00:04:06,000 --> 00:04:07,000

and that's where this comes into play.

106

00:04:07,000 --> 00:04:11,000

This is an accelerometer, and just like a crash test dummy...

107

00:04:11,000 --> 00:04:13,000

I'm going to install this in Buster's chest...

108

00:04:13,000 --> 00:04:17,000

to let us know how many G's he pulls on each of the surfaces we're dropping on.

109

00:04:17,000 --> 00:04:20,000

With an accelerometer heart to track his impact...

110

00:04:20,000 --> 00:04:21,000

Let's close him up.

111

00:04:21,000 --> 00:04:24,000

The PVC man is ready for the drop.

112

00:04:27,000 --> 00:04:29,000

Only in MythBusters is someone transferred on a stretcher...

113

00:04:29,000 --> 00:04:30,000

to be dropped off a building.

114

00:04:30,000 --> 00:04:34,000

However, first he needs to adopt the burn notice position.

115

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

Now in the show, our character states...

116

00:04:36,000 --> 00:04:39,000

that properly distributing your weight, i.e. landing butt first...

117

00:04:39,000 --> 00:04:41,000

onto a mattress on the water...

118

00:04:41,000 --> 00:04:43,000

is the safest way to jump into the pool.

119

00:04:43,000 --> 00:04:45,000

So Buster will jump butt first.

120

00:04:45,000 --> 00:04:49,000

But first up, Buster will take the plunge without a mattress.

121

00:04:49,000 --> 00:04:52,000

So what kind of damage will that drop do?

122

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

Here we go Buster.

123

00:04:54,000 --> 00:04:55,000

Time to jump into the pool.

124

00:04:55,000 --> 00:05:00,000

Okay, dropping Buster into the water from 35 feet.

125

00:05:00,000 --> 00:05:03,000

In 3, 2, 1, go!

126

00:05:10,000 --> 00:05:15,000

That was just as much fun as it seemed like.

127

00:05:15,000 --> 00:05:19,000

Buster took the fall and his backside took a walk...

128

00:05:19,000 --> 00:05:22,000

from both the water and the bottom of the pool.

129

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

But what does the data say?

130

00:05:24,000 --> 00:05:28,000

So we dropped our dummy 35 feet straight into the water...

131

00:05:28,000 --> 00:05:31,000

and we saw an initial impact of 50 G's...

132

00:05:31,000 --> 00:05:36,000

followed by an impact along the bottom of the pool of 29 G's.

133

00:05:36,000 --> 00:05:39,000

Now 50 G's is our threshold for potential death.

134

00:05:39,000 --> 00:05:43,000

One way or another, you're not walking away from an impact like that.

135

00:05:43,000 --> 00:05:46,000

Yep, there's no walking away from that.

136

00:05:46,000 --> 00:05:48,000

But how will it compare with the myth?

137

00:05:48,000 --> 00:05:50,000

Can the average mattress...

138

00:05:50,000 --> 00:05:54,000

For our mattress test we've chosen a standard inner spring mattress.

139

00:05:54,000 --> 00:05:55,000

That's this one right here.

140

00:05:55,000 --> 00:05:58,000

Really make a fatal flop survivable.

141

00:05:58,000 --> 00:06:00,000

Perfect.

142

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

Okay, 3, 2, 1, go!

143

00:06:07,000 --> 00:06:09,000

Nice!

144

00:06:09,000 --> 00:06:11,000

X marks the spot.

145

00:06:12,000 --> 00:06:15,000

Buster hit with an audible impact.

146

00:06:15,000 --> 00:06:18,000

But did the mattress cushion his tush?

147

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

Buster's drop was perfect.

148

00:06:21,000 --> 00:06:24,000

And although he might not look like it, according to our accelerometer data...

149

00:06:24,000 --> 00:06:26,000

he is a freaking mess.

150

00:06:26,000 --> 00:06:28,000

He pulled 86 G's hitting that mattress...

151

00:06:28,000 --> 00:06:32,000

roughly equivalent to a severe car accident.

152

00:06:32,000 --> 00:06:35,000

And that was supposed to be the safe jump.

153

00:06:35,000 --> 00:06:37,000

It's not looking very good for this story.

154

00:06:37,000 --> 00:06:39,000

It's not looking good.

155

00:06:39,000 --> 00:06:42,000

Because that's a more damaging impact than on to water alone.

156

00:06:42,000 --> 00:06:44,000

However...

157

00:06:44,000 --> 00:06:46,000

Well, I love our accelerometer data from all these drops...

158

00:06:46,000 --> 00:06:49,000

but I can't help feeling that they're not giving us the full picture.

159

00:06:49,000 --> 00:06:53,000

I'd love in some way to be able to see what kind of injuries Buster might take...

160

00:06:53,000 --> 00:06:55,000

from that kind of fall.

161

00:06:55,000 --> 00:06:57,000

I know what you mean.

162

00:06:57,000 --> 00:06:59,000

And I might have just the thing.

163

00:07:05,000 --> 00:07:08,000

Next up, a myth on the rocks.

164

00:07:10,000 --> 00:07:13,000

Okay, so our next myth is a great one that comes from the 15th century.

165

00:07:13,000 --> 00:07:14,000

Awesome. What's the story?

166

00:07:14,000 --> 00:07:16,000

Well, it's about cannons.

167

00:07:16,000 --> 00:07:18,000

Or more specifically about the cannonballs.

168

00:07:18,000 --> 00:07:21,000

So the European canineers of the time were reluctant to fire their cannons...

169

00:07:21,000 --> 00:07:23,000

on the battlefield for two reasons.

170

00:07:23,000 --> 00:07:26,000

Well, I guess one reason would be so they couldn't retrieve the cannonballs...

171

00:07:26,000 --> 00:07:27,000

and fire them back.

172

00:07:27,000 --> 00:07:29,000

So I guess the other reason could be that...

173

00:07:29,000 --> 00:07:31,000

you know, cast iron was a pretty valuable commodity back then.

174

00:07:31,000 --> 00:07:34,000

So you could melt down the cannonballs and make your own cannons.

175

00:07:34,000 --> 00:07:35,000

Exactly.

176

00:07:35,000 --> 00:07:39,000

So the myth is that instead of firing their cast iron cannonballs...

177

00:07:39,000 --> 00:07:41,000

they made their own cannonballs out of stone...

178

00:07:41,000 --> 00:07:44,000

and fired them to have equivalent damage to the cast iron...

179

00:07:44,000 --> 00:07:48,000

yet exploded impacts where they couldn't be sent back or melted down.

180

00:07:48,000 --> 00:07:49,000

Interesting.

181

00:07:49,000 --> 00:07:50,000

That is brilliant.

182

00:07:50,000 --> 00:07:53,000

On the battlefields of 15th century Europe...

183

00:07:53,000 --> 00:07:57,000

some canineers didn't want to give the enemy any ammunition.

184

00:07:57,000 --> 00:08:01,000

So supposedly they fashioned their cannon fodder out of rock...

185

00:08:01,000 --> 00:08:05,000

but would a stone cannonball really do as much damage as metal...

186

00:08:05,000 --> 00:08:07,000

and explode on impact?

187

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

Okay, so ultimately we're going to have to build a castle of some kind...

188

00:08:11,000 --> 00:08:14,000

and compare the damage done by cast iron and stone cannonballs.

189

00:08:14,000 --> 00:08:16,000

Which means we're going to have to make some stone cannonballs...

190

00:08:16,000 --> 00:08:18,000

but also we're going to have to get a hold of a cannon.

191

00:08:18,000 --> 00:08:21,000

Well, we do know somebody who has the perfect antique cannon.

192

00:08:21,000 --> 00:08:24,000

We can just call up Harry Webb and see if he'll let us use old Moses.

193

00:08:24,000 --> 00:08:27,000

Yeah, but you know, something tells me he's not going to be too happy about us...

194

00:08:27,000 --> 00:08:29,000

firing stone cannonballs through old Moses.

195

00:08:29,000 --> 00:08:30,000

What if we break it?

196

00:08:30,000 --> 00:08:34,000

Well, we could use the small cannon that I built for the ball and chain prison escape.

197

00:08:34,000 --> 00:08:38,000

Good idea, but you know, we've never actually fired that at genuine battle speed...

198

00:08:38,000 --> 00:08:42,000

so maybe we use old Moses to get the true firing speed of a cannonball...

199

00:08:42,000 --> 00:08:45,000

then we calibrate your cannon to match that and go from there.

200

00:08:45,000 --> 00:08:46,000

Great.

201

00:08:46,000 --> 00:08:49,000

Yep, before anyone casts the first stone...

202

00:08:49,000 --> 00:08:51,000

the mythbusters head to the bomb range.

203

00:08:53,000 --> 00:08:55,000

We've safely fired our cannon several times on the show.

204

00:08:55,000 --> 00:08:57,000

We used it for the ball and chain myth.

205

00:08:58,000 --> 00:09:01,000

We've actually fired cheese from it.

206

00:09:02,000 --> 00:09:06,000

But we've never actually had to fire anything at what you call battle speeds...

207

00:09:06,000 --> 00:09:08,000

so that's what we need to find out first.

208

00:09:08,000 --> 00:09:11,000

How fast does a steel cannonball travel from a real cannon...

209

00:09:11,000 --> 00:09:15,000

and once we know that, we can calibrate this cannon to match its speed.

210

00:09:15,000 --> 00:09:18,000

But before any cannon calibration...

211

00:09:18,000 --> 00:09:21,000

they're pulling out all the stops to create a rock solid barricade...

212

00:09:21,000 --> 00:09:24,000

to stop the cannonball in its tracks.

213

00:09:24,000 --> 00:09:26,000

That looks about perfect.

214

00:09:26,000 --> 00:09:30,000

Meanwhile, old Moses moses up to the bomb range.

215

00:09:31,000 --> 00:09:32,000

Wow.

216

00:09:32,000 --> 00:09:35,000

Old Moses and the mythbusters go way back.

217

00:09:37,000 --> 00:09:41,000

In fact, you might say it's the cannon of choice when it comes to mythbusting.

218

00:09:44,000 --> 00:09:46,000

We're gonna fire a cannonball out of old Moses.

219

00:09:46,000 --> 00:09:48,000

We're gonna catch it on high speed.

220

00:09:48,000 --> 00:09:51,000

We're gonna use the scale to see how fast that cannonball is going...

221

00:09:51,000 --> 00:09:54,000

and then we're gonna match our cannonball to that same speed.

222

00:09:54,000 --> 00:09:57,000

Now since these cannonballs are so important, we have to find it.

223

00:09:57,000 --> 00:09:59,000

So we have a cannonball catcher.

224

00:09:59,000 --> 00:10:02,000

We have three garbage cans filled with water in front of a concrete wall...

225

00:10:02,000 --> 00:10:03,000

covered in bed liner.

226

00:10:03,000 --> 00:10:06,000

That should slow the cannonball down and we'll be able to retrieve it.

227

00:10:06,000 --> 00:10:11,000

Behind the wall, there's also a second line of barrels for optimum cannonball catching.

228

00:10:11,000 --> 00:10:15,000

And behind that, the ultimate safety stop at Dirt Nilside.

229

00:10:15,000 --> 00:10:18,000

One pound of black powder.

230

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

So now it's over to carry to prep the powder.

231

00:10:20,000 --> 00:10:23,000

Foil container to prevent sparks.

232

00:10:24,000 --> 00:10:26,000

One powerful burrito.

233

00:10:26,000 --> 00:10:27,000

Vented.

234

00:10:27,000 --> 00:10:28,000

Vented.

235

00:10:28,000 --> 00:10:32,000

One pound of black powder is the battle standard for a cannon like old Moses.

236

00:10:32,000 --> 00:10:38,000

And safely behind the blastproof shields, it's the countdown to cannonball calibration.

237

00:10:38,000 --> 00:10:42,000

Okay, this is old Moses in three, two, one.

238

00:10:46,000 --> 00:10:47,000

That was energetic.

239

00:10:48,000 --> 00:10:49,000

Oh my God.

240

00:10:49,000 --> 00:10:51,000

Isn't that beautiful a ray of water?

241

00:10:52,000 --> 00:10:55,000

The red bloom of water looked striking.

242

00:10:57,000 --> 00:11:00,000

And the ball catchers caught the cannonball.

243

00:11:02,000 --> 00:11:05,000

So we've got one, two, three barrels.

244

00:11:05,000 --> 00:11:07,000

Hey, here's the ball. Wow.

245

00:11:07,000 --> 00:11:10,000

Alright, let's see how fast it was going.

246

00:11:10,000 --> 00:11:13,000

There's the shot and there's the ball.

247

00:11:13,000 --> 00:11:14,000

With some us velocity.

248

00:11:14,000 --> 00:11:16,000

1200 feet per second.

249

00:11:16,000 --> 00:11:17,000

Nice.

250

00:11:17,000 --> 00:11:19,000

So that's the speed to match.

251

00:11:19,000 --> 00:11:23,000

And it's out with old Moses and in with a Mythbusters miniature cannon.

252

00:11:26,000 --> 00:11:27,000

Coming up.

253

00:11:29,000 --> 00:11:31,000

Busters cousin drops in.

254

00:11:32,000 --> 00:11:33,000

Perfect hit.

255

00:11:33,000 --> 00:11:34,000

And later.

256

00:11:34,000 --> 00:11:37,000

How many tools does it take to make a stone cannonball?

257

00:11:37,000 --> 00:11:38,000

We're going to find out.

258

00:11:38,000 --> 00:11:39,000

Yeah.

259

00:12:08,000 --> 00:12:10,000

We're going to dummy up something more life like.

260

00:12:10,000 --> 00:12:15,000

Remember that I said I had something that was a little better than the dummies we'd been using?

261

00:12:15,000 --> 00:12:16,000

We do.

262

00:12:16,000 --> 00:12:17,000

Hey Adam, check this out.

263

00:12:23,000 --> 00:12:27,000

Yep, you may remember this disturbing face from the Halloween special.

264

00:12:27,000 --> 00:12:29,000

Are you ready for the horror?

265

00:12:31,000 --> 00:12:35,000

But its role as John Doe hid the Sindabber's real purpose.

266

00:12:35,000 --> 00:12:36,000

To the window.

267

00:12:37,000 --> 00:12:41,000

As an ultra realistic human analog.

268

00:12:41,000 --> 00:12:44,000

These are surgical training dummies.

269

00:12:44,000 --> 00:12:48,000

They're made muscle by muscle and they're actually sutured in place.

270

00:12:48,000 --> 00:12:50,000

Oh my God.

271

00:12:50,000 --> 00:12:54,000

I dare say that it's absolutely beautiful.

272

00:12:54,000 --> 00:12:56,000

This is medically accurate.

273

00:12:56,000 --> 00:12:57,000

It is.

274

00:12:57,000 --> 00:12:58,000

It's made of a polymer.

275

00:12:58,000 --> 00:13:03,000

It's water based and everything is as realistic as modern technology can make it.

276

00:13:03,000 --> 00:13:06,000

And its anatomy isn't the only thing that's realistic.

277

00:13:06,000 --> 00:13:11,000

I wish you were here because it's beautiful and it smells kind of bad, which you'd expect.

278

00:13:11,000 --> 00:13:16,000

But before the Sindabber can take the plunge, Jamie needs to give it a skin.

279

00:13:16,000 --> 00:13:20,000

And this shrink wrapping also doubles as waterproofing.

280

00:13:23,000 --> 00:13:24,000

Ready for market.

281

00:13:24,000 --> 00:13:28,000

So with the Sindabber skinned up, it's time to drop it off at the pool.

282

00:13:30,000 --> 00:13:31,000

You feeling ready buddy?

283

00:13:31,000 --> 00:13:38,000

One of the nice things about using this particular type of dummy is that with the help of a portable X-ray machine like this device over here,

284

00:13:38,000 --> 00:13:45,000

we can actually figure out what happened internally to the dummy without performing the equivalent of an autopsy.

285

00:13:45,000 --> 00:13:48,000

So after a checkup to make sure everything is where it should be,

286

00:13:48,000 --> 00:13:50,000

You can see that the ribs come across.

287

00:13:50,000 --> 00:13:51,000

They're all intact.

288

00:13:51,000 --> 00:13:53,000

You can see all the cervical vertebra.

289

00:13:53,000 --> 00:13:59,000

It's time to strap up the Sindbuster for its first fall into four and a half feet of water.

290

00:14:01,000 --> 00:14:04,000

Sindabber into the pool from 35 feet.

291

00:14:04,000 --> 00:14:08,000

In three, two, one, go.

292

00:14:11,000 --> 00:14:12,000

A perfect hit.

293

00:14:13,000 --> 00:14:15,000

It bottoms up for the new buster.

294

00:14:17,000 --> 00:14:20,000

But what kind of damage did that drop do?

295

00:14:21,000 --> 00:14:27,000

Well to find out, it's fished out for a closer examination by both the X-ray and an expert.

296

00:14:27,000 --> 00:14:33,000

Now that we've dropped our dummy, we would really like to get an expert opinion on exactly how much damage it sustained.

297

00:14:33,000 --> 00:14:38,000

And we'd like an expert to deal with this kind of injury every single day and that's called an orthopedic surgeon.

298

00:14:38,000 --> 00:14:40,000

We found one named Dr. Noah Weiss.

299

00:14:40,000 --> 00:14:44,000

Dr. Weiss, do you want to give us a free consult on buster's injuries?

300

00:14:44,000 --> 00:14:45,000

Sure, I'd be happy to.

301

00:14:45,000 --> 00:14:46,000

Let's go take a look.

302

00:14:47,000 --> 00:14:54,000

We can see over here is there's actually been a separation between the lumbar spine and the sacrum.

303

00:14:54,000 --> 00:14:59,000

This is a very severe injury that would most certainly result in major spinal cord damage.

304

00:14:59,000 --> 00:15:02,000

Wow, so our dummy's paralyzed.

305

00:15:02,000 --> 00:15:03,000

It's paralyzed.

306

00:15:04,000 --> 00:15:09,000

So our Sindabber, after being dropped into the swimming pool without a mattress in its way, has sustained some very serious damage.

307

00:15:09,000 --> 00:15:12,000

A shattered pelvis and a paralyzing spine injury.

308

00:15:12,000 --> 00:15:18,000

And if it seems like I'm smiling, I'm only happy that we got some significant results from this dummy.

309

00:15:18,000 --> 00:15:21,000

Now we're going to drop one into a mattress.

310

00:15:22,000 --> 00:15:28,000

In their previous test with the original buster, the g-load of the drop onto a mattress was higher.

311

00:15:28,000 --> 00:15:35,000

But will that mean that Sindabuster 2 sustains more injury by making a bed and leaping into it?

312

00:15:35,000 --> 00:15:36,000

Ready, Adam?

313

00:15:36,000 --> 00:15:37,000

Ready.

314

00:15:37,000 --> 00:15:41,000

Three, two, one, go.

315

00:15:43,000 --> 00:15:44,000

Perfect hit.

316

00:15:44,000 --> 00:15:45,000

Perfect hit.

317

00:15:47,000 --> 00:15:49,000

Buster hit the crash pad.

318

00:15:49,000 --> 00:15:51,000

And its butt took the brunt.

319

00:15:53,000 --> 00:15:58,000

So it's over to Dr. Weiss to find out if the Sindabuster's rear is in the clear.

320

00:15:58,000 --> 00:16:06,000

On physical examination, what's immediately apparent is the pelvis is far more unstable compared to the previous endeavor.

321

00:16:06,000 --> 00:16:07,000

Really?

322

00:16:07,000 --> 00:16:11,000

Yeah, this is completely disrupted.

323

00:16:11,000 --> 00:16:12,000

Wow.

324

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

And that's not all.

325

00:16:13,000 --> 00:16:18,000

As the X-rays reveal, the mattress jumper sustained far more damage all over.

326

00:16:18,000 --> 00:16:27,000

In addition to a similar injury where he basically blew apart his pelvis, this one also appears to have two injuries to his spine.

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00:16:27,000 --> 00:16:33,000

One in the lumbar spine or low back and one in the mid-back or thoracic spine.

328

00:16:33,000 --> 00:16:41,000

He dislocated his knee, he dislocated his elbow, and the injury to the pelvis was much worse than in the first endeavor.

329

00:16:41,000 --> 00:16:44,000

So the mattress was far worse than falling into water.

330

00:16:44,000 --> 00:16:51,000

I think both jumps were a problem, but it definitely appears to be much worse landing on the mattress in the water.

331

00:16:51,000 --> 00:16:52,000

So he's even more dead?

332

00:16:52,000 --> 00:16:54,000

He would be even more dead than the first one.

333

00:16:54,000 --> 00:16:55,000

Is that a medical term?

334

00:16:55,000 --> 00:16:57,000

It is now.

335

00:17:02,000 --> 00:17:07,000

We have tested this thing six ways to Sunday, actually four ways and on weekdays, but we have found it.

336

00:17:07,000 --> 00:17:13,000

Yes, jumping from 35 feet is bad into water, but in the mattress, it's like twice as bad.

337

00:17:13,000 --> 00:17:17,000

This is a counterintuitive result, which for us is totally awesome.

338

00:17:17,000 --> 00:17:21,000

Yep, both Buster and Sin Buster tell the same story.

339

00:17:21,000 --> 00:17:25,000

Despite what you'd expect, a mattress doesn't push in a splash landing.

340

00:17:25,000 --> 00:17:27,000

It only makes it worse.

341

00:17:27,000 --> 00:17:30,000

So where would you say this mitts dance?

342

00:17:31,000 --> 00:17:39,000

You know, it's on the tip of my tongue, but I can't quite, what is it, not right, not truthful, ill-conceived?

343

00:17:39,000 --> 00:17:43,000

Ill-conceived, improper, let's say just wrong.

344

00:17:43,000 --> 00:17:44,000

Okay, it's wrong.

345

00:17:44,000 --> 00:17:45,000

It's wrong.

346

00:17:45,000 --> 00:17:51,000

But you know what bothers me is that people have actually been known to dive from that height into shallow water and survive.

347

00:17:51,000 --> 00:17:59,000

I've been thinking about that, and I think what we could do is find someone who knows how to safely jump from those heights into shallow water and have them show us the method.

348

00:17:59,000 --> 00:18:01,000

I think that would be a good thing to know.

349

00:18:01,000 --> 00:18:02,000

Let's do it.

350

00:18:02,000 --> 00:18:03,000

Okay.

351

00:18:04,000 --> 00:18:11,000

The myth is Buster, but is there any way to get the drop on a fall into four and a half feet of water?

352

00:18:13,000 --> 00:18:19,000

Coming up on Mythbusters, for the first time in 400 years, we've fired cannonballs made of stone.

353

00:18:19,000 --> 00:18:20,000

Let's go.

354

00:18:26,000 --> 00:18:33,000

Between a rock and a hard place, supposedly some 15th century cannons fired rocks instead of iron.

355

00:18:33,000 --> 00:18:38,000

Because not only did they do the same damage, they also broke up on impact.

356

00:18:38,000 --> 00:18:45,000

But before they get to the stone, first the mythbusters need to calibrate the mini cannon.

357

00:18:45,000 --> 00:18:46,000

Time for the little guns.

358

00:18:46,000 --> 00:18:51,000

Just like Old Moses, the miniature cannon faces off against a full barrel safety system.

359

00:18:51,000 --> 00:18:53,000

Gotta mix up a good batch.

360

00:18:53,000 --> 00:18:56,000

But that's where the similarities end.

361

00:18:57,000 --> 00:19:03,000

Okay, we know that Old Moses' battle speed fires a cannonball traveling at 1200 feet per second.

362

00:19:03,000 --> 00:19:07,000

So now that we know that, we can match our cannon to that speed.

363

00:19:07,000 --> 00:19:13,000

Now Old Moses used one pound of black powder to get the ball up to speed, but we're going to need to increase that for our cannon.

364

00:19:13,000 --> 00:19:14,000

Why?

365

00:19:14,000 --> 00:19:18,000

Well, the barrel is shorter, which means the ball won't have as much time to accelerate.

366

00:19:18,000 --> 00:19:20,000

So we've got to give it a little bit more kick.

367

00:19:20,000 --> 00:19:26,000

To allow for that, we're going to use a bit more black powder to get us up to the 1200 feet per second we're looking for.

368

00:19:26,000 --> 00:19:30,000

Right, so the cannon is aimed at the ball catchers.

369

00:19:30,000 --> 00:19:33,000

The steel is loaded.

370

00:19:33,000 --> 00:19:35,000

And the fuse is lit.

371

00:19:36,000 --> 00:19:37,000

Let's go.

372

00:19:37,000 --> 00:19:39,000

Then it's back to the bunker.

373

00:19:39,000 --> 00:19:43,000

Alright, fuse is lit. Ready for the calibration test.

374

00:19:43,000 --> 00:19:46,000

Alright, see if Stubby can do it.

375

00:19:46,000 --> 00:19:48,000

Gonna be soon.

376

00:19:58,000 --> 00:20:05,000

So that was the misfire that somehow sent our cannonball up and over the huge safety berm and into somebody's house.

377

00:20:05,000 --> 00:20:11,000

Yeah, and when we realized that it happened, we called off the experiment immediately to help out in any way we could.

378

00:20:11,000 --> 00:20:15,000

But first, that meant looking after the people whose property had been damaged.

379

00:20:15,000 --> 00:20:20,000

And we thought it was very important that we rebuild bridges with a local community as a whole.

380

00:20:20,000 --> 00:20:27,000

And at that same time, our team was conducting an investigation to figure out what went wrong to prevent it from ever happening again in the future.

381

00:20:27,000 --> 00:20:30,000

Believe me, it was an intense few months for everyone involved.

382

00:20:30,000 --> 00:20:37,000

Yeah, you know, but once we started making progress on all of those things, the property, the community, the safety review, we wanted to move forward.

383

00:20:37,000 --> 00:20:40,000

And we started thinking about finishing off this myth.

384

00:20:40,000 --> 00:20:44,000

Yeah, and first up was to find a new, more remote location.

385

00:20:44,000 --> 00:20:49,000

And then, Harry Webb decided that we could use Old Moses to fire our stone cannonballs after all.

386

00:20:49,000 --> 00:20:54,000

Which meant the first thing up was to figure out what type of rock these cannonballs were even made out of.

387

00:20:54,000 --> 00:20:57,000

Gonna be diamonds around here somewhere.

388

00:20:57,000 --> 00:21:06,000

And for that rock research, Tori visited the California Academy of Sciences to talk to mineral maestro geologist Peter Rupnery.

389

00:21:06,000 --> 00:21:09,000

What would have been the three best types of stones that they could have used?

390

00:21:09,000 --> 00:21:11,000

I think sandstone would have been a common material.

391

00:21:11,000 --> 00:21:14,000

It was used for a lot of construction in various parts of Europe.

392

00:21:14,000 --> 00:21:16,000

It's very soft. It would be easy to work.

393

00:21:16,000 --> 00:21:21,000

I don't know how well a sandstone cannonball would survive being shot out of a cannon.

394

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

They also would probably have used a lot of limestone.

395

00:21:24,000 --> 00:21:27,000

It's very hard, but also common and easy to work.

396

00:21:27,000 --> 00:21:31,000

And there would have been a lot of experience working this kind of sedimentary rock.

397

00:21:31,000 --> 00:21:33,000

Granite, on the other hand, is an igneous rock.

398

00:21:33,000 --> 00:21:38,000

It's not as common, but it's highly priced because of its strength.

399

00:21:38,000 --> 00:21:41,000

It's very dense. You probably do a lot of damage.

400

00:21:41,000 --> 00:21:44,000

Well, I guess we won't know until we make our own cannonballs and see how well they do.

401

00:21:44,000 --> 00:21:45,000

Cool.

402

00:21:45,000 --> 00:21:46,000

I have one question for you.

403

00:21:46,000 --> 00:21:48,000

Yeah. How much kryptonite do you have?

404

00:21:48,000 --> 00:21:50,000

That's a secret.

405

00:21:52,000 --> 00:21:55,000

Sandstone, limestone and granite are the candidates.

406

00:21:55,000 --> 00:22:02,000

But will any have the combination of hardness and composition to be as effective as metal and break

up on impact?

407

00:22:04,000 --> 00:22:07,000

Well, with each mythbuster working on a different rock,

408

00:22:07,000 --> 00:22:11,000

it's time for all three to put their boulders to the grindstone.

409

00:22:14,000 --> 00:22:18,000

Grant decides to carve his sandstone cannonball on the lathe.

410

00:22:19,000 --> 00:22:24,000

While Carrie needs a more aggressive tool to make an impression on her limestone.

411

00:22:25,000 --> 00:22:27,000

Can I switch to sandstone, please?

412

00:22:28,000 --> 00:22:32,000

But Tori has turned in the power tools for a super-powered tool.

413

00:22:32,000 --> 00:22:36,000

Look at this thing. It's designed to polish concrete.

414

00:22:39,000 --> 00:22:41,000

That's what I'm talking about.

415

00:22:42,000 --> 00:22:48,000

Even though the igneous granite is the hardest rock on the block, the concrete grinder soon has it beat.

416

00:22:48,000 --> 00:22:51,000

I like to call this a piece, but on the brick.

417

00:22:53,000 --> 00:22:55,000

Well, I guess I should make another one.

418

00:22:56,000 --> 00:23:03,000

Tori's leading the way, and it's not long before both Carrie and Grant have taken on the concrete polisher too.

419

00:23:07,000 --> 00:23:09,000

Yeah, I really like working on TV.

420

00:23:09,000 --> 00:23:13,000

I think it's the glamour, the clothes.

421

00:23:16,000 --> 00:23:18,000

It makes me feel really pretty.

422

00:23:19,000 --> 00:23:24,000

And although the softest rock, the sandstone, is easier to carve, it has its drawbacks too.

423

00:23:24,000 --> 00:23:31,000

The thing is, because it's so soft, it won't probably break on impact, but my question is, is it going to survive the launch?

424

00:23:32,000 --> 00:23:36,000

After a lot of hard work and hours of grinding, our cannonballs are done, and they look great.

425

00:23:36,000 --> 00:23:40,000

We got a sandstone, we got a limestone, and we got a granite cannonball.

426

00:23:40,000 --> 00:23:47,000

Now all we need to do is load them into a real cannon, fire them at a castle wall, and see how they compare to an iron cannonball.

427

00:23:49,000 --> 00:23:58,000

According to this myth, by using a mattress to break your fall, you could hit the sack and escape.

428

00:23:58,000 --> 00:24:01,000

But in reality, not so much.

429

00:24:01,000 --> 00:24:04,000

It would be even more dead than the first one.

430

00:24:04,000 --> 00:24:05,000

Is that a medical term?

431

00:24:05,000 --> 00:24:06,000

It is now.

432

00:24:06,000 --> 00:24:15,000

Having established that jumping off a three-story building, either directly in the four and a half feet of water, or onto a mattress in that water, is potentially lethal.

433

00:24:15,000 --> 00:24:21,000

It begs the question, what exactly would it take to jump safely from that height and into that depth of water?

434

00:24:21,000 --> 00:24:31,000

So we've come here to the George F. Haynes International Swim Center in Santa Clara, California, where they have a magnificent pool and a platform that sits precisely three stories above that pool.

435

00:24:31,000 --> 00:24:38,000

And in a little while, Mr. James Franklin Heineman is going to find out what it would take to dive safely from this height.

436

00:24:38,000 --> 00:24:40,000

Better him than me.

437

00:24:40,000 --> 00:24:45,000

Given the jumping off a height like that, the wrong way into water could seriously hurt you.

438

00:24:45,000 --> 00:24:49,000

I'm not about to do anything fancy off of that without some training.

439

00:24:49,000 --> 00:24:52,000

Now luckily, we've got just the guy to do that.

440

00:24:52,000 --> 00:24:55,000

He taught us how to jump off of buildings.

441

00:24:55,000 --> 00:24:58,000

He's wrapped us in bubble wrap and thrown us off of buildings.

442

00:25:00,000 --> 00:25:01,000

That was intense.

443

00:25:01,000 --> 00:25:03,000

His name is Randy Lamb.

444

00:25:03,000 --> 00:25:09,000

He's a professional stuntman, and he is tasked today with taking Jamie right to the edge and throwing him off.

445

00:25:09,000 --> 00:25:15,000

Throwing him off and ensuring that his plunge is less than the four and a half foot depth of the myth.

446

00:25:15,000 --> 00:25:21,000

But first, what kind of depth does the average drop from 35 feet get?

447

00:25:23,000 --> 00:25:24,000

Wow.

448

00:25:29,000 --> 00:25:31,000

That was really cool.

449

00:25:33,000 --> 00:25:34,000

I'm screwed.

450

00:25:35,000 --> 00:25:40,000

Randy's jump carried him about two-thirds the depth of the pool, about 12 or 13 feet.

451

00:25:40,000 --> 00:25:47,000

It's a lot farther than four and a half feet, and I have to admit I'm really curious to see what kind of form his shallow dive takes.

452

00:25:47,000 --> 00:25:50,000

Well, that's what Jamie is about to find out.

453

00:25:50,000 --> 00:25:54,000

So Randy, what are my options as far as flattening out quickly without hurting myself?

454

00:25:54,000 --> 00:25:58,000

As you're coming down, you want to be right now in a very vertical position.

455

00:25:58,000 --> 00:26:03,000

Just as your feet touch the water, I want you to pull them in front of you, keep your legs straight, and pike right here.

456

00:26:03,000 --> 00:26:06,000

All right? This position here should scoop you up.

457

00:26:06,000 --> 00:26:07,000

Okay.

458

00:26:07,000 --> 00:26:13,000

It's a tactic that should slow Jamie down as he enters the water and make his angle of entry shallower.

459

00:26:13,000 --> 00:26:15,000

And how did that feel?

460

00:26:15,000 --> 00:26:16,000

It felt all right.

461

00:26:16,000 --> 00:26:22,000

But with a three-story dive into the mythical four and a half feet to come, practice is going to make perfect.

462

00:26:22,000 --> 00:26:26,000

So cue the music. We're going to need a training montage.

463

00:26:28,000 --> 00:26:29,000

Lay back, lay back.

464

00:26:30,000 --> 00:26:35,000

If there's one thing we've learned in acquiring techniques to deal with dangerous situations like this one,

465

00:26:35,000 --> 00:26:39,000

is that you need to work your way up incrementally.

466

00:26:39,000 --> 00:26:41,000

I feel like I just got spanked.

467

00:26:41,000 --> 00:26:47,000

You can't just take instructions that as you're jumping, you're going through in your head,

468

00:26:47,000 --> 00:26:50,000

do this, now I'm going to do this, and then I'm going to do this.

469

00:26:50,000 --> 00:26:53,000

It all happens so fast, it has to be automatic.

470

00:26:53,000 --> 00:26:58,000

And that's what I'm in the process of doing right now is burning that in so that I don't even have to think about it.

471

00:26:58,000 --> 00:27:00,000

Lay tight, lay tight.

472

00:27:00,000 --> 00:27:01,000

Nice.

473

00:27:01,000 --> 00:27:05,000

And before long, Jamie has graduated to the 15-foot height.

474

00:27:05,000 --> 00:27:12,000

He surveys the distance, estimates his trajectory, and he jumps.

475

00:27:14,000 --> 00:27:17,000

That was a really good one. Barely heard a sound.

476

00:27:17,000 --> 00:27:18,000

Nice work, sir.

477

00:27:18,000 --> 00:27:24,000

Taking it drop by drop, Jamie's gotten his depth to five and a half feet.

478

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

And his technique is getting so good that soon.

479

00:27:27,000 --> 00:27:29,000

That was your best one yet.

480

00:27:29,000 --> 00:27:32,000

I think you should move up and start practicing from a little bit higher to get comfortable up there.

481

00:27:32,000 --> 00:27:33,000

All right.

482

00:27:36,000 --> 00:27:39,000

As Jamie practices and moves to ever higher diving platforms,

483

00:27:39,000 --> 00:27:45,000

there's actually a quite interesting reason for which he might get better at decelerating faster as he goes higher.

484

00:27:45,000 --> 00:27:50,000

Water resists an impact in direct proportion to the speed of the impact.

485

00:27:50,000 --> 00:27:54,000

Kerry Grant and Torrey investigated this in their Water vs. Concrete episode.

486

00:27:54,000 --> 00:27:56,000

Block belly, block in.

487

00:27:56,000 --> 00:27:58,000

And it definitely applies here.

488

00:27:58,000 --> 00:28:04,000

So while he did pretty good at 15 feet, he might be able to actually hit his target at 35.

489

00:28:07,000 --> 00:28:09,000

That one was fantastic.

490

00:28:09,000 --> 00:28:12,000

That was as good as your best jump from 15 feet.

491

00:28:12,000 --> 00:28:16,000

Yeah, well, I mean, if that one was as good as I got from 15 feet,

492

00:28:16,000 --> 00:28:19,000

maybe I'll be able to do just as good from 35.

493

00:28:19,000 --> 00:28:21,000

Yeah, exactly.

494

00:28:21,000 --> 00:28:23,000

Nothing to do but keep practicing.

495

00:28:24,000 --> 00:28:27,000

And after a day of jumping in with both feet,

496

00:28:27,000 --> 00:28:31,000

that 35 foot fall will have to wait until tomorrow.

497

00:28:31,000 --> 00:28:33,000

So how are you feeling after all that?

498

00:28:33,000 --> 00:28:35,000

Ow.

499

00:28:35,000 --> 00:28:37,000

Sorry about that.

500

00:28:37,000 --> 00:28:39,000

Don't try anything you've seen on the show at home.

501

00:28:39,000 --> 00:28:41,000

We are what you're called experts.

502

00:28:42,000 --> 00:28:50,000

We've come out to a quarry in Angel's Camp so we can test the myth of the stone cannonball.

503

00:28:50,000 --> 00:28:53,000

It was said that these were not only as effective as iron cannonballs,

504

00:28:53,000 --> 00:28:57,000

but they exploded upon impact, which means they couldn't be fired back.

505

00:28:57,000 --> 00:28:59,000

Here comes the cannon.

506

00:29:00,000 --> 00:29:01,000

Look at O's moment.

507

00:29:01,000 --> 00:29:03,000

It's ready for action.

508

00:29:03,000 --> 00:29:06,000

Now, since we've never shot one of these stone cannonballs,

509

00:29:06,000 --> 00:29:07,000

we're going to fire this cannon remotely.

510

00:29:07,000 --> 00:29:10,000

So what I'm doing right now is I'm rolling out 500 feet of wire

511

00:29:10,000 --> 00:29:15,000

so that we can launch this thing from behind this pile of rocks with an electric match.

512

00:29:15,000 --> 00:29:18,000

And that's not the only precaution they're taking.

513

00:29:18,000 --> 00:29:23,000

For our stone cannonball experiment, we have water barrels that are stacked too high, three deep.

514

00:29:23,000 --> 00:29:25,000

Behind that, a soft sand berm.

515

00:29:25,000 --> 00:29:31,000

And behind that, we are way out in the middle of nowhere in a rock quarry with walls that are 300 feet tall.

516

00:29:31,000 --> 00:29:32,000

That's the setup.

517

00:29:32,000 --> 00:29:37,000

So now to calibrate their stone balls to the steel ball speed of their previous test.

518

00:29:38,000 --> 00:29:40,000

All right, we need to test the speed of the stone cannonballs.

519

00:29:40,000 --> 00:29:42,000

So what do you say we start with the sandstone?

520

00:29:42,000 --> 00:29:43,000

That sounds good.

521

00:29:43,000 --> 00:29:47,000

Now remember, we're trying to get 1200 feet per second just like the steel ball.

522

00:29:47,000 --> 00:29:51,000

You guys, let me just point out, this is probably the first time in 400 years

523

00:29:51,000 --> 00:29:53,000

somebody has fired a stone cannonball.

524

00:29:53,000 --> 00:29:54,000

This is going to be cool.

525

00:29:54,000 --> 00:29:56,000

Cool and tricky.

526

00:29:56,000 --> 00:30:00,000

Since with three different masses to get all the balls traveling at the same velocity,

527

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

they're going to need a formula.

528

00:30:02,000 --> 00:30:08,000

So we need to know how much black powder to use to get our stone cannonballs to have the same velocity as the steel balls.

529

00:30:08,000 --> 00:30:11,000

Now we plug in their weights to a basic formula based on kinetic energy.

530

00:30:11,000 --> 00:30:12,000

This is what we get.

531

00:30:12,000 --> 00:30:17,000

Our 1.3 pound sandstone ball needs 0.3 pounds of black powder.

532

00:30:17,000 --> 00:30:24,000

Now the 1.4 pound limestone ball needs just a little bit more with 0.33 pounds of black powder.

533

00:30:24,000 --> 00:30:29,000

And finally our granite ball, which is 1.7 pounds, needs 0.36 pounds of black powder.

534

00:30:29,000 --> 00:30:31,000

Just a little bit more than that.

535

00:30:31,000 --> 00:30:32,000

That's the theory.

536

00:30:32,000 --> 00:30:34,000

But will those numbers work in practice?

537

00:30:34,000 --> 00:30:37,000

And will the cannonballs survive the launch?

538

00:30:37,000 --> 00:30:41,000

First up to find its black powder butter zone is the sandstone.

539

00:30:41,000 --> 00:30:45,000

K, 0.3 of a pound, which is 5 ounces.

540

00:30:45,000 --> 00:30:51,000

And to protect old Moses Barrel, the sandstone is packaged inside a cardboard canister.

541

00:30:52,000 --> 00:30:54,000

We are loaded.

542

00:30:56,000 --> 00:30:59,000

Let's see what sandstone is made of.

543

00:30:59,000 --> 00:31:00,000

Sandstone.

544

00:31:00,000 --> 00:31:01,000

What?

545

00:31:01,000 --> 00:31:02,000

That's what it's made of.

546

00:31:02,000 --> 00:31:03,000

Alright, here we go.

547

00:31:03,000 --> 00:31:09,000

This is sandstone cannonball speed test in 3, 2, 1.

548

00:31:14,000 --> 00:31:16,000

Love that echo in the canyon.

549

00:31:16,000 --> 00:31:17,000

Let's go see what it did.

550

00:31:17,000 --> 00:31:18,000

Alright.

551

00:31:18,000 --> 00:31:20,000

Clearly it rocked it.

552

00:31:21,000 --> 00:31:25,000

We got our sandstone cannonball to fire at approximately 1200 feet per second.

553

00:31:25,000 --> 00:31:27,000

Now that's the butter zone to match our steel cannonball.

554

00:31:27,000 --> 00:31:30,000

Now we're moving on to limestone.

555

00:31:30,000 --> 00:31:35,000

According to the formula, it should take a third of a pound to get the limestone flying.

556

00:31:35,000 --> 00:31:36,000

Got it.

557

00:31:36,000 --> 00:31:41,000

Alright, this is limestone speed test in 3, 2, 1.

558

00:31:45,000 --> 00:31:48,000

And not only did that have enough oaf to knock the gauge over,

559

00:31:48,000 --> 00:31:52,000

it was also enough oaf to match the steel cannonball speed.

560

00:31:52,000 --> 00:31:56,000

So we managed to get our limestone cannonball to 1200 feet per second.

561

00:31:56,000 --> 00:32:00,000

That means limestone is good to go for attack.

562

00:32:00,000 --> 00:32:06,000

The final rock to take aim is the hardest and heaviest stone cannonball, the granite,

563

00:32:06,000 --> 00:32:09,000

which means it needs the most black powder.

564

00:32:09,000 --> 00:32:10,000

Clear front.

565

00:32:10,000 --> 00:32:11,000

Alright, here we go.

566

00:32:11,000 --> 00:32:15,000

This is granite cannonball speed test in 3, 2, 1.

567

00:32:19,000 --> 00:32:23,000

Hey, look, it's still in attack.

568

00:32:23,000 --> 00:32:24,000

And washed.

569

00:32:24,000 --> 00:32:27,000

Alright, let's check the high speed and see how fast it went.

570

00:32:27,000 --> 00:32:33,000

So we just fired the granite cannonball and we reached 1159 feet per second.

571

00:32:33,000 --> 00:32:35,000

We are in the range that we're looking for.

572

00:32:35,000 --> 00:32:37,000

Now it's time to fire into a castle.

573

00:32:39,000 --> 00:32:43,000

So all three balls are up to speed and ready to rock.

574

00:32:43,000 --> 00:32:46,000

Just as soon as the mythbusters can find a castle.

575

00:32:49,000 --> 00:32:52,000

That is the most disturbing castle I've ever seen.

576

00:32:52,000 --> 00:32:53,000

Right after the break.

577

00:32:53,000 --> 00:32:54,000

Time for battle.

578

00:32:54,000 --> 00:32:59,000

It's the balls to the wall finale of the stone cannonball saga.

579

00:32:59,000 --> 00:33:01,000

In 3, 2, 1.

580

00:33:19,000 --> 00:33:30,000

This thing, the Sndaver, opens up whole new vistas for us in terms of assessing physical damage from our experiment.

581

00:33:30,000 --> 00:33:33,000

I'm only just starting to grasp how awesome this is.

582

00:33:48,000 --> 00:33:50,000

And we pretty much busted that outright.

583

00:33:50,000 --> 00:33:51,000

So he'd be even more dead.

584

00:33:51,000 --> 00:33:57,000

We are now investigating whether there is any technique at all that can help you safely make such a jump.

585

00:33:57,000 --> 00:34:03,000

Yep, and yesterday Jamie spent the day getting in touch with his inner aquatic mammal.

586

00:34:03,000 --> 00:34:06,000

But it's taken its toll.

587

00:34:06,000 --> 00:34:11,000

I took a lot of jumps yesterday and by the end of the day I was in a lot of pain.

588

00:34:11,000 --> 00:34:13,000

This morning I was still in a lot of pain.

589

00:34:13,000 --> 00:34:18,000

So I decided to call our orthopedic surgeon and see if there was anything I should be concerned about.

590

00:34:18,000 --> 00:34:22,000

And he said that, well, not really as far as the tissue damage or anything like that,

591

00:34:22,000 --> 00:34:28,000

but that is a warning sign that I'm taking a heck of a lot of impact in my lower back.

592

00:34:28,000 --> 00:34:30,000

And that's an area I really don't want to mess with.

593

00:34:30,000 --> 00:34:33,000

So I'm handing it over to our stunt guy, Randy.

594

00:34:33,000 --> 00:34:36,000

Jamie's back is telling him to back out.

595

00:34:36,000 --> 00:34:38,000

So cue the stuntman.

596

00:34:38,000 --> 00:34:39,000

Alright, Randy.

597

00:34:39,000 --> 00:34:40,000

It's all down to you, sir.

598

00:34:40,000 --> 00:34:43,000

35 feet into 4 and a half.

599

00:34:43,000 --> 00:34:48,000

Okay, sure.

600

00:34:48,000 --> 00:34:50,000

I wasn't supposed to jump right there.

601

00:34:50,000 --> 00:34:51,000

I didn't think so.

602

00:34:51,000 --> 00:34:53,000

Full marks for enthusiasm.

603

00:34:53,000 --> 00:34:55,000

Full marks for enthusiasm.

604

00:34:55,000 --> 00:35:00,000

And it's clear from this impromptu plunge that he has the technique down.

605

00:35:00,000 --> 00:35:05,000

But this time it's for real and it's a long way from the top with a very shallow landing.

606

00:35:05,000 --> 00:35:09,000

Will Randy jump and come up trumps?

607

00:35:09,000 --> 00:35:13,000

Alright, here goes the scoop in 3, 2, 1.

608

00:35:20,000 --> 00:35:21,000

Wow!

609

00:35:21,000 --> 00:35:23,000

Dude, I think that might have been survivable.

610

00:35:23,000 --> 00:35:25,000

Hold on, let's check this out.

611

00:35:26,000 --> 00:35:27,000

Dude!

612

00:35:27,000 --> 00:35:28,000

He would have survived that.

613

00:35:28,000 --> 00:35:29,000

I think you're totally right.

614

00:35:29,000 --> 00:35:30,000

He would have survived that.

615

00:35:30,000 --> 00:35:33,000

He dipped a few inches below the line, but he's so decelerated.

616

00:35:33,000 --> 00:35:34,000

That's just a bump on the bottom.

617

00:35:34,000 --> 00:35:35,000

That's not an injury.

618

00:35:35,000 --> 00:35:36,000

Yeah.

619

00:35:36,000 --> 00:35:37,000

Randy's the man.

620

00:35:37,000 --> 00:35:38,000

Yeah.

621

00:35:38,000 --> 00:35:41,000

Randy's the man because he's gone one up on the myth.

622

00:35:41,000 --> 00:35:46,000

Not only did he take the fall from the same height into the same shallow depth,

623

00:35:46,000 --> 00:35:48,000

he made it out injury-free.

624

00:35:49,000 --> 00:35:50,000

Randy, that was beautiful.

625

00:35:50,000 --> 00:35:51,000

It's how I feel.

626

00:35:51,000 --> 00:35:54,000

It's not as bad as I thought it was going to be,

627

00:35:54,000 --> 00:35:57,000

but I can understand why Jamie is tender today.

628

00:35:59,000 --> 00:36:01,000

It's certainly not a painless way to land,

629

00:36:01,000 --> 00:36:05,000

but it sure beats a shattered pelvis and a broken spine.

630

00:36:05,000 --> 00:36:08,000

Randy has successfully jumped shallow enough

631

00:36:08,000 --> 00:36:12,000

that he would have survived a 35-foot jump into 4 1/2-foot deep water.

632

00:36:12,000 --> 00:36:15,000

I have to admit, everything that we tested so far in this story,

633

00:36:15,000 --> 00:36:18,000

I was not giving good odds for him being able to do that,

634

00:36:18,000 --> 00:36:22,000

but I guess 30 years of experience as a stuntman counts for something.

635

00:36:22,000 --> 00:36:23,000

So how do you want to call this?

636

00:36:23,000 --> 00:36:25,000

Well, as far as the clip we started with goes,

637

00:36:25,000 --> 00:36:26,000

everything that they describe,

638

00:36:26,000 --> 00:36:28,000

whether jumping into the pool straight

639

00:36:28,000 --> 00:36:31,000

or jumping into the pool with a mattress on top of it,

640

00:36:31,000 --> 00:36:34,000

is either super dangerous or even potentially lethal.

641

00:36:34,000 --> 00:36:35,000

Yeah, it's busted.

642

00:36:35,000 --> 00:36:37,000

Not to say they couldn't be done, though.

643

00:36:37,000 --> 00:36:40,000

At least if you've got decades of experience as a stunt person.

644

00:36:40,000 --> 00:36:41,000

Exactly right.

645

00:36:41,000 --> 00:36:43,000

So don't try this at home.

646

00:36:43,000 --> 00:36:44,000

We didn't.

647

00:36:47,000 --> 00:36:48,000

My butt still hurts.

648

00:36:57,000 --> 00:36:58,000

Castles.

649

00:36:58,000 --> 00:37:01,000

They're big, old, and made of stone.

650

00:37:01,000 --> 00:37:03,000

And while you'll find plenty in Europe,

651

00:37:03,000 --> 00:37:05,000

in the States, they're pretty rare.

652

00:37:08,000 --> 00:37:11,000

So the Mythbusters are getting creatively medieval.

653

00:37:11,000 --> 00:37:14,000

This ought to keep the savages out.

654

00:37:14,000 --> 00:37:16,000

And making their own.

655

00:37:17,000 --> 00:37:19,000

Now, I know this might seem like overkill,

656

00:37:19,000 --> 00:37:22,000

having two pallets of solid concrete bricks.

657

00:37:22,000 --> 00:37:24,000

Each of the bricks weighing 80 pounds,

658

00:37:24,000 --> 00:37:25,000

but it's not an exaggeration.

659

00:37:25,000 --> 00:37:28,000

An actual rampart of a castle, which is the barrier,

660

00:37:28,000 --> 00:37:31,000

has been known to be six feet to 18 feet thick.

661

00:37:31,000 --> 00:37:34,000

And what we have here is an eight-foot thickness.

662

00:37:34,000 --> 00:37:36,000

So this is going to give us a good representation

663

00:37:36,000 --> 00:37:39,000

of what that rampart of the castle would be.

664

00:37:39,000 --> 00:37:41,000

A great representation.

665

00:37:41,000 --> 00:37:43,000

And with the sturdy concrete ramparts in place,

666

00:37:43,000 --> 00:37:46,000

each Mythbuster has a different idea

667

00:37:46,000 --> 00:37:48,000

on what constitutes a castle.

668

00:37:48,000 --> 00:37:50,000

No interdraffids!

669

00:37:50,000 --> 00:37:52,000

No, we will never surrender.

670

00:37:52,000 --> 00:37:54,000

Then we will attack!

671

00:37:55,000 --> 00:37:57,000

Don't worry, they're shooting rock-and-rolls.

672

00:37:57,000 --> 00:37:59,000

I'm not scared of those.

673

00:37:59,000 --> 00:38:03,000

That's three castles to face off against three stone cannonballs.

674

00:38:03,000 --> 00:38:05,000

But how will they know if the rock balls

675

00:38:05,000 --> 00:38:07,000

are as effective as a steel ball?

676

00:38:07,000 --> 00:38:10,000

Well, with an old Moses comparison for starters.

677

00:38:10,000 --> 00:38:13,000

All right, here we go. This is control test.

678

00:38:13,000 --> 00:38:16,000

Steel cannonball with one pound of black powder.

679

00:38:16,000 --> 00:38:19,000

In three, two, one.

680

00:38:19,000 --> 00:38:22,000

Oh!

681

00:38:22,000 --> 00:38:27,000

There's no doubt that the metal cannonball

682

00:38:27,000 --> 00:38:30,000

jolted the concrete as it penetrated two layers

683

00:38:30,000 --> 00:38:32,000

and shattered four bricks.

684

00:38:32,000 --> 00:38:35,000

That is one effective cannonball!

685

00:38:35,000 --> 00:38:37,000

There it is.

686

00:38:37,000 --> 00:38:39,000

There it is.

687

00:38:39,000 --> 00:38:41,000

All right, let's see how the steel cannonballs do.

688

00:38:41,000 --> 00:38:43,000

I see why they use cannons.

689

00:38:43,000 --> 00:38:45,000

Now that they've seen what steel can do,

690

00:38:45,000 --> 00:38:47,000

it's time to test this myth.

691

00:38:47,000 --> 00:38:50,000

How will the metal cannonballs match the metal

692

00:38:50,000 --> 00:38:52,000

and break up on impact?

693

00:38:52,000 --> 00:38:54,000

Well, first, they're starting with the sandstone.

694

00:38:54,000 --> 00:38:56,000

Okay, ready, Harry?

695

00:38:56,000 --> 00:38:58,000

With enough black powder to fire the ball

696

00:38:58,000 --> 00:39:00,000

at the set speed of 1,200 feet per second.

697

00:39:00,000 --> 00:39:02,000

Loaded.

698

00:39:02,000 --> 00:39:04,000

The ball is in old Moses' court now.

699

00:39:04,000 --> 00:39:07,000

This is sandstone versus the castle.

700

00:39:07,000 --> 00:39:10,000

In three, two, one.

701

00:39:10,000 --> 00:39:12,000

Oh, that sounded like damage to me.

702

00:39:12,000 --> 00:39:14,000

That was a great boom.

703

00:39:14,000 --> 00:39:16,000

Awesome!

704

00:39:16,000 --> 00:39:18,000

That did some serious damage.

705

00:39:18,000 --> 00:39:20,000

And it shattered, meaning there's nothing to send back.

706

00:39:20,000 --> 00:39:22,000

But even though it penetrated one layer

707

00:39:22,000 --> 00:39:24,000

and damaged two bricks,

708

00:39:24,000 --> 00:39:26,000

the softer sandstone ball couldn't match

709

00:39:26,000 --> 00:39:28,000

the damage of the metal ball.

710

00:39:28,000 --> 00:39:32,000

So next, it's limestone versus Carrie's dream castle.

711

00:39:32,000 --> 00:39:36,000

That is probably the most adorable castle I've ever seen.

712

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

Next up, we're going to use the limestone ball

713

00:39:39,000 --> 00:39:41,000

against Carrie's castle.

714

00:39:41,000 --> 00:39:43,000

Now, looking at this ball,

715

00:39:43,000 --> 00:39:45,000

it's probably going to do really well on damage,

716

00:39:45,000 --> 00:39:47,000

and it's so poor.

717

00:39:47,000 --> 00:39:49,000

It's got all these pockets.

718

00:39:49,000 --> 00:39:51,000

I think it's going to shatter.

719

00:39:51,000 --> 00:39:53,000

I think this thing's going to be great.

720

00:39:53,000 --> 00:39:55,000

Good luck.

721

00:39:55,000 --> 00:39:57,000

In three, two, one.

722

00:39:57,000 --> 00:39:59,000

That sounded like a really good damage chest to me.

723

00:39:59,000 --> 00:40:01,000

It certainly was,

724

00:40:01,000 --> 00:40:04,000

because the limestone was hard enough to destroy three bricks,

725

00:40:04,000 --> 00:40:07,000

closer to the damage the steel ball caused.

726

00:40:07,000 --> 00:40:10,000

And more importantly, it disintegrated on impact.

727

00:40:10,000 --> 00:40:12,000

Look at that! Oh, my gosh!

728

00:40:12,000 --> 00:40:14,000

That works great!

729

00:40:14,000 --> 00:40:16,000

The limestone is incredible!

730

00:40:16,000 --> 00:40:18,000

It's got shattering.

731

00:40:18,000 --> 00:40:20,000

You know, I'm a little upset

732

00:40:20,000 --> 00:40:22,000

that Carrie's dream castle

733

00:40:22,000 --> 00:40:25,000

with the giant orange princess is destroyed.

734

00:40:25,000 --> 00:40:27,000

But I mean, it was so worth it with these results.

735

00:40:27,000 --> 00:40:30,000

I mean, we destroyed a layer of brick

736

00:40:30,000 --> 00:40:32,000

and the ball crumbled.

737

00:40:32,000 --> 00:40:35,000

This is looking so good for our myth right now.

738

00:40:35,000 --> 00:40:37,000

Looking good for the myth,

739

00:40:37,000 --> 00:40:39,000

but the final stone is still not ready.

740

00:40:39,000 --> 00:40:41,000

But the final stone cannonball

741

00:40:41,000 --> 00:40:43,000

is the most rock solid of all.

742

00:40:43,000 --> 00:40:45,000

Time for battle.

743

00:40:45,000 --> 00:40:48,000

The granite is a lot harder than the previous rocks.

744

00:40:48,000 --> 00:40:50,000

And while it may do some damage,

745

00:40:50,000 --> 00:40:54,000

the question is, will it shatter as the myth suggests?

746

00:40:54,000 --> 00:40:56,000

Granite cannonball into the castle.

747

00:40:56,000 --> 00:40:59,000

In three, two, one.

748

00:41:02,000 --> 00:41:04,000

That sounded like such a smack!

749

00:41:04,000 --> 00:41:06,000

Sounds like success, man!

750

00:41:06,000 --> 00:41:08,000

All right, let's see what it did.

751

00:41:08,000 --> 00:41:11,000

Definitely scored the damage category.

752

00:41:11,000 --> 00:41:13,000

And look what's left of the cannonball.

753

00:41:13,000 --> 00:41:15,000

I mean, we did some serious damage

754

00:41:15,000 --> 00:41:17,000

almost as much as the steel cannonball

755

00:41:17,000 --> 00:41:19,000

and it disintegrated.

756

00:41:21,000 --> 00:41:24,000

Now, I've spent hours sculpting this cannonball

757

00:41:24,000 --> 00:41:26,000

and a lot of effort went into building this castle.

758

00:41:26,000 --> 00:41:29,000

But I've never been happier saying two things I've built destroyed,

759

00:41:29,000 --> 00:41:31,000

especially with these results.

760

00:41:31,000 --> 00:41:34,000

I mean, the granite cannonball did the same damage

761

00:41:34,000 --> 00:41:36,000

as the steel cannonball.

762

00:41:36,000 --> 00:41:38,000

The steel cannonball you could have shot back.

763

00:41:38,000 --> 00:41:40,000

The granite cannonball destroyed.

764

00:41:40,000 --> 00:41:42,000

This one's plausible.