1

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

On this episode of Myth Busters, we lock and load.

2

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

Get lost.

3

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

Behold the Heinemann in its natural habitat.

4

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

And let loose.

5

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

First up, Adam and Jamie look into the age-old anomaly that while blindfolded,

6

00:00:17,000 --> 00:00:23,000

I feel like I'm doing pretty good, it's supposedly impossible to travel in a straight line.

7

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

Control us into the middle of the field then.

8

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

Somebody order a car?

9

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

Carrie Grant and Tori find out if a fender bender

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

could detonate a trunk full of special effects explosives.

11

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

This is our target car.

12

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

Stand by for a rocket-propelled car crash.

13

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

Who are the Myth Busters?

14

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

Adam Savage.

15

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

I am the master of the science.

16

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

And Jamie Heinemann.

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

Between then more than 30 years of special effects experience,

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

together with Brad Imahara,

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

Carrie Byron,

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00:01:06,000 --> 00:01:09,000

and Tori Belachie,

21

00:01:09,000 --> 00:01:12,000

they don't just tell the Myths,

22

00:01:12,000 --> 00:01:15,000

they put them to the test.

23

00:01:16,000 --> 00:01:29,000

Watch out, because Adam and Jamie are about to walk, swim, and drive blindfolded.

24

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

What's with the blindfold?

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00:01:31,000 --> 00:01:34,000

Well, you ever work on something and it's not going the way you want it to

26

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

and you feel like you're just going around in circles?

27

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

I know exactly what you mean.

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

Excellent, because that is what this story is all about.

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00:01:41,000 --> 00:01:46,000

The myth is that a human, when blindfolded, cannot travel in a straight line.

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00:01:46,000 --> 00:01:47,000

Really?

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00:01:47,000 --> 00:01:50,000

It turns out that not only can't we walk in a straight line,

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00:01:50,000 --> 00:01:54,000

but that left-door on devices we will actually walk in circles

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00:01:54,000 --> 00:01:57,000

and that this might be one of the reasons we might get lost in the woods.

34

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

I thought with all your survival training you'd love this story.

35

00:02:01,000 --> 00:02:03,000

Hello, Jamie?

36

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

Oh, he's gone.

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00:02:06,000 --> 00:02:12,000

It's a deceptively simple concept that has puzzled serious scientists for a hundred years.

38

00:02:12,000 --> 00:02:17,000

Supposedly, when blindfolded, it's impossible for humans to travel,

39

00:02:17,000 --> 00:02:21,000

whether on foot, in water, or by road, in a straight line.

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00:02:21,000 --> 00:02:25,000

It's a challenge Adam and Jamie just can't resist.

41

00:02:25,000 --> 00:02:27,000

Come on, come on, back in here.

42

00:02:27,000 --> 00:02:29,000

Did you even hear a word that I said?

43

00:02:29,000 --> 00:02:32,000

Yeah, humans can't move in a straight line while blindfolded.

44

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

That's the story. How do you want to test it?

45

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

Well, when I think about moving in a straight line, I think about walking.

46

00:02:37,000 --> 00:02:39,000

I think you might be right. Is that where you want to begin?

47

00:02:39,000 --> 00:02:43,000

Yeah, all we need is a couple of blindfolds and a big, wide-open field.

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00:02:43,000 --> 00:02:44,000

Let's do it.

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00:02:44,000 --> 00:02:47,000

A big field, you say? How about this one?

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00:02:47,000 --> 00:02:49,000

Our testing here is pretty straightforward.

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00:02:49,000 --> 00:02:54,000

We've got a field in which we can walk 3,000 feet in any direction that we choose.

52

00:02:54,000 --> 00:02:57,000

We've got a blindfold. This one here is from my personal collection.

53

00:02:57,000 --> 00:03:00,000

And headphones to remove any other stimulus.

54

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

And we're just going to try and walk in a straight line and see what happens.

55

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

Sure, we'll see what happens, but Jamie likes to be more...sciencey.

56

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

We've got three ways of telling how good we are at walking in a straight line while blindfolded.

57

00:03:12,000 --> 00:03:15,000

First is by using the global positioning system, or GPS.

58

00:03:15,000 --> 00:03:19,000

This little thing will be plotting a map for us that we can look at afterwards.

59

00:03:19,000 --> 00:03:23,000

Secondly, we've got these lovely little orange flags that we can place.

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

Are you ready to go?

61

00:03:24,000 --> 00:03:25,000

What?

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00:03:25,000 --> 00:03:29,000

And lastly, we'll know if we hit the target,

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00:03:29,000 --> 00:03:33,000

because we will have had to have walked in more or less a straight line to get there.

64

00:03:33,000 --> 00:03:35,000

How do I think I'm going to do?

65

00:03:35,000 --> 00:03:39,000

I don't think I'm going to be able to maintain an incredibly straight line,

66

00:03:39,000 --> 00:03:41,000

but I don't think I'm going to be that far off.

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00:03:41,000 --> 00:03:43,000

I think I may veer to the left or to the right,

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00:03:43,000 --> 00:03:47,000

but I think I'll end up pretty close to my goal, that cluster of trees over there.

69

00:03:47,000 --> 00:03:49,000

Or is it there?

70

00:03:49,000 --> 00:03:53,000

Okay, in three, two, one, go.

71

00:03:53,000 --> 00:03:58,000

All he has to do is walk in a straight line with his eyes closed.

72

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

How hard can it be?

73

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

It is a very weird thing to be walking without any visual or auditory stimulus.

74

00:04:05,000 --> 00:04:10,000

What's really weird is, apparently, how surprisingly difficult it is.

75

00:04:10,000 --> 00:04:14,000

You're holding a picture of it in your head, and in your mind's eye,

76

00:04:14,000 --> 00:04:18,000

you're walking a nice straight trajectory across that landscape.

77

00:04:18,000 --> 00:04:21,000

I mean, tickling at the back of your mind, you're thinking something might be wrong,

78

00:04:21,000 --> 00:04:22,000

but tries you might.

79

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

You feel like you're walking straight.

80

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

Whoa!

81

00:04:26,000 --> 00:04:31,000

You started it out pretty nice, but after about 300 feet or so,

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00:04:31,000 --> 00:04:35,000

you started to turn to the left, and you just kept doing that

83

00:04:35,000 --> 00:04:38,000

until you ended up right back in the fence.

84

00:04:38,000 --> 00:04:42,000

I swear I thought I was walking a perfectly straight line.

85

00:04:42,000 --> 00:04:47,000

Nothing told me that I was possibly walking in a 200-foot diameter circle.

86

00:04:47,000 --> 00:04:50,000

I am totally amazed by that result.

87

00:04:50,000 --> 00:04:53,000

A result nailed by the GPS trail.

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00:04:53,000 --> 00:04:58,000

The astonishing disparity between Adam's perception and his actual route

89

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

is there for all to see.

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

That is hilarious.

91

00:05:04,000 --> 00:05:08,000

It's a result that begs several questions, the first of which is,

92

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

will Jamie do any better?

93

00:05:10,000 --> 00:05:16,000

Jamie's blind man walking in three, two, one, go!

94

00:05:16,000 --> 00:05:20,000

With all the confidence and certainty you'd expect from the Heidelman,

95

00:05:20,000 --> 00:05:23,000

he strides off towards the target tree,

96

00:05:23,000 --> 00:05:28,000

before veering off course like he's got a short right leg.

97

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

And any doubt that subtle topographical features,

98

00:05:31,000 --> 00:05:33,000

with the reason Adam went left,

99

00:05:33,000 --> 00:05:37,000

are dispelled as Jamie leans so far to the right,

100

00:05:37,000 --> 00:05:41,000

he turns back on himself in a corkscrew pattern.

101

00:05:41,000 --> 00:05:45,000

I ended up right back in the road, just like you did.

102

00:05:45,000 --> 00:05:47,000

Time to delve deeper.

103

00:05:47,000 --> 00:05:49,000

Now the question we have is,

104

00:05:49,000 --> 00:05:52,000

is that leaning that we each had to one direction or the other consistent?

105

00:05:52,000 --> 00:05:55,000

Walking blind, test number two.

106

00:05:55,000 --> 00:05:57,000

Is it something that could be corrected for?

107

00:05:57,000 --> 00:06:00,000

Well that's what we're just about to find out.

108

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

He's doing a little better this time.

109

00:06:03,000 --> 00:06:05,000

Adam's start is certainly straighter,

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00:06:05,000 --> 00:06:09,000

but it's not long before the test literally takes a turn for the worse.

111

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

Test two? I didn't walk straight,

112

00:06:11,000 --> 00:06:14,000

and I didn't even walk straight in the same way I didn't walk straight the first time.

113

00:06:14,000 --> 00:06:16,000

I went in a circle in the other direction.

114

00:06:16,000 --> 00:06:19,000

Yep, two things are clear from Adam's second test.

115

00:06:19,000 --> 00:06:22,000

His route is far from straight,

116

00:06:22,000 --> 00:06:25,000

and there's no discernible pattern to his meanderings.

117

00:06:25,000 --> 00:06:27,000

Bye. Bye.

118

00:06:27,000 --> 00:06:30,000

A theory compounded on Jamie's second test,

119

00:06:30,000 --> 00:06:34,000

because once again, he immediately heads off in the wrong direction.

120

00:06:34,000 --> 00:06:36,000

I'm lost.

121

00:06:36,000 --> 00:06:41,000

Trying to walk in a straight line while being blindfolded is an exercise in futility,

122

00:06:41,000 --> 00:06:46,000

because without any cues like vision or sounds and so on,

123

00:06:46,000 --> 00:06:51,000

you're relying on purely mechanical means of determining your direction.

124

00:06:51,000 --> 00:06:55,000

I feel like he's done Kehode and I'm following him around.

125

00:06:55,000 --> 00:06:58,000

But you're fluid, you're not like a machine.

126

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

You can kind of meander and wander,

127

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

and in fact, that's kind of what these GPS paths are showing,

128

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

is this looks like a meandering stream.

129

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

And that meandering, corkscrewing, leads Jamie and Adam straight to a firm conclusion.

130

00:07:13,000 --> 00:07:18,000

We came here to look at the myth that a person who is blindfolded cannot walk in a straight line,

131

00:07:18,000 --> 00:07:22,000

and we have definitely proven that with the data we've gathered.

132

00:07:22,000 --> 00:07:24,000

But the myth specifically says,

133

00:07:24,000 --> 00:07:26,000

travel and not just walk.

134

00:07:26,000 --> 00:07:29,000

So to complete the data set and nail the science,

135

00:07:29,000 --> 00:07:33,000

Adam and Jamie will be hitting the highways and waterways,

136

00:07:33,000 --> 00:07:37,000

attempting alternative forms of blindfold locomotion.

137

00:07:37,000 --> 00:07:38,000

What's next?

138

00:07:38,000 --> 00:07:40,000

Swimming blindfolded.

139

00:07:40,000 --> 00:07:41,000

Well, we can't do that here.

140

00:07:41,000 --> 00:07:42,000

No.

141

00:07:42,000 --> 00:07:43,000

Let's go someplace else.

142

00:07:43,000 --> 00:07:44,000

Alright.

143

00:07:54,000 --> 00:07:56,000

You're going to love this one.

144

00:07:56,000 --> 00:08:00,000

This myth is about a binary explosive that is used in Hollywood effects films.

145

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

A guy is transporting it in the trunk of his car.

146

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

He gets rear-ended and the car explodes.

147

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

Now here's the thing, under normal conditions,

148

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

until you mix the two parts together,

149

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

the explosive is completely stable.

150

00:08:12,000 --> 00:08:16,000

But once they're mixed, you can set it off by shooting it with a bullet.

151

00:08:16,000 --> 00:08:20,000

Okay, so the myth here is that the impact from a car crash has enough energy

152

00:08:20,000 --> 00:08:24,000

to actually set off this supposedly stable explosive.

153

00:08:24,000 --> 00:08:25,000

Exactly.

154

00:08:25,000 --> 00:08:27,000

Guns, car crashes, explosions.

155

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

I mean, it doesn't get any better than this.

156

00:08:29,000 --> 00:08:35,000

It's the rear-end fender-bender from Hollywood that was never meant to end up on screen.

157

00:08:35,000 --> 00:08:39,000

Considering it usually requires the impact of a gunshot to set it off,

158

00:08:39,000 --> 00:08:47,000

can a trunk full of special effects binary explosive really go bluey in a car crash?

159

00:08:47,000 --> 00:08:50,000

This is the first time we've actually used this particular explosive.

160

00:08:50,000 --> 00:08:53,000

So I think we might have to do a little research.

161

00:08:53,000 --> 00:08:57,000

Yeah, let's go to the bomb range and we'll ask ourselves four questions.

162

00:08:57,000 --> 00:08:58,000

One, what is it?

163

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

Two, how does it work?

164

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

Three, will a car collision set it off?

165

00:09:02,000 --> 00:09:05,000

And then four, will a bigger amount give us a bigger explosion?

166

00:09:05,000 --> 00:09:07,000

Explosions at the bomb range?

167

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

That's my favorite kind of research.

168

00:09:10,000 --> 00:09:15,000

With those four questions and no small amount of mayhem in mind...

169

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

Ah, guns and explosives, what could be better?

170

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

The Mythbusters rock up to the bomb range,

171

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

where it's time for our little shoot and tell.

172

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

This is the Hollywood binary explosive of the myth.

173

00:09:26,000 --> 00:09:29,000

You've got an oxidizer and a catalyst.

174

00:09:29,000 --> 00:09:32,000

The beauty of this, on their own, they're virtually inert.

175

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

But if you mix them together and shoot them with a high-powered rifle,

176

00:09:35,000 --> 00:09:39,000

you get a super-fast-chain reaction that gives you a really nice explosion.

177

00:09:39,000 --> 00:09:42,000

This is the first time we've used it on our show,

178

00:09:42,000 --> 00:09:47,000

but it shares many similarities with other high explosives that we have used on our show.

179

00:09:47,000 --> 00:09:51,000

Namely, it requires a shock wave in order to set it off.

180

00:09:51,000 --> 00:09:53,000

A hammer won't do it.

181

00:09:53,000 --> 00:09:56,000

A small handgun fire won't do it.

182

00:09:56,000 --> 00:09:59,000

Even automatic small caliber fire won't do it.

183

00:09:59,000 --> 00:10:03,000

You need a high-powered rifle, and that's what we're going to use.

184

00:10:03,000 --> 00:10:05,000

And this is the gun.

185

00:10:05,000 --> 00:10:07,000

It's a .308 sniper rifle.

186

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

This thing has a muzzle velocity of 2,500 feet per second.

187

00:10:10,000 --> 00:10:14,000

That's plenty of power to set off our binary explosive.

188

00:10:16,000 --> 00:10:18,000

Okay, here we go. Firey.

189

00:10:18,000 --> 00:10:21,000

Now, the plan is we're going to fire into our catalyst.

190

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

Okay, catalysts are low.

191

00:10:27,000 --> 00:10:29,000

No explosion.

192

00:10:29,000 --> 00:10:31,000

And then we're going to fire into our oxidizer.

193

00:10:36,000 --> 00:10:37,000

No explosion.

194

00:10:37,000 --> 00:10:39,000

Time to mix them.

195

00:10:40,000 --> 00:10:42,000

Then we're going to mix the two components together,

196

00:10:42,000 --> 00:10:45,000

fire into that, and see if it explodes.

197

00:10:45,000 --> 00:10:49,000

Now, if it explodes, that tells us a very important thing about this myth.

198

00:10:49,000 --> 00:10:52,000

The chemicals were mixed in the back of this guy's trunk,

199

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

which means that guy was crazy.

200

00:10:55,000 --> 00:10:58,000

Alright, this is the mix of binary explosive. You guys ready?

201

00:10:58,000 --> 00:10:59,000

Ready.

202

00:10:59,000 --> 00:11:00,000

Did you mix it good?

203

00:11:00,000 --> 00:11:01,000

Oh, I did.

204

00:11:04,000 --> 00:11:05,000

Wow!

205

00:11:05,000 --> 00:11:06,000

That was a good pop!

206

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

So we've come out to the bomb range to find out exactly what we're dealing with.

207

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

Turns out we're dealing with something pretty awesome.

208

00:11:16,000 --> 00:11:20,000

You mix it together, you add a little energy from a high-powered rifle,

209

00:11:21,000 --> 00:11:25,000

and you get a chemical reaction that results in a cloud of rapidly expanding gases,

210

00:11:25,000 --> 00:11:27,000

or as we like to call it, an explosion.

211

00:11:28,000 --> 00:11:30,000

Now the question is, what's next?

212

00:11:30,000 --> 00:11:31,000

Does more equal more?

213

00:11:31,000 --> 00:11:36,000

If we ramp up to a trunk full of this stuff, how much bigger will the explosion be?

214

00:11:36,000 --> 00:11:39,000

That's right, it's bigger boom time.

215

00:11:39,000 --> 00:11:41,000

Next on MythBusters,

216

00:11:42,000 --> 00:11:46,000

the walrus is back in is not so natural habitat.

217

00:11:46,000 --> 00:11:47,000

And later,

218

00:11:48,000 --> 00:11:51,000

Carrie Grant and Tori ramp it up with rockets.

219

00:11:56,000 --> 00:12:03,000

Our myth-busting pedestrians have already established that blindfolds and straight lines don't mix.

220

00:12:03,000 --> 00:12:04,000

Whoa!

221

00:12:07,000 --> 00:12:09,000

But how about other types of travel?

222

00:12:09,000 --> 00:12:11,000

I can't believe we didn't get pulled over.

223

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

We've already established that when blindfolded, we were unable to walk in a straight line.

224

00:12:16,000 --> 00:12:21,000

Now, it's time to find out if we're able to swim in a straight line while blindfolded.

225

00:12:21,000 --> 00:12:24,000

Each of us will take a turn putting on a pair of blacked-out swimming goggles.

226

00:12:24,000 --> 00:12:29,000

Then we'll see if we can swim a straight line from here to the reflector across the lake.

227

00:12:29,000 --> 00:12:31,000

The GPS will tell us how we did.

228

00:12:31,000 --> 00:12:33,000

You know what I like about tests when I get to our wetsuit?

229

00:12:33,000 --> 00:12:37,000

Tight material tends to hold me in a little bit, make me look a little less tubby.

230

00:12:39,000 --> 00:12:40,000

It's not working, is it?

231

00:12:40,000 --> 00:12:41,000

Oh, crap.

232

00:12:41,000 --> 00:12:43,000

Speaking of body shape,

233

00:12:43,000 --> 00:12:50,000

GPS me is the wonky walking of the previous test all about that particular method of movement.

234

00:12:50,000 --> 00:12:52,000

Woof! Woof!

235

00:12:52,000 --> 00:12:54,000

Oh, it's cold!

236

00:12:54,000 --> 00:13:00,000

Will the biomechanics of swimming keep our out-of-shape swim team on the straight and narrow?

237

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

Well, a mere 30 feet into the test, it's clear that the blindfold,

238

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

by blocking out any visual landmarks, makes the answer a drifting, dizzying, no.

239

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

He's swimming around and around in a corkscrew.

240

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

Once again, the really compelling detail is not how far off course Adam is straying.

241

00:13:19,000 --> 00:13:21,000

I must be close!

242

00:13:21,000 --> 00:13:24,000

But that he thinks he's going straight.

243

00:13:24,000 --> 00:13:26,000

I feel like I'm doing pretty good.

244

00:13:26,000 --> 00:13:27,000

Can I met the landscape?

245

00:13:27,000 --> 00:13:29,000

The target's still right there.

246

00:13:29,000 --> 00:13:31,000

No, no Adam, it isn't.

247

00:13:31,000 --> 00:13:34,000

Let's see if the walrus can do any better.

248

00:13:34,000 --> 00:13:35,000

I'm ready.

249

00:13:35,000 --> 00:13:37,000

Well, Adam didn't do so well.

250

00:13:37,000 --> 00:13:39,000

Will I be able to do any better?

251

00:13:39,000 --> 00:13:42,000

Without any kind of reference, I don't see why I would.

252

00:13:42,000 --> 00:13:47,000

Aiming blindfolded for a target straight across the lake, two things are clear.

253

00:13:47,000 --> 00:13:53,000

For a marine mammal, he is clearly not at home in the water.

254

00:13:53,000 --> 00:13:56,000

And his pretest prediction was right.

255

00:13:56,000 --> 00:14:00,000

As well as the occasional left, followed by a right.

256

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

Some more right, and well, you get the picture.

257

00:14:05,000 --> 00:14:09,000

But Jamie didn't fare any better than I did in attempting to swim in a straight line.

258

00:14:09,000 --> 00:14:11,000

In fact, he fared far worse.

259

00:14:11,000 --> 00:14:15,000

He did have the intuition in the middle that things were going horribly awry.

260

00:14:15,000 --> 00:14:17,000

I get the feeling I'm swimming in a circle.

261

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

Whereas I thought I was heading straight for the target.

262

00:14:20,000 --> 00:14:22,000

Verding's time.

263

00:14:22,000 --> 00:14:24,000

Is it possible to swim in a straight line while blindfolded?

264

00:14:24,000 --> 00:14:25,000

No.

265

00:14:25,000 --> 00:14:26,000

So what's next?

266

00:14:26,000 --> 00:14:27,000

Driving.

267

00:14:27,000 --> 00:14:29,000

I love it.

268

00:14:30,000 --> 00:14:39,000

Can the impact energy of a fender bender set off a trunk load of binary explosive

269

00:14:39,000 --> 00:14:42,000

and blow a cart of smithereens?

270

00:14:42,000 --> 00:14:47,000

Carrie Grant and Tori are at the bomb range aiming to find out.

271

00:14:47,000 --> 00:14:49,000

Wow!

272

00:14:49,000 --> 00:14:50,000

That's a good pop.

273

00:14:50,000 --> 00:14:55,000

So we know if we're working with explosives like Ampho, when you use more of it, you get a bigger boom.

274

00:14:55,000 --> 00:14:57,000

It seems pretty obvious.

275

00:14:57,000 --> 00:14:59,000

But that might not actually be the case here.

276

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

In special effects, they use really small quantities.

277

00:15:02,000 --> 00:15:04,000

One load is only half a pound.

278

00:15:04,000 --> 00:15:06,000

And in fact, when it's mixed, it's really, really stable.

279

00:15:06,000 --> 00:15:11,000

So what we need to know is if a single bullet will actually detonate the entire batch

280

00:15:11,000 --> 00:15:13,000

when you're using a very large quantity.

281

00:15:13,000 --> 00:15:17,000

Alright, this is Hollywood binary explosive double load.

282

00:15:17,000 --> 00:15:19,000

Send it.

283

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

Now as you can see from the destroyed box,

284

00:15:30,000 --> 00:15:33,000

doubling the material gave us at least double the explosion, if not more.

285

00:15:33,000 --> 00:15:37,000

But now what we want to see is if you had multiple cans mixed up,

286

00:15:37,000 --> 00:15:40,000

would hitting one of them set off a chain reaction,

287

00:15:40,000 --> 00:15:43,000

or would the one that got hit by a bullet just explode?

288

00:15:43,000 --> 00:15:45,000

So we're going to mix up five jars of this stuff,

289

00:15:45,000 --> 00:15:49,000

line them up, take a shot at one and see if it sets off the rest.

290

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

Alright, here we go.

291

00:15:51,000 --> 00:15:53,000

One.

292

00:15:53,000 --> 00:15:55,000

Wow!

293

00:15:55,000 --> 00:15:57,000

That was awesome!

294

00:15:57,000 --> 00:15:59,000

We got a chain reaction, they all went off.

295

00:15:59,000 --> 00:16:00,000

Totally.

296

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

I like combining guns and explosives.

297

00:16:02,000 --> 00:16:04,000

Yeah!

298

00:16:04,000 --> 00:16:07,000

When we first started the story, we had four questions.

299

00:16:07,000 --> 00:16:08,000

What is this explosive?

300

00:16:08,000 --> 00:16:09,000

How does it work?

301

00:16:09,000 --> 00:16:13,000

Does more equal a bigger boom and can a car crash set it off?

302

00:16:13,000 --> 00:16:15,000

Well, we have answers to the first three.

303

00:16:15,000 --> 00:16:17,000

You know what it is, you know how it works,

304

00:16:17,000 --> 00:16:23,000

and we know that one small canister will detonate a chain reaction in a much larger batch.

305

00:16:23,000 --> 00:16:27,000

So the big question is, will a high energy impact,

306

00:16:27,000 --> 00:16:31,000

other than a high velocity round be enough to set off our binary explosives?

307

00:16:31,000 --> 00:16:36,000

That's right, we are about to see if we can create an explosion from a car crash.

308

00:16:36,000 --> 00:16:40,000

Coming up next on MythBusters, where to leave my car?

309

00:16:49,000 --> 00:16:52,000

In the myth of the exploding fender bender,

310

00:16:53,000 --> 00:16:58,000

Carrie Grant and Tori are having fun playing with guns and blabble.

311

00:17:01,000 --> 00:17:05,000

Alright, so we know that our Hollywood binary explosive needs to be mixed to go off.

312

00:17:06,000 --> 00:17:10,000

We also know that it takes a high velocity round to make it explode,

313

00:17:10,000 --> 00:17:15,000

and that it can go off in a chain reaction, even if it's in several different little containers.

314

00:17:15,000 --> 00:17:21,000

So now we want to see if an impact will set off this binary explosive,

315

00:17:21,000 --> 00:17:23,000

just like in a car crash.

316

00:17:23,000 --> 00:17:25,000

Take a big haul, you need a big shovel.

317

00:17:25,000 --> 00:17:29,000

So to replicate the exact conditions of the mythical scenario,

318

00:17:29,000 --> 00:17:32,000

the team is setting up for an actual car crash.

319

00:17:32,000 --> 00:17:34,000

Somebody order a car?

320

00:17:34,000 --> 00:17:36,000

In a controlled environment.

321

00:17:36,000 --> 00:17:39,000

Now you'll notice we're not on a road or on a runway.

322

00:17:39,000 --> 00:17:44,000

Turns out it's really hard to find a place that'll let you crash a car with explosives.

323

00:17:44,000 --> 00:17:46,000

So this is our answer.

324

00:17:46,000 --> 00:17:50,000

We're going to bury a car halfway deep, so that just the trunk is sticking out.

325

00:17:50,000 --> 00:17:53,000

Recreate the crash by dropping another car at 150 feet,

326

00:17:53,000 --> 00:17:59,000

so that it hits at three-way speed, with 50 pounds of binary explosive in the truck.

327

00:17:59,000 --> 00:18:05,000

Alright, so now that we have our hull dug, it's time to put our car nose down into the hull.

328

00:18:05,000 --> 00:18:13,000

This way the car won't move at all when we drop the other car from 150 feet from the crane into the trunk.

329

00:18:13,000 --> 00:18:15,000

Looks like we got a big one.

330

00:18:16,000 --> 00:18:20,000

With 50 pounds of premixed binary explosive in the trunk,

331

00:18:20,000 --> 00:18:23,000

20 times more than this,

332

00:18:24,000 --> 00:18:28,000

it could well be the end of the road for our flame-covered friend.

333

00:18:28,000 --> 00:18:31,000

Alright, car's loaded, let's drop a car on it.

334

00:18:31,000 --> 00:18:36,000

We're almost doubling the speed, and the collision will create 880,000 joules of kinetic energy.

335

00:18:36,000 --> 00:18:37,000

Yeah.

336

00:18:37,000 --> 00:18:39,000

I still don't think it's going to explode.

337

00:18:39,000 --> 00:18:42,000

Well, there's only one way to find out.

338

00:18:42,000 --> 00:18:45,000

Dropping a car from 150 feet at 60 miles an hour,

339

00:18:45,000 --> 00:18:49,000

and crashing it into another car that's standing on end,

340

00:18:49,000 --> 00:18:52,000

half buried in the ground, with a trunk full of explosives.

341

00:18:52,000 --> 00:18:54,000

Just another day at the office.

342

00:18:54,000 --> 00:18:57,000

Alright, this is freeway speed.

343

00:18:57,000 --> 00:19:01,000

100 loads of binary explosive in the trunk, rear-end collision.

344

00:19:01,000 --> 00:19:04,000

In three, two, one.

345

00:19:10,000 --> 00:19:12,000

Correct hit.

346

00:19:12,000 --> 00:19:14,000

That was a great hit.

347

00:19:14,000 --> 00:19:16,000

No explosion.

348

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

No explosion, and with the circumstances of the myth recreated exactly,

349

00:19:24,000 --> 00:19:26,000

albeit at 90 degrees,

350

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

the damning conclusion is quick to follow.

351

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

We wanted to create a crash at freeway speed.

352

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

I think we did one better.

353

00:19:35,000 --> 00:19:37,000

Why? Because that car's buried into the ground.

354

00:19:37,000 --> 00:19:40,000

It had nowhere to go. That means it absorbed all the energy of the collision.

355

00:19:40,000 --> 00:19:42,000

Still, no explosion.

356

00:19:42,000 --> 00:19:43,000

This myth is busted.

357

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

Under normal circumstances, the myth is busted.

358

00:19:46,000 --> 00:19:50,000

But can the impact from a fender bender ever initiate an explosion

359

00:19:50,000 --> 00:19:52,000

under any circumstances?

360

00:19:52,000 --> 00:19:56,000

To find out, this story is getting super-sized.

361

00:19:56,000 --> 00:19:58,000

I think we need more speed.

362

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

Some extreme speed.

363

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

Well, we could make a rocket-powered car.

364

00:20:02,000 --> 00:20:04,000

I mean, that would give us a lot of speed.

365

00:20:04,000 --> 00:20:06,000

Alright, road trip.

366

00:20:06,000 --> 00:20:08,000

I hope this works.

367

00:20:11,000 --> 00:20:16,000

Having walked wonky, oh, and swum squiggly,

368

00:20:16,000 --> 00:20:19,000

the myth that it's impossible to stay on the straight and narrow

369

00:20:19,000 --> 00:20:22,000

while blindfolded is looking good.

370

00:20:22,000 --> 00:20:26,000

But our dynamic duo are covering all of their bases

371

00:20:26,000 --> 00:20:29,000

and taking human locomotion out of the equation.

372

00:20:29,000 --> 00:20:31,000

Even with the aid of a machine,

373

00:20:31,000 --> 00:20:35,000

can you travel a straight line while sight-deprived?

374

00:20:36,000 --> 00:20:38,000

It's a blindfolded driving. Should we get to it?

375

00:20:38,000 --> 00:20:40,000

I think so.

376

00:20:40,000 --> 00:20:42,000

This test is really simple.

377

00:20:42,000 --> 00:20:45,000

Once again, we're going to use blinders and hearing suppression.

378

00:20:45,000 --> 00:20:48,000

And all we're going to do is try and drive a straight line

379

00:20:48,000 --> 00:20:51,000

right towards the city of San Francisco.

380

00:20:51,000 --> 00:20:54,000

So that we can tell where we've been,

381

00:20:54,000 --> 00:20:58,000

we're going to attach this sports chalker to the back of our golf cart,

382

00:20:58,000 --> 00:21:00,000

and that line's going to tell the whole story.

383

00:21:00,000 --> 00:21:05,000

They'll also be using their trusty GPS unit to plot their course electronically.

384

00:21:05,000 --> 00:21:08,000

And in this most straightforward of tests,

385

00:21:08,000 --> 00:21:13,000

Adam thinks he's about to bust the myth by doing just that, going straight.

386

00:21:13,000 --> 00:21:14,000

I do have a prediction for this test.

387

00:21:14,000 --> 00:21:18,000

I don't think it's going to be very hard to drive in a straight line.

388

00:21:18,000 --> 00:21:24,000

I think all I need to do is align the wheels and not move my hands.

389

00:21:24,000 --> 00:21:26,000

I'm holding my hands steady,

390

00:21:26,000 --> 00:21:29,000

but I can't shake the feeling that I'm drifting to the right.

391

00:21:29,000 --> 00:21:31,000

Interesting.

392

00:21:31,000 --> 00:21:35,000

Once again, Adam rejects straight line reality

393

00:21:35,000 --> 00:21:39,000

in favor of his own internal vision.

394

00:21:39,000 --> 00:21:41,000

Okay, you're going to have to stop.

395

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

Well, you can open your eyes.

396

00:21:47,000 --> 00:21:49,000

I was drifting to the left?

397

00:21:49,000 --> 00:21:51,000

Yeah. Want to try again?

398

00:21:51,000 --> 00:21:53,000

Absolutely.

399

00:21:53,000 --> 00:21:58,000

But two further tests only confirm the fact that driving in a straight line

400

00:21:58,000 --> 00:22:01,000

is not as simple as holding the steering wheel steady.

401

00:22:01,000 --> 00:22:04,000

Oh, I feel a terrain change.

402

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

I think I'm in trouble.

403

00:22:07,000 --> 00:22:12,000

Any number of small adjustments and corrections have to be made to stay the course.

404

00:22:12,000 --> 00:22:17,000

You know, I think the wind is like giving me a false feeling of turning.

405

00:22:17,000 --> 00:22:18,000

I could be.

406

00:22:18,000 --> 00:22:23,000

Adjustments that are impossible to make for Adam at least without a visual reference.

407

00:22:24,000 --> 00:22:26,000

Ha ha ha ha!

408

00:22:26,000 --> 00:22:27,000

Whoa!

409

00:22:27,000 --> 00:22:29,000

It drove us into the middle of a field.

410

00:22:29,000 --> 00:22:33,000

And GPS data illustrates that perfectly.

411

00:22:33,000 --> 00:22:38,000

The question is, can Jamie do any better on his three test drives?

412

00:22:38,000 --> 00:22:39,000

Go!

413

00:22:42,000 --> 00:22:47,000

Basically, I'm trying to focus on my internal sense of orientation.

414

00:22:47,000 --> 00:22:50,000

And I have to say, it doesn't feel like it's very accurate.

415

00:22:50,000 --> 00:22:52,000

That doesn't feel right.

416

00:22:53,000 --> 00:22:57,000

That leaves me with only a very rough sense of what I'm doing based on the wind

417

00:22:57,000 --> 00:23:01,000

and the roughness of the road, which isn't a whole heck of a lot.

418

00:23:01,000 --> 00:23:04,000

Honey, I could be going around in circles for a while, I think.

419

00:23:04,000 --> 00:23:08,000

So this doesn't really work too well, I don't think.

420

00:23:08,000 --> 00:23:11,000

Despite making it further down the runway than Adam,

421

00:23:11,000 --> 00:23:16,000

Jamie has only given this myth another kick in the confirmed direction.

422

00:23:16,000 --> 00:23:20,000

So far, we've walked, we've swum, and now we've driven.

423

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

I'll admit, I thought we weren't going to get anything out of the driving test

424

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

in terms of results.

425

00:23:24,000 --> 00:23:27,000

But I mean, supposedly, during this machine, where all you need to do

426

00:23:27,000 --> 00:23:31,000

is hold tight to the steering wheel and it'll carry you on a straight line.

427

00:23:31,000 --> 00:23:34,000

The only thing that's very steady is the strong wind.

428

00:23:34,000 --> 00:23:38,000

But even in that machine, the kinesthetic feedback we're getting from the world

429

00:23:38,000 --> 00:23:40,000

forced both Jamie and I to make corrections.

430

00:23:40,000 --> 00:23:44,000

These corrections were based on a map of our landscape we had in our head,

431

00:23:44,000 --> 00:23:48,000

which wasn't correct, and thus our corrections were incorrect,

432

00:23:48,000 --> 00:23:51,000

and sent us careening all over the runway, even driving,

433

00:23:51,000 --> 00:23:53,000

and we could not make a straight line.

434

00:23:53,000 --> 00:23:57,000

It's an interesting anomaly, and there seems to be no rhyme or reason

435

00:23:57,000 --> 00:23:59,000

as to why we can't do it.

436

00:23:59,000 --> 00:24:04,000

There's no correlation between left and right handedness or body asymmetry.

437

00:24:04,000 --> 00:24:08,000

It simply appears that deprived of our eyesight,

438

00:24:08,000 --> 00:24:14,000

we are physically incapable of maintaining the unnatural construct of a straight line.

439

00:24:14,000 --> 00:24:18,000

So the myth is confirmed, but Adam and Jamie want to take it further

440

00:24:18,000 --> 00:24:22,000

and explore the real world implications.

441

00:24:29,000 --> 00:24:34,000

OK, so a 60 mile an hour crash is not going to set it off, but we can't stop there.

442

00:24:34,000 --> 00:24:36,000

All right, how about this?

443

00:24:36,000 --> 00:24:41,000

How about instead of a regular fender bender, it was like a super car crashing into the back

444

00:24:41,000 --> 00:24:43,000

of another car, it's a couple hundred miles an hour?

445

00:24:43,000 --> 00:24:47,000

I love it, and I know exactly where we're going to go to test this. Road trip?

446

00:24:47,000 --> 00:24:50,000

Yeah, but just in case, let's not put the explosive in the trunk.

447

00:24:50,000 --> 00:24:51,000

Good idea.

448

00:24:51,000 --> 00:24:57,000

When ramping it up is on the menu, there's one location that's guaranteed to find the dial marked.

449

00:24:57,000 --> 00:25:02,000

Awesome, turn it up to 11, rip it off, and run away laughing.

450

00:25:02,000 --> 00:25:04,000

Perfect day for science.

451

00:25:04,000 --> 00:25:09,000

So we are back at New Mexico Tech, one of the most incredible test facilities in the world.

452

00:25:09,000 --> 00:25:13,000

Why are we here? Because of their rocket sled.

453

00:25:13,000 --> 00:25:17,000

Last time we were here, we split a car in half.

454

00:25:17,000 --> 00:25:22,000

With this track, our rocket sled should be able to accelerate with 63,000 pounds of thrust

455

00:25:22,000 --> 00:25:30,000

over a quarter second upwards of 300 miles an hour to create what we hope is going to be the world's fastest car crash.

456

00:25:33,000 --> 00:25:35,000

And this is our target car.

457

00:25:35,000 --> 00:25:43,000

It's completely isolated if we're stopped on the freeway with 200 loads of mixed binary explosive in the trunk.

458

00:25:43,000 --> 00:25:48,000

When that rocket sled car comes crashing into the back end, we will find out once and for all

459

00:25:48,000 --> 00:25:53,000

if a collision has enough energy to create a detonation and give us a massive explosion.

460

00:25:53,000 --> 00:26:00,000

But before the team launches a rocket-propelled fender bender, a control is required.

461

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

You know it's going to be a good experiment when the control test is a massive explosion.

462

00:26:04,000 --> 00:26:07,000

Knowing just what kind of havoc the rocket sled can wreak,

463

00:26:10,000 --> 00:26:15,000

detecting whether the binary explosive has actually detonated amongst the carnage,

464

00:26:15,000 --> 00:26:18,000

what an impossibly large force.

465

00:26:18,000 --> 00:26:20,000

may be difficult.

466

00:26:20,000 --> 00:26:22,000

Mythbusters version of cocktail.

467

00:26:22,000 --> 00:26:23,000

Shaking off dirt.

468

00:26:23,000 --> 00:26:28,000

So to be sure, the team will set off the same amount of binary explosive,

469

00:26:28,000 --> 00:26:34,000

200 loads in the trunk of this car and establish a devastation benchmark.

470

00:26:34,000 --> 00:26:36,000

This is the biggest bomb range at New Mexico Tech.

471

00:26:36,000 --> 00:26:39,000

New Mexico Tech, where you can get a PhD and blow in **** up.

472

00:26:39,000 --> 00:26:42,000

In fact, it's also the most robust bunker.

473

00:26:42,000 --> 00:26:46,000

It is built to withstand 20,000 pounds of TNT.

474

00:26:46,000 --> 00:26:49,000

Our explosion is not quite that big, but it's within the spirit of the myth,

475

00:26:49,000 --> 00:26:51,000

a trunk full of binary explosive.

476

00:26:51,000 --> 00:26:57,000

Okay, so because this is potentially so dangerous, we need to be very far away and underground.

477

00:26:57,000 --> 00:26:58,000

Oh, sweet home.

478

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

So we're going to do it the old fashioned way.

479

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

We used to detonate it.

480

00:27:01,000 --> 00:27:07,000

All right, this is binary car control filled with 200 loads of binary explosive.

481

00:27:07,000 --> 00:27:11,000

In five, four, three, two, one.

482

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

Wow, that was a massive explosion.

483

00:27:23,000 --> 00:27:25,000

That was an incredible explosion.

484

00:27:25,000 --> 00:27:29,000

I mean, I had no idea this binary explosive had this much destructive power,

485

00:27:29,000 --> 00:27:34,000

but we know that they took a blast cap in order to set this off.

486

00:27:36,000 --> 00:27:41,000

The real question now is, will a car crash have enough energy to set this off

487

00:27:41,000 --> 00:27:42,000

and do the same amount of damage?

488

00:27:42,000 --> 00:27:44,000

Well, at least now we have a benchmark.

489

00:27:44,000 --> 00:27:48,000

In the ramped up rocket sled crash, they'll be looking for a shock wave,

490

00:27:48,000 --> 00:27:54,000

followed by a fireball and the car roof being blown 200 feet in the air.

491

00:27:54,000 --> 00:27:57,000

And those are just the control benchmarks.

492

00:27:57,000 --> 00:28:03,000

With that, it's time to hit the track and set up for the fender bender to end all fender benders.

493

00:28:03,000 --> 00:28:09,000

I know this engine doesn't look like much, but it's going to be putting out a million horsepower today.

494

00:28:09,000 --> 00:28:13,000

This is the first time New Mexico Tech has actually put a car on the rocket sled.

495

00:28:13,000 --> 00:28:14,000

There's a lot of jeopardy here.

496

00:28:14,000 --> 00:28:20,000

Aerodynamically, if that car starts to lift off the track, it's going to pull that rocket sled off of the track,

497

00:28:20,000 --> 00:28:22,000

crash the experiment and the track.

498

00:28:22,000 --> 00:28:26,000

Hence the concerted team effort preparing the impact vehicle.

499

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

A truck with rockets as standard.

500

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

This is the first time they are flying a vehicle down the track.

501

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

Anything can happen.

502

00:28:33,000 --> 00:28:36,000

But there's one thing Tori thinks won't happen.

503

00:28:36,000 --> 00:28:39,000

Now we know a high powered rifle will set off the binary explosive.

504

00:28:39,000 --> 00:28:44,000

Nat is traveling at 2,000 feet per second, which is 1,400 miles an hour.

505

00:28:44,000 --> 00:28:45,000

Wouldn't be a truck without one of these.

506

00:28:48,000 --> 00:28:51,000

Now our car is only going to be traveling at 300 miles an hour.

507

00:28:51,000 --> 00:28:56,000

So I have a hard time believing that that crash is going to be enough to detonate the explosive.

508

00:28:56,000 --> 00:29:00,000

But we have done everything we can scientifically to cover our bases.

509

00:29:00,000 --> 00:29:02,000

Let's see what happens.

510

00:29:02,000 --> 00:29:06,000

With a trunk full of pre-mix binary explosives in the target car.

511

00:29:06,000 --> 00:29:08,000

200 loads.

512

00:29:09,000 --> 00:29:14,000

All that's left to do is winch the truck back to the start of the track and add the rockets.

513

00:29:14,000 --> 00:29:16,000

These are 5 inch HVAR rockets.

514

00:29:16,000 --> 00:29:18,000

There's going to be 10 of them on our sled.

515

00:29:18,000 --> 00:29:22,000

Now they were made in the 1950s, but believe me, they still pack a punch.

516

00:29:22,000 --> 00:29:26,000

They're going to give us 65,000 pounds of thrust in a quarter of a second.

517

00:29:26,000 --> 00:29:30,000

That causes sled to experience 17 Gs of acceleration.

518

00:29:30,000 --> 00:29:33,000

That should be more than enough to get our truck going.

519

00:29:33,000 --> 00:29:36,000

Next, it's Myth Buster vs. Wild.

520

00:29:36,000 --> 00:29:40,000

Will you really walk in circles in the woods?

521

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

Oh crap.

522

00:29:47,000 --> 00:29:55,000

So, the blindfold cleanly removed our ability to walk, swim, or even drive in anything remotely approaching a straight line.

523

00:29:55,000 --> 00:29:57,000

Well that pretty much means the myth is confirmed, doesn't it?

524

00:29:57,000 --> 00:30:00,000

Yeah, but there's something that's still bugging me about this story.

525

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

What's that?

526

00:30:01,000 --> 00:30:06,000

Well, under no circumstances do humans ever actually try and perambulate while blindfolded.

527

00:30:06,000 --> 00:30:08,000

Where's the real world application?

528

00:30:08,000 --> 00:30:09,000

What do you have in mind?

529

00:30:09,000 --> 00:30:15,000

I'm thinking that if humans are supposed to get lost in the woods and that they supposedly walk in circles,

530

00:30:15,000 --> 00:30:20,000

let's you and me head out to the woods and see if we can get lost and end up walking in circles.

531

00:30:20,000 --> 00:30:21,000

It's a plan.

532

00:30:21,000 --> 00:30:22,000

Excellent.

533

00:30:22,000 --> 00:30:29,000

It's widely reported that unprepared walkers lost in the woods unwittingly wander in circles,

534

00:30:29,000 --> 00:30:33,000

with no clear view of their destination or established landmarks.

535

00:30:33,000 --> 00:30:37,000

It's as if they were blindfolded.

536

00:30:37,000 --> 00:30:43,000

It's a potential life-saving story Adam and Jamie can't resist tackling.

537

00:30:43,000 --> 00:30:48,000

Behold the Heinemann in his natural habitat.

538

00:30:48,000 --> 00:30:53,000

On a clear day in unknown territory, unable to see their direction for the trees,

539

00:30:53,000 --> 00:30:56,000

can they stick to a pre-selected bearing?

540

00:30:56,000 --> 00:31:06,000

Jamie and I are each going to choose a specific trajectory and try and walk a straight line on that trajectory while being tracked by a GPS.

541

00:31:06,000 --> 00:31:10,000

In three, two, one, here we go.

542

00:31:10,000 --> 00:31:15,000

After 30 minutes, we're going to come back home and see exactly how we did.

543

00:31:15,000 --> 00:31:18,000

Now I'm not talking walking a straight line like a ruler.

544

00:31:18,000 --> 00:31:24,000

I'm talking I have some place I need to get to and I want to go there directly.

545

00:31:24,000 --> 00:31:28,000

I'm going to be doing several things to keep me walking in a straight line.

546

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

I'm going to try and take sightings off of trees or other landmarks,

547

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

and I'm going to note my position relative to the sun.

548

00:31:34,000 --> 00:31:38,000

Right now the sun is directly overhead and off to my left.

549

00:31:38,000 --> 00:31:42,000

And so if I want to use that to orient myself as I'm walking through the forest,

550

00:31:42,000 --> 00:31:46,000

all I have to do is keep it in approximately that position.

551

00:31:46,000 --> 00:31:49,000

Of course, as time passes, it's going to move through the sky,

552

00:31:49,000 --> 00:31:54,000

but I can still keep it kind of on that one side fairly easily to compensate for it,

553

00:31:54,000 --> 00:31:57,000

and that'll make sure I don't walk in circles.

554

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

Oh, that's the time. Time to go home.

555

00:32:03,000 --> 00:32:08,000

Using their trusty GPS units, they head back to position one where the results are in.

556

00:32:08,000 --> 00:32:12,000

Despite terrain obstacles and obscured long-range visibility,

557

00:32:12,000 --> 00:32:17,000

Jamie, using a range of techniques, maintained a very accurate trajectory.

558

00:32:17,000 --> 00:32:20,000

And even Adam generally headed in the right direction.

559

00:32:20,000 --> 00:32:26,000

Using the sun to get his bearings, he clearly avoided the corkscrewing the myth implies.

560

00:32:28,000 --> 00:32:31,000

While I might not have the survival training that Jamie has,

561

00:32:31,000 --> 00:32:34,000

my techniques actually worked pretty good with the help of a gorgeous day in the sun.

562

00:32:34,000 --> 00:32:37,000

I was able to maintain a reasonably straight trajectory.

563

00:32:37,000 --> 00:32:42,000

But for the next test, they're going to make things tougher and turn off the sun.

564

00:32:42,000 --> 00:32:46,000

We have to replicate a situation that is less than optimal as far as navigating.

565

00:32:46,000 --> 00:32:51,000

Maybe it's a snowstorm, or maybe it's at night, and all you've got is a flashlight.

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00:32:51,000 --> 00:32:56,000

One way or another, you can only see in the immediate vicinity right next to you.

567

00:32:56,000 --> 00:33:02,000

Now, I tried a number of different things back at the shop to see if I could recreate that kind of situation.

568

00:33:06,000 --> 00:33:07,000

Definitely not.

569

00:33:07,000 --> 00:33:13,000

And it turns out the perfect artificial snowstorm used by experts to train for wide-out conditions,

570

00:33:13,000 --> 00:33:18,000

where your vision is restricted to a radius of just a few feet, is the bucket head.

571

00:33:20,000 --> 00:33:21,000

Okay, here we go.

572

00:33:22,000 --> 00:33:25,000

As before, Adam and Jamie have a pre-selected bearing.

573

00:33:25,000 --> 00:33:29,000

They can see their feet at a limited distance in front of them.

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00:33:29,000 --> 00:33:34,000

But crucially, they can't see the sun or use long-range sight markers.

575

00:33:34,000 --> 00:33:38,000

But our expert outdoorsman has his technique down pat.

576

00:33:38,000 --> 00:33:43,000

By methodically pacing at right angles around direct obstacles...

577

00:33:43,000 --> 00:33:45,000

They're forward.

578

00:33:45,000 --> 00:33:48,000

...he maintains his straight-line trajectory.

579

00:33:48,000 --> 00:33:51,000

And go forward again.

580

00:33:51,000 --> 00:33:59,000

While Jamie robotically paces towards his goal, the extreme conditions get the better of untrained Adam.

581

00:33:59,000 --> 00:34:02,000

Something tells me that things have gone horribly wrong.

582

00:34:02,000 --> 00:34:06,000

...until he's simply wandering in the woods with a bucket on his head.

583

00:34:07,000 --> 00:34:17,000

With the test complete, the GPS results show that Erwinite Adam beautifully illustrated just how important survival training is in extreme conditions.

584

00:34:17,000 --> 00:34:21,000

Look at that! I almost drew an ampersand in the woods.

585

00:34:21,000 --> 00:34:27,000

In contrast, Jamie's route was indicative of his practical approach and technique.

586

00:34:27,000 --> 00:34:29,000

I think we've learned an important lesson here.

587

00:34:29,000 --> 00:34:31,000

You don't have to obliterate someone's vision.

588

00:34:31,000 --> 00:34:35,000

You can just merely restrict it, and all of a sudden they might start walking in circles.

589

00:34:35,000 --> 00:34:40,000

Right. But with proper training, you can still walk into the straight line and to safety.

590

00:34:40,000 --> 00:34:42,000

Thanks, Jamie.

591

00:34:42,000 --> 00:34:47,000

Yep, while lost in the woods, as long as you can see the sun, anyone can walk in a straight line.

592

00:34:47,000 --> 00:34:52,000

However, with limited visibility, you'll need training and a disciplined approach.

593

00:34:52,000 --> 00:34:55,000

But is there another option for a successful escape?

594

00:34:55,000 --> 00:34:57,000

What about teamwork?

595

00:34:57,000 --> 00:34:58,000

Let's get out of here.

596

00:34:58,000 --> 00:34:59,000

I'll navigate.

597

00:34:59,000 --> 00:35:00,000

Alright.

598

00:35:01,000 --> 00:35:03,000

Coming up, there's a blast-off...

599

00:35:04,000 --> 00:35:05,000

...and a dance-off.

600

00:35:05,000 --> 00:35:07,000

Watch, I can make Jimmy dance.

601

00:35:15,000 --> 00:35:20,000

One way or another, it seems that humans are not inclined to walk in a straight line if they can't see very well.

602

00:35:20,000 --> 00:35:25,000

It makes me wonder, though, if there's not some kind of mechanical solution.

603

00:35:27,000 --> 00:35:29,000

This I've got to see.

604

00:35:30,000 --> 00:35:34,000

All episode long, Adam and I have been trying to travel in a straight line.

605

00:35:34,000 --> 00:35:37,000

I'm holding my hands firm and steady. What's wrong with me?

606

00:35:37,000 --> 00:35:40,000

Without very much success, I must say.

607

00:35:40,000 --> 00:35:42,000

He's swimming around and around in a corkscrew.

608

00:35:42,000 --> 00:35:46,000

But now we've had an idea that may just be the solution to our problem.

609

00:35:46,000 --> 00:35:50,000

And we're not exactly sure, but the problem seems to be that, lacking any stimulus,

610

00:35:50,000 --> 00:35:53,000

the human mind creates a landscape for itself.

611

00:35:53,000 --> 00:35:55,000

Can't shake the feeling that I'm drifting to the right.

612

00:35:55,000 --> 00:35:57,000

That's not exactly correct.

613

00:35:57,000 --> 00:36:02,000

And then makes corrections based on that landscape that lead it very far astray, very, very quickly.

614

00:36:02,000 --> 00:36:07,000

So we thought, what if a device could be created that would allow two people working in tandem

615

00:36:07,000 --> 00:36:11,000

to directly, physically feel when they were being led off of a straight line?

616

00:36:11,000 --> 00:36:13,000

That's when we came up with this.

617

00:36:14,000 --> 00:36:18,000

By securing themselves into each end of a rigid straight line tether,

618

00:36:18,000 --> 00:36:24,000

the theory is physical feedback from the hip harnesses will alert them if they wander off the straight and narrow.

619

00:36:26,000 --> 00:36:28,000

Hey, watch, I can make Jimmy dance.

620

00:36:28,000 --> 00:36:34,000

The fatal flaw for our blindfoldees could be the high degree of teamwork required.

621

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

That's enough of that.

622

00:36:36,000 --> 00:36:41,000

With their simple A to arrow course set up, it's time to turn out the lights.

623

00:36:41,000 --> 00:36:43,000

I got my goggles. Here we go.

624

00:36:43,000 --> 00:36:47,000

In three, two, one, let's go.

625

00:36:47,000 --> 00:36:50,000

They're off, and the early signs are encouraging.

626

00:36:50,000 --> 00:36:53,000

I feel like walking in a nice straight line.

627

00:36:53,000 --> 00:36:54,000

Okay.

628

00:36:54,000 --> 00:36:58,000

Unlike Jamie's solo efforts, when he veered off course very early,

629

00:36:58,000 --> 00:37:02,000

our pair of parameters look like they've got this conundrum cracked.

630

00:37:02,000 --> 00:37:05,000

Now I know what it really is like to have a monkey in your back.

631

00:37:05,000 --> 00:37:07,000

Ha ha ha!

632

00:37:07,000 --> 00:37:13,000

But it's not long before their internal reality conflicts with the real one, and they steer off course.

633

00:37:13,000 --> 00:37:17,000

In my mental landscape, we're traveling slightly to the right of the arrow.

634

00:37:17,000 --> 00:37:20,000

Feels like we're doing okay. I feel like you're leaning a little to the right.

635

00:37:20,000 --> 00:37:25,000

Our device's whole point was to try and add a kinesthetic sense to the human body

636

00:37:25,000 --> 00:37:28,000

that it was moving off of a straight line.

637

00:37:28,000 --> 00:37:33,000

And I honestly felt like we were maybe slightly veering off course,

638

00:37:33,000 --> 00:37:40,000

but we walked a complete horseshoe, and not once did I have the sense that we were making a tight turn.

639

00:37:40,000 --> 00:37:41,000

Just didn't work.

640

00:37:41,000 --> 00:37:44,000

Ha ha ha ha ha!

641

00:37:44,000 --> 00:37:46,000

We're basically where we started!

642

00:37:46,000 --> 00:37:48,000

That's amazing.

643

00:37:48,000 --> 00:37:50,000

The arrow's way over there!

644

00:37:50,000 --> 00:37:53,000

Ha ha ha ha!

645

00:37:53,000 --> 00:37:55,000

This didn't work at all!

646

00:37:55,000 --> 00:37:57,000

Well, what are you going to do? That's science.

647

00:37:57,000 --> 00:38:01,000

You come up with a theory, you test it, either it works or it doesn't.

648

00:38:01,000 --> 00:38:03,000

And in this case, it didn't.

649

00:38:04,000 --> 00:38:06,000

Are we ready?

650

00:38:06,000 --> 00:38:08,000

Yes, we're ready.

651

00:38:08,000 --> 00:38:09,000

Right.

652

00:38:09,000 --> 00:38:13,000

Well, it would seem that all of our tests have definitively shown

653

00:38:13,000 --> 00:38:17,000

that human beings tend to lack the ability to walk in a straight line.

654

00:38:17,000 --> 00:38:22,000

Now, what we haven't attempted to figure out is the why of that phenomenon.

655

00:38:22,000 --> 00:38:26,000

But I think it's safe to say that it's confirmed.

656

00:38:29,000 --> 00:38:30,000

Are you there?

657

00:38:30,000 --> 00:38:33,000

I'm right here. It's totally confirmed. I agree.

658

00:38:33,000 --> 00:38:49,000

That's what the detonation of a trunk full of Hollywood binary explosive looks like.

659

00:38:49,000 --> 00:38:52,000

Love a good explosion in the morning.

660

00:38:52,000 --> 00:38:57,000

Question is, can the impact from a fender bender initiate that explosion?

661

00:38:57,000 --> 00:38:59,000

All right, ready? Launch!

662

00:38:59,000 --> 00:39:05,000

If a rocket-propelled truck can't do it, no conceivable car crash ever could.

663

00:39:05,000 --> 00:39:12,000

Because at 300 miles an hour, we're exceeding the speed of the fastest supercar on the road.

664

00:39:12,000 --> 00:39:15,000

This is binary explosive versus the rocket sled.

665

00:39:15,000 --> 00:39:17,000

It's this myth's final chance.

666

00:39:17,000 --> 00:39:18,000

Here we go.

667

00:39:18,000 --> 00:39:20,000

And final countdown.

668

00:39:20,000 --> 00:39:28,000

In five, four, three, two, one.

669

00:39:30,000 --> 00:39:35,000

Oh my god, what just happened?

670

00:39:35,000 --> 00:39:36,000

I don't know!

671

00:39:37,000 --> 00:39:47,000

What just happened was an old beat-up pickup truck powered by 10-H bar rockets

672

00:39:47,000 --> 00:39:55,000

pumping out 65,000 pounds in front of a full 17 Gs

673

00:39:55,000 --> 00:39:58,000

and got up to almost 300 miles an hour.

674

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

Oh my god, that was awesome.

675

00:40:02,000 --> 00:40:04,000

Wow!

676

00:40:04,000 --> 00:40:10,000

As fender benders go, that was at the end of the scale marked insane.

677

00:40:10,000 --> 00:40:16,000

But to find out whether the binary explosive in the trunk of the target car was detonated,

678

00:40:16,000 --> 00:40:21,000

the team needs to get a closer look and compare it to the control blast.

679

00:40:21,000 --> 00:40:26,000

We watched 200 loads of binary explosive detonate so that we could compare it to what we just witnessed.

680

00:40:26,000 --> 00:40:30,000

We saw a rocket sled come down the track at almost 300 miles an hour

681

00:40:30,000 --> 00:40:35,000

and crash into the back end of a car with the same amount of explosives.

682

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

Now, though a spectacular sight, it was not a detonation.

683

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

What we saw with our explosion was a flash of fire.

684

00:40:44,000 --> 00:40:47,000

What we saw here was a disintegration.

685

00:40:48,000 --> 00:40:51,000

Did anybody get the license plate on that car?

686

00:40:52,000 --> 00:40:56,000

Now we know that our binary explosive can be set off by a high-power rifle round.

687

00:40:58,000 --> 00:41:02,000

But this myth is about a collision, specifically a vehicle collision.

688

00:41:02,000 --> 00:41:10,000

We continue to ramp car speeds all the way up to nearly 300 miles per hour and still no detonation.

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00:41:10,000 --> 00:41:16,000

As incredible as it seems, the energy that could cause this type of damage was still not enough

690

00:41:16,000 --> 00:41:19,000

to initiate the explosion.

691

00:41:19,000 --> 00:41:22,000

And that's the beauty of binary explosives.

692

00:41:22,000 --> 00:41:29,000

Safety-conscious Hollywood Special Effects teams can rely on a very specific detonation fingerprint

693

00:41:29,000 --> 00:41:35,000

and know that any incidental impact will not have disastrous consequences.

694

00:41:36,000 --> 00:41:39,000

Which leaves just one conclusion.

695

00:41:39,000 --> 00:41:42,000

Wow, that was incredible.

696

00:41:42,000 --> 00:41:45,000

I don't think this myth can be any more busted.

697

00:41:45,000 --> 00:41:47,000

Now that was a high-speed crash.

698

00:41:47,000 --> 00:41:49,000

And you know what, you're not going to see a crash like that on the road.

699

00:41:49,000 --> 00:41:51,000

And even if you did, there'd be no explosion.

700

00:41:51,000 --> 00:41:53,000

Definitely not a detonation.

701

00:41:53,000 --> 00:41:59,000

Alright, so a collision from a car is never going to set off a trunkful of binary explosives.

702

00:41:59,000 --> 00:42:00,000

This one is busted.

703

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

Busted.

704

00:42:01,000 --> 00:42:02,000

Busted.

705

00:42:02,000 --> 00:42:03,000

That was awesome.