

1

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

On this episode of MythBusters, you're in charge.

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

The team randomly selects stories from the mailbox and gives them a whirl.

3

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

You've asked are Hollywood gun handling techniques effective or just for show?

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

Nice, thanks, Duff.

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

Your next request is to test a ballistic nymph sent in by the troops.

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

Then there's the internet craze for crazy roadside assistants.

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

A really dangerous way to fill a tire.

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

And the final lucky dip in this eclectic mix of myths

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

is a mathematical paradox from a game show.

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

We have a winner.

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

Who are the MythBusters?

12

00:00:47,000 --> 00:00:48,000

Adam Savage.

13

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

I reject the reality and substitute my own.

14

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

And Jamie Heineman.

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

We're gonna have an adventure.

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

Between them more than 30 years of special effects experience,

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

together with Tori Balechi, Brent Imahara.

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

This is the most dangerous thing we're gonna do all week.

19

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

And Carrie Byron.

20

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

Let's do it.

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00:01:07,000 --> 00:01:13,000

They don't just tell the myths, they put them to the test.

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00:01:13,000 --> 00:01:24,000

Step right up, step right up for a viewer request extravaganza.

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00:01:24,000 --> 00:01:26,000

What's this about?

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

Ah, well this is the Wheel of Myth Fortune.

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00:01:29,000 --> 00:01:33,000

And each one of these boxes is a suggestion from a fan for a story we should do.

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00:01:33,000 --> 00:01:35,000

Give it a spin.

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00:01:35,000 --> 00:01:47,000

Dear MythBusters, can you please test the Monty Hall paradox from the game show Let's Make a Deal?

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00:01:47,000 --> 00:01:48,000

This is great.

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00:01:48,000 --> 00:01:52,000

I know you're a big fan of game shows, but let me remind you what this one is.

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

Monty Hall offers a contestant a choice of one of three doors,

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

says a surprise behind one of them.

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00:01:57,000 --> 00:01:59,000

And the contestant chooses, let's say, door B.

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00:01:59,000 --> 00:02:02,000

Before he gets to see if there's a prize behind that, Monty opens up door A

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

and shows him that there's nothing behind it.

35

00:02:04,000 --> 00:02:11,000

Monty then offers the contestant a chance to switch from his original door B to the remaining door C.

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00:02:11,000 --> 00:02:13,000

The question is, should you switch?

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00:02:13,000 --> 00:02:15,000

Now this is interesting for two reasons.

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00:02:15,000 --> 00:02:19,000

One is that apparently psychologically people do not want to switch from their original choice.

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00:02:19,000 --> 00:02:23,000

Two is, apparently they will win more often if they do switch.

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00:02:23,000 --> 00:02:28,000

Wow, well, I'm not sure why that would be the case, but let's test it.

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00:02:28,000 --> 00:02:34,000

It's unusual that a complex mathematical paradox is named after a game show host.

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00:02:34,000 --> 00:02:39,000

But this counterintuitive problem has puzzled number crunchers for years.

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00:02:39,000 --> 00:02:44,000

After a door selection is made, the host always opens one of the remaining two doors

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00:02:44,000 --> 00:02:49,000

and then gives the contestant a chance to stick with their original choice

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00:02:49,000 --> 00:02:52,000

or switch to the other, an open door.

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

Which leaves us with a two-part myth.

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00:02:54,000 --> 00:03:01,000

Supposedly, people overwhelmingly decide to stick and apparently it's better to switch.

48

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

So how do you want to go about this?

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

Well, as far as I can see, there's two parts to this story.

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

One psychological and one statistical.

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00:03:08,000 --> 00:03:11,000

The psychological being that people do not want to switch from their original choice.

52

00:03:11,000 --> 00:03:15,000

The statistical being that there is an advantage to them if they do.

53

00:03:15,000 --> 00:03:17,000

Well, let's start with the psychological then.

54

00:03:17,000 --> 00:03:18,000

Perfect.

55

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

So, let the games begin.

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00:03:20,000 --> 00:03:25,000

If we're going to test this out on the general public, we should get a bunch of people, say, 20 or so.

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00:03:25,000 --> 00:03:28,000

20 sounds like a good number. How do you want to run them through it?

58

00:03:28,000 --> 00:03:31,000

Well, we could do it with, say, a deck of cards.

59

00:03:31,000 --> 00:03:37,000

I feel like that's missing something essential to a game show experience that may influence people's decision-making.

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00:03:37,000 --> 00:03:42,000

So I'm thinking a real stage and some real doors and set up a Mythbusters game show scenario.

61

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

That looks great!

62

00:03:44,000 --> 00:03:50,000

And with their pre-made props in tow, the team's mathematical mission begins at a local theater.

63

00:03:50,000 --> 00:03:53,000

Ladies and gentlemen, door number one.

64

00:03:53,000 --> 00:04:00,000

Where they prepare their game show setting, which includes the obligatory over-the-top game show host outfit.

65

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

Ta-da!

66

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

Uh, maybe you should try door number three.

67

00:04:09,000 --> 00:04:10,000

Much better.

68

00:04:10,000 --> 00:04:11,000

Now, shall we start?

69

00:04:11,000 --> 00:04:12,000

Yep.

70

00:04:12,000 --> 00:04:17,000

With Adam dressed for the test, let's find out exactly what the test is.

71

00:04:17,000 --> 00:04:25,000

We've gotten 20 volunteers and the door behind which the prize has been placed will be determined

by a computer-generated randomizer.

72

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

The psychology of this myth is what we're investigating with this test.

73

00:04:34,000 --> 00:04:40,000

It is stated that most people, if given the choice to switch their door, will not do it.

74

00:04:40,000 --> 00:04:41,000

Hello, sir. Hi.

75

00:04:41,000 --> 00:04:46,000

We want to find out if that's true. We're going to bring in a bunch of contestants, run them through the whole test.

76

00:04:46,000 --> 00:04:51,000

But what we're really looking for is to see how many stick with their original choice and how many switch.

77

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

We are playing a little game today called Pick a Door.

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00:04:58,000 --> 00:04:59,000

Okay.

79

00:04:59,000 --> 00:05:03,000

I would like to start this game by you telling me which door is your choice.

80

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

I will take number one.

81

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

Number one. Door number one is your choice.

82

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

Jamie, will you please show Brian what's behind door number three?

83

00:05:12,000 --> 00:05:13,000

Nothing.

84

00:05:13,000 --> 00:05:16,000

As you can see, there's nothing behind door number three.

85

00:05:16,000 --> 00:05:22,000

For those of you playing at home, there's an important fact you should know, which is that whenever I open an empty door for the contestant,

86

00:05:22,000 --> 00:05:26,000

I know where the prize is and I'm showing them an empty door on purpose.

87

00:05:26,000 --> 00:05:31,000

Your prize is either behind door number one, your original choice, or door number two.

88

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

I'm going to give you one last chance.

89

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

You could switch right now to door number two if you'd like, or you can stick with your original choice.

90

00:05:38,000 --> 00:05:45,000

And so to the moment of truth, as per the first part of the myth, will he stick or will he take the opportunity to switch?

91

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

I will stick with my door number one.

92

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

You will stick? How come?

93

00:05:50,000 --> 00:05:52,000

Because it was my first instinct.

94

00:05:52,000 --> 00:05:57,000

There it is. Contestant number one sticks and Adam and Jamie have their first data point.

95

00:05:57,000 --> 00:05:59,000

Jamie, will you show Brian what's behind door number one?

96

00:06:01,000 --> 00:06:02,000

Nothing.

97

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

Sorry, there's nothing behind door number one. Thank you so much for playing. That's an excellent data point.

98

00:06:07,000 --> 00:06:08,000

Have a good day.

99

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

Thank you.

100

00:06:09,000 --> 00:06:13,000

With no pre-knowledge of the test, from backstage, the next contestant steps out.

101

00:06:13,000 --> 00:06:14,000

Are you?

102

00:06:14,000 --> 00:06:18,000

And after picking her door, which door is your choice?

103

00:06:18,000 --> 00:06:19,000

One.

104

00:06:19,000 --> 00:06:24,000

Jamie opens up a losing door and Adam moves the test along to the relevant data point.

105

00:06:24,000 --> 00:06:28,000

You can switch to door number three, or you can stick with your original choice.

106

00:06:28,000 --> 00:06:30,000

What's it going to be? Are you going to switch or stick?

107

00:06:30,000 --> 00:06:31,000

I'm sticking.

108

00:06:31,000 --> 00:06:32,000

You're sticking?

109

00:06:32,000 --> 00:06:33,000

How come?

110

00:06:33,000 --> 00:06:34,000

Because the door is pink.

111

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

Okay. This time, sticking pays off.

112

00:06:36,000 --> 00:06:37,000

We have a winner.

113

00:06:37,000 --> 00:06:40,000

It's a winner. Congratulations.

114

00:06:40,000 --> 00:06:44,000

But remember, the win-lose result is irrelevant in part one of the myth.

115

00:06:44,000 --> 00:06:47,000

We're testing the psychology of the decision-making.

116

00:06:47,000 --> 00:06:51,000

Is it true that the contestants will predominantly choose to stick?

117

00:06:51,000 --> 00:06:52,000

Nothing.

118

00:06:52,000 --> 00:06:56,000

I'd like to offer you one last chance to perhaps switch your choice to door number three,

119

00:06:56,000 --> 00:06:58,000

or stick with your original choice.

120

00:06:58,000 --> 00:06:59,000

I'll stick with one.

121

00:06:59,000 --> 00:07:00,000

You really want to stick?

122

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

Yeah.

123

00:07:01,000 --> 00:07:02,000

How come?

124

00:07:02,000 --> 00:07:03,000

My gut feelings.

125

00:07:03,000 --> 00:07:04,000

Gut feelings?

126

00:07:04,000 --> 00:07:05,000

That's three from three.

127

00:07:05,000 --> 00:07:06,000

I'm sorry.

128

00:07:06,000 --> 00:07:11,000

And as the 100% record in favor of the myth continues,

129

00:07:11,000 --> 00:07:13,000

I'm going to still go with number one.

130

00:07:13,000 --> 00:07:15,000

Things start to get really interesting.

131

00:07:15,000 --> 00:07:16,000

I'm going to stick with number two.

132

00:07:16,000 --> 00:07:17,000

You're going to stick with number two.

133

00:07:17,000 --> 00:07:18,000

Is there a reason behind you wanting to stick?

134

00:07:18,000 --> 00:07:20,000

First choice.

135

00:07:20,000 --> 00:07:23,000

Because it's not just the score that's providing a pattern.

136

00:07:23,000 --> 00:07:24,000

I'm going to stick with two.

137

00:07:24,000 --> 00:07:25,000

Stick with three.

138

00:07:25,000 --> 00:07:26,000

I'd like to stick with my original choice.

139

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

You're going to stick.

140

00:07:27,000 --> 00:07:30,000

But the motivation for sticking is becoming clearer.

141

00:07:30,000 --> 00:07:31,000

I'm going to stick.

142

00:07:31,000 --> 00:07:33,000

You're going to stick. How come?

143

00:07:33,000 --> 00:07:35,000

I guess it's a 50-50 chance.

144

00:07:35,000 --> 00:07:37,000

The perception is that with two doors left,

145

00:07:37,000 --> 00:07:40,000

there's a 50-50 chance of winning.

146

00:07:40,000 --> 00:07:44,000

And so there's seemingly no advantage to switching.

147

00:07:44,000 --> 00:07:45,000

You know, I trust my instincts.

148

00:07:45,000 --> 00:07:46,000

I'm going to stay with door number two.

149

00:07:46,000 --> 00:07:51,000

And incredibly, as every single contestant decides to stick,

150

00:07:51,000 --> 00:07:52,000

I'm going to stay with three.

151

00:07:52,000 --> 00:07:55,000

Part one of the myth is looking great.

152

00:07:55,000 --> 00:07:56,000

Dude, this is so cool.

153

00:07:56,000 --> 00:07:59,000

They are all of them sticking with their original choice.

154

00:07:59,000 --> 00:08:00,000

I know.

155

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

That's so cool.

156

00:08:01,000 --> 00:08:03,000

I would not have called that.

157

00:08:03,000 --> 00:08:04,000

Stick with number one.

158

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

And to fully decipher the results.

159

00:08:06,000 --> 00:08:07,000

I'm going to stick.

160

00:08:07,000 --> 00:08:10,000

Out of the Jamie Roll, their game show credits.

161

00:08:10,000 --> 00:08:11,000

Fantastic.

162

00:08:11,000 --> 00:08:12,000

Congratulations.

163

00:08:12,000 --> 00:08:13,000

Thank you.

164

00:08:13,000 --> 00:08:14,000

Nicely done.

165

00:08:14,000 --> 00:08:15,000

Thank you so much for this.

166

00:08:15,000 --> 00:08:17,000

And head back to the shop.

167

00:08:21,000 --> 00:08:23,000

Okay, Wheel of Myth Fortune.

168

00:08:23,000 --> 00:08:24,000

Shall I give it a spin?

169

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

Please.

170

00:08:25,000 --> 00:08:26,000

Go for it.

171

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

What does it say?

172

00:08:30,000 --> 00:08:33,000

This letter comes from a U.S. soldier.

173

00:08:33,000 --> 00:08:36,000

He writes, dear mythbusters, if a hand grenade lands next to you,

174

00:08:36,000 --> 00:08:40,000

is it better to hit the ground because shrapnel will go up and out?

175

00:08:40,000 --> 00:08:41,000

Oh, okay.

176

00:08:41,000 --> 00:08:42,000

Because if the shrapnel goes up and out,

177

00:08:42,000 --> 00:08:44,000

it might create a safe zone down below.

178

00:08:45,000 --> 00:08:47,000

Raised by a brave friend in the military,

179

00:08:47,000 --> 00:08:49,000

it's an interesting ballistics question.

180

00:08:49,000 --> 00:08:54,000

Is the lethal fragment pattern of a grenade really just up and away?

181

00:08:54,000 --> 00:08:59,000

Can you actually avoid shrapnel damage by hitting the deck?

182

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

All right, so there's two things lethal about a grenade,

183

00:09:02,000 --> 00:09:04,000

the shockwave and the shrapnel.

184

00:09:04,000 --> 00:09:05,000

All right, well, why don't we do this?

185

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

Let's go to the bomb range.

186

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

We'll set off some hand grenades and find out at what point the shockwave is no longer lethal.

187

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

Right.

188

00:09:12,000 --> 00:09:13,000

At that distance, you'd be safe,

189

00:09:13,000 --> 00:09:15,000

and then all you'd have to worry about is the shrapnel.

190

00:09:15,000 --> 00:09:19,000

So we build something to catch all the shrapnel at that distance and see what we get.

191

00:09:21,000 --> 00:09:25,000

To kick things off, the guys hit their favorite location.

192

00:09:26,000 --> 00:09:28,000

We've come out to the Alameda County Sheriff's Bomb Range

193

00:09:28,000 --> 00:09:33,000

to test the myth that if a grenade is going off and you hit the deck, lay flat on the ground,

194

00:09:33,000 --> 00:09:35,000

you will get no shrapnel.

195

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

But before you get the shrapnel, we need to establish the blast wave perimeter

196

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

because inside of that, shrapnel or not, you'd be dead.

197

00:09:42,000 --> 00:09:45,000

Now to do that, we're going to use our Oseco Burst Discs.

198

00:09:45,000 --> 00:09:49,000

They're set to 75 psi, which is a threshold of certain death.

199

00:09:50,000 --> 00:09:55,000

Now we'll have 10 burst discs starting at a foot all the way out to 10 feet from the blast.

200

00:09:55,000 --> 00:09:59,000

Now this will record the lethality of the blast from the grenade.

201

00:09:59,000 --> 00:10:04,000

Now we've used these burst discs in the past, knocked your socks off, and what's blast proof.

202

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

So it's going to give us the data we need.

203

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

All right, here's the last one.

204

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

Sensors are set.

205

00:10:12,000 --> 00:10:18,000

Remember, this first detonation is designed to determine how far the lethal perimeter of the shock wave extends.

206

00:10:18,000 --> 00:10:25,000

Later, the team will use that minimum survival distance as the point at which they measure the height of the shrapnel distribution.

207

00:10:26,000 --> 00:10:32,000

But for now, it's all about the shock wave, which means they're ready to pull the pin, right?

208

00:10:32,000 --> 00:10:34,000

Wrong.

209

00:10:34,000 --> 00:10:37,000

Because pulling a pin from a grenade can be somewhat dangerous,

210

00:10:37,000 --> 00:10:40,000

we're having JD set it up so that we can fire remotely from the bunker.

211

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

So while the team hunker down in the bunker,

212

00:10:42,000 --> 00:10:48,000

Sergeant JD Nelson takes a decommissioned grenade and rigs it with an equivalent amount of high explosive,

213

00:10:48,000 --> 00:10:52,000

a blasting cap, and a remote control detonator.

214

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

And that definitely means it's boom time.

215

00:10:55,000 --> 00:10:57,000

All right, you guys ready? Let's do this.

216

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

All right, this is testing the blast wave of a hand grenade.

217

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

You know this is the first time I've ever seen a hand grenade go off this closely?

218

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

Yeah, me too.

219

00:11:05,000 --> 00:11:10,000

Here we go. In three, two, one, fire.

220

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

Wow, that was awesome.

221

00:11:15,000 --> 00:11:16,000

That was energetic.

222

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

Let's check it out.

223

00:11:17,000 --> 00:11:23,000

What they're checking is how many of the burst discs burst, and crucially, which one survived.

224

00:11:23,000 --> 00:11:25,000

One, two, three, four, five.

225

00:11:25,000 --> 00:11:29,000

All right, five foot radius. That is our blast zone for our grenade.

226

00:11:29,000 --> 00:11:32,000

So we set off our grenade and we got some good results.

227

00:11:32,000 --> 00:11:34,000

The burst disc at five feet away ruptured.

228

00:11:34,000 --> 00:11:39,000

The one at six feet didn't, meaning at five feet the shock wave alone would kill you,

229

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

but at six feet you'd survive.

230

00:11:41,000 --> 00:11:46,000

So we're going to set up our shrapnel catchers just outside that five foot radius

231

00:11:46,000 --> 00:11:49,000

and find out exactly what the fragment pattern is.

232

00:11:49,000 --> 00:11:51,000

Okay, let's go get the shrapnel catchers.

233

00:11:51,000 --> 00:11:52,000

Perfect.

234

00:11:52,000 --> 00:11:54,000

Yep, it's time to bring out the shrapnel catchers.

235

00:11:54,000 --> 00:12:00,000

The idea of this test is to determine exactly how high the fragments hit.

236

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

Okay, so just outside of five feet.

237

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

If there's a zone near the ground that is free from damage, then the myth will be confirmed.

238

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

And from what he's already seen, Grant is optimistic.

239

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

So if you look at the high speed footage, it's looking really good for the Smith.

240

00:12:16,000 --> 00:12:19,000

So you see the blast wave propagate.

241

00:12:19,000 --> 00:12:23,000

If you're outside of that lethal five foot radius, you're safe from that.

242

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

What we're interested in is the shrapnel, which is all the little sparkly bits.

243

00:12:27,000 --> 00:12:30,000

And you see that going up and out.

244

00:12:30,000 --> 00:12:34,000

Now the important thing for us is what happens if you're close to the ground.

245

00:12:34,000 --> 00:12:37,000

How much of that shrapnel will actually hit you?

246

00:12:37,000 --> 00:12:39,000

Coming up, Adam and Jamie butt heads.

247

00:12:39,000 --> 00:12:41,000

Adam's going to kick my butt.

248

00:12:41,000 --> 00:12:46,000

In order to crunch the Monty Hall numbers in your face.

249

00:12:54,000 --> 00:12:59,000

What do you get when you cross a complex probability puzzle with a game show?

250

00:12:59,000 --> 00:13:05,000

The answer is the viewer requested myth known as the Monty Hall Paradox.

251

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

And so far, Adam and Jamie have answered part one of the problem.

252

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

What's it going to be? Are you going to switch or are you going to stick?

253

00:13:14,000 --> 00:13:18,000

As far as the psychology of sticking or switching goes,

254

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

I'm going to stick with two.

255

00:13:19,000 --> 00:13:22,000

Contestants are unwilling to change their choice.

256

00:13:22,000 --> 00:13:23,000

I'm going to stick.

257

00:13:25,000 --> 00:13:26,000

So where do we stand?

258

00:13:26,000 --> 00:13:31,000

Well, amazingly, our volunteers chose to stick 100% of the time.

259

00:13:31,000 --> 00:13:35,000

So the second part states that we should see a clear statistical advantage to switching.

260

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

Did we see anything like that in the numbers?

261

00:13:37,000 --> 00:13:40,000

Well, given that nobody decided to switch, we don't really know.

262

00:13:40,000 --> 00:13:42,000

Clearly, we should run this again.

263

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

And I think with an equal number of switching iterations to sticking iterations

264

00:13:47,000 --> 00:13:49,000

so that we can really compare the number.

265

00:13:50,000 --> 00:13:53,000

As Jamie said, with all of the contestants sticking,

266

00:13:53,000 --> 00:13:57,000

they don't yet have any data on whether switching is advantageous.

267

00:13:58,000 --> 00:14:02,000

So test two will focus on the statistical paradox.

268

00:14:02,000 --> 00:14:08,000

Is switching in what appears to be a 50-50 situation really your best bet?

269

00:14:08,000 --> 00:14:15,000

To find out, Adam and Jamie will collect a large and definitive sample of 100 data points

270

00:14:15,000 --> 00:14:19,000

with an elegant mechanical mini-game show set up.

271

00:14:19,000 --> 00:14:25,000

So what I need to do right now is build a physical Money Hall Paradox testing simulator.

272

00:14:25,000 --> 00:14:29,000

And it's a machine. I need to think of it like a machine because there's a lot of moving parts.

273

00:14:29,000 --> 00:14:33,000

I'm thinking it's going to have two sets of three doors, one for me, one for Jamie.

274

00:14:33,000 --> 00:14:39,000

It's going to have a roll of 50 tests randomly selected, preloaded, so that we can cycle through it really fast.

275

00:14:39,000 --> 00:14:43,000

It's not going to be a simple build, but I think in the end it's going to be really cool.

276

00:14:43,000 --> 00:14:45,000

All right, let's bring it on in.

277

00:14:45,000 --> 00:14:47,000

This rig serves a couple of functions.

278

00:14:47,000 --> 00:14:51,000

First, it increases our sample size, which in turn increases our accuracy.

279

00:14:51,000 --> 00:14:59,000

Secondly, it removes the variable of choice from the equation and puts both switching and sticking on an even playing field.

280

00:14:59,000 --> 00:15:04,000

We'll show you how you would fare over time with either choice.

281

00:15:04,000 --> 00:15:07,000

So this all looks lovely, but how's it work?

282

00:15:07,000 --> 00:15:12,000

You and I are going to run through each of the tests, and each time we win, we take a red piece of paper

283

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

and we thumb-tack it up onto the board behind us.

284

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

At the end, we should be able to see visually if there's a difference between me always switching

285

00:15:20,000 --> 00:15:24,000

and you never switching, and we should be able to count and compare the numbers.

286

00:15:24,000 --> 00:15:26,000

How do I think I'll do?

287

00:15:26,000 --> 00:15:30,000

Well, if the myth is true, Adam's going to kick my butt.

288

00:15:30,000 --> 00:15:34,000

To find out, it's pick a door, take two.

289

00:15:34,000 --> 00:15:36,000

Test number one, choose your door.

290

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

I choose one.

291

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

I choose door number two, open an empty door.

292

00:15:40,000 --> 00:15:42,000

I'm sticking. I lose.

293

00:15:42,000 --> 00:15:45,000

I am switching. I win!

294

00:15:45,000 --> 00:15:48,000

Unlike the previous test, I choose one.

295

00:15:48,000 --> 00:15:49,000

I choose three.

296

00:15:49,000 --> 00:15:53,000

Adam and Jamie are focusing only on the win-lose result.

297

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

I'm sticking. I lose.

298

00:15:55,000 --> 00:15:58,000

I am switching. I win!

299

00:15:58,000 --> 00:16:01,000

The rules are exactly the same.

300

00:16:01,000 --> 00:16:02,000

Test number three.

301

00:16:02,000 --> 00:16:05,000

Except the stick or switch variable is removed.

302

00:16:05,000 --> 00:16:06,000

I'm sticking.

303

00:16:06,000 --> 00:16:08,000

Jamie always sticks.

304

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

I lose.

305

00:16:09,000 --> 00:16:10,000

And Adam always switches.

306

00:16:10,000 --> 00:16:12,000

I am switching. I win!

307

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

This is crazy. I can't keep winning like this.

308

00:16:15,000 --> 00:16:18,000

In addition, the large sample means that over time...

309

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

I'm sticking. I lose.

310

00:16:20,000 --> 00:16:25,000

the results will reflect the true probability of the choice to stick or switch.

311

00:16:25,000 --> 00:16:28,000

I'm sticking. I win.

312

00:16:28,000 --> 00:16:33,000

But it's not long before the results on the board paint a definitive picture.

313

00:16:33,000 --> 00:16:34,000

I choose two.

314

00:16:34,000 --> 00:16:39,000

The Monty Hall paradox is interesting because on the face of it, it seems simple.

315

00:16:39,000 --> 00:16:41,000

I am switching. I win!

316

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

During the final stage of it, you've got two choices.

317

00:16:44,000 --> 00:16:47,000

You know one of them is a winner and one of them is not.

318

00:16:47,000 --> 00:16:51,000

So common sense would tell you that you've got a 50-50 chance of winning.

319

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

And yet you've done.

320

00:16:52,000 --> 00:16:55,000

That's where the paradox comes in.

321

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

I am switching. I win!

322

00:16:57,000 --> 00:16:59,000

Seven in a row in your face!

323

00:16:59,000 --> 00:17:03,000

You could talk about the mathematics and the statistics and the theory and the proofs of this story

324

00:17:03,000 --> 00:17:04,000

until you're blue in the face.

325

00:17:04,000 --> 00:17:08,000

But the only way to make the numbers really clear is just to do it.

326

00:17:08,000 --> 00:17:11,000

And the results are crystal clear.

327

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

Switching is far, far better than sticking with your original choice.

328

00:17:16,000 --> 00:17:19,000

What's going on here is really interesting.

329

00:17:19,000 --> 00:17:24,000

If the prize is equally likely to be behind each of the doors, then if a player picks door one,

330

00:17:24,000 --> 00:17:27,000

there's a one in three chance the prize is behind it.

331

00:17:27,000 --> 00:17:32,000

That means that there's a two in three chance that the prize is behind doors two and three.

332

00:17:32,000 --> 00:17:37,000

Now take away door three, and there's still a two in three chance that it's behind door two.

333

00:17:37,000 --> 00:17:41,000

So switching effectively doubles your chances of winning.

334

00:17:41,000 --> 00:17:45,000

So what advice can we offer our viewers about the Monty Hall paradox?

335

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

Well, clearly if you're ever playing this game, you will have an overwhelming urge to stick with your original choice.

336

00:17:51,000 --> 00:17:57,000

But given the fact that the host knows where the prize is and shows you an empty door,

337

00:17:57,000 --> 00:18:00,000

it is always an advantage for you to switch.

338

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

Then it would be confirmed.

339

00:18:01,000 --> 00:18:03,000

Totally confirmed.

340

00:18:08,000 --> 00:18:09,000

Next.

341

00:18:09,000 --> 00:18:10,000

Ready for some shrapnel?

342

00:18:10,000 --> 00:18:14,000

Carrie Grandin Tory get the low down on Hit the Deck.

343

00:18:22,000 --> 00:18:25,000

Carrie Grandin Tory are back at the bomb range.

344

00:18:25,000 --> 00:18:30,000

They're testing the myth that the shrapnel of a grenade only goes up and out.

345

00:18:30,000 --> 00:18:33,000

And if you hit the deck, you won't get hit.

346

00:18:34,000 --> 00:18:36,000

And here's what we've learned so far.

347

00:18:36,000 --> 00:18:42,000

When the grenade explodes, there's about a five foot perimeter in which the blast wave is what's going to kill you.

348

00:18:42,000 --> 00:18:46,000

But from the high speed, it looks like the shrapnel is all going upward,

349

00:18:46,000 --> 00:18:48,000

leaving a safety zone low near the ground.

350

00:18:48,000 --> 00:18:51,000

That's where our shrapnel catcher comes in.

351

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

Now around me are our shrapnel catchers.

352

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

Now the white section represents somebody standing.

353

00:18:56,000 --> 00:19:00,000

In the red section represents somebody getting down on the ground.

354

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

Give me 20.

355

00:19:03,000 --> 00:19:06,000

Now there are two reasons why hitting the deck might be advantageous.

356

00:19:06,000 --> 00:19:10,000

First of all, obviously you're minimizing your profile to the grenade.

357

00:19:10,000 --> 00:19:15,000

But secondly, the pattern of the shrapnel seems to be going up and out.

358

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

And that's why we're adding a top to our shrapnel catcher so we can see what that looks like.

359

00:19:20,000 --> 00:19:25,000

The debris from the preliminary explosion does seem to indicate it's moving up and out.

360

00:19:25,000 --> 00:19:30,000

But to find out for sure, any lethal damage from the less visible metal fragments

361

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

will mark the painted plywood of these boards.

362

00:19:33,000 --> 00:19:37,000

If the area at the bottom is clear, then the myth is confirmed.

363

00:19:38,000 --> 00:19:41,000

Just to cover all our bases, we're going to use a couple different kinds of grenades.

364

00:19:41,000 --> 00:19:46,000

We have a vintage mid-century pineapple grenade and a more modern baseball grenade.

365

00:19:46,000 --> 00:19:49,000

Now though these names are somewhat innocuous baseball pineapples,

366

00:19:49,000 --> 00:19:54,000

the important thing to know is that they're going to be throwing out shrapnel at 22,000 feet per second.

367

00:19:54,000 --> 00:19:59,000

Now just to illustrate what we're talking about here, the inside of this grenade is perforated.

368

00:19:59,000 --> 00:20:02,000

Each one of these little sections is going to be a lethal projectile.

369

00:20:03,000 --> 00:20:08,000

First up, JD hooks up the pineapple grenade with its distinctive grooves

370

00:20:08,000 --> 00:20:10,000

and the team heads down to the bunker.

371

00:20:11,000 --> 00:20:12,000

Ready for some shrapnel?

372

00:20:12,000 --> 00:20:18,000

With the remote detonator rigged, it's time to find out if you can avoid grenade shrapnel by hitting the deck.

373

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

In three, two, one.

374

00:20:24,000 --> 00:20:28,000

Wow!

375

00:20:30,000 --> 00:20:33,000

That did some serious damage.

376

00:20:33,000 --> 00:20:35,000

We even knocked down one of the shrapnel gadgets.

377

00:20:35,000 --> 00:20:37,000

Yeah, I think we're going to have a lot of shrapnel.

378

00:20:37,000 --> 00:20:38,000

Alright, let's go check it out.

379

00:20:39,000 --> 00:20:44,000

And what they find is that being around when a grenade goes off is not a good idea at all.

380

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

The shrapnel spray on the acrylic roof alone is frightening.

381

00:20:49,000 --> 00:20:50,000

Oh, look at that!

382

00:20:51,000 --> 00:20:53,000

Wow, we got a lot of shrapnel.

383

00:20:53,000 --> 00:20:55,000

But did we get it down below?

384

00:20:55,000 --> 00:20:56,000

Yep.

385

00:20:56,000 --> 00:20:58,000

So it looks like this one is busted.

386

00:20:58,000 --> 00:21:01,000

You don't get away scot-free down low.

387

00:21:01,000 --> 00:21:06,000

Well, the shrapnel pattern is definitely clear and it's even emphasized if you look at the exit wounds.

388

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

There's a lot more shrapnel at the top than there is at the bottom.

389

00:21:09,000 --> 00:21:14,000

But clearly, there's still shrapnel at the bottom, so this myth is busted.

390

00:21:14,000 --> 00:21:20,000

Yep, for the pineapple grenade at least, the myth that the blast carries all of the shrapnel up and away

391

00:21:20,000 --> 00:21:24,000

and leaves a clear zone near the ground is busted.

392

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

Alright, so this one is busted.

393

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

Why don't we move on to the modern day grenade and see what that does?

394

00:21:29,000 --> 00:21:30,000

Modern grenade.

395

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

The team moves in at the double and replaces all of the shrapnel catchers.

396

00:21:35,000 --> 00:21:38,000

And JD does his thing with the baseball grenade.

397

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

Okay, baseball grenade shrapnel test.

398

00:21:41,000 --> 00:21:42,000

Do it.

399

00:21:42,000 --> 00:21:43,000

Charging.

400

00:21:44,000 --> 00:21:47,000

In three, two, one.

401

00:21:51,000 --> 00:21:54,000

That was way bigger than the pineapple grenade.

402

00:21:54,000 --> 00:21:56,000

Let's go check the shrapnel pattern.

403

00:21:56,000 --> 00:21:59,000

And their discovery puts this ballistic myth to bed.

404

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

Whoa!

405

00:22:02,000 --> 00:22:04,000

Look at that, the modern day grenade.

406

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

How do you even more shrapnel in this shrapnel-free zone?

407

00:22:07,000 --> 00:22:10,000

Even if you hit the deck, you're still gonna get hit by shrapnel.

408

00:22:10,000 --> 00:22:17,000

The myth that when a grenade is going off, if you hit the deck, you will have no shrapnel hit you is busted.

409

00:22:17,000 --> 00:22:23,000

True, the pattern of shrapnel mostly goes upward, but there's still a lot that goes down below in that zone.

410

00:22:23,000 --> 00:22:25,000

The exit wounds tell the story.

411

00:22:25,000 --> 00:22:32,000

The fragment pattern is a chaotic spray in all directions, including the mythical shrapnel-free zone.

412

00:22:32,000 --> 00:22:41,000

But it is less dense down low, which suggests that hitting the deck, although busted, is the best of a very bad situation.

413

00:22:41,000 --> 00:22:46,000

Yeah, it might be busted, but look, if I'm in this situation, I'm gonna hit the deck.

414

00:22:46,000 --> 00:22:47,000

Absolutely.

415

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

Coming up on Mythbusters, Adam and I shoot each other in the face.

416

00:23:02,000 --> 00:23:11,000

Alright.

417

00:23:11,000 --> 00:23:13,000

Sit here, Mythbusters.

418

00:23:13,000 --> 00:23:18,000

I've been an action movie fanatic for years, and I've noticed something about the way people hold guns in movies.

419

00:23:18,000 --> 00:23:25,000

I've seen guns fired from the hip, fired with an extended arm, one-handed, two-handed, and even two guns at the same time.

420

00:23:25,000 --> 00:23:28,000

Lately, everyone seems to be holding guns sideways.

421

00:23:28,000 --> 00:23:36,000

Do any of these styles offer specific advantages and accuracy over the others, or are they all just meant to look cool?

422

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

Well, that seems pretty straightforward.

423

00:23:37,000 --> 00:23:41,000

We get some guns, some targets, and see which technique is more accurate.

424

00:23:41,000 --> 00:23:42,000

Let's get shooting.

425

00:23:44,000 --> 00:23:50,000

The history of firearm fashion is replete with a heap of ever-changing, stylish poses.

426

00:23:50,000 --> 00:23:54,000

And this fan request is all about accuracy.

427

00:23:54,000 --> 00:24:01,000

They want to know of five classic cinematic stances, which work and which are style over substance.

428

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

To find out, Adam and Jamie are down at the range.

429

00:24:08,000 --> 00:24:10,000

This is perfect. Shall we get to shooting?

430

00:24:10,000 --> 00:24:11,000

I think so.

431

00:24:11,000 --> 00:24:13,000

Shooting and shooting.

432

00:24:13,000 --> 00:24:14,000

Here is the plan.

433

00:24:14,000 --> 00:24:21,000

For every single handling technique we'll be testing, Jamie and I will each unload a full magazine of eight bullets at the intended target,

434

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

and we will score ourselves based on timing and accuracy.

435

00:24:24,000 --> 00:24:35,000

At the end of all those tests, a quick look at both the targets and the scores really ought to give us a fantastic picture about which handling techniques are truly effective and which ones are just for show.

436

00:24:36,000 --> 00:24:40,000

That sounds straightforward. All they need now are some guns and targets.

437

00:24:41,000 --> 00:24:42,000

Here is today's target.

438

00:24:42,000 --> 00:24:46,000

If you see one of these perched over your bed in the middle of the night, shoot it! Shoot it immediately!

439

00:24:47,000 --> 00:24:52,000

The gun we'll be using is a .45 caliber semi-automatic pistol.

440

00:24:52,000 --> 00:24:59,000

We'll be putting 230 grain full metal jack ammo in it. Very common gun. Very common ammo worldwide.

441

00:24:59,000 --> 00:25:01,000

Scoring pretty straightforward.

442

00:25:01,000 --> 00:25:06,000

Black section equals 10 points. Yellow section 7 points. White 6. Red 5.

443

00:25:06,000 --> 00:25:14,000

Once we've tallied up all the points from shooting, we will divide that by the amount of seconds it took to fire all eight bullets, and that'll give us a final score.

444

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

The main tool we'll be using for this test is an acoustic timer. When we press this button, it'll start working, it'll hear each shot, and it'll give us the total amount of time it took to make the eight shots.

445

00:25:26,000 --> 00:25:33,000

Now I know you may be looking at this set of thinking that we're making things pretty easy for ourselves, but the point of this experiment isn't about whether Jamie Iyer could shot.

446

00:25:33,000 --> 00:25:43,000

It's actually to compare the different handholds and their accuracy and their effectiveness. We've chosen this distance to give us the best resolution for that comparison.

447

00:25:43,000 --> 00:25:55,000

That's the setup. A gun, two targets, 15 feet away, a scoring system that combines accuracy and firing rate, and there's a ballistics expert on hand to keep everyone safe.

448

00:25:55,000 --> 00:25:59,000

The only missing component is a baseline control.

449

00:25:59,000 --> 00:26:01,000

Range is hot. Safety is on.

450

00:26:01,000 --> 00:26:06,000

We'll be comparing all the firing styles we're using against this, the Weaver Stance.

451

00:26:07,000 --> 00:26:15,000

It's been used since the 1980s by law enforcement and in competition, and it's regarded as the most effective way to repeatedly and accurately fire a handgun.

452

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

That's good shooting, because it's a really good group.

453

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

And Jamie and I have actually been trained in it.

454

00:26:20,000 --> 00:26:31,000

The Weaver position has a couple of things going for it. The first is that it feels nice and stable. You're using both hands. You've got a good, solid purchase on the gun.

455

00:26:31,000 --> 00:26:40,000

The second thing is that you're holding it in such a position that you can see down the sights of the gun. That also seems to me like a pretty good idea.

456

00:26:40,000 --> 00:26:55,000

With the Weaver technique complete, the scores can be collated. And if any of the five Hollywood poses to be tested come close to Adam and Jamie's control average of 7.3, it'll be confirmed it's a reasonable technique.

457

00:26:56,000 --> 00:27:00,000

All right, well, we've got our control. Let's start holding the gun in other ways.

458

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

And first up, popularized by Bogart in gangster movies of the 30s and 40s, it's shooting from the hill.

459

00:27:08,000 --> 00:27:16,000

I don't know about you, but I don't have high hopes for this stance. And come on, you can't even see the sights. How are you going to know where you're aiming?

460

00:27:16,000 --> 00:27:21,000

And after the gun resets, how are you going to get that second shot? I don't think it's going to be that effective.

461

00:27:21,000 --> 00:27:23,000

Jamie's been shooting from the hip for years.

462

00:27:24,000 --> 00:27:25,000

Ready?

463

00:27:25,000 --> 00:27:26,000

Safety's off.

464

00:27:26,000 --> 00:27:28,000

Shooting from the hip.

465

00:27:29,000 --> 00:27:36,000

As Jamie fires off his eight rounds, it seems Adam's prediction is spot on. Jamie missed all eight.

466

00:27:36,000 --> 00:27:43,000

You just got no clue where it's going. I mean, you're just sort of like, well, that seems about right.

467

00:27:43,000 --> 00:27:45,000

I can't wait to try.

468

00:27:45,000 --> 00:27:46,000

Good luck.

469

00:27:46,000 --> 00:27:48,000

This is a crazy position to shoot from.

470

00:27:49,000 --> 00:27:55,000

With a few hits loosely spread around the target, Adam is marginally more successful than Jamie.

471

00:27:55,000 --> 00:27:58,000

But this classic stance is clearly not ideal.

472

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

It's crazy. There's just no kinesthetic reset down here. Just you're hoping every single time.

473

00:28:05,000 --> 00:28:07,000

Oh, let's figure out what the score is.

474

00:28:07,000 --> 00:28:13,000

And the scoreboard story is a sorry tale of woe for the first Hollywood handling technique.

475

00:28:13,000 --> 00:28:20,000

An average of 2.8 is significantly short of the control, meaning that method is busted.

476

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

Well, that was fun.

477

00:28:22,000 --> 00:28:24,000

Oh, it's not over yet. There's more to go.

478

00:28:25,000 --> 00:28:29,000

Coming up on MythBusters. Fix your tire by fire.

479

00:28:29,000 --> 00:28:31,000

Woo-hoo!

480

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

It's gonna go!

481

00:28:41,000 --> 00:28:49,000

Jamie and Adam have already proved that as far as firearm fashion goes, shooting from the hip might look cool, but it's just not very effective.

482

00:28:50,000 --> 00:28:55,000

It's crazy. There's just no kinesthetic reset down here. Just you're hoping every single time.

483

00:28:55,000 --> 00:29:05,000

Up next is the straight arm from the shoulder. It peaked in popularity in the cheesy action movies of the 80s, but has long been a stylish staple.

484

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

But will it work?

485

00:29:08,000 --> 00:29:17,000

My feeling is that the straight arm position is gonna be good because I am able to line up with the sights as well as my body in a fairly stable position.

486

00:29:18,000 --> 00:29:24,000

Jamie unloads, and even before the points are tallied, it's clear the position is working well.

487

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

Nice shooting, Tex!

488

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

As Adam also demonstrates.

489

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

Okay, Adam, straight arm shooting.

490

00:29:31,000 --> 00:29:40,000

Compared to the hip shot, it's stable, which enables rapid repeat firing, and being able to use the gun's sights is another obvious advantage.

491

00:29:43,000 --> 00:29:45,000

That's fun.

492

00:29:45,000 --> 00:29:51,000

And it all boils down to a score that compares extremely favorably with the control.

493

00:29:52,000 --> 00:29:59,000

I love this stance. Almost as much as I like the weaver. It gives me a tremendous amount of control. The accuracy was as good as the weaver stance.

494

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

Yeah, this one's a winner.

495

00:30:02,000 --> 00:30:04,000

So next up is the gangster style, right?

496

00:30:04,000 --> 00:30:10,000

Yes, yes. What we were just doing, like this, body on the side, except with the gun turned like we're a straight up thug.

497

00:30:11,000 --> 00:30:20,000

A staple of the 90s, on-screen hoodlums seem to think a 90 degree twist adds a little something to their shooting skills.

498

00:30:21,000 --> 00:30:24,000

But does it really? Adam's excited to find out.

499

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

I have always wanted to hold the gun this way.

500

00:30:30,000 --> 00:30:36,000

I've heard tell that you could break your wrist. Clearly I don't think that's about to happen, but I'm interested to see what my accuracy is like.

501

00:30:36,000 --> 00:30:37,000

Okay, I'm ready.

502

00:30:41,000 --> 00:30:43,000

Did I hit it once?

503

00:30:44,000 --> 00:30:49,000

Although the straight arm did enable Adam to fire off his rounds quickly enough, his score was poor.

504

00:30:50,000 --> 00:30:51,000

Final score of 1.0.

505

00:30:52,000 --> 00:30:53,000

Let's see how Jamie does.

506

00:30:53,000 --> 00:30:55,000

Mr. Heidemann gangster style.

507

00:30:57,000 --> 00:31:02,000

Looking suspiciously natural in the gangster pose, Jamie outscores Adam.

508

00:31:03,000 --> 00:31:04,000

Final score is 1.6.

509

00:31:05,000 --> 00:31:06,000

Nice, gangster.

510

00:31:06,000 --> 00:31:13,000

But when totaled into the table, the result tells us this funky looking firearm fashion is frankly defunct.

511

00:31:14,000 --> 00:31:22,000

I'll be honest with you, the gangster style, it's the one I was anticipating the most and after shooting with it, it is by far the most ridiculous of all.

512

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

You can't see where your bullets are going. You have no point of reference. You're looking at the wrong part.

513

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

You're actually ignoring useful sights that are right. Forget about it. Don't shoot that way.

514

00:31:37,000 --> 00:31:40,000

We love Myth Fortune. What we got?

515

00:31:43,000 --> 00:31:48,000

Dear Myth Busters, is it true that you can reseal an inflated tire using starter fluid?

516

00:31:48,000 --> 00:31:54,000

There's so many videos on the internet of people with deflated tires, they put something flammable in it, light it, and it goes whoop!

517

00:31:54,000 --> 00:31:58,000

And it actually reseats, inflates, and stays inflated.

518

00:31:58,000 --> 00:32:01,000

Sounds simple enough. All we need is a tire and some starter fluid.

519

00:32:01,000 --> 00:32:03,000

This could be so dangerous.

520

00:32:03,000 --> 00:32:04,000

Or explosive.

521

00:32:05,000 --> 00:32:09,000

Where there's fire, there's folk that just can't help themselves.

522

00:32:09,000 --> 00:32:16,000

But despite the danger, the Myth Busters want to know if these clips of explosive roadside assistance are real.

523

00:32:16,000 --> 00:32:21,000

Can you really reseal and inflate a tire by heating things up?

524

00:32:22,000 --> 00:32:24,000

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

525

00:32:26,000 --> 00:32:30,000

Getting a flat on a deserted road, this is how all horror movies start.

526

00:32:31,000 --> 00:32:35,000

Imagine you're in a deserted location, you've got a flat tire, and you've got no spare.

527

00:32:35,000 --> 00:32:37,000

That's what the myth is all about.

528

00:32:37,000 --> 00:32:43,000

Seating a tire on a rim and inflating it when you've got nothing but a can of starter fluid and a lighter.

529

00:32:43,000 --> 00:32:48,000

Now in the internet clip, we see a man spray starter fluid into the deflated tire.

530

00:32:48,000 --> 00:32:53,000

He lights a match and it seats instantly and inflates and stays inflated.

531

00:32:53,000 --> 00:32:55,000

So that is what we're going to be testing.

532

00:32:55,000 --> 00:32:58,000

So we're going to try this with a classic tire, and if that doesn't work,

533

00:32:59,000 --> 00:33:02,000

we're going to move on to a truck tire because it has thicker walls.

534

00:33:02,000 --> 00:33:09,000

First up, it's the regular size tire, which Carrie lets down before getting dressed up for a date with danger.

535

00:33:09,000 --> 00:33:15,000

Good luck, Carrie. Here's the fluid, here's your lighter, don't blow yourself up.

536

00:33:15,000 --> 00:33:19,000

Just like the video, the tire is deflated and unseated from the rim.

537

00:33:19,000 --> 00:33:26,000

And also, just like the reference clip, Carrie sprays an accelerant into the tire before lighting it.

538

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

Well, we've got a tire on fire.

539

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

But it's just a big let down.

540

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

But it's not inflating.

541

00:33:35,000 --> 00:33:36,000

No.

542

00:33:36,000 --> 00:33:37,000

Okay.

543

00:33:37,000 --> 00:33:38,000

Just go poof.

544

00:33:38,000 --> 00:33:39,000

Yeah.

545

00:33:39,000 --> 00:33:40,000

Let's try that again.

546

00:33:40,000 --> 00:33:45,000

Take two, but this time Tori pumps his foot on the tire, mixing the accelerant with air.

547

00:33:45,000 --> 00:33:49,000

Let's see if we can get some air in there, we're going to bet our mixed ratio.

548

00:33:49,000 --> 00:33:51,000

Woohoo!

549

00:33:51,000 --> 00:33:54,000

That worked like a charm!

550

00:33:54,000 --> 00:33:58,000

Except now they seem to have a rapidly inflating tire on fire.

551

00:33:58,000 --> 00:34:02,000

That means that explosion is a very real possibility.

552

00:34:02,000 --> 00:34:04,000

Woohoo!

553

00:34:04,000 --> 00:34:06,000

It's going to go!

554

00:34:06,000 --> 00:34:08,000

Maybe we should all step a little bit further back.

555

00:34:08,000 --> 00:34:09,000

Okay.

556

00:34:09,000 --> 00:34:12,000

That was probably the most terrifying tire inflating I've ever experienced.

557

00:34:12,000 --> 00:34:17,000

Seems like a really dangerous way to fill a tire.

558

00:34:17,000 --> 00:34:23,000

We got the starter fluid into the tire, we got the mixture right, Carrie lit it, and it instantly seated and inflated just like in the video.

559

00:34:23,000 --> 00:34:28,000

In fact, it worked so well that it looked like the tire was going to explode and we all took off running.

560

00:34:28,000 --> 00:34:29,000

Woohoo!

561

00:34:29,000 --> 00:34:37,000

However, when it was all said and done, a lot of cooling happened, a lot of fuel was burnt, and we actually created a vacuum inside the tire.

562

00:34:37,000 --> 00:34:38,000

Yeah, look at that.

563

00:34:38,000 --> 00:34:39,000

It's a vacuum.

564

00:34:39,000 --> 00:34:40,000

Wow.

565

00:34:40,000 --> 00:34:42,000

I would call that inflated.

566

00:34:42,000 --> 00:34:44,000

I call that the opposite of inflated.

567

00:34:44,000 --> 00:34:46,000

So there's a couple parts to this myth.

568

00:34:46,000 --> 00:34:48,000

One, does it seat the tire on the rim?

569

00:34:48,000 --> 00:34:49,000

Yes.

570

00:34:49,000 --> 00:34:53,000

You ignite the gases, they expand rapidly, and it pops right on.

571

00:34:53,000 --> 00:34:55,000

Two, does it inflate the tire?

572

00:34:55,000 --> 00:34:56,000

Yes.

573

00:34:56,000 --> 00:35:00,000

It actually inflates it very quickly, and it almost looks like it's going to blow up.

574

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

But three, and most important, does it stay inflated?

575

00:35:03,000 --> 00:35:04,000

No.

576

00:35:04,000 --> 00:35:09,000

Because as the gases cool, it forms sort of a vacuum, and you see the tire shrink back down onto the rim.

577

00:35:09,000 --> 00:35:11,000

So this one is busted.

578

00:35:11,000 --> 00:35:12,000

Busted.

579

00:35:12,000 --> 00:35:14,000

But there is some truth to the myth.

580

00:35:14,000 --> 00:35:20,000

It's an excellent, if highly dangerous method of reseeding and briefly inflating the tire.

581

00:35:20,000 --> 00:35:24,000

It just doesn't stay inflated, but the team isn't done yet.

582

00:35:24,000 --> 00:35:27,000

All right, next up, have you do any truck tire?

583

00:35:27,000 --> 00:35:31,000

The clip the viewers sent in showed the trick being done on a truck tire.

584

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

So to cover all their bases, they're giving that a go.

585

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

And once again, Carrie gets the accelerant right into the tire before lighting it.

586

00:35:40,000 --> 00:35:41,000

Whoa!

587

00:35:41,000 --> 00:35:42,000

Woo-hoo!

588

00:35:42,000 --> 00:35:43,000

Nice!

589

00:35:43,000 --> 00:35:44,000

It worked!

590

00:35:44,000 --> 00:35:45,000

But did it really?

591

00:35:45,000 --> 00:35:46,000

Oh, but look at that.

592

00:35:46,000 --> 00:35:47,000

It's lost its inflation.

593

00:35:47,000 --> 00:35:48,000

Oh!

594

00:35:48,000 --> 00:35:52,000

So it's a great party trick, but not really good for road repairs.

595

00:35:52,000 --> 00:35:53,000

Not practical.

596

00:35:53,000 --> 00:35:59,000

The initial rapid expansion of gases from the explosion does pop the tire onto the rim.

597

00:35:59,000 --> 00:36:03,000

But when those gases cool, you're pretty much back to square one.

598

00:36:03,000 --> 00:36:04,000

Woo-hoo!

599

00:36:04,000 --> 00:36:09,000

Now after watching the video, it seemed like seating and inflating your tire with fire

600

00:36:09,000 --> 00:36:11,000

is dangerous, and well, it's facing it.

601

00:36:11,000 --> 00:36:12,000

It is.

602

00:36:12,000 --> 00:36:13,000

However, it does work.

603

00:36:13,000 --> 00:36:16,000

You can seat the tire, but it does not stay inflated.

604

00:36:16,000 --> 00:36:20,000

You still need some kind of compressed air to keep the tire filled.

605

00:36:20,000 --> 00:36:22,000

So this one's busted.

606

00:36:40,000 --> 00:36:46,000

Welcome back.

607

00:36:46,000 --> 00:36:51,000

We have been testing a bunch of gun handling techniques that we have seen in the movies,

608

00:36:51,000 --> 00:36:55,000

but now it's time to add another layer, a gun shape layer.

609

00:36:55,000 --> 00:36:56,000

That's right.

610

00:36:56,000 --> 00:37:00,000

It's now time for two guns.

611

00:37:00,000 --> 00:37:04,000

So, Matrix style two gun gun play is up next.

612

00:37:04,000 --> 00:37:09,000

But are you really doubling your chances of a ballistics bullseye?

613

00:37:09,000 --> 00:37:11,000

Jamie, you look badass.

614

00:37:11,000 --> 00:37:12,000

I'll tell you that.

615

00:37:12,000 --> 00:37:13,000

Ready.

616

00:37:13,000 --> 00:37:14,000

Here we go.

617

00:37:14,000 --> 00:37:17,000

There is one important factor to note.

618

00:37:17,000 --> 00:37:22,000

Despite using double the amount of ammo, the final time-adjusted score will still give

619

00:37:22,000 --> 00:37:24,000

an accurate comparison to the control.

620

00:37:24,000 --> 00:37:29,000

After all, firing twice as many bullets takes twice as long.

621

00:37:29,000 --> 00:37:31,000

Nice work, home ray.

622

00:37:31,000 --> 00:37:33,000

That was an experience.

623

00:37:33,000 --> 00:37:36,000

There's a certain kind of symmetry to it that I liked.

624

00:37:36,000 --> 00:37:40,000

You can almost brace your hands together on each other while you're firing.

625

00:37:40,000 --> 00:37:42,000

Before we tally the total, Adam's up.

626

00:37:42,000 --> 00:37:47,000

And despite Jamie having a tashed tickling experience, Adam's not confident.

627

00:37:47,000 --> 00:37:48,000

Safety's on.

628

00:37:48,000 --> 00:37:52,000

Bang, bang, bang, bang, bang, bang, bang, bang, bang, bang, bang, bang, low score, low score,

629

00:37:52,000 --> 00:37:53,000

moving on, right?

630

00:37:53,000 --> 00:37:54,000

That's what I'm expecting.

631

00:37:54,000 --> 00:37:55,000

Okay, here we go.

632

00:37:55,000 --> 00:37:56,000

Safety's off.

633

00:37:57,000 --> 00:38:02,000

Yep, the balance and symmetry of shooting two guns at once may be the reason it looks

634

00:38:02,000 --> 00:38:08,000

so cool, but really, it's a tricky feat of coordination that makes real marksmanship

635

00:38:08,000 --> 00:38:09,000

tough.

636

00:38:10,000 --> 00:38:11,000

Yay!

637

00:38:11,000 --> 00:38:12,000

That was awesome.

638

00:38:12,000 --> 00:38:13,000

Isn't it?

639

00:38:13,000 --> 00:38:14,000

Yes!

640

00:38:14,000 --> 00:38:15,000

I really like how that feels.

641

00:38:15,000 --> 00:38:18,000

It's like a rocking horse of death.

642

00:38:18,000 --> 00:38:19,000

Jamie was totally right.

643

00:38:19,000 --> 00:38:23,000

Two guns might not mean double the score, but it is super fun.

644

00:38:23,000 --> 00:38:27,000

I mean, you end up with this kind of rhythm where you're rocking your head and firing

645

00:38:27,000 --> 00:38:33,000

bang, bang, bang, bang, bang, bang, bang, bang, feels very kind of weirdly natural and like

646

00:38:33,000 --> 00:38:34,000

your cartoon character.

647

00:38:34,000 --> 00:38:35,000

So what could be better?

648

00:38:36,000 --> 00:38:43,000

The score for one thing, because the final tally of 4.1 means it might be an adrenaline-surgingly

649

00:38:43,000 --> 00:38:46,000

ton of fun, but it's also a whole heap of busted.

650

00:38:48,000 --> 00:38:50,000

Well, have we covered just about everything?

651

00:38:50,000 --> 00:38:51,000

Just about.

652

00:38:51,000 --> 00:38:52,000

There's one more thing I want to try.

653

00:38:52,000 --> 00:38:56,000

Two guns towards one target, but in the movies I've seen this.

654

00:38:56,000 --> 00:38:58,000

Crossed hands, two different targets.

655

00:38:58,000 --> 00:38:59,000

I think we should try it.

656

00:38:59,000 --> 00:39:00,000

Why not?

657

00:39:00,000 --> 00:39:01,000

All right.

658

00:39:01,000 --> 00:39:02,000

These aren't real guns.

659

00:39:02,000 --> 00:39:05,000

These are our standing guns, because I don't point real guns at our camera man.

660

00:39:07,000 --> 00:39:13,000

It's where ballet meets ballistic gunplay, the ultimate in slick cinematic choreography,

661

00:39:13,000 --> 00:39:15,000

but Adam is unimpressed.

662

00:39:16,000 --> 00:39:18,000

Chris Cross is ridiculous.

663

00:39:18,000 --> 00:39:24,000

I say now that it's second only to the gangster style in ridiculousness and the lack of effectiveness.

664

00:39:24,000 --> 00:39:30,000

With the target several feet apart, Jamie gets his bearings, lines up and unleashes hell.

665

00:39:38,000 --> 00:39:42,000

You look like you're going little popcorn machine there for a second.

666

00:39:42,000 --> 00:39:45,000

I figured I might as well have some fun with it.

667

00:39:45,000 --> 00:39:50,000

Yep, he was off balance and the patting your head while rubbing your stomach type action

668

00:39:50,000 --> 00:39:53,000

means coordination was also an issue.

669

00:39:53,000 --> 00:39:58,000

All of which was reflected in a low score that matches the pre-test prediction.

670

00:39:58,000 --> 00:40:00,000

Final score, 2.1.

671

00:40:00,000 --> 00:40:06,000

But there's no denying Jamie did look every inch the cool cinematic hitman.

672

00:40:06,000 --> 00:40:10,000

Something as he takes his position, Adam aspires to.

673

00:40:10,000 --> 00:40:15,000

And as he fires at the dual targets, it turns out it's a role Adam believes he can fill.

674

00:40:15,000 --> 00:40:17,000

Not bad.

675

00:40:17,000 --> 00:40:19,000

Not bad at all.

676

00:40:19,000 --> 00:40:23,000

The stance was much more effective than he expected.

677

00:40:23,000 --> 00:40:28,000

Final score was 7.1, which is pretty good.

678

00:40:28,000 --> 00:40:35,000

But despite Adam's surprisingly healthy points total and considering he used twice as many rounds as the control,

679

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

in the final analysis, it just doesn't cut it.

680

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

I thought because you could brace your arms against each other it might work, but it doesn't.

681

00:40:44,000 --> 00:40:48,000

You'd be much better off using a proper technique and one gun.

682

00:40:48,000 --> 00:40:51,000

Crisscross is clearly busted.

683

00:40:51,000 --> 00:40:59,000

So if Crisscross consigned to the busted bin, let's get the low down on the whole history of filmic firearm fashion.

684

00:40:59,000 --> 00:41:02,000

Let's assess what we've learned, shall we?

685

00:41:02,000 --> 00:41:06,000

We started with the weaver technique, which was the best score and the best clustering for Jamie and I.

686

00:41:06,000 --> 00:41:11,000

And we went to shooting from the hip, which was pretty much the worst.

687

00:41:11,000 --> 00:41:15,000

When you did look down the sights, as we did while holding the gun at the side,

688

00:41:15,000 --> 00:41:20,000

we did pretty darn well getting most of the bullets on the target and the second best score to the weaver.

689

00:41:20,000 --> 00:41:24,000

Gangsta style, what can I say? It's terrible. It's ridiculous.

690

00:41:24,000 --> 00:41:27,000

It's totally a useless way to hold a handgun.

691

00:41:27,000 --> 00:41:31,000

Then we brought two guns into the mix and what we saw when we brought two guns into the mix, we doubled the bullets,

692

00:41:31,000 --> 00:41:38,000

was not double the scores. In fact, the scores most of the time went down except for, I think, a couple lucky shots for me at the end.

693

00:41:38,000 --> 00:41:44,000

After looking at all of this, I have to conclude that as long as you're looking down the sights of a single gun and concentrating on it,

694

00:41:44,000 --> 00:41:49,000

you're going to have the most effective shooting technique. You don't need two guns.

695

00:41:52,000 --> 00:41:54,000

This wheel thing worked pretty well.

696

00:41:54,000 --> 00:41:58,000

It did, but I'm wondering what do we do with the mix we haven't read or filmed yet?

697

00:41:58,000 --> 00:42:03,000

Well, let's just leave this thing set up. I have a feeling we're going to be using it again.

698

00:42:03,000 --> 00:42:06,000

Alright, you heard the man. Send us your ideas.