Which sailing stone went farther?

Two rocks moved on the same December morning. Each left a longer trail than its GPS unit recorded. Use the measurements below to decide which rock went farther.

Two records from Death Valley

The GPS column covers one movement on December 4, 2013. The complete trail includes that movement and later travel. All distances are in metres (m).

Stone	December 4 GPS run	Complete trail
A3	65.6 m	157.5 m
A6	64.1 m	162.4 m

1. Which stone went farther during the GPS run, and by how much?

2. Which stone had the longer complete trail, and by how much?

3. How many metres of each trail fall outside the GPS run?

Stone A3 (m)

Stone A6 (m)

4. What detail about the later travel is missing from these totals?

Source: Norris and colleagues, PLOS ONE (2014), results, figure 6 and table 1.

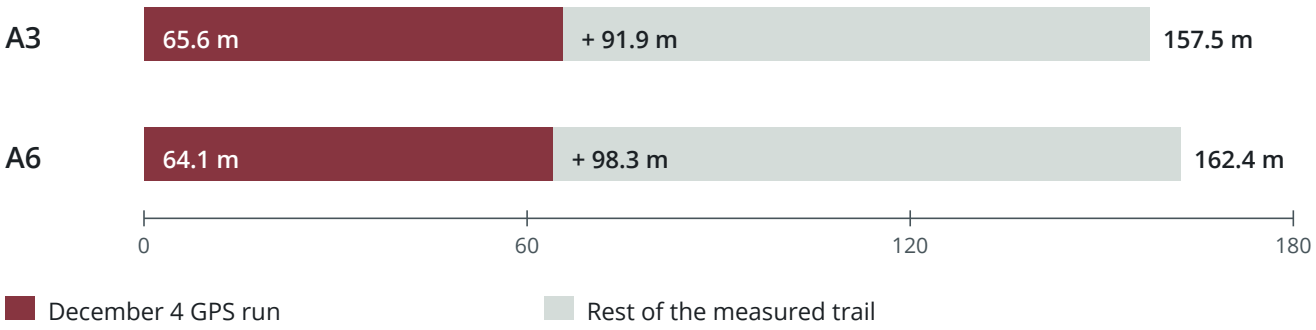
Open the field study

Turn the page for the worked answers.

The trail outlasted the batteries

A3 edged ahead during the recorded run. A6 left the longer trail overall. The two answers describe different periods of travel.

Distance along the trail, in metres



1 / During the GPS run

A3 went 1.5 m farther. Subtract 64.1 from 65.6.

2 / Across the complete trail

A6 left a trail 4.9 m longer. Subtract 157.5 from 162.4.

3 / Outside the recorded run

A3: 157.5 − 65.6 = 91.9 m. A6: 162.4 − 64.1 = 98.3 m.

4 / What the extra distance cannot date

The researchers report that both rocks moved again after their GPS batteries ran down. A trail adds up the distance. It has no clock. These totals alone cannot tell us when each later movement happened, how fast it was or how many separate movements occurred.

What evidence would help?

A time-stamped camera sequence with a fixed landmark, or another working position logger covering the same interval, could put a time against part of the remaining trail.

Read the source study

Open the accessible web exercise