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(Music)

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00:00:04,000 --> 00:00:08,000
I'm Ashwin Vasavada, Deputy Project Scientist for the Mars Science Laboratory mission

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00:00:08,000 --> 00:00:12,000
and this is your Curiosity Rover Report.

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Curiosity has spent the last two months studying the first rocks that we can tie to the base of Mount Sharp,

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the 3-mile-high mountain in the center of Gale Crater.

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This is our first look at what the mountain is made of.

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We're now, more sure than ever that we're going to learn about the early history of Mars,

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it's changing climate, and the potential for Mars to support life.

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To tell you why we're so excited,

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we have to go back a few months when we were still a few miles away from Mount Sharp.

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At that point, our team started noticing distinct patterns on the rocks around us.

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There were tilted beds of sandstone all facing south in the direction of Mount Sharp.

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The geologists in our team concluded that these tilted beds of sandstone formed

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where streams empty into standing bodies of water, like lakes.

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The sediments carried by the flowing water sink when they enter the lake,

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forming a sloped wall that slowly advances forward as sediment continues to fall.

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In September of this year, Curiosity arrived at the rocks that form the base of Mount Sharp itself.

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What we found waiting for us was a new type of rock: one that forms when tiny particles of sediment

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slowly settle out within a lake, forming mud at the lake bottom.

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These mudstones are very finely layered,

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suggesting that the river and lake system was going through cycles of change.

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Our hypothesis is this: where now there is a mountain, there once was a lake.

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Over a span of perhaps millions of years, water flowed from the northern rim of Gale Crater toward the center

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bringing sediment that slowly formed the lower layers of Mount Sharp.

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At any one time, the lake may have only been a few meters deep,

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just enough to form those sandstone deltas and thin layers of mud.

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But fluctuations in the water supply or the climate

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allowed this to happen over and over, slowly building up the mountain.

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Over the next few months, we'll continue to climb up the lower layers

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of Mount Sharp to see if our hypothesis for how it formed holds up.

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We'll also look at the chemistry of the rocks to see if the water that was once present

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would've been of the kind that could support microbial life, if it ever was present.