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Grade	
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## Martian Landscapes

## Pre-Lab Quiz

Record you team's answer as well as your reasonings and explanations.

1.

2.

3.

4.

## Part 1: Zooniverse: AI4Mars

1. Research the NASA Mars rovers Spirit, Opportunity, Curiosity, and Perseverance. When did each mission launch and study Mars? If a rover has retired, why did its mission end? What were/are the main goals of each mission? How are the missions of the Mars rovers aligned?

2. Block off bedrock, float rock(s), sand, pebbles, and hill/peak features in ten separate rover images of Mars from the Zooniverse, labeling features with green, teal, and yellow, black, and red polygon shapes. Screenshot your classification to include in the table below before submitting it on the Zooniverse by clicking 'Done'.

Include a screenshot of your labeled image below	Describe your image. What type of terrain was present (bedrock, sand, etc.)? Was your image of the ground nearby? A larger landscape? Something else?



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3. Why is this classification work important? What resources can be saved by ensuring in advance that the Mars rovers traverse the Martian terrain as safely as possible?

4. List a way in which the camera equipped on the Mars rover is similar to the astronomical cameras on the Van Allen Observatory and Iowa Robotic Observatory telescopes. List a way in which the two types of cameras are different.

## Part 2: Zooniverse: Planet Four

1. Describe, in your own words, the process by which the ‘fan’ shapes and ‘blotch’ shapes that you will classify today form on the south polar cap of Mars.

2. Label the dark material features you see on ten separate HiRISE images of the Martian south pole from the Zooniverse. Screenshot your classification to include in the table below. You will need to progress through many ‘No’ submissions where you don’t see any seasonal fans and/or blotches to label before finding ten images you can label; you can only count images with fans and blotches (even if just one) toward your ten images you detail below.

Include a screenshot of your labeled image below	Describe your image. How many fans? Blotches? What direction do the fans point (left, right, etc.)? How dark or faint do the fans and blotches appear?



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3. Can you think of any other locations in the Solar System where similar processes might form 'fan' or 'blotch' shapes on a surface? If so, describe them, and if not, explain why not.

4. Is this type of lab, where you are working with data from a project doing real scientific research, more interesting to you than your typical lab, less interesting, or about the same?