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| Mission to Mars  3-5-ETS1-2 Engineering Design | | | |
|  | Limited Progress | Progressing | Exemplary |
| *Assessment for**Phase 3*  **Constructing Explanations and Designing Solutions.** Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. | **Phase 3: Landing Site Selection**   * The student does not use criteria to select their landing site. * The student does not provide a criteria-driven justification for their preferred landing site. | **Phase 3: Landing Site Selection**   * The student uses criteria to select their landing site. * The student justifies their landing site but with little or no reference to criteria. | **Phase 3: Landing Site Selection**   * The student uses criteria to select their landing site. * The student justifies their landing site based on the criteria. |
| *Assessment for**Phases 1 and 2*  **3-5-ETS1-2**. Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. | **Phase 1: Pre-Mission Planning**   * The student does not consult non-fiction sources to develop background knowledge about Mars.   **Phase 2: Packing Challenge**   * The student does not justify their crew member selections. based on the non-fiction texts. * The student doesn’t revise their crew list and try again. | **Phase 1: Pre-Mission Planning**   * The student consults some sources to develop background knowledge about Mars but doesn’t take sufficient notes.   **Phase 2: Packing Challenge**   * The student selects crew members based on the non-fiction texts but doesn’t provide sufficient rationale. * The student revises their crew list and tries again. | **Phase 1: Pre-Mission Planning**   * The student consults sources to develop background knowledge about Mars and documents their learning through notes which are used in later phases of the project.   **Phase 2: Packing Challenge**   * The student selects crew members based on the non-fiction texts and provides sufficient rationale. * The student revises their crew list and tries again. |
| *Assessment for Phase 4*  **3-5-ETS1-2.** At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. | **Phase 4: Route Planning and Roving**   * The student did not follow the criteria for avoiding hazards or collecting a diverse set of geologic samples and therefore had little to contribute to the group’s understanding. | **Phase 4: Route Planning and Roving**   * The student followed the criteria for avoiding hazards and collecting a diverse set of geologic samples and contributed to the oral discussion about improving route designs. | **Phase 4: Route Planning and Roving**   * The student followed the criteria for avoiding hazards and collecting a diverse set of geologic samples and contributed to the oral discussion about improving route designs by referring to quantitative abstractions and mathematical approaches to solving the route problems. |
| *Assessment for Phase 5*  **Influence of Science, Engineering, and Technology on Society and the Natural World**  Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. | **Phase 5: Post Mission - Assessment, Reflections, and Reasoning**   * The student did not incorporate specific examples of appropriate crewmates, scientific data collection criteria for landing sites, and sufficient risk mitigation while route planning and roving. * The student did not use insights from any of the mission phases to critique the fictitious mission plan. | **Phase 5: Post Mission - Assessment, Reflections, and Reasoning**   * The student incorporated some examples of appropriate crewmates, scientific data collection criteria for landing sites, and sufficient risk mitigation while route planning and roving. * The student used insights from one or two phases to critique the fictitious mission plan. | **Phase 5: Post Mission - Assessment, Reflections, and Reasoning**   * The student incorporated specific examples of appropriate crewmates, scientific data collection criteria for landing sites, and sufficient risk mitigation while route planning and roving. * The student used insights from all phases to critique the fictitious mission plan. |