Mars Rover Celebration Pacing Guide for Grades 6-8

Week	Lesson	Big Ideas	Days/ Length*	Component	Minutes	Essential Question	Key Vocabulary	Available Activities
Week 1	Lesson 1	Solar System	2 (90 min)	Engagement	15	How might you describe the solar system to a friend who knows nothing about the relative sizes of the sun and planets or the distances among them?	apply astronomical scale	Solar System Tour Building a Solar System Science Notebooks Exit Tickets
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 2	Introduction to Mars	2 (90 min)	Engagement	15	How do you think the activities you completed on making observations and on researching Mars will help you design a successful mission for your Mars Rover?	astronomy astrology surface	Internal Dialogue Mini-Lesson Mars (Runtime 02:46) Mars Foreign Object Lab Science Notebooks
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
Week 2	Lesson 3	Research Tools and Skills †	2 (90 min)	Engagement	15	Which of the informational text features you learned about today was the most helpful to you in researching information for your Mars Rover project?	research plagiarism	Informational Text Mini-Lesson GoogleEarth Science Notebooks
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 4	Investigate Mars	2 (90 min)	Engagement	15	How do I know when I've found important information in my reading?	main idea paraphrase topic summarize	Identifying Details Mini-Lesson Lost Rover Activity Science Notebooks Exit Tickets
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 5	Selecting Team Rover Missions	2 (90 min)	Engagement	15	Why is it important to form a valid (reasonable or sensible) and specific scientific question before conducting your research?	geology hypothesis mission valid	Scientific Question Mini-Lesson Writing a Scientific Question Science Notebooks
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			

* This pacing guide is designed around a 45 minute period of time. For additional time, adjust accordingly.

† Assistance your district's Technology Department my be needed to download and install required software

Week	Lesson	Big Ideas	Days/ Length*	Component	Minutes	Essential Question	Key Vocabulary	Available Activities
Week 3	Lesson 6	Mission Measurements	2 (90 min)	Engagement	15	How does coming up with a plausible solution for your scientific question help you design the measurements you need for your Mars Rover mission?	measurement plausible	Defining Missions Mini-Lesson Brainstorming Activity Science Notebooks Exit Tickets
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 7	Measuring Features	2 (90 min)	Engagement	15	Why are taking accurate measurements critical to your Mars rover mission?	crater impact inference standardized	Inferencing Mini-Lesson *"How the Foot Came to Be"* Story Mars Crater Lab Science Notebooks
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 8	Landing Selection	1 (45 min)	Engagement	10	How did you select the place for your Mars rover mission? Describe how your selected site meets the needs of your question?	control variable terrain	Curiosity Trailer (Runtime 1:37) Getting to Mars (Runtime 3:51) Gale Crater Interactive Science Notebooks
				Exploration	25			
				Explanation	10			
				Elaboration	as needed			
				Evaluation	as needed			
Week 4	Lesson 9	Speaccraft Structure and Design	3 (135 min)	Engagement	20	What attributes will my Mars Rover need to: get to Mars, carry out its mission and, send the data back to Earth?	aerodynamic attribute	Reading Strategies Mini-Lesson Research Station Spacecraft Design Station Rover Communication Station Science Notebooks
				Exploration	90			
				Explanation	25			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 10	Landing on Mars; Rover Movement and Survival	2 (90 min)	Engagement	10	Why is the method you chose for landing your Rover on Mars the best one for your mission?	conditions problematic	Persuasive Writing Mini-Lesson Mars in a Minute (Runtime 1:00) Landing Strategies Science Notebooks
				Exploration	65			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			

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Week	Lesson	Big Ideas	Days/ Length*	Component	Minutes	Essential Question	Key Vocabulary	Available Activities
Week 5	Lesson 11	Brainstorming and Preliminary Design	2 (90 min)	Engagement	15	Which step of the Engineering Design Process was the most difficult for your team? What made this step so challenging for you?	consider evaluate process	How It's Made (Runtime 2:47) Engineering Design Process Concept Map Mini-Lesson
				Exploration	60			
				Explanation	15			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 12	Final Designs	1 (45 min)	Engagement	10	How will creating a prototype of your rover help you prepare for the Mars Rover Celebration?	engineering diagram prototype	Captions/Diagrams Mini-Lesson Career Activity Final Designs Science Notebooks Exit Tickets
				Exploration	25			
				Explanation	10			
				Elaboration	as needed			
				Evaluation	as needed			
Week 6	Lesson 13	Constructing Mock-Ups	3 (135 min)	Engagement	10	How does assigning a different job to each member of your team (designer, scientist, project manager, engineer) help you to complete your Mars rover mission?	characteristic ingenuity manager	Engines of our Ingenuity (Runtime 3:43) Construct Rovers Science Notebooks
				Exploration	105			
				Explanation	20			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 14	Manual and Skit	2 (90 min)	Engagement	10	What are the key elements of an effective presentation that your group should keep in mind when writing your Mars Rover skit?	concise flow refine	Writing a Skit Mini-Lesson Writing Team Rover Skits Science Notebooks
				Exploration	70			
				Explanation	10			
				Elaboration	as needed			
				Evaluation	as needed			
	Lesson 15	Presentation of Skits and Models	2 (90 min)	Engagement	5	How did listening to the other teams present help you to improve your own Mars rover presentation? Be specific.	NONE	NASA Johnson Style (Runtime 3:48) Team Rover Presentations
				Exploration	75			
				Explanation	10			
				Elaboration	as needed			
				Evaluation	as needed			

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