Mars Rover Celebration Pacing Guide for Grades 3-5

Week	Lesson	Big Ideas	Days/ Length*	Component	Minutes	Essential Question	Key Vocabulary
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?	calculate represent revolution rotation solar system
				Exploration	60		
				Explanation	15		
				Elaboration	as needed		
				Evaluation	as needed		
	Lesson 2	Introduction to Mars	2 (90 min)	Engagement	15	How will what you learned today about the planet Mars and about making observations help you design a successful mission for your Mars Rover?	astronomy astrology surface
				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
				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
				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 ask valid (good) scientific questions?	geology hypothesis mission valid
				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
Week 3	Lesson 6	Mission Measurements	2 (90 min)	Engagement	15	Why is it important to write your scientific question so you can answer it using data?	measurement plausible solution
				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?	accurate crater impact inference
				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
				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
				Exploration	90		
				Explanation	25		
				Elaboration	as needed		
				Evaluation	as needed		
	Lesson 10	Landing on Mars; Rover Movement and Survival	2 (90 min)	Engagement	15	Why is the method you chose for landing your Rover on Mars the best one for your mission?	conditions problematic
				Exploration	60		
				Explanation	15		
				Elaboration	as needed		
				Evaluation	as needed		

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Week	Lesson	Big Ideas	Days/ Length*	Component	Minutes	Essential Question	Key Vocabulary
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?	evaluate generate select
				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
				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
				Exploration	105		
				Explanation	10		
				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?	professional refine rehearse
				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
				Exploration	75		
				Explanation	10		
				Elaboration	as needed		
				Evaluation	as needed		

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