The table presents data about the planets in the Solar System.

Planet	Average Distance from Sun (AU)	Mass (10^{24} kg)	Orbital Period (Earth days)
Uranus	19.2	86.8	30,589
Mercury	.387	0.33	88.0
Jupiter	5.20	1898	4331
Earth	1	5.97	365.2
Saturn	9.58	568	10,747
Mars	1.52	0.642	687.0
Neptune	30.1	102	59,800
Venus	.722	4.87	224.7

The measured weight of an object depends on its mass and the gravitational attraction of the body on which it rests. Order the planets based on the weight of a constant mass on each surface, from greatest to least.

Correct answer:

Uranus	Jupiter
Mercury	Saturn
Jupiter	Neptune
Earth	Uranus
Saturn	Earth
Mars	Venus
Neptune	Mars
Venus	Mercury

Title

Item Identification Number	2
Grade Level	6-8
Item Type	Ordering a list
Item Sub-Type:	
Content Standard	MS-PS2-4. **Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.** [Clarification Statement: Examples of evidence for arguments could include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system.] [*Assessment Boundary: Assessment does not include Newton's Law of Gravitation or Kepler's Laws.*]
Practice Standard	4. Analyzing and interpreting data
Claim	
Evidence	In this task, the student shows evidence of understanding the relationship between the mass of an body and its gravitational pull. The student shows evidence of the NGSS Practice Standard by analyzing and interpreting the data given in the item to order the planets by the strength of their gravitational pulls.

Innovative Characteristic	1. Quality assessment of standard The task is aligned to standard MS-PS2-4 and demonstrates the understanding of these standards setting the foundation for understanding the nature of gravitational acceleration and the applications of gravity in space science and physics. 2. Practice-forward 3. Assessing conceptual understanding The task assesses the understanding of the concepts of fractional parts and equivalent fractions. 4. Integrative task 5. Fluency Assessment 6. Expressing mathematical reasoning 7. Modeling/Application 8. Technology-enhanced Incremental Transformative Drag and Drop list-ordering technology will be used.
Complexity (see attached reference document)	Low For Part 1 of the task, the student recognizes planetary mass as the important data needed to answer the question. (DOK 1) For Part 2 of the task, the student applies the data by ordering the planets by their mass. (DOK 2)
Approximate length of time to complete the task	3 minutes
Display requirements	The task will be displayed on a regular computer screen.

Response requirements	Students will use the mouse to select their answers and drag them into the appropriate positions/order on the computer screen.
Scoring method	Machine scored
Accessibility features	1. Screen readers text-to-speech/speech-to-text software 2. Font size/graphic enlargement 3. Choice of background/text color 4. Highlight critical feature 5. Passage/item/response choice 6. Graphic organizers or representations 7. Customized dictionary or other home language support 8. Embedded pop-up glossary 9. Reducing visual distractions surrounding written text 10. Avatars (personalized for speaking or sign language) 11. Caption for audio 12. Option response: adapted keyboards, StickyKeys, MouseKeys, FilterKeys 13. Customized timing 14. Braille printing or refreshable Braille devices