

Lunar Lander Student Worksheet

Your name: _____ Class Period _____

Partner's name if you have a partner: _____

Welcome to Data Games!

1) Watch the first short video introducing *Lunar Lander*

- If your teacher wants you to watch this video on your own computer, type in this URL:

<http://tinyurl.com/LunarVidOne>

2) Open the game

- Type in this URL to open the *Lunar Lander* game:

<http://tinyurl.com/lunarlander-datagame>

3) Click *Play*

4) If you have a partner, click *Two Landers*

5) Customize your spacecraft(s)

- Use *Setup* to change the names of your lunar lander and captain, the colors, and control keys.
- Click *Exit Setup* when you're done.

6) Begin flights

- You can see Earth in the background now. Click *Start Descent* or just begin using the controls to make some good landings on the moon.

7) After you've made a few flights

- (Q1) What do you think makes a landing a "good" one?

- (Q2) What does the graph look like for a "good" landing? Be specific.

Your name: _____ Partner's name if any: _____

8) Now play with a partner if you can, and see who can make the better landing.

- (Q3) When is it obvious that someone has a better landing?

- (Q4) When is it hard to tell which player has a better landing?

9) Watch the second short video

- If your teacher wants you to watch this video on your own computer, type in this URL:

<http://tinyurl.com/LunarVidTwo>

10) Practice creating a score formula

- To make a score formula, choose **New Attribute in Landing Attempts** from the Table's Gear menu.
- First enter the one shown in the video for practice.
 - Type "score" into the Attribute Name field.
 - Click *Insert Value*, and select *total_time* from the drop-down menu.
 - Type a "+" sign, and then click *Insert Value* again and select *fuel_remaining*.
 - Type a "+" sign, and then click *Insert Value* again and select *impact*, so that the score formula is:
"total_time+fuel_remaining+impact"
 - Then click *Apply*.
- You may need to widen your Table to see the new *score* column by placing your cursor over one of the vertical bars in the middle, and dragging it to the right.
- Make a flight or two and check that new values show up in the *score* column in the Table.

11) Play some games to try out this score formula

- (Q5) Explain briefly why this formula is not a good one.

Your name: _____ Partner's name if any: _____

12) Create your own score formula

- (Q6) For a “good” landing to have a high score, which variable(s) do you want to have large values? _____
- (Q7) For a “good” landing to have a high score, which variable(s) do you want to have small values? _____
- Go to the Gear menu in the Table again, choose **New Attribute in Landing Attempts**, and type in a new formula for *score*.
- Enter a different formula that makes landings you think will receive high scores, and landings you think will receive lower scores.
- You can use these operators in your formula:

+	addition
-	subtraction
*	multiplication
/	division
()	parentheses for grouping
^	exponentiation

You can also use any of the special functions listed in the *Insert Function* drop-down menu.

13) Test out your new formula

- Try a number of new flights and landings, and continue revising your score formula as needed.
- There are a variety of possible good formulas you could come up with here!

14) After you're satisfied with your formula

- (Q8) What is your score formula? _____

15) Try another student's formula

- When your teacher tells you to, swap formulas with another student in your class.
- (Q9) Write down one other student's formula here:

- Enter the other student's formula into your Table, and see what scores that formula gives your landings.

Your name: _____ Partner's name if any: _____

- (Q10) What do you think of this formula compared to yours? Explain your thinking about which formula you think works best to score landings.