



Homeschool Learning Network The Science of a Homerun

Name _____

Date _____

Subjects: Science, Math, Sports**Grades:** 6-12**Concepts:**

Students will experiment with the speed and angle of a pitched ball in combination with the speed of a swung bat in order to determine what scientifically constitutes a homerun.

Lesson:

What exactly constitutes a homerun? The ability to hit an out-of-the-park homerun has many contributing factors, including the speed and angle of the pitched ball, and the speed of the swing. We will use the Exploritorium's Shockwave "Slugger" program to experiment with different combinations of pitches to determine how many different combinations can scientifically produce a homerun!

Visit the Exploritorium Slugger Site <http://www.exploritorium.edu/baseball/> and read about the scientific factors that make up a homerun. When you have finished reading, use the information in the chart below to complete the rest of the chart. Then try a couple of your own experiments and fill in lines 8, 9, and 10 of the chart! When you are done, complete the summary questions that follow. Answers can be found at the end of this Learning Guide.

Bat Speed	Pitch Speed	Angle of Ball	Distance Hit	Homerun? (365 feet or more)
1. 30	50	36		
2. 65	50	10		
3. 65	100	58		
4. 65		35	420	Yes
5. 50	78	50		
6. 65	90		440	Yes
7.	75	35	282	No
8.				
9.				
10.				

1. What is the least distance you can hit the ball?
2. What is the greatest distance?
3. What happens when you increase the angle on a fastball with a fast swing?



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Lesson Answers

	Bat Speed	Pitch Speed	Angle of Ball	Distance Hit	Homerun?
1.	30	50	36	184	No
2.	65	50	10	203	No
3.	65	100	58	387	Yes
4.	65	78	35	420	Yes
5.	50	78	50	318	No
6.	65	90	44	440	Yes
7.	40	75	35	282	No

- 13 feet
- 472 feet
- It will increase in distance until midrange (36 degrees), and then it will decrease in distance.