

Name:

Date:



HARRY O'MALLEY

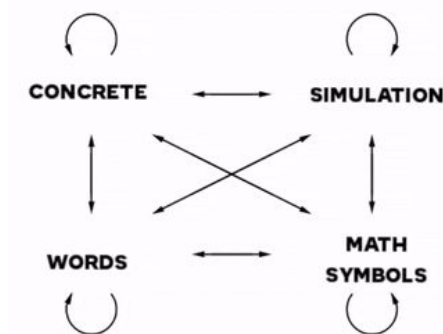
Smoosh Depth vs Object Width - Linear - Lesson 1

#0 - Teacher hands out the following materials to each student

1 block of Play-Doh, 1 ruler, 1 index card, 1 copy of this handout, 1 calculator, 1 pencil

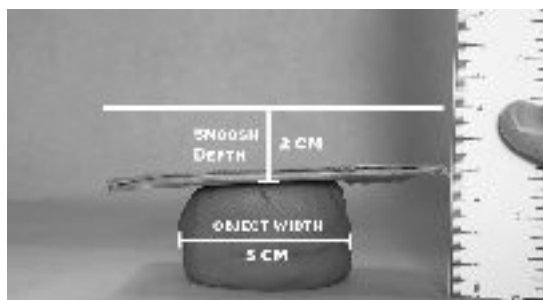
#1 - Teacher explains the information below

In this unit, you'll learn about smooching in four different ways: through concrete examples, simulations, words, and math symbols. You'll be learning how to create each representation. You'll also learn how to translate from one representation to another.

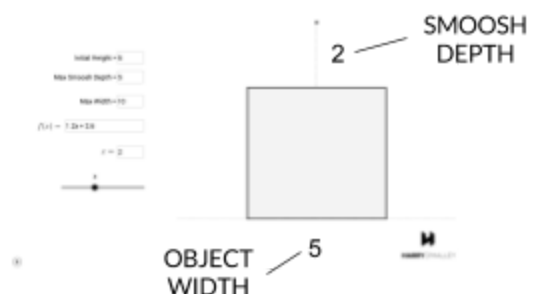


In our study of smooching, we are interested in two different numbers: the smooch depth and the width of the object being smooched. Here's how those two numbers appear in each of the representations.

CONCRETE



SIMULATION



WORDS

Starting at a **width** of 2.6 cm, the **width** of the object increases at a rate of 1.2 cm per cm of **smooch depth** from 0 cm to 5 cm of **smooch depth**.

MATH SYMBOLS

$$f(x) = 1.2x + 2.6, \quad 0 \leq x \leq 5$$

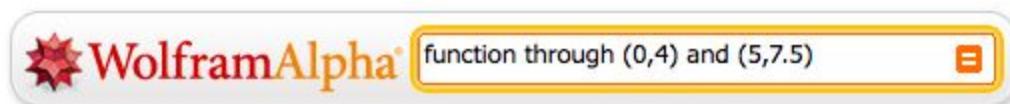
OBJECT WIDTH SMOOSH DEPTH

#4 -Teacher models process below using Wolfram Alpha widget and site

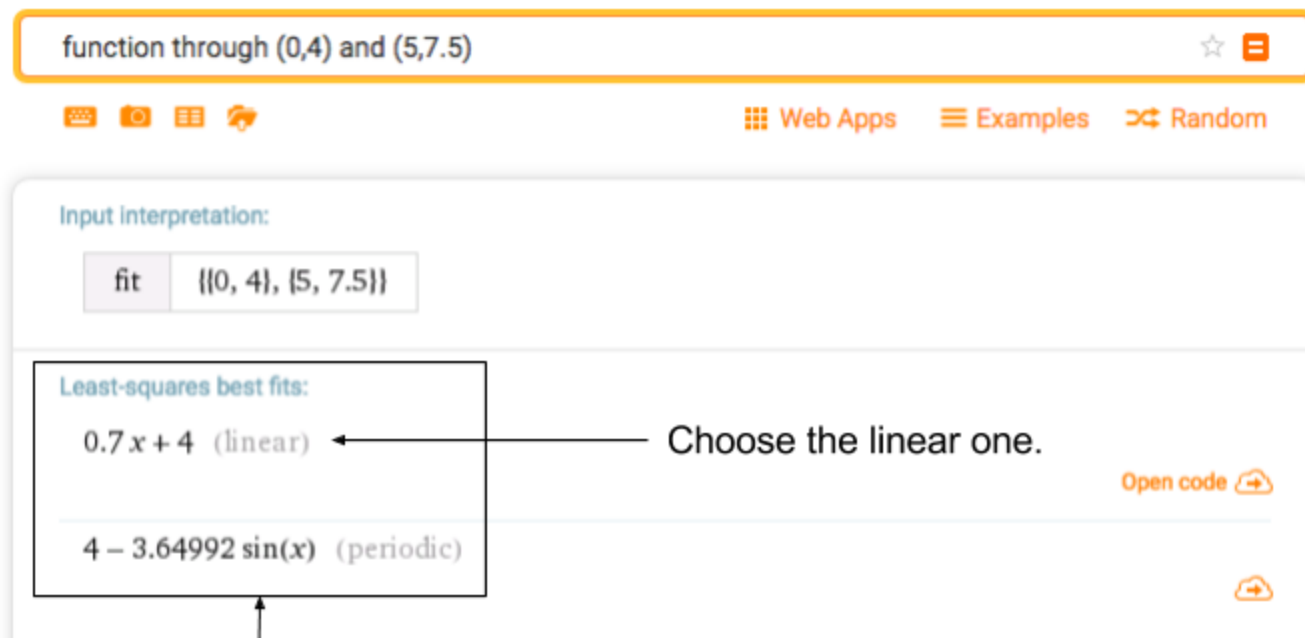


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Now it's time to write the function. Take the first pair of numbers in your table and the last pair and ask WolframAlpha to write a function through those two pairs. If your first pair was (0,4) and your second pair was (5,7.5) you would enter this:



Wolfram Alpha will provide you with two different functions for the data (see below). We will be working with the linear one.



Two functions are given.

#5 -Student uses Wolfram Alpha Widget and site to generate function

#6 -Student completes the task below

Write your function below, beginning with "f(x) =". If we were using the function above, we would write $f(x) = 0.7x + 4$.

Your function: _____

#7 -Teacher explains and models task, then student finishes the task



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Using your calculator, find the value of $f(0)$, $f(1)$, $f(2)$, $f(3)$, $f(4)$, and $f(5)$. Place your answers in the table below. Verify that the values that the function gives are close to the actual values you measured. In other words, convince yourself that the function is reasonable.

Smooch Depth x	Object Width $f(x)$
0	
1	
2	
3	
4	
5	

CONCRETE TO SIMULATION



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#8 - Teacher plays “Smooch Math - Simulation Introduction” video

#9 - Student completes the task below

In this section, you'll create a simulation of the smooching you just created. Follow the instructions below:

1. Enter 6 as the initial height of the object. Press Enter.
2. Enter 5 as the Max Smooch Depth since that's how much we smooched it. Press Enter.
3. What is the widest that your Play-Doh got? Enter that number as the Max Width. Press Enter.
4. Enter your function in the “ $f(x)=$ ” area. Press Enter.
5. Slide the slider back to the beginning, to a value of 0.
6. Enter a value of 0 in the “ $x=$ ” area. Press Enter. This sets the smooch depth to 0.
7. Look at the width of the object. It will appear below the object.
8. Record this information in the data table below by placing a 0 in the first row of the smooch depth column and the corresponding object width in the Object Width column.
9. Repeat steps 6-9 for x values of 1, 2, 3, 4, and 5.
10. Verify that the data that the simulation produces matches your function's data from the previous page.
11. Press the play button to see the smooching in action.
12. Press pause once you're done.

Smooch Depth x	Object Width $f(x)$
0	
1	
2	
3	
4	
5	

CONCRETE TO WORDS

#10 - Teacher explains task below, then student completes the task

The following sentence shows precise and accurate language to use when describing the width of an object that is being smooshed according to the functions in this module. Fill in the blanks with your information. Then memorize the sentence until you can write it from memory. Then actually write it from memory below it. Only look if you really need to.

Starting at a width of _____ cm, the width of the object increases at a rate of _____ cm per cm of smoosh depth from 0 cm to 5 cm of smoosh depth.