

#35 – You Better Wurk! How to be a Super Model-ing Teacher

Brian Shay
@MrBrianShay
Brian.Shay@sduhsd.net

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Super Model-ing Experts and Resources!

- Michael Fenton
- Robert Kaplinsky
- Geoff Krall
- Dan Meyer
- Andrew Stadel
- Desmos.com
- OpenMiddle.com
- Twitter: #MTBoS
- VisualPatterns.org
- IllustrativeMathematics.org
- MathematicsVisionProject.org
- InquiryMaths.com
- nRich.Maths.org
- Mathalicious.com

Indiana Jones movie clip: <https://www.youtube.com/watch?v=dJ920fat50M>

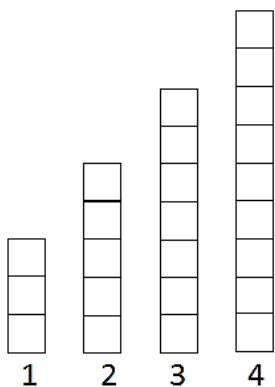


- Density of Gold: about 19.32 g/cm^3 (at room temperature at sea level)
- Density of Sand: varies based on composition, but an estimate is 2.5 g/cm^3
- Size of Statue: about 7.5" tall, 4.25" wide, and 5" deep
- 1 inch \sim 2.54 cm, 1 lb \sim .45 kg
- A grown man can easily lift about 30 – 40 pounds in one hand (13.6 – 18.1 kg)

IM1 3.2H/IM1 3.3 Scott's Workout

A Solidify Understanding Task

Scott has decided to add push-ups to his daily exercise routine. He is keeping track of the number of push-ups he completes each day in the bar graph below, with day one showing he completed three push-ups. After four days, Scott is certain he can continue this pattern of increasing the number of push-ups he completes each day.



1. How many push-ups will Scott do on day 10?
2. How many push-ups will Scott do on day n ?
3. Model the number of push-ups Scott will complete on any given day. Include both explicit and recursive equations.

Aly is also including push-ups in her workout and says she does more push-ups than Scott because she does fifteen push-ups every day.

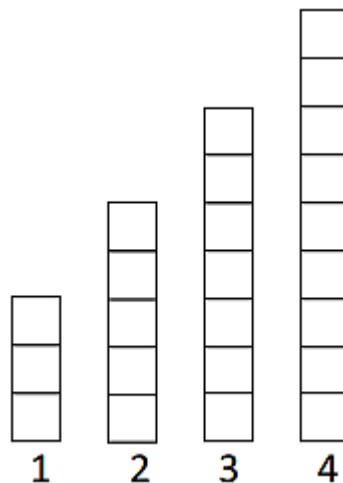
4. On which day will Scott do more push-ups than Aly?
5. How many total push-ups will they each have done by day 3? By day 6?

6. On which day will their total number of push-ups be the same? How many total push-ups will they have on this day?

IM1 9.2H/IM2 1.3: Scott's Macho March

A Solidify Understanding Task

After looking in the mirror and feeling flabby, Scott decided that he really needs to get in shape. He joined a gym and added push-ups to his daily exercise routine. He started keeping track of the number of push-ups he completed each day in the bar graph below, with day one showing he completed three push-ups. After four days, Scott was certain he can continue this pattern of increasing the number of push-ups for at least a few months.



1. Model the number of push-ups Scott will complete on any given day. Include both explicit and recursive equations.

Scott's gym is sponsoring a "Macho March" promotion during the month of March. The goal of "Macho March" is to raise money for charity by doing push-ups. Scott has decided to participate and has sponsors that will donate money to the charity if he can do a total of at least 500 push-ups. As a bonus, they will donate an additional \$10 for every 100 push-ups he can do beyond his goal of 500 push-ups.

2. Estimate the total number of push-ups that Scott will do in a month if he continues to increase the number of push-ups he does each day in the pattern shown above.
3. How many total push-ups will Scott have done after one full week?
4. Model the total number of push-ups that Scott has completed on any given day during "Macho March". Include both recursive and explicit equations.
5. Will Scott meet his goal and earn the donation for the charity? Will he get a bonus? If so, how much? Explain.

IM3 1.1H/3.1: Scott's Macho March MADNESS

A Solidify Understanding Task

Each year, Scott participates in the “Macho March” promotion. The goal of “Macho March” is to raise money for charity by finding sponsors to donate based on the number of push-ups completed within the month. Last year, Scott was proud of the money he raised, but was also determined to increase the number of push-ups he would complete this year



This year, Scott’s plan is to look at the total number of push-ups he completed for the month on any given day last year, and do that many push-ups on the same day this year. For example, on day one, he will do three push-ups. On day two, he will do eight push-ups (the sum or total number of push-ups he completed on day one and two from last year). See earlier task for table and equations from last year. If Scott follows this pattern, determine the following:

1. On day three, he will complete ____ push-ups.
2. How many push-ups will Scott complete on day four? How did you come up with this number? Write the recursive equation to represent the number of push-ups Scott will complete today based on the number of push-ups he completed yesterday.
3. How many **cumulative** push-ups will Scott have completed for the month on day four?
4. Without finding the explicit equation, make a conjecture as to the type of function that would represent the explicit equation for the cumulative number of push-ups Scott would complete on any given day this year.
5. How does the rate of change for this explicit equation compare to the rates of change for the explicit equations in questions 1 and 2?
6. When looking at consecutive differences, how does the rate of change compare to the explicit equation for the function.
7. Find an explicit equation for the cumulative number of push-ups Scott would complete on any given day this year.