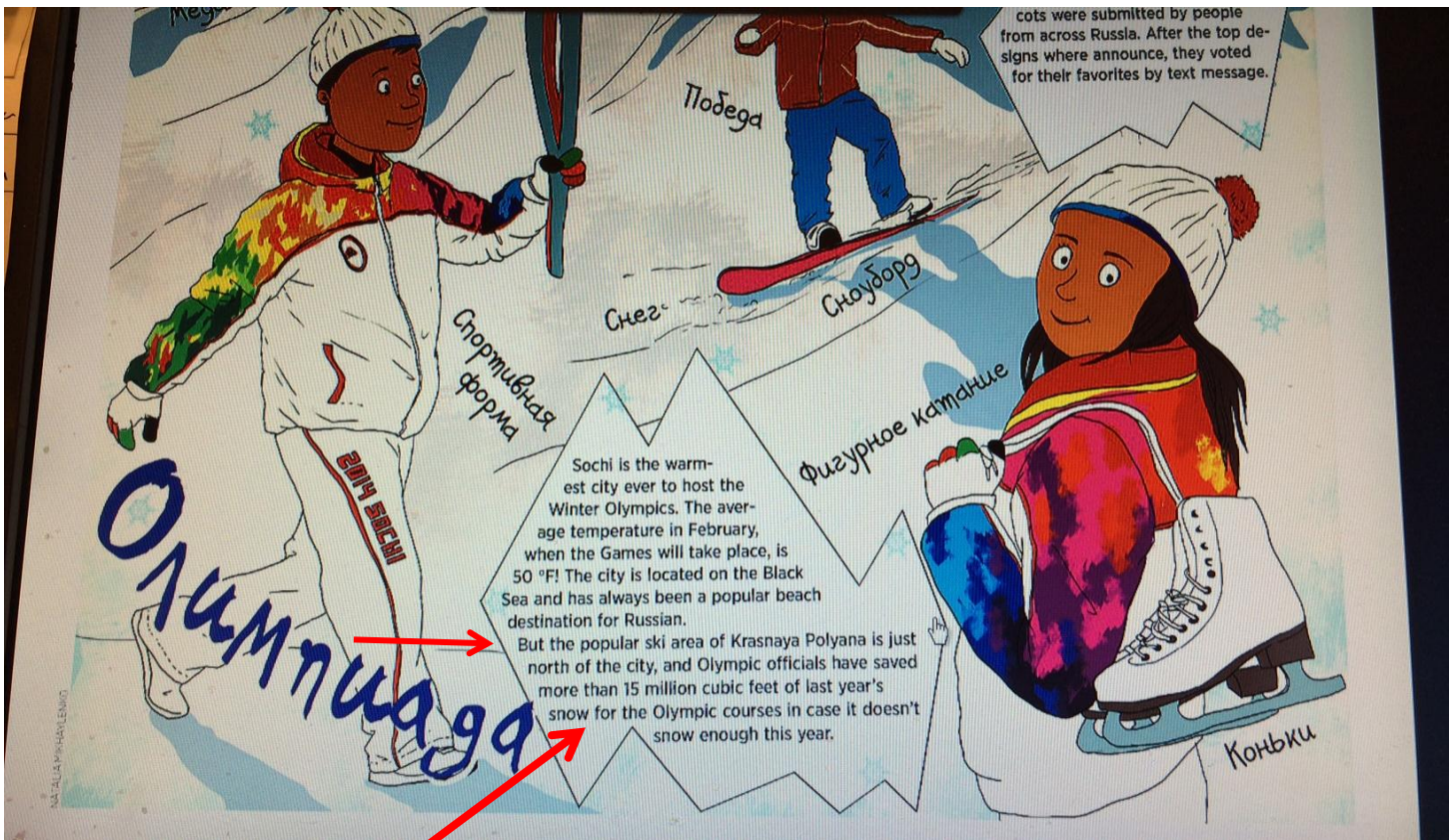


HEAT

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Tx 78701 jpcise@aol.com & New York Times Nov.17, 2013 Russian Advertisement, Russia Beyond The Headlines



INTRODUCTION: Read this area first. In case not enough snow falls on the Russian ski slopes for the February 2014 Olympics near Sochi Russia (on Black Sea), Russian Olympic officials have saved 15 million cubic feet of last year's snow.

QUESTIONS: (a) If this $15 \times 10^6 \text{ ft}^3$ of snow was used to make a ski trail 100 ft. wide and 3 ft. deep, how many feet long would the ski trail be? (b) How long would the ski trail in (a) be in miles? (c) Convert $15 \times 10^6 \text{ ft}^3$ into m^3 ? (d) Find the mass in kg. of $15 \times 10^6 \text{ ft}^3$ of snow? (e) Let all that snow melt in a huge big box square enclosed building (like Wal-Mart or Target, etc.) with 15 ft. high ceilings. Consider the inside building temperature dropped from 31 to 21 degrees Centigrade. What would the length and width (would be the same since a square building) of such a square building in feet and miles?

HINTS: Heat needed to melt snow = Heat extracted from air in huge building so as to drop the inside temp. 31 to 21 °C .
 Air density = 1.2 kg/m^3 , specific heat of air = 1 KJ/kg K , latent heat of fusion of water = 334 KJ/Kg , $5280 \text{ ft.} = 1 \text{ mile}$
 density of snow = 250 Kg/m^3 , density = mass/volume , mass = density X volume , $L_f = Q/m$, $Q = c m \Delta t$, $0.0283 \text{ m}^3/\text{ft}^3$

ANSWERS: (a) 50,000 ft. (b) 9.47 miles, (c) $0.4245 \times 10^6 \text{ m}^3$, (d) $106.125 \times 10^6 \text{ kg.}$, (e) $L = W = 83,400 \text{ ft.} = 15.8 \text{ miles}$

