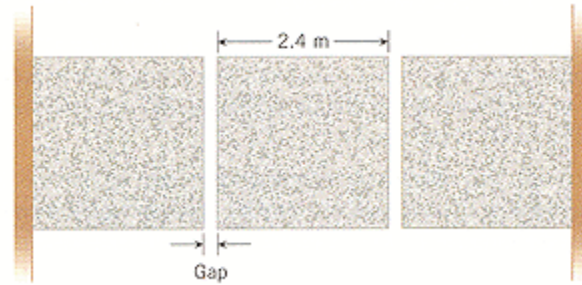


1. A steel section of the Alaskan pipeline had a length of 65.00-m and a temperature of 21.00-°C when it was installed. What is its change in length when the temperature drops to a frigid -46.00-°C?
(-5.23 x 10⁻²-m)

2. When the temperature of a coin is raised by 75.00-°C, the coin's diameter increases by 1.90 x 10⁻⁵-m. If the original diameter is 1.80 x 10⁻²-m, find the coefficient of linear expansion. **(1.41 x 10⁻⁵-°C)**

3. Concrete sidewalks are always laid in sections, with gaps between each section. For example, the drawing shows three identical 2.40-m sections, the outer two of which are against immovable walls. What is the minimum gap width necessary to account for an increase in temperature of 38 °C?
(1.64 x 10⁻³-m)



4. A lead object and a quartz object each have the same initial volume. The volume of each increases by the same amount, because the temperature increases. If the temperature of the lead object increases by 3.80-°C, by how much does the temperature of the quartz object increase? **(220-°C)**

5. Suppose that the steel gas tank in your car is filled when the temperature is 16.00-°C. How many gallons will spill out of the 20.00 gallon tank when the temperature rises to 25.00-°C? **(1.65 x 10⁻¹-gal)**

6. If the price of electrical energy is \$0.10 per kilowatt-hour, what is the cost of using electrical energy to heat the water in a swimming pool (10.0-m x 9.00-m x 2.00-m) from 11.00 to 29.00-°C? **(\$377)**

7. When you take a bath, how many kilograms of hot water (47.00-°C) must you mix with cold water (14.00-°C) so that the temperature of the bath is 36.00-°C? The total mass of water (hot plus cold) is 192.00-kg. Ignore any heat flow between the water and its external surroundings. **(128.00-kg)**

8. An ice chest at a beach party contains 13 cans of soda at 2.00°C. Each can of soda has a mass of 0.37-kg and a specific heat capacity of 3500-J/(kg·°C). Someone adds a 6.10-kg watermelon at 27.00-°C to the chest. The specific heat capacity of watermelon is nearly the same as that of water. Ignore the specific heat capacity of the chest and determine the final temperature of the soda and watermelon. **(17.1-°C)**

9. How much heat must be added to 0.25-kg of aluminum to change it from a solid at 130.00-°C to a liquid at 660.00-°C (its melting point)?
(2.00 x 10⁵-J)

10. A person eats a container of yogurt. The Nutritional Facts label states that it contains 235 Calories (1 Calorie = 4186-J). What mass of perspiration would one have to lose to get rid of this energy? At body temperature, the latent heat of vaporization of water is 2.42 x 10⁶-J/kg. **(4.06 x 10⁻¹-kg)**